What Transition for Sussex?

AN ESD PROJECT

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An Education for Sustainable Development (ESD) project:

Can the University of Sussex become a Transition University?

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Introduction

The Transition Movement is a promising response to the growing threats of environmental degradation, peak oil and economic instability. Started in 2006 in the little town of Totnes (UK), the grassroots movement has spread throughout the globe. This paper looks at the implications of this movement for the University of Sussex (US) and how it may foster its transition towards a more community-led, environmentally friendly and low impact university.

This project is one of five 'Education for Sustainable Development' (ESD) initiatives, launched at the US in 2013. These projects aim to bring together students and staff in order to develop an "intelligent and creative approach to dealing with sustainable development issues, as part of both curricular and extra-curricular activities."[1] They were launched in response to the University's perceived failure to embed issues of sustainability within its curriculum – an issue highlighted by the 2012 People & Planet Green League audit[2] (with some improvement in 2013)[3]. Funded by the Higher Education Funding Council for England (HEFCE), ESD projects aim "to make sustainable development a central part of our strategy for the future development of the higher education sector."[4] The other projects include the creation of an outdoor learning space, the establishment of a re-usable water bottle scheme, the organisation of a food awareness event ('Pieces of a Feast') and the launch of a 'Transition Sussex' website[5] to bring these projects together.

The inspiration to write this paper sprang from a discussion within a BA seminar: 'Global Environmental Politics' in March 2013. The question asked was: How can the US become an exemplary institution within a rapidly-changing Higher Education (HE) sector, placing 'sustainable development' at the very core of its operation. Our research team has subsequently expanded to over 10 students, both undergraduates and postgraduates. Our understanding is that within contemporary society, universities not only act as hubs of knowledge generation, but also as spaces for debating key social issues. These issues are pivotal with regards to today's twin challenges of social and environmental sustainability.

We are at a point in history where humans are increasingly undermining the very pre-conditions of our own existence whilst material inequalities continue to rise. Dr James Hansen, renowned climatologist and the former head of the NASA Goddard Institute for Space Studies, puts it in no uncertain terms. "The climate is nearing tipping points. Changes are beginning to appear and there is a potential for explosive changes, effects that would be irreversible, if we do not rapidly slow fossil-fuel emissions over the next few decades."[6] Furthermore according to one recent study, the UK is "one of the most unequal rich countries in the world, with the poorest tenth of people receiving only 1 per cent of total income, while the richest tenth take home 31 per cent."[7] Given the magnitude of the challenges faced, the team decided that the US should start acting to bridge the gap between theory and practice. No longer simply a 'hub of knowledge generation' we could work together to create an institution which leads by example.

History of the Transition Movement

It was at this stage in our research that we came across the Transition Movement. Growing rapidly around the world, this grassroots movement seeks localised solutions to the growing threats of environmental degradation, peak energy prices and increasing economic instability. One key figure within this process is the influential author Rob Hopkins, who co-founded Transition Town Totnes (TTT) in 2006. TTT is a "dynamic, community-led and run charity that exists to strengthen the local economy, reduce the cost of living and build our resilience for a future with less cheap energy and a changing climate."[8] The wealth of interest which came flooding in prompted the creation of the Transition Network.[9] It had a simple mission – to inspire, encourage, connect, support and train communities, Brixton to São Paulo, as they adopt and adapt the transition model on their journey to rebuild democratic, community-led livelihoods and drastically reduce fossil fuel dependence.[10] According to the Transition Network, a transition initiative is "a place where there is a community-led process that helps that town/village/city/neighbourhood become stronger and happier."[11] Nowadays, there is a thriving community which establishes Transition initiatives in around 35 countries[12]; the closest to the US being Transition Town Lewes[13].

The earliest instance of this movement surfacing concretely within the HE sector can be found in Transition University Edinburgh.[14] Since 2009, they have been creating an inclusive and participatory (staff, students and citizens of the Edinburgh Transition Town) project with the aim to support and advise the university community in their bid to achieve environmental sustainability. Their projects include cutting energy consumption and skills sharing, such as 'delicious low-impact cooking' classes. Members of the transition committee sit in various official panels and boards of the University in order to ensure university-wide development. The transition model has now been adopted by the University's higher management and the campaign has essentially been incorporated into the University's daily operations.

Another example of a sustained Transition University campaign can be found at the University of St Andrews. They received funding to hire three full time staff in 2011-12 to work explicitly towards transition goals. Joshua Msika, coordinator of the Transition University of St Andrews steering group, notes: "The Transition University staff are university employees but are not directly answerable to anyone from higher management. This is important because their top priority is to work for the University as a community, not the University as a business."[15] They have also managed to boost the Transition University team by running 10-15 volunteer internships. Interns commit to four hours per week which builds them a portfolio based around the Institute of Environmental Manager's checklist of desirable skills.

In order to build a broader movement within the HE sector People & Planet kick-started a Transition Universities 'Going Greener' campaign. The aim is to reduce carbon emissions from HE institutions by at least 43% by 2020.[16] The campaign supports a network of *Transition Universities* working to become resilient and community-led in addressing their environmental and social impacts. Hanna Smith from People & Planet emphasises that the ethos of this movement is one of grassroots and local action.[17] It begins with the premise that we, the people of the world, cannot afford to wait for governments to prioritise sustainable development. Instead, communities should adopt a 'DIY approach' to local issues.

In order to monitor nationwide progress towards lower environmental impact, People & Planet compiles an annual Green League Table ranking UK Universities by environmental and ethical performance. The US is ranked 65th, with a score of 36.5, around half of the 70 points target. 25.5 points out of 40 were awarded for policy, and only 11 out of 30 for performance. This represents a fall from our 2012 ranking of 45th, scoring 40 points.[18]

The People & Planet website[19] offers a few concrete examples on how to transition towards lower energy consumption and localise food consumption. Foremost however, it underscores the importance of locally adapted bottom-up initiatives involving all stakeholders on an equal footing. The concept of a transition university is relatively flexible, affording considerable scope for each local community to influence the movement itself.

Transition at the University of Sussex

The US within meadows and fields

In order to adapt and adopt the vision of Transition within the context of the US, this report highlights key areas where the University has the potential to minimise its negative environmental impacts by reducing its carbon footprint, promoting local biodiversity and minimising its waste. Although there are many potential avenues for research, we have identified four key areas for our report: Section one focuses on biodiversity because US is located within the thriving South Downs National Park, which is incredibly species-rich in both flora and fauna. Section two, “Living infrastructure”, analyses different building possibilities given the University’s plans to vastly expand student numbers. The third and fourth sections, “Energy consumption” and “Waste reduction and disposal”, represent pivotal areas in the University’s resource input and output. With the help of a number of field trips (i.e. to the Biomass Heat and Power Plant at the University of East Anglia, recycling and landfill facilities in the Sussex area), interviews with experts and practitioners (i.e. People & Planet, UEA Carbon Crew, Student Union representatives) and workshops (Brighton-based Organic Roofs, Sussex Estates and Facilities Management), we have examined and evaluated on-going activities at Sussex, and explored ideas for improvement.

This report represents a first step; it aims at encouraging both further research and active initiatives to put these findings into practice. With the overarching aim of transitioning the US into an inclusive, community-led and low-impact campus, this

report proposes to take Transition as a priority goal and establish corresponding practices.

One key finding which runs through all four sections of the report is an apparent lack of student representation within relevant decision-making bodies. This prevents a more inclusive, transparent and creative approach to sustainability. In general, key characteristics of a Transition Initiative (e.g. community-led, local and bottom-up action) are lacking at the US.

However on-going sustainability projects (co-coordinated by individuals, the Student Union as well as the ESD) do exist. For example, the 'SCOOP' food cooperative provides affordable organic wholefoods, 'Sussex Roots' runs the campus allotment and the 'Sussex Shoots' local veg-box scheme is about to be launched. 'Free Wheelers' provide bike repairs, whilst the 'Re:Cycle' bicycle-hire cooperative lends bikes to students at affordable prices. Thousands of students and staff came together to oppose the recent outsourcing of services, and social media forums have been created to spread information about on-campus alternatives to Chartwells-managed food outlets.[20] Furthermore, a Transition Sussex website is in the process of completion to bring together Sussex's grassroots initiatives in order to share ideas and resources.

Stronger institutionalised support for this wealth of activity would help move towards the transitioning of the US into an inclusive academic institution which puts high-level research into practice. This would establish the US as a university capable of finding and adopting solutions to today's key environmental and social challenges.

