

ENVIRONMENT

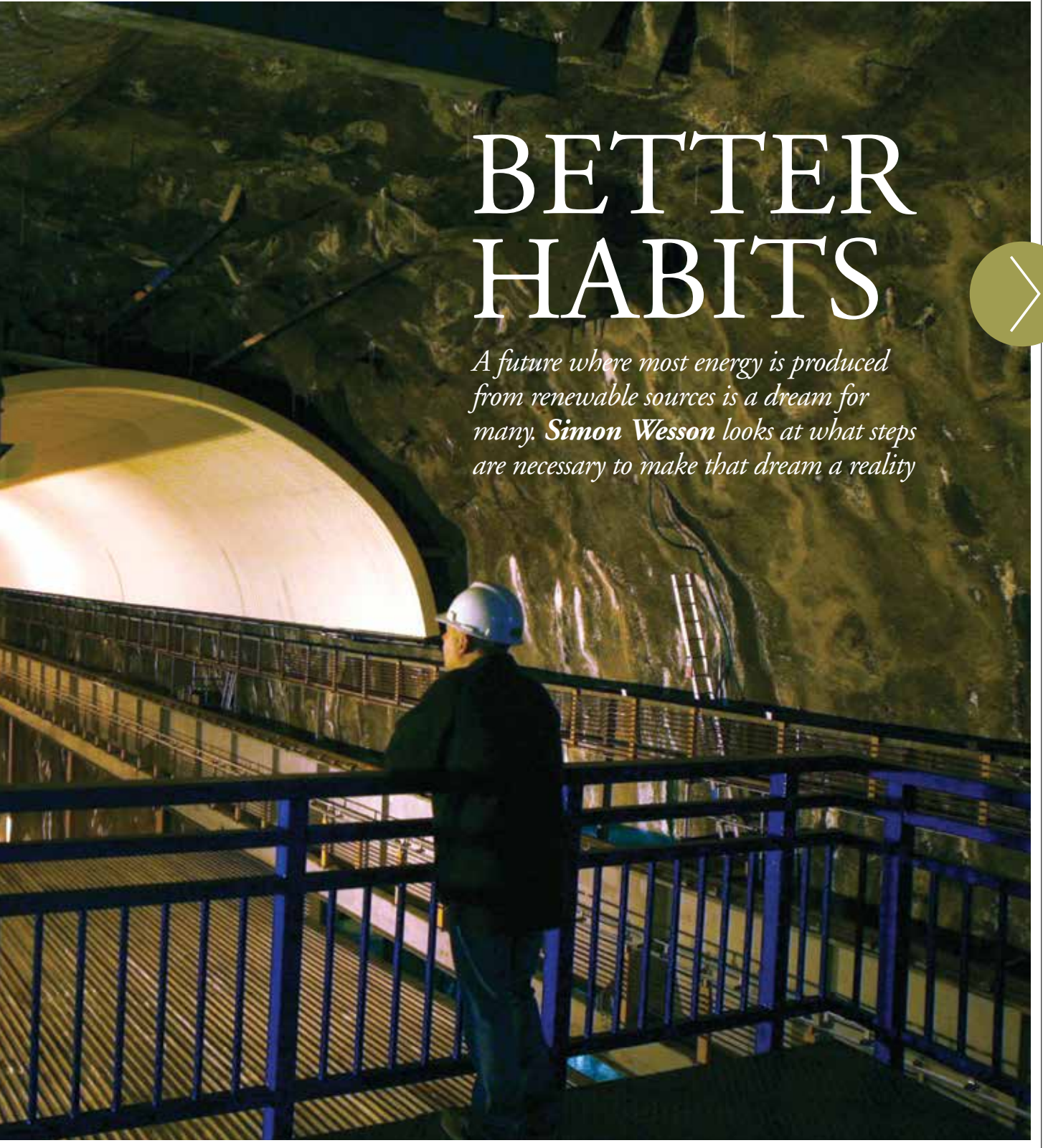


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BETTER HABITS

*A future where most energy is produced from renewable sources is a dream for many. **Simon Wesson** looks at what steps are necessary to make that dream a reality*



BETTER HABITS

For the first time ever renewable energy surpassed coal in supplying the UK's electricity for a whole quarter according to government statistics released in September 2015, which recorded that 25 per cent of electricity supply was generated by wind, solar and bioenergy. While gas-fired power stations provided 30 per cent of our electricity, the rapid growth in renewable energy was achieved due to both more wind and sun, and more turbines and solar panels having been installed compared to the same period in 2014, when renewables contributed 16.4 per cent of electricity.

Twenty-five per cent for a quarter seems impressive, but in the relatively near future it could be a mere drop in the ocean. According to a new report by Greenpeace, by 2030 Britain could be producing 85 per cent of all its power via renewable energy. Although this comes with the rather large proviso that to achieve that figure, significant changes in production are needed, as well as a 60 per cent reduction in demand for domestic heating achieved through home insulation programmes and other initiatives.

The UK Energy Research Centre's (UKERC) 2013 publication, *The UK Energy System in 2050: Comparing Low-Carbon, Resilient Scenarios*, reports the results of its modeling and primarily predicts the need for greatly increased energy efficiency and conservation in all sectors, and decarbonisation of the UK electricity system by 2030 by at least 80 per cent. It says meeting the carbon emission reduction target requires a wholesale transformation of the energy system. The report outlines continuing uncertainty about the optimal low-carbon electricity supply and which of the four main options for low-carbon electricity supply – nuclear power, large-scale renewables, fossil fuel power stations with carbon capture and storage (CCS) technologies, and small-scale renewables – will become dominant because it is the cheapest. The UKERC's model shows some electrification of heat and/or transport, using the largely decarbonised electricity, but the degree of electrification differs markedly across the various model scenarios, as do the technologies that are deployed. What it does conclude, however, is that by 2050 electricity (directly or through heat pumps) makes a major contribution to heating in all scenarios, supplemented by biomass and solar thermal.

While this future where renewable energy prevails is a dream for many, today the reality is that we are still reliant on older technology, including nuclear power – the third largest source of power, supplying 21.5 per cent of electricity in the UK. At the time of writing, the UK government had just announced that Hinkley Point C power station in Somerset – which will be operated by French company EDF – will be partly funded by Chinese investment. Hinkley will cost more to build than any other power station and critics argue that the same investment in onshore wind power generation could produce more energy, more easily. Why, in the face of the growth of renewable sources of energy, are we still relying on nuclear technology? Professor Jim Watson, Director of the ESRC-funded UK Energy Research Centre, argues that while



Previous page

The cavernous machine hall at Dinorwig Power Station in North Wales, a hydro electricity plant that is the largest of its kind in Europe

Nuclear debate

David Cameron talks to workers at Hinkley Point B as it is announced a deal to construct the new Hinkley Point C has been struck with French energy giant EDF

nuclear power stations continue to be built there does still remain an emphasis on using newer technologies – and many home users are also in tune with this thinking. But for him, although how energy is generated is important, great progress could be made in reducing the amount of energy we use.

MAKING PROGRESS

“Renewable electricity generation increased rapidly in the last few years. It has risen from three per cent of power generation in 2000 to 19 per cent in 2014. At the same time, the UK has made significant progress with energy efficiency, which can go much further. But, as a nation, compared to many other northern European countries, our level of energy efficiency (especially in homes) is currently much lower. Our housing stock is comparatively poor – and much more could be done to improve it,” says Professor Watson. In terms of changing behaviours, he says that relatively new technologies like smart meters can help reduce energy consumption, but while some people may be ‘early adopters’

Why, in the face of the growth of renewable sources of energy, are we still relying on nuclear technology?



A 60 per cent reduction in demand for domestic heating achieved through home insulation programmes and other initiatives is required

of such technologies, others will be uninterested. For those currently uninterested, where the opportunity still exists, they might be better off doing the cheapest things first such as insulation; for other households, smart technologies could help motivate them to act.

“At the moment the obvious things to have installed are cavity walls and loft insulation, which is often low cost and has historically been free to many customers due to government and utility programmes. Shifting to energy-efficient lighting, or investing in high-efficiency appliances when they are being replaced, will also help, while more expensive measures include double glazing, upgrades to older central heating boilers and newer measures such as external/internal wall insulation – which can be very costly,” says Professor Watson.

So, are current government policies persuasive enough to make us change our habits? Professor Watson believes it’s a question of how good policy is: “Policies for energy efficiency got stronger and more effective since 2000 – although that trend reversed in the last two years because the recently cancelled Green Deal policy failed to deliver the energy savings the previous government wanted it to. It was a poorly designed policy. So, for me, a key question for the new government is what policies will be put in place instead of Green Deal – and whether these will be more effective.”