At this pivotal moment in the histories of the University of Sussex, the UK's HE sector and indeed the entirety of human civilisation, it is essential that we come together to bridge the gap between sustainability in theory and in practice. US Management's 2013 Draft Strategic Plan states that Sussex has a unique place amongst British universities due to "our combination of academic radicalism with rigorous criticality."[21] It is our sincere hope that together we can transition the US into an institution which matches its academic credentials with real-life contributions towards environmental and social sustainability. In short we are asking: how can the US *be* the change that we want to *see*, *read about* and *teach* in the world!

Biodiversity

Sussex University and the surrounding countryside

Sussex University is nestled in the eastern side of the South Downs National Park, designated as such in 2010.[22] As one of 15 national parks in England,[23] this designation highlights the cultural, ecological and historic importance of the area surrounding the University. This area is recognised as one of outstanding natural beauty, and is comprised of coastal habitats, woodland, heathland, pasture/arable farmland as well as urban areas.

Fields of the South Downs

The South Downs vegetation sits on chalk hills, meaning the soil retains little water and is low in essential nutrients. This combined with centuries of grazing means few plants are able to dominate - creating a highly diverse grassland community. Chalk grassland may be as diverse as 40 species per square metre.[24]

Two species which particularly favour chalk grassland are the rare Pasque flower (*Pulsatilla vulgaris*), which is only found in 19 sites across England, and the kidney vetch (*Anthyllis vulneraria)* - a small yellow flower which grows in clumps and is the sole foodplant for the small blue butterfly larvae, a priority species in the UK due to its serious population decline. Orchid species such as fragrant orchid (Gymnadenia conopsea), bee orchid (Ophrys apifera) and the pink pyramidal orchid (Anacamptis pyramidalis) can also be found in the area surrounding the University.

The University is situated in the Brighton & Hove and Lewes Downs area, which is in the process of applying to become a UNESCO (United Nations Educational, Scientific and Cultural Organization) 'Biosphere Reserve'. The purpose of this designation is international recognition of the South Downs as a ‘world class environment’, promoting a balanced relationship between people and nature.[25]

Some of the project aims[26] are as follows:

1. **Promote nature conservation**

   Improving local wildlife habitats, preserving resources such as water, and better downland management

2. **Sustainable socio-economic development**

   Reduce energy use and waste generation, encourage local food production etc.

3. **Knowledge, learning and awareness**

Increase awareness and knowledge of our environment by working with local universities and the public and actively engage people in the conservation and management of their local area.

The vast diversity of the South Downs is one of its keynote features, making it extremely important to protect. As an anthropogenic habitat (one which was created by people) it is important to continue managing the land to promote biodiversity. Furthermore, international recognition of the South Downs environment through the biosphere project bid is a call for the University to fully engage with the surrounding area, increasing student and staff awareness of the wildlife we share this beautiful landscape with.

Early flowers after the winter

Current University Initiatives

The University has a publicly available Grounds Environmental Policy. This document lays out an array of grounds management procedures. Policies include “a presumption against the use of all chemical pesticides, herbicides and artificial fertilizers”, as well as the commitment that “all horticultural organic waste will be composted.”[27] One major sub-section of this document which is particularly relevant to this paper is that of 'Biodiversity & Grounds Management'. It is here that we can find details of two of Sussex Estates' most positive biodiversity promotion initiatives: tree management and wildflower meadows.

Tree Management

The presence of indigenous tree species at Sussex played a huge role in the original campus design. Sir Basil Spence, the architect who designed the University campus in the 1960s has been reported to have taken his inspiration from a spine of mature trees which ran through the centre of the campus.[28] Much of this original spine has unfortunately been lost, however there remains a number of rare specimens on campus, including some mature Beech (*Fagus sylvatica*) and some of the largest English Elms (*Ulmus procera*) remaining in the country.

Since the year 2000, a tree survey has been carried out creating a catalogue of individual trees which is updated in a five-year cycle. Furthermore, in December 2012, staff and students combined to help plant new woodland containing 2,500 indigenous trees on campus. This was part of a bigger initiative from leading conservation charity 'The Woodland Trust', who planted six million trees nationwide.

Wildflower Meadows

University estates are also in charge of managing a number of wildflower meadows in and around campus. These meadows have the dual purposes of adding to the campus' position as a designated area of outstanding natural beauty and, perhaps more importantly, providing vital nutrition for our rapidly declining population of bees and other pollinators. A number of rare wild orchid species which are present on campus are being regularly monitored and plotted onto a biodiversity map.[29] Furthermore, in a recent project a number of new meadows have been created.

The idea of creating areas of nectar-rich forage on campus came from Dr Karin Alton, a honey bee researcher at the University's Laboratory of Apiculture and Social Insects (LASI). Away from Sussex, she runs 'FlowerScapes', who supply special seed mixes for creating habitats that attract pollinators. Dr Alton explains: "Our pollinating insects have suffered major declines; honey bee colonies, for instance, have decreased by three-quarters in the last century, and two species of bumblebee have become extinct. One of the major sources of this decline is lack of food resources in the wider countryside."[30]

A rich wildflower meadow at the US

Policy and Performance

Estates policy on grounds management seems congruent with the aims of biodiversity promotion and sustainability. However, it is telling that in the recent

People & Planet Green League results, Sussex scored 25 out of 40 for policy, yet only 11 out of 30 for performance.[31] Biodiversity policies are important, but bottom-up community engagement will be necessary if we are to create a truly sustainable campus.

One common trend which emerged during the research for this paper was a lack of collaboration between university estates and various environmental student groups. Sussex boasts an active Environmental Society, the SCOOP food cooperative and the Roots society. Yet, they all seem to exist without much collaboration with estates management. In a recent interview, Emily Tamsin Holme of the Roots Society reported: "During my three years with Roots I feel there has been very little contact with anyone from the University."[32] Furthermore, Ben Lucas, the outgoing Ethical & Environmental officer of the Student Union made the following statement.

> During my time as Ethical & Environmental officer I had limited contact with the University. I was only invited to attend 3 organised termly meetings to discuss ethical and environmental issues at the University of Sussex. I felt this was inadequate and made me wonder how highly these issues are prioritised at a management level. Whilst some of my ideas were heard and carried out, and other good things have been done, more frequent contact on these issues with not only elected officials, but open meetings with concerned students could lead to more ideas/alternative solutions to Sussex's declining standings in the Green League tables.[33]

It is important to note that a similar desire for more student and estates engagement has been expressed by university estates in recent meetings. One factor contributing to this apparent communication breakdown could be the 2012 closure of the entire “Lifelong Learning” department along with all of its community engagement schemes. This department formerly acted as go-between, coordinating different stakeholders. Vice-Chancellor Michael Farthing commented on the closure: "Given the government’s policies regarding the funding of higher education, the University can no longer support such courses.”[34] Regular meetings between estates, Student Union officers and the wider student body would certainly go some way to restore community engagement on sustainability issues.

One issue which has become a recent cause for concern for a number of stakeholders is that of the University's expansion plans. The 2013 Draft strategic plan announces: "Our ambition is to achieve substantial growth in student numbers of up to 50%. This will be achieved over the planning period [2013-18] by sustained investment in staff and campus infrastructure."[35] Given the nature of the University's location this will incur significant risk to local biodiversity. This paper may not be the place to discuss the nuances of this issue given the lack of details currently available, however, the lack of meaningful consultation points towards a wider deficiency in community engagement at Sussex.

University estates staff had been working extremely hard to promote local biodiversity despite ongoing uncertainty regarding who their employer would be in 2014. After management's unilateral decision to outsource the entire department, Interserve was selected “to provide sustainable and high-quality services to students and staff as the University grows.”[36] They assumed full operational responsibility on

campus from 1 January 2014. A number of key members of estates accepted voluntary redundancy and the direction of Sussex estates management is uncertain.

It has been suggested, however, that local decision making could be negatively affected. Interserve have gross revenue of £2.3 billion and a workforce of over 50,000 people worldwide,[37] so it seems likely that decision-making structures will be distant and lines of accountability blurred. It is impossible at this stage to be sure what the future may hold for Sussex estates.

Falmer and the South Downs National Park

Summary

In conclusion, greater communication and cooperation must be implemented at all levels between the students, staff and management with regards to biodiversity policy. Sussex's bottom-up decision-making structures have been shown over this past year to be limited at best. Despite mass protest from staff and students, management have proceeded with their outsourcing plans.

However, there remain a number of ways in which the Sussex community can work together to promote community cohesion and local biodiversity. Increasing pressure can be placed upon Sussex management to implement a more democratic command structure at Sussex. Management's vast expansion plans should be scrutinised, and if they do go ahead, mitigation of negative environmental impacts should be at the core of sustainable development planning. This can be achieved through communication with conservation organisations such as Sussex Wildlife Trust and the Brighton & Hove Biosphere Project. Furthermore, regular meetings between student groups and the new estates team will help keep up communication between different actors on campus. This will go some way towards ensuring that the good work which is already occurring, such as wildflower meadow and tree maintenance, is continued.