In this day and age energy and mobility are taken for granted by most people in developed nations who see the ability to heat and light a home, and to drive or take public transport, as a right rather than a luxury. So how can policymakers and other organisations change this view so that instead of producing more energy because we’re consuming more, we learn to use less? Professor of

Taking initiatives
Loft insulation is one of the quickest and cheapest ways of reducing demand for domestic heating

Sociology at Lancaster University, Elizabeth Shove believes policymakers and other organisations have to “acknowledge their own role in making and shaping future possibilities”.

She says: “A first step is to recognise the many ways in which policymakers are involved in making and sustaining contemporary ways of life and the patterns of energy demand and mobility associated with them. This takes different forms – for example, in designing programmes and investments that deliver ‘the same’ service, but with fewer resources, advocates of energy efficiency perpetuate and do not question what are taken to be ‘normal’ standards. In addition, areas of policy like those relating to childcare provision, working life or healthcare, have implications for how daily lives are organised, for what people do and for where they go: all of which translate into energy demand.”

The professor also says that the policy challenge is not that of teaching people to cut back, as if this was a matter of personal choice, but of grasping opportunities to configure institutions and infrastructures such that they both suppose and enable lower carbon ways of living.

“What people now take to be normal has a short history: the status quo will not last forever. The prize, for policymakers and other organisations, is to acknowledge their own role in making and shaping future possibilities and in actively working to establish ways of living, working and having fun that are different and radically less resource-demanding than those with which we are familiar today.” ■

www.ukerc.ac.uk; www.lancaster.ac.uk/staff/shove

Simon Wesson is a Press and Communications Officer at the Economic and Social Research Council.

How can we all help ensure improved agricultural output without an environmental impact?

OPINION

DOING MORE WITH LESS

By Dr Ruth Little

POLICYMAKERS AND RESEARCH funding agencies view 'sustainable intensification' as the future of food production in Britain. In theory, sustainable intensification promises to strike a delicate balance between increasing agricultural production while sustaining the natural environment. In reality, it is a term that divides opinion on whether this is an achievable goal or an oxymoron that will never be realised in practice.

In Britain, as in every other country, agricultural gains need to be made against a complex backdrop of less available land, finite energy and resource inputs, and the imperative to reduce greenhouse gas emissions. Food waste will have to be minimised across the supply chain and the production of livestock and crops made more resilient to the challenges posed by changing climate. Soil fertility must be enhanced and natural habitats protected to support the pollinators and other processes upon which so much of our food production relies.

THE FOOD FUTURE

This is a big ask and we are already running to catch up. The UK government's Department for Environment, Food and Rural Affairs (Defra) has concluded that 30 per cent of the UK's aquatic and terrestrial habitats are 'declining', with soil degradation costing the UK economy £0.9-£1.4 billion per year. Exotic and endemic diseases continue to challenge the British livestock sector, including two cases of bird flu (H7N7) in 2015 and continuing high levels of bovine tuberculosis in the West of England and parts of Wales that led to the slaughter of over 32,000 cattle in 2014. The economic sustainability of parts of the UK agricultural industry has been thrown into the spotlight over the past decade, with dairy prices falling to a low of 20 pence per litre and the



For too long people have been regarded as passive recipients of new technologies



number of dairy farms in Britain halving to fewer than 10,000.

How do we create a more sustainable food future for Britain? Key research and policy priorities include the reduction of losses from animal and plant diseases; greater resilience of crops and farmed animals to environmental stresses; more efficient and sustainable use of nutrients, water and energy; and more sustainable soil management. What each of the priorities has in common is the necessity of putting people at the centre of efforts to achieve sustainable intensification. The natural sciences are contributing new technologies and agricultural advancements, but sustainable intensification is not just

about technological fixes. Farmers, growers, land managers, retailers and consumers will all need to become more involved in ensuring these changes happen. Whether it is by increasing recycling, reducing waste, changing consumption habits or adopting new technologies, human behaviour is the critical determinant of success in achieving the goals of sustainable intensification.

When conducting social scientific research in agriculture, it is common to be asked, 'Why aren't people doing what we want them to?' The reason for this is that for too long people have been regarded as 'end users' and passive recipients of new technologies and policies. Instead, they need to be viewed as active participants in the process. For sustainable intensification to be an achievable goal, there needs to be much closer collaboration with the people who will be tasked day-to-day with implementing this vital transition towards 'doing more with less'.