Finally, it is worth mentioning that it is often during these troubled times that grassroots organisation flourishes most. The Transition movement was born out of communities deciding not to wait for traditional authorities to address the issues which matter most to them. In short, it was only ever going to be grassroots community organisation which pushes forward the Sussex transition!

Living Infrastructure

Rooftop of the Jubilee Lecture Theatre

This picture was neither taken in a park nor within meadows and fields. It was taken on the green roof top of the Jubilee Lecture Hall and is a great example of the green living space that can be planted on top of buildings.

Roof top of the Checkland Building, University of Brighton

Similarly, this thriving flora with rich and long grass and flowers, providing a habitat for a range of species, would not be out of place on the grounds within the South Downs. Yet, it rests on top of the University of Brighton's Checkland building.[38]

According to Organic Roofs, a local business working in the field of living infrastructure, green roofs can “provide a food source for threatened species in your area, making your living roof a meaningful contribution to wider efforts to address the challenges of the 21st century.”[39] But not only can they expand the area where local flora and fauna may thrive, they also provide additional gardens and living space for the community where people can engage with each other while being surrounded by ‘nature’. Lee Evans, the director at Organic Roofs, was kind enough to hold an inspiring workshop where this Transition group evaluated living infrastructures, investigating the benefits that they can provide for the US campus. Living infrastructure provides a chance for US buildings to make a meaningful impact towards conserving the environment and providing a healthy living space for its people and wildlife.

Living or green infrastructure conceptualises space as 'multi-functional', which means that a space is shaped so that it provides multiple benefits. It seeks to develop a more symbiotic way of appropriating the environment, one that is much closer to the cyclical and sustainable way of nature. The concept originated through urban movements and planning to infiltrate and change the dichotomy of urban and non-urban. Yet, already the Hanging Gardens of Babylon could be seen as an early example of green roofs. Living infrastructure nowadays is seen as a solution to make cities greener and reduce the devastating impact that urban areas have on biodiversity and natural grounds. It aims at building around the landscape instead of transforming it.

Living infrastructures manifested themselves very differently around the world. The trend has specifically increased in a few cities such as Portland, Copenhagen and

London. This is particularly relevant in these areas, as they are 'urban heat centres' and have a high proportion of concrete within an area that significantly changes the environment. Roof vegetation can absorb the heat and reduce the urban temperature. It effectively brings indigenous nature (plants, flowers and insects) back into the city centres.[40] 'Imaginary Green London' is a vision by the Environment Agency of how London could look like if more care was taken to bring back nature into (or onto) the city of London.[41]

'Imaginary Green London

By 'greening' urban spaces, living infrastructures can make a positive impact towards limiting climate change as well as towards adaptating to it (such as water management to counter inundations, prevent rainwater run-off, maintenance of biodiversity, capability to store carbon and pollution within the vegetation growing on the buildings).[42] With the growing expansion of buildings and on-going construction at Sussex, green roofs and other living infrastructures can provide a way to limit the detrimental effects that new areas of concrete have on natural grounds, biodiversity and the environment as a whole. They can, after careful inspection of the building structure, often be retrofitted onto existing roofs.

Jubilee Building Entrance

Importantly, they could reduce water run-off and reduce the pressure on the drainage system on campus. The drainage system was not suitable for the expansion of the campus community, leading to new drainage construction in the summer of 2013 to ease the threat of flooding and blockage.[43] Instead of a large expansion of the drainage system, which involves the introduction of non-natural material into the ground[44] and a disturbance to the human and non-human campus community, green roofs could tackle the drainage problem at its roots. They would reduce the rainwater run-off as they store water within their vegetation, easing the pressure on the campus drainage system.

Construction material for the Drainage System

With the integration of plants that are especially suitable for threatened species, the US could make a valuable contribution to the conservation of rare species and biodiversity in Sussex. It could provide green habitat amid concrete, with even small areas such as the green roof on top of the

Jubilee (see image) providing resting places for birds. In her study on green roofs in the Sussex area, a former US student, Helen Burgess, found that they indeed provide habitat for very rare birds.[45] The University of Brighton is building green roofs and their vegetation nourishes rare wildlife such as Chalkhill Blue Butterflies and Hazel Pot Beetles.[46] So-called 'extensive green roofs' are left to colonize naturally or sown with local wildflower mixes (as opposed to 'intensive green roofs' which are more like gardens or parks). These enhance the local vegetation, require very little maintenance and are relatively inexpensive to establish.[47]

Living walls and roofs can also reduce energy use as they cool down buildings in the summer and insulate heat in the winter.[48] Apart from monetary benefits[49], which amortise the initial higher costs of installing living infrastructures, this can reduce the carbon impact on the atmosphere.

Importantly, living infrastructure aims to benefit people on an everyday basis. The University of Brighton conducted a project to study and build green roofs along the principles of permaculture. The project report states that green roofs provide "a living, participatory teaching and learning experience."[50] They increase green and natural public space for students and staff; they are a way to re-appropriate and build green space that would otherwise be lost in conventional construction styles.

Green roof of the Jubilee Lecture Hall

From a Transition Movement's standpoint, increasing green public spaces for the campus community to engage outdoors in the natural surroundings (i.e. holding seminars outside, groups planting flowers, maintaining gardens, organising picnics, etc.) would be highly welcomed. Arguably, careful consideration of the existing building structure has to be taken into consideration when building living roofs. Yet, while providing efficient and cost reducing insulation, living infrastructures could decrease potential detrimental impacts of more buildings being constructed on

campus. Therefore, green roofs have great potential to lower the US' environmental impact, providing a visual statement of the beliefs, principles and values of living within natural boundaries.

The US contract with Interserve, which is taking over the facility management services, includes provision to “improve and enhance the University Estate.”[51] Currently, £5 million have been set aside for projects.[52] Part of this could be dedicated to living infrastructure, creating a project that would not only integrate natural concerns into the campus infrastructure, but would help to ease increasing drainage pressure on site and enable the University to display its green credentials. That way, the campus can combine the needs of its distinguished and diverse natural surrounding with those of its human members. This would provide Sussex with the possibility to take up its role as an institution that is on the fore of finding and teaching solutions to biodiversity decay and the destruction of our lived environments.

Energy Production and Consumption

Energy production and consumption are at the forefront of the US' sustainability issues. However, given the current outsourcing plans, we have identified potential limitations that could result from such a move in relation to the University's transition. In order to make a contribution, we first evaluate the potential for on-site energy production by examining the case of the Heat and Power Plant of The University of East Anglia (UEA). Following this, we will discuss current initiatives from the UEA aimed at the reduction of energy use, as well as potential areas for investments for the US.

Energy Production

A 'closed circuit' at Sussex

Patrick Pica, former Energy and Environment Manager at the US, was previously responsible for a Sussex biomass feasibility study. The aim was to assess whether it would be possible to create a 'closed circuit' in which Sussex generates the majority of its own power needs. The advantages of such a system would be twofold. Firstly, this would contribute to a drastic reduction in the University's carbon footprint. Secondly, local power generation could shelter Sussex from vastly fluctuating (usually rising) fossil fuel prices. Essentially, this 'closed circuit' would be an attempt to combat what People & Planet refer to as "the twin challenges of climate change and energy security."[53]

However, Pica's study was shelved due to the impending outsourcing of Estates and Facilities Management; nonetheless, we decided to resume this line of enquiry due to its compatibility with a vision of localised Transition. It is questionable whether private contractors will prove willing to undertake a project with such long-term returns, but we can continue to present alternatives which may soon become economically viable.

Energy production at the UEA

In order to research current local power generation initiatives, a visit to the UEA (currently 28th in the P&P Green League table[54]) was organised. UEA currently uses natural gas to fuel its combined heat and power system utilising a district heating system. Heat networks, also referred to as district heating schemes, supply heat from a central source directly to homes and businesses through a network of pipes carrying hot water.[55]

In April 2009, the Department of Energy & Climate Change commissioned an assessment of the technical potential and costs of district heating in the UK.[56] The assessment showed that in the right conditions heat networks could:

- supply up to 14% of the UK's heat demand

- be a cost-effective and viable alternative to individual renewable technologies while reducing the cost of energy for consumer

The Biomass Heat Plant at the UEA

Natural gas has in fact been described as a low-carbon substitute for oil and coal. However recent studies suggest that shale gas, an increasing component of natural gas consumed, has a 20-100% greater footprint than coal over a 20 year time-horizon. Whilst burning natural gas emits less greenhouse gases than oil or coal, the extra emissions occur at the moment when shale is hydraulically fractured. Large quantities of methane are released into the atmosphere, which is intentionally burned or released through vents.[57]

Furthermore we have already seen the strong opposition in the West Sussex community to local oil and shale gas exploration, with over a hundred people arrested attempting to prevent exploration near Balcombe last year.[58]

What is Biomass and what are the advantages?

Biomass is organic matter of "contemporary biological origin (i.e. that was living recently)"[59] such as wood, straw, energy crops, sewage sludge, waste organic materials, and animal litter. It can be described as "a form of stored solar energy which is captured by the organic matter as it grows. This energy is released by combustion (burning) or fermentation and distillation (to produce liquid transport fuels). Biomass materials used as fuel sources can provide heat, electrical and motive power."[60] From a financial perspective, combusting biomass fuel has already been recognised as one of the most cost-effective ways of using biomass for energy production (in terms of the cost per tonne of carbon emissions avoided).[61] Thus, there is real financial incentive for switching to biomass.

Biomass at the UEA – the logistics

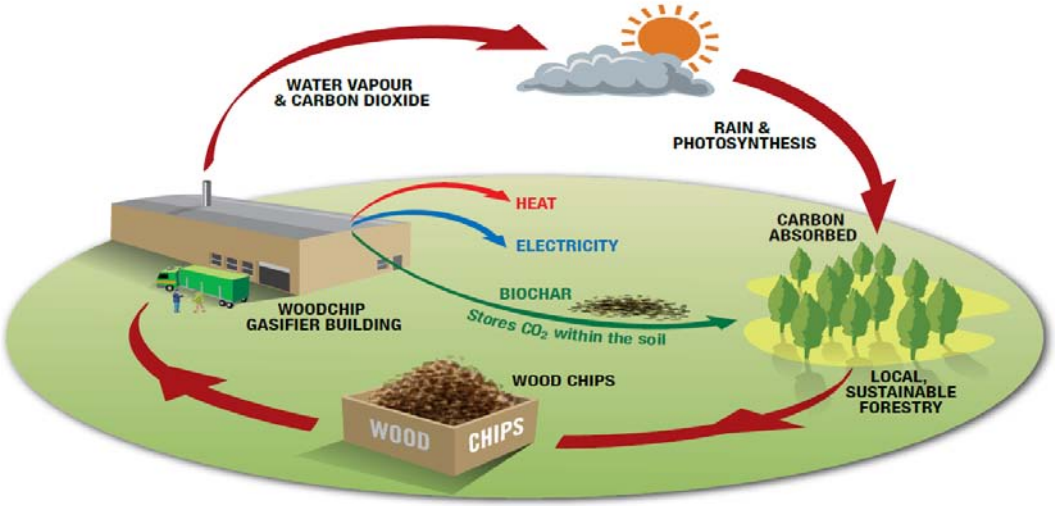
A Biomass gasification facility was initiated at the UEA through an audit undertaken by Dr Simon Gerrard (Chief Technical Officer of the Adapt Low Carbon Group) and his colleagues in 2003-4. Building began in 2006-7 and was predominantly funded by UEA itself (with a £2.7 million fund provided by DEFRA ESD). The gasifier is currently under extended testing as it is not yet operational. Since the initial build, they have lacked sufficient in-house expertise regarding its running and maintenance. This has essentially been built-up over the last three years through a continuous learning process.

The gasifier, if running as planned, would be in operation 24 hours a day, 365 days a year in a predominantly automated fashion with minimal staffing requirements. It would produce one third of UEA's campus energy and heat needs (1.5 megawatts peak electricity; 2.5 megawatts heat).

Woodchips stored in the Biomass Heat Plant

The last 'Energy and Environment' report from US management estimated 2012-13 electricity consumption at 20,810,783 kilowatt hours (kWh), and the total site gas-heating consumption at 41,071,635 kWh. The 1.5 megawatts peak electricity which the gasifier could generate translates to 13,148,715 kWh per year.[62] This would be 63.2% of our electricity needs. The 2.5 megawatts of heat generated would translate to 21,915,000kWh per year replacing 53% of our gas consumption.

Running at this capacity would require 10-12,000 tonnes of biomass per year, equating to three lorry loads per day. As such, transportation emissions would need to be taken into account before analysing the carbon-reduction impact of this project. The biomass used is currently exclusively virgin woodchip from managed forests. As such, its production does not entail the use of potentially arable land, as it is a bi-product of the commercial logging industry. The woodchips are sourced locally from a 'thinning' process.[63] Whilst the biomass gasifier could in theory run on recycled wood or any biological material, this would risk emissions of toxic chemicals, breaking minimum legal safety standards as well as raising further problems for the cleaning process. Nonetheless, the building of such a facility aims towards developing a more sustainable energy production cycle by effectively running it in a closed circuit fashion, as presented in the schema below.



The Biomass Heat Plant Closed-Circuit

Bi-products from the process include bio-char which has a range of potential uses, including being put back in the land. It has a proven track-record of increasing soil-fertility and is currently being tested for its carbon sequestration potential (negative

carbon emissions). Furthermore, phenols that are produced can be used in the development of (compostable) bio-plastics.

What current transition for the US?

In October 2013, the US announced Interserve as its preferred bidder for facilities management services. One of the goals of the University in appointing Interserve for facilities management is to "bring about a significant improvement in services". As such, energy efficiency is reduced to no more than a 'service' delivered by a multi-national corporation.

The 10-year contract is expected to see the University and Interserve working together to improve services and bring about additional investment and benefits such as:

> Investment by Interserve to improve energy efficiency and carbon management and help [US] meet our carbon management targets. Interserve have guaranteed to reduce carbon emissions by 42% in 2016 and 60% in 2023, enabling the campus to become one of the most eco-friendly and efficient in the country.[64]

Whilst this initially seems positive, there are a number of issues which stand out. Primarily, the University and Interserve will form a limited liability partnership (LLP) in order to operate the contract.[65] The LLP will become a separate legal entity and so Interserve has limited liability in the case of extreme failures.[66] Furthermore, such drastic targets without any information about how they are to be achieved, raises some questions. Furthermore Interserve have large vested interest in the nuclear power industry. According to their website "Interserve has over 65 years' experience delivering large-scale, safety critical projects within the nuclear sector."[67] This may be problematic, as it conflicts with the concept of on-site production.

At this stage we cannot be sure what plans the US management and Interserve have in store, but it is important that we monitor the situation closely and get included in the decision-making process. Large investments in carbon-reduction will certainly be welcome. However, we must ask ourselves why these investments are being made through the intermediary of Interserve. We need to work towards a longer-term environmental agenda, one reaching beyond the 10-year time frame proposed by Interserve.

Energy Consumption

Whilst financial investments in energy production can make a contribution towards achieving the aim of Transition, such positive impact can too easily be rendered meaningless unless supported by a new 'consumption strategy'. Addressing debates concerned with the economics literature on the possibility of decoupling economic growth from energy use, Sussex University researcher Dr David Ockwell has argued for the need to go beyond a simple focus on decarbonising energy supply. Besides decarbonising energy supply, the 'rebound effect' is a central factor of concern. "The rebound effect refers to the idea that increases in energy efficiency might result in increases in energy consumption."[68] One school of thought has argued that the

effect of any energy-efficiency improvements is a net increase in overall energy consumption.[69,70]

> An example of a direct rebound effect would be if an improvement in the fuel efficiency of a car resulted in consumers driving the car further due to the reduced cost of driving each mile and therefore, on aggregate, used more fuel than they did before the efficiency improvement was made. An example of an indirect rebound effect would be if the money saved from reduced fuel consumption from more efficient cars were spent on overseas flights. The economy-wide rebound effect is the sum of the direct and indirect rebound effects.[71]

In terms of our argument, it means the expected effect from investments by Interserve does not necessarily guarantee a reduction in greenhouse emissions from campus; they need to be supported by a new energy consumption strategy.

For Dr Ockwell, the policy implications are straightforward; two urgent policy requirements are necessary:

- Decarbonising energy supply: If energy use is more closely related to economic growth than has traditionally been assumed, as the ecological economics literature suggests, this implies an urgent need to focus efforts on decarbonising energy supply.

- Developing and deploying energy-efficient technologies while paying attention to potential rebound effects: while some energy-efficient technologies may have the potential to reduce the energy intensity of economic activity, they must be considered within the context of any potential rebound effect.

In fact, this argument reinforces the notion that we need to find complementary strategies to that of simply decarbonising energy supply. We need to alter consumption behaviour in order for energy-efficient technologies to achieve their true potential: decreasing our energy-needs. It is consumers' behaviours we need to 'decarbonise'. We now provide two examples to illustrate this point.

Metering

After initial research, it became apparent that the metering infrastructure at Sussex is outdated. Brighton University (currently 5th in the People & Planet Green League[72]) has real-time energy management of buildings, enabling them to track energy consumption all over campus and take appropriate action in those areas where energy consumption is highest. In comparison, at Sussex, meters are read manually by two employees (there are currently three incoming energy supplies to campus which are monitored on a half-hourly basis and only one monthly report). There are 85 meters in total and figures are only produced on a quarterly basis. Therefore, data at the US is poor due to an apparent lack of previous and ongoing investment in metering infrastructure. The US could benefit from investments in this area as close, real-time monitoring is essential to reduce energy consumption levels.

Carbon Crew at the UEA

The UEA adopted a new strategy, the Carbon Crew, to showcase the benefits of the reduction of energy use on campus. The Carbon Crew was implemented in 2007 under the control of Adapt Commercial – the UEA's own environment and sustainability focused consultancy company.[73] The then estates energy managers used Adapt and Carbon Crew to learn about people's behaviour with respect to carbon emissions and energy consumption, and to change behaviours for the better.

Carbon Crew led to the creation of teams comprised of students and staff who volunteer their time to promote environmental issues and best practice on campus. With respect to students, this has grown from 4-5 active students up to 20 currently. Members help in disseminating information, reminding colleagues to properly recycle and eliminate unnecessary waste by switching off lights and unused electrical equipment. A 'Reducing our impact' course is also run as part of the Carbon Crew initiative.

From 2007-10, the Carbon Crew contributed to a 10-15% reduction in energy use on campus. This initiative demonstrates that in-house management was able to develop a strategy to promote carbon reduction. Indeed, the consumption reduction resulted from no more than an established dialogue (between staff and students) to encourage everyday sustainable behaviours.

The seemingly individualistic consumption challenge became an affair of collective spirit. A website was created to provide information on various energy saving behaviours people can 'pledge' to undertake; the site provides feedback on the total energy saved from various 'pledges', and information on the total energy saved by each member signed up to the scheme. Importantly, providing feedback enables people to connect everyday behaviours to energy use and savings, hence consumption reduction.

This teaches us another important point: the aim of sustainability through carbon footprint reduction is not simply dependent on financial investments in technology from a corporation such as Interserve. A comprehensive dialogue between staff and students is pivotal to the smooth-running of such initiatives and to improving energy and carbon management.

We can therefore see how alternative projects such as those presented above make a positive impact towards the aim of Transition. Sussex already hosts a wealth of grassroots activity and, on the consumption side at least, students and staff have a say in how to achieve more sustainable carbon management. Established projects,

such as at UEA, have shown that comprehensive strategies, which involve the wider campus community, can make an even larger contribution towards actually reducing energy consumption and achieving the aim of Transition.

Waste Disposal and Prevention

Recycling and waste bin at the US

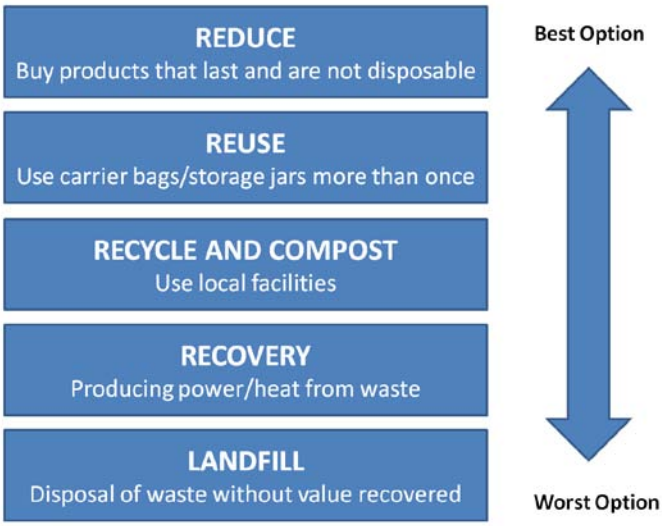
One of the key issues for a university to minimise its impact on the planet is its waste.[74] Waste represents resources that were originally used to produce an object that is discarded, as well as resources that could have been re-used. In transitioning Sussex, it is crucial to have a thorough understanding and approach to our waste.

Particularly useful in this context is the concept of 'cradle to cradle', coined by Walter R. Stahel in the 1970s, and made popular by William McDonough and Michael Braungart with their book "Cradle to Cradle: Remaking the Way We Make Things" (2002). It developed a holistic concept aimed at re-using products in the way of 'upcycling', rather than 'downcycling'. According to McDonough and Braungart, the current recycling system down-cycles: the conversion of materials leads to lower quality and reduced functionality. Yet, they suggest, society should see materials as nutrients that constantly circulate within production processes, aiming for high-quality use of these nutrients. In their book, they give various examples of cities, cars and campuses around the world designed according to the principles of organic life-cycles.[75] Correspondingly, a 'waste' and 'recycling' approach should aim at waste prevention and product upcycling instead of downcycling.[76]

This section is divided into two. The first part is on waste prevention. It looks at present initiatives at Sussex to reduce wasteful materials, analyses initiatives from other universities and points at the waste reduction potential of the US. The second part is on waste management and deals with on-going recycling projects at Sussex, and makes suggestions on how Sussex could improve in-house and external recycling. The institutionalised way of treating and disposing waste is key in enabling people at the University to use and discard of resources more responsibly.

Whereas Sussex scores reasonably high on the Green League table for waste recycling with 3 out of 4 points, it performs poorly on waste production, attaining just 1 out of 4.[77] Recycling will always be a pivotal issue for efficient resource use. Yet, most important of all, reducing waste production - that is, waste prevention - can tackle the root causes of landfill, and needs greater attention. As highlighted by the Waste Management Hierarchy (see below), waste reduction (i.e. avoiding disposable products, the re-use of items) is preferable to recycling and composting, as well as producing energy and heat out of the discarded products. In order to compost and recycle, new resources and energy are needed to clean, break down and renew the

materials. Most of the time, the resulting materials are of less quality than they were before. Along the process, depending on the specific materials and facility, hazardous waste and gases are created. The energy, labour and resource intensiveness of recycling became particularly obvious for this group during site visits to the Newhaven Energy Recovery Facility[78] as well as the Hollingdean Material Recovery Facility[79].



Waste Management Hierarchy[80]

Waste prevention

The US has several on-going initiatives that aim at reusing products instead of wasting them. Amongst others are 'Warp-it', a redistribution network that facilitates the process of giving away or loaning unwanted items.[81] The free-shop run by the Students' Union gives students who graduate or move out of campus the possibility to leave their old items such as books, clothes or cutlery behind so that freshers can reuse them. Both are useful ways to prevent waste and give materials a new chance of being used for what they were produced. Furthermore, the 'Mug for life' initiative is a great way to reduce the amount of paper cups used on campus. As a collaboration with the Students Union, this initiative enables students who buy a Sussex thermos mug (£ 4.95) to get a free first hot drink and to purchase their future hot drinks with a 10p discount in all Sussex food outlets or Students Union shops or bars. The collection of old cooking oil by the Big Lemon Bus Company[82] provides another opportunity to use 'old resources'.

These initiatives are highly welcomed, but only provide an initial starting point for further attention to waste prevention, as the People & Planet table highlighted. The use of re-usable cups instead of disposable cups should be the norm. Paper cups should also add a charge to reflect the impact that they have on the planet (see below). Furthermore, collaboration with the Big Lemon Bus Company to transport US students would strengthen the linkages of low-impact transportation and the campus

community.

On-going initiatives such as those described should be advertised in a more visible way, which could trigger a greater response from interested students and staff. Many of us only found out about some of these projects through our involvement with this report. Talking to other students confirmed that we were not the only ones with a lack of knowledge of on-going initiatives or possibilities to recycle and compost. Raising awareness and spreading the corresponding knowledge within the wider campus community could make a difference in reducing landfill.

An example of the great impact that can be made by properly advertised, high-visibility campaigns is provided by the Keep Cups initiative at the University of East Anglia (UEA).[83] This introduced re-usable, durable and lightweight cups, and has made a real difference. According to a member of the initiative, UEA has sold 4,000 Keepcups and had reduced the number of paper cups sold in 2010 by 163,000. Each paper cup takes 0.09 square metres of forest to produce. This waste of resources was intolerable for the Campus Kitchen team. With a marketing campaign under the slogan 'Keep Cups don't grow on trees', as well as a discount of 15p per coffee and 50p on Wednesdays, the University has seen a significant reduction of paper cups: halting the number used in following years.

The 'mug for life' initiative at the US, in contrast, has been less advertised in food outlets and there is no visible campaign alerting students to its existence. Few students know that a discount of 10p applies to hot drinks bought with a reusable cup. Yet, initiatives that are publicly advertised as well as connected with the students, staff and infrastructure, i.e. the cafes, have been embraced by the campus community and made a meaningful difference in consumption patterns at UEA.

Another example for this can be found in the 'green accommodation' at UEA. It offers infrastructure to support an environmentally friendly daily life. It provides 'Green Flats' to students who would like to live an environmentally friendly lifestyle and share and practise this with their fellow flatmates. The day to day practicalities are determined by each flat, but generally involve some of the following ideas: sharing laundry and cooking, recycling, growing herbs and finding imaginative ways to use left-over food. According to a member of the Carbon Crew, which oversees and develops sustainability and low-carbon initiatives at UEA, 50% of the freshers were interested in such a living space. This number far exceeded the availability of green accommodation.

People & Planet have a list of suggestions for further recycling schemes that could be implemented at Sussex.[84] Another round of funding for student-led initiatives could trigger new and creative waste reduction projects for the University.

Waste Disposal and Recycling

In 2013, the University of Sussex recycled 61.11% of its total waste and produced 159.95 kg of waste per head. Compare this to the 49.44 kg per head[85] for the University of Brighton, and it becomes apparent that there is significant scope for waste reduction at Sussex. With respect to recycling and composting accessibility, it is rather difficult for students to easily access corresponding bins in the food outlets

Indoor Waste Bins at the US

and on campus. Although the number of bins around campus is quite evenly distributed, the amount of normal, non-recycling bins is higher and more available than recycling bins. These recycling bins are mostly situated next to cafés and eating outlets, but not next to frequently used pathways, i.e. lecture halls, seminar rooms or computer clusters where students often bring beverages and food. Furthermore, though the cafes have biodegradable cutlery, compost bins are not available and the possibility of composting the cutlery is not advertised within the cafes.

The US could draw from the example of the University of Greenwich, which has designed new recycling bins, sold by the University itself in order to improve recycling behaviour. It is a bin that makes recycling easier than non-recycling, and is made out of chipped plastic from old bins. These bins are the result of a collaboration between the University of Greenwich and Leafield Environment and are called the 'Meridian Envirobin'. The bin is a product designed to suit tight spaces and has even been nominated for the Plastic Industry Awards 2012 'Industrial Product Design of the Year'.[86] As one initiative amongst others, it has helped to improve Greenwich's People & Planet League rank in only a few years.

'Meridian Envirobin' – University of Greenwich self-designed bin

With respect to sustainable waste management, there are several on-going practices on the Sussex campus to recycle and reduce waste that goes to landfill. A very important one is its composting scheme, as it represents a great way to turn materials back into soil and fruitful ground for natural vegetation. The composting scheme consists of an external company that collects food waste from the kitchens of the cafes. On average, 32.5kg of food waste per week per building is collected and brought to the green waste compound. This amounts to 20 tonnes of this waste which is directly used on campus grounds.[87] This is a very sustainable practice, as it represents a local cycle of materials life and provides a great way to reuse the materials. However, the aim to compost 50% of food waste by diverting it from landfill sites has yet to be fulfilled. Furthermore, UEA, for example, is even reusing its green waste that is externally composted on patches where vegetables are grown.

US cutlery, Vegware, is made out of biodegradable materials. The disposable cups, cutlery and food bags are made from cornstarch. Unfortunately, it seems that many students are not well aware of that fact. An employee from the Catering Team states: "We have specific bins in the outlets for customers to place their paper cups in, but most cups find their way into the campus bins which we have no control over." This is not surprising because, as stated above, specific bins for compost are not provided in many of the food outlets. Furthermore, it is difficult to tell which cups are

biodegradable and which ones are not. According to both the Students Union and the Catering Service, 54,880 cornstarch cups have been purchased by the University from August 2012 to July 2013. The other plastic cups are purchased from Raynards and are recyclable; however, most of them end up in normal campus bins as well. Whilst it would be impossible to tell how many get recycled, from August 2012 to July 2013, 203,545 cups have been purchased by the University. This raises ethical questions on every level about the legitimacy of using food to produce biodegradable cups if they are not even composted.

Generally, it would be preferable if more information about waste treatment, recycling and waste disposal was publicly available. In the course of our research, it was difficult to put numbers into context of overall volumes of waste and waste reduction improvements. More specific information about the recycling of the 43 tonnes of green waste would be desirable. Were they recycled into energy, compost for university grounds or commercial compost? What are the specific recycling quotas for the following years? Judging from the content of some bins, it would also be helpful to display in more detail what kind of material can be thrown into which specific bin type. According to a member from the Carbon Crew from UEA, exact numbers and figures for waste and resource use was key in identifying the areas most in need for action and in triggering corresponding projects.

For a lower impact with respect to its waste, creative projects should be encouraged and funded by the University. Inclusive and participatory channels should be established so that fruitful solutions towards lowering waste output can be identified in a joint effort. This becomes particularly crucial as an expansion of the US student body will increase the absolute volume of landfill.

Conclusion

What role can and should a university play in order to address the twin challenges of environmental and social sustainability? What is its responsibility as a knowledge hub, aiming to educate students whilst asserting its position at the forefront of contemporary research? We argue that universities are communication platforms wherein students, staff and researchers interact to create valuable knowledge in an attempt to answer society's challenges. Given the magnitude of today's environmental and social problems, the Transition Movement offers the US an alternative framework for action. By seeking localised solutions the University of Sussex can act to become an exemplary institution, bridging the gap between theory and practice and leading by example.

At a turbulent moment within the history of the HE sector, the US stands at a crossroads. On the one hand, the US is falling in the Green League table and has been divided amidst a bitterly-disputed outsourcing process. On the other hand, however, Sussex boasts a wealth of community activity and cutting-edge research, placing it at the very forefront of environmental and social sustainability issues.

Stanmer Park

General Trends

This report has looked at a few areas to identify key projects and potentials for the US to become a Transition University. They are by no means conclusive, but represent key areas in which Sussex could lower its environmental impact in a participatory way.

One area of growing importance highlighted by People & Planet that we were unable to address is ethical investment. People & Planet's most recent campaign 'Fossil Free' is an attempt to pressure universities into disinvesting in the fossil fuel industry and other companies deemed unethical.[88] The US currently scores 0/3 for Ethical

Investment, with no policy in place and no representative decision-making body to influence this fact.[89]

One pivotal overarching trend at Sussex is a general lack of student and staff representation on relevant decision-making panels. The University Council, the highest decision-making body within the University, is a 25-person body containing one undergraduate student and two members of academic staff.[90] Furthermore, there is currently no community representation on panels responsible for decisions regarding estates management or investment policy. Perhaps the single largest recent example of the University's lack of inclusive decision-making was the unpopular decision to outsource 235 on-campus jobs.

However, given the fact that some outsourcing processes are already completed, it is imperative that the Sussex community comes together to work around our new private partners. For the duration of their time here, we need to ensure their compliance with their promises and campaign for social and environmental improvements. Appropriate channels have to be established to monitor progress towards a more sustainable future as well as for the campus community to take part. We need to ensure that Interserve is able to "meet the evolving needs of pupils, staff and the community."[91]

In general, more support for creative grassroots projects involving the entire Sussex community will be needed if we are to drastically reduce the US' negative environmental impact. The majority of sustainability projects operate at a grassroots level and have, to date, required very little input from upper management. Each of the following section summaries provides some proposals for both grassroots organisation and university policy.

Biodiversity

There is an evident need to strengthen communication between all stakeholders, making the campus into an environment wherein humans and other species can coexist. We therefore suggest regular meetings to bring together students, academic staff and the estates team in order to discuss how we can work together on campus. Attempts to engage with local non-university stakeholders, such as Sussex Wildlife Trust, the Brighton & Hove Biosphere Project and Transition Town Lewes could also prove fruitful. The US is situated within a unique, biodiverse landscape which is important not only to Sussex residents, but also to the global scientific community. All expansion plans should therefore be heavily scrutinised, and the Sussex community should work together to be included in this conversation. Finally, we need to ensure the good work of our former estates team, such as the tree survey and wildflower meadow maintenance, is not lost or de-prioritised as Interserve takes over in 2014.

Living Infrastucture

One possible method of reducing the negative impact of the campus upon local biodiversity is using living infrastructure. This provides a rare opportunity to integrate our physical campus within our unique surroundings. Additionally, green roofs can lower energy consumption and maintenance costs while providing green public

spaces for the campus community. All expansion plans should scrutinise the possibility for living infrastructure, and the Sussex community should be involved in creating an enjoyable, inclusive living space on the ground and on top of university buildings.

Energy

The energy section identified two main areas for improvement: energy production and energy consumption. The former presents the opportunity of developing a more sustainable energy production cycle by operating in a closed-circuit fashion. This would entail the dual advantages of sheltering Sussex from fluctuating grid energy prices, as well as providing local autonomy over which sources of energy to use. We identified biomass heat plants as one potential alternative to importing energy from the national grid, using the UEA's project as a case study. This project is experimental and the outcome remains uncertain, so we suggest continued analysis of relevant developments. Furthermore, comprehensive analysis of other local and renewable energy sources is an area that we suggest further research into.

In terms of consumption, we have advocated investments in technologies such as a metering system which can monitor each building's energy consumption in real-time. Furthermore, we saw how UEA's Carbon Crew initiative helped to develop a strategy to promote the benefits of carbon reduction among students and faculty. This is a model that seems easily replicable and could compliment the carbon-reduction campaigns which already exist on Sussex campus.

Waste

The waste section identified a number of (on-going) crucial projects to lower the landfill impact of the campus community, i.e. the Sussex thermos mug and the free shop run by the Students' Union. Increasing public awareness of on-going projects as well as how to engage with them is critical to their success. Importantly, public information about recycling opportunities as well as corresponding bins should be easily accessible. Crucially, the focus on recycling waste should be shifted to preventing waste, which is more likely to have a significant impact on reducing landfill. An engagement with the whole campus community as well as further financial support could encourage additional creative projects that have the capacity to reduce Sussex's waste.

Areas that this report has not been able to address but which are equally important are ethical investment, sustainable food, sustainability education as well as water consumption. According to the Green League table, the US scores very poorly in these areas. Improvements are urgently needed and some of the corresponding ESD projects this year addressed these issues (i.e. 'Pieces of a Feast' which encouraged a do-it-yourself local food production as well as consumption). Further efforts at tackling these problems would be highly welcomed (i.e. in the course of further funding from the University or HEFCE). Most important of all, sustainability needs to be mainstreamed within the curriculum, employment and investment schemes of the US.

Transition for Sussex - What Next?

The strength of the Transition Movement is that it creates new ideas and new ways of living together. It addresses the question of how we, as a community, can tackle the problems at hand, *together*.

This group identifies concrete suggestions for a Transition of the University of Sussex towards a more socially and environmentally sustainable institution. We advocate the establishment of more institutionalised support for students and bottom-up initiatives that are going on at the moment, but seem to suffer from a lack of attention and visibility. Institutionalised meetings where students, staff and faculty have a significant stake into the decision-making process would increase the participation, as well as ensure the well-being of the campus community. Links with Transition Town Lewes should be developed. Monetary support, such as ESD funding that enabled this project, should be made available for future student initiatives.

These propositions could increase the US' ranking in the Green League Table and establish Sussex as a university at the forefront of creative, sustainable institutions. This would increase the attractiveness of the US for students and researchers, as it is more than a simple hub of knowledge.

We believe that the University of Sussex can become an exciting living and knowledge space, where its community can discover, develop, experiment and establish creative solutions to pressing problems such as environmental degradation and growing inequality.

Notes

[1] University of Sussex. 'Education for Sustainable Development (ESD) at Sussex', (2013), http://www.sussex.ac.uk/tldu/initiatives/esd [Accessed: 29.11.2013].

[2] People & Planet. 'University of Sussex awarded 1st class in the People & Planet Green League 2012', (2012), http://peopleandplanet.org/green-league-2012/tables?ggl12profile=8778&test=82701 [Accessed: 04.05.2013].

[3] People & Planet. 'University of Sussex awarded 2:1 class in the People & Planet Green League 2013', (2013), http://peopleandplanet.org/green-league-2013/tables?ggl13profile=10011&test=1eb338 [Accessed 04 May 2013].

[4] Higher Education Funding Council for England. 'Sustainable development in higher education: 2008 update to strategic statement and action plan', (2009), http://www.hefce.ac.uk/pubs/year/2009/200903/ [Accessed: 04.10.2013]

[5] Soon to be available online at http://sussexstudents.wix.com/transitionsussexuni

[6] Hansen, James. 'Coal-fired power stations are death factories. Close them', *The Observer*, (2009), http://www.theguardian.com/commentisfree/2009/feb/15/james-hansen-power-plants-coal [Accessed: 08.16.2013].

[7] Haddad, Moussa. *The Perfect Storm: Economic stagnation, the rising cost of living, public spending cuts, and the impact on UK poverty*. Policy Paper 14.06.2012, Oxfam GB. Available at: http://policy-practice.oxfam.org.uk/publications/the-perfect-storm-economic-stagnation-the-rising-cost-of-living-public-spending-228591 [Accessed: 20.10.2013].

[8] Transition Town Totnes. 'Welcome to Transition Town Totnes', (2012), http://www.transitiontowntotnes.org [Accessed: 18.09.2013].

[9] Transition Network. 'Welcome', (2012), http://www.transitionnetwork.org/ [Accessed: 18.09.2013].

[10] Transition Network. 'About', (2012), http://www.transitionnetwork.org/about [Accessed 12.11.2013].

[11] *Ibid*.

[12] *Ibid*.

[13] Transition Town Lewes. 'Home', (2013), http://www.transitiontownlewes.org/ [Accessed: 20.09.2013].

[14] Transition Edinburgh University. 'Home', (2013), http://www.transitionedinburghuni.org.uk/ [Accessed: 20.09.2013].

[15] Msika, Joshua. Telephone Interview with Jack Clements, 25.10.2013.

[16] People & Planet. 'Going Greener: Creating Transition Universities', (2013), http://peopleandplanet.org/goinggreener [Accessed: 25.09.2013].

[17] Smith, Hanna. Telephone Interview with Jack Clements, September 2013.

[18] Op. cit., People and Planet, 'University of Sussex awarded 2:1 class in the People & Planet Green League 2013'.

[19] *Op. cit.*, People & Planet. 'Going Greener: Creating Transition Universities'.

[20] Sussex Food Alternative. 'SussexFoodAlternative | Facebook', (2013), https://www.facebook.com/sussexfoodalternative [Accessed: 20.11.2013].

[21] University of Sussex. *Draft Strategic Plan 2013-18*, University Sussex: Falmer, p. 5. Avaiable at: http://www.sussex.ac.uk/ogs/planning/newstrategicplan/strategicplandraft [Accessed: 13.11.2013].

[22] Natural England. 'South Downs National Park confirmation announced on 12 November 2009', (2009), http://www.naturalengland.org.uk/ourwork/conservation/designations/new/southdowns/default.aspx [Accessed 13.11.2013].

[23] National Parks. 'Welcome the National Parks', (2014), http://wwwnationalparks.gov.uk [Accessed: 31.01.2014].

[24] Natural History Museum. 'Chalk grassland', (1999), http://www.nhm.ac.uk/nature-online/british-natural-history/british-habitats/chalk-downland/ [Accessed: 01.09.2013].

[25] South Downs. 'About the National Park and the National Park Authority', (2013), http://www.southdowns.gov.uk/about-us [Accessed: 12.12.2013].

[26] The full aims and objectives can be found at Brighton & Hove and Lewes Downs Biosphere Project. 'Aims and Objectives', (2013), http://biospherehere.org.uk/what-on-earth-aim-objectives/ [Accessed: 01.10.2013].

[27] University of Sussex. 'Grounds Environmental Policy', (2013), http://www.sussex.ac.uk/efm/services/grounds/grounds-environmental-policy [Accessed 01.07.2013].

[28] University of Sussex. 'Tree Management', (2013), http://www.sussex.ac.uk/efm/services/grounds/tree-management [Accessed 01.07.2013].
[29] University of Sussex. 'Biodiversity Map, (2013), Available at: https://www.sussex.ac.uk/webteam/gateway/file.php?name=biodiversity-map.pdf&site=316 [Accessed 01.07.2013].
[30] University of Sussex. 'Wild Flowers, (2013), http://www.sussex.ac.uk/internal/bulletin/2012-13/070613/wildflowers [Accessed 01.07.2013].
[31] *Op. cit.,* People and Planet, 'University of Sussex awarded 2:1 class in the People & Planet Green League 2013'.
[32] Tamsin, Emily. Telephone Interview with Jack Clements, 10.09.2013.
[33] Lucas, Ben. Email correspondence with authors, 20.09.2013.
[34] Grove, Jack. 'Sussex to close community engagement programmes', *Times Higher Education*, (25.01.2012), http://www.timeshighereducation.co.uk/418817.article [Accessed: 01.09.2013].
[35] *Op. cit.*, University of Sussex. *Draft Strategic Plan 2013-18*.
[36] University of Sussex. 'Interserve is preferred bidder for facilities services at Sussex', (2013), http://www.sussex.ac.uk/broadcast/read/21573 [Accessed: 01.10.2013].
[37] Interserve. 'Home / About Us', (2013), http://www.interserve.com/about-us [Accessed: 01.10.2013].
[38] University of Brighton. 'Checkland's green roofs update...', (2013), http://staffcentral.brighton.ac.uk/estateandfacilities/projects/checkland-greenroof-update.html [Accessed: 22.10.2013].
[39] Organic Roofs. 'Home', (2013), http://www.organicroofs.co.uk/ [Accessed: 28.09.2013].
[40] Burgess, Helen. 'An assessment of the potential of green roofs for bird conservation in the UK', (2004), http://livingroofs.org/2010030891/green-roof-policies-and-research/resbiodiv.html [Accessed 18.10.2013].
[41] Environment Agency. 'Flood', (2013), http://www.environment-agency.gov.uk/default.aspx [Accessed 18.10.2013].
[42] Living Roofs. 'Introduction to Green Roof Benefits', (2013), http://livingroofs.org/2010030565/green-roof-benefits/greenroof-benefits.html [Accessed 18.10.2013].
[43] University of Sussex. 'Campus drainage system to be upgraded this summer', (2013), http://www.sussex.ac.uk/internal/bulletin/staff/2012-13/280613/drainage [Accessed 18.09.2013].
[44] University of Sussex. 'New sewage pipes will increase capacity of campus drainage system', (2013), http://www.sussex.ac.uk/internal/bulletin/staff/2013-14/041013/sewage [Accessed 09.12.2013].
[45] *Op. cit.,* Burgess, Helen. 'An assessment of the potential of green roofs for bird conservation in the UK'.
[46] *Op. cit.,* University of Brighton. 'Checkland's green roofs update...'.
[47] Kadas, Gyongyver. 'Rare Invertebrates Colonizing Green Roofs in London, in: Urban Habitats', (2006), http://www.urbanhabitats.org/v04n01/invertebrates_full.html#cite11 [Accessed 20.10.2013].
[48] For further information on the benefits, capabilities and obstacles, see Living Roofs, a British Organisation that is the UK member for the European Federation of Green Roof Association, http://livingroofs.org/ [Accessed 18.10.2013] or Sheffield University who runs several academic experience on different types of roofing materials in order to improve the efficiency and sustainable impact of green roofs at: http://www.sheffield.ac.uk/landscape/researchknowledge/greenroof [Accessed 23.10.2013].
[49] See DEFRA. 'Press release: British Embassy brings UK green roof expert to Budapest', (2013), https://www.gov.uk/government/world-location-news/british-embassy-brings-uk-green-roof-expert-to-budapest [Accessed 20.10.2013].
[50] University of Brighton. 'Permaculture Design and Green Roofs', (2013), http://livingroofs.org/2010030891/green-roof-policies-and-research/resbiodiv.html [Accessed 20.10.2013].
[51] *Op. cit.*, University of Sussex. 'News Interserve is preferred bidder for facilities services at Sussex', (2013).
[52] *Ibid.*
[53] *Op cit.*, People & Planet, 'Going Greener: Creating Transition Universities'.
[54] People & Planet, 'People & Planet Green League 2013 Tables', (2013), http://peopleandplanet.org/green-league-2013/tables#gl2013_class1st [Accessed 05.05.2013].

[55] Gov.uk. 'Increasing the use of low-carbon technologies', (2013), https://www.gov.uk/government/policies/increasing-the-use-of-low-carbon-technologies/supporting-pages/heat-networks [Accessed 01.12.2013].
[56] *Ibid.*
[57] Howarth, Robert W., Renee Santoro and Anthony Ingraffea. 'Methane and the greenhouse-gas footprint of natural gas from shale formations,' *Climatic Change*, 106, 4 (2011), pp. 679-690.
[58] See Press Associaton. 'Anti-fracking protesters pull out of Balcombe camp', *The Guardian*, (30.09.2013), http://www.theguardian.com/environment/2013/sep/30/anti-fracking-protesters-balcombe-camp [Accessed: 01.12.2013].
[59] CarbonTrust. *Biomass heating: A practical guide for potential users*. Carbon Trust: London (2008), p. 8. Available at: http://www.carbontrust.com/media/31667/ctg012_biomass_heating.pdf [Accessed 01.10.2013].
[60] *Ibid*.
[61] *Ibid.*
[62] A kilowatt hour is one kilowatt running for one hour.
[63] This happens when trees are removed from managed woodland to enable other trees sufficient growing space.
[64] *Op. cit.*, University of Sussex. 'News: Interserve is preferred bidder for facilities services at Sussex'.
[65] *Ibid.*
[66] Companies House. **'**Limited Liability Partnerships (LLPs) FAQs', (2013), http://www.companieshouse.gov.uk/infoAndGuide/faq/llpFAQ.shtml [Accessed: 01.11.2013].
[67] Interserve. 'Nuclear', (2013), http://www.interserve.com/sectors/nuclear [Accessed: 01.11.2013].
[68] Ockwell, David G. 'Energy and economic growth: Grounding our understanding in physical reality,' *Energy Policy*, 36, 12 (2008), p. 4602.
[69] Brookes, Len G. 'The greenhouse effect: the fallacies in the energy efficiency solution,' *Energy Policy* 18, (1990), pp. 199–201.
[70] Inhaber, Herbert and Harry Saunders. 'The road to nowhere,' *The Sciences* 34 (1994), pp. 20–25.
[71] Ockwell, David G. 'Energy and economic growth: Grounding our understanding in physical reality,' *Energy Policy*, 36, 12 (2008), p. 4602.
[72] *Op cit., People & Planet*, 'People & Planet Green League 2013 Tables'.
[73] CRED. 'Welcome', (2013), http://uea.cred2.co.uk [Accessed 01.09.2013].
[74] In this section, waste is used to depict objects that people discard and throw away. In many cases these resources can still be used and are not in themselves 'waste', but are turned into waste by throwing them into a bin. It is important to highlight the human perception and culture of these resources to draw attention to the fact that 'waste' is a valuable resource and should not be considered to be useless or, in fact, 'waste'. This issue was particularly highlighted during a workshop on food waste that took place in the course of another ESD project "growing a feast".
[75] TED.com. 'William McDonough: Cradle to cradle design', (2005), http://www.ted.com/talks/william_mcdonough_on_cradle_to_cradle_design.html [Accessed 02.07.2013].
[76] Whereas the book focused on producing materials in a more sustainable and holistic way, this concept can be used to evaluate the US waste approach and how existing materials are treated.
[77] *Op. cit.*, People & Planet. 'University of Sussex awarded 2:1 class in the People & Planet Green League 2013'.
[78] Veolia. 'New Haven Energy Recovery Facility', (2013), http://www.veoliaenvironmentalservices.co.uk/southdowns/Facilities/Newhaven-Energy-Recovery-Facility-/ [Accessed 20.08.2013].
[79] Veolia. 'Hollingdean Materials Recovery Facility', (2013), http://www.veoliaenvironmentalservices.co.uk/southdowns/Facilities/Hollingdean-Materials-Recovery-Facility/ [Accessed 20.08.2013].
[80] University of Sussex. *Waste Management Policy*, University of Sussex: Falmer. February 2012, p. 7.
[81] University of Sussex. 'Recycling Waste, (2013), http://www.sussex.ac.uk/efm/services/recycling-and-waste-management/recycling-waste [Accessed 13.07.2013].
[82] The Big Lemon. 'Waste Collection Sites', (2013), http://www.thebiglemon.com/lemonJuice/CollectionSites/ [Accessed 13.09.2013].
[83] University of East Anglia. 'The Campus Kitchen', (2013), http://www.uea.ac.uk/CampusKitchen/things-we-are-proud-of [Accessed 13.07.2013].

[84] People & Planet. 'Zero-Waste Transition: More Project Ideas', (2013), http://peopleandplanet.org/goinggreener/waste/more-ideas [Accessed 04.07.2013].

[85] People & Planet. 'University of Brighton awarded 1st class in the People & Planet Green League 2013', (2013), http://peopleandplanet.org/green-league-2013/tables?ggl13profile=9921&test=45a52c [Accessed 05.08.2013].

[86] University of Greenwich. 'Sustainability: University of Greenwich', (2012), http://blogs.gre.ac.uk/greengreenwich/waste/new-bins/ [Accessed 05.08.2013].

[87] People & Planet. 'University of Sussex: Case Studies – Waste Management', (2012), Available at: http://peopleandplanet.org/dl/sussex_casestudy.pdf [Accessed 10.06.2013].

[88] People & Planet. 'People & Planet's Fossil Free campaign,' (2013), http://peopleandplanet.org/fossil-free [Accessed 30.01.2014].

[89] Op. cit., People & Planet. 'University of Sussex awarded 2:1 class in the People & Planet Green League 2013'.

[90] University of Sussex. 'Governance Documents', (2013), http://www.sussex.ac.uk/ogs/govdocuments [Accessed: 01.11.2013].

[91] Interserve. 'Education', (2013), http://www.interserve.com/sectors/education [Accessed: 30.01.2014].

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