A 'sustainable' food system for the UK must combine the complex and often competing priorities of environmental and economic sustainability with the goal of delivering enhanced biodiversity as well as affordable, nutritious food. More inputs alone will not result in improved efficiency or sustainability. The foundations of sustainable intensification need to be based upon harnessing human as well as natural capital, through the development of practical technologies and progressive, implementable agricultural policy. ■

www.sheffield.ac.uk/geography/staff/ruth_little

Dr Ruth Little is Research Fellow in the Department of Geography at the University of Sheffield.



NATURAL WORLD

Making a beeline

What are the links between human and bee societies and why are bees so important to us?

MOST PEOPLE HAVE heard that bee populations are in decline, but why is it that the public has become so passionate about these creatures? Urban beekeeping is on the rise in cities across the world and gardeners are planting wild flowers so that bees can forage. Protestors dressed in bee costumes have even staged demonstrations on behalf of bees outside government buildings.

Anthropologists Dr Rebecca Marsland and Dr Kate Milosavljevic, at the University of Edinburgh, are investigating the links between bees and human societies in their project Beelines. That our societies depend on pollinating insects is clear. In the UK insect pollination is worth £400-£500 million a year. Across the world glasshouse pollination of tomatoes and soft fruits depend on the supply of commercially reared bumblebees. Every year, two thirds of the honeybee population in the US are transported to Central Valley to pollinate the almond trees that produce 90 per cent of the world's almond crop. But these activities, on which we depend for much

of our food supply, are in jeopardy because of complex threats to bee populations including a decline in wildflower forage, the spread of disease, and the use of pesticides and beekeeping practices.

DEEP CONNECTIONS

The relationship between humans and bees, especially honeybees, runs deeper than the economies of food security. Bees are not the only creatures that pollinate our food-producing plants, yet we do not see hoverflies in advertisements for beauty products or on packets of wildflower seeds. Honeybee societies have inspired humans to think about the ways in which we live: from Aristotle who saw the bees' 'king' as evidence of the political organisation of bees, to the Tudors who found in the organisation of honeybees evidence for the natural status of the monarchy, up to the contemporary biologist Thomas Seeley who recommends that we learn from bees



techniques of democratic decision-making. Bees are also admired for their obedience, thrift, industriousness, unity and self-sacrifice to the whole. Their colonies appear to us like our cities, and their social organisation, like ours, depends on language and a division of labour.

Initial findings from this research project are that bees continue to inspire our worlds, and we, in turn, shape theirs. Beekeeping practices reflect different world views, from the industrial big bucks of the pollination industry in the US, to the 'natural' beekeepers who aim to adopt beekeeping practices to recreate how bees might choose to live in the wild. The beekeeping world also reflects controversies such as using chemicals to treat disease and to kill unwanted insect pests, and the human impulse to control the 'natural' world. ■

www.beelines.org

CONSERVATION

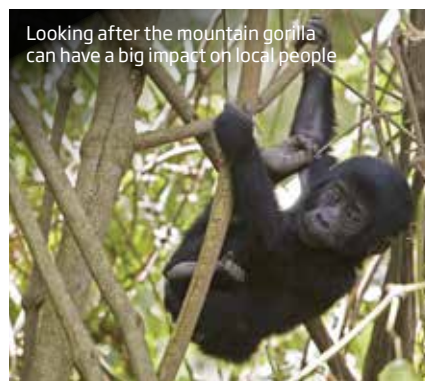
LOCAL CONFLICTS

How do conservation programmes affect local communities?

UGANDA IS HOME to about half of the world's mountain gorillas, which live mainly in the Bwindi rainforests that were declared a National Park in 1993. In efforts to conserve the gorillas and other endangered species, indigenous people were relocated from the forest and access to the park was restricted. This led to conflict with local people and, in an effort to alleviate tensions, integrated conservation and development projects (ICDPs) were introduced to share the benefits and income from gorilla-tourism. But research has shown that the benefits have not been shared equally and, as a result, the contribution of ICDPs to material and social entitlement has been uneven.

RESTRICTED BEHAVIOUR

The investigation was carried out by researchers at the University of East Anglia (UEA) and supported by the Ecosystem



Looking after the mountain gorilla can have a big impact on local people

Services for Poverty Alleviation (ESPA) programme, which is part-funded by the ESRC. An assessment of the outcomes of conservation projects on local people was made using a 'justice framework' that the researchers developed. The researchers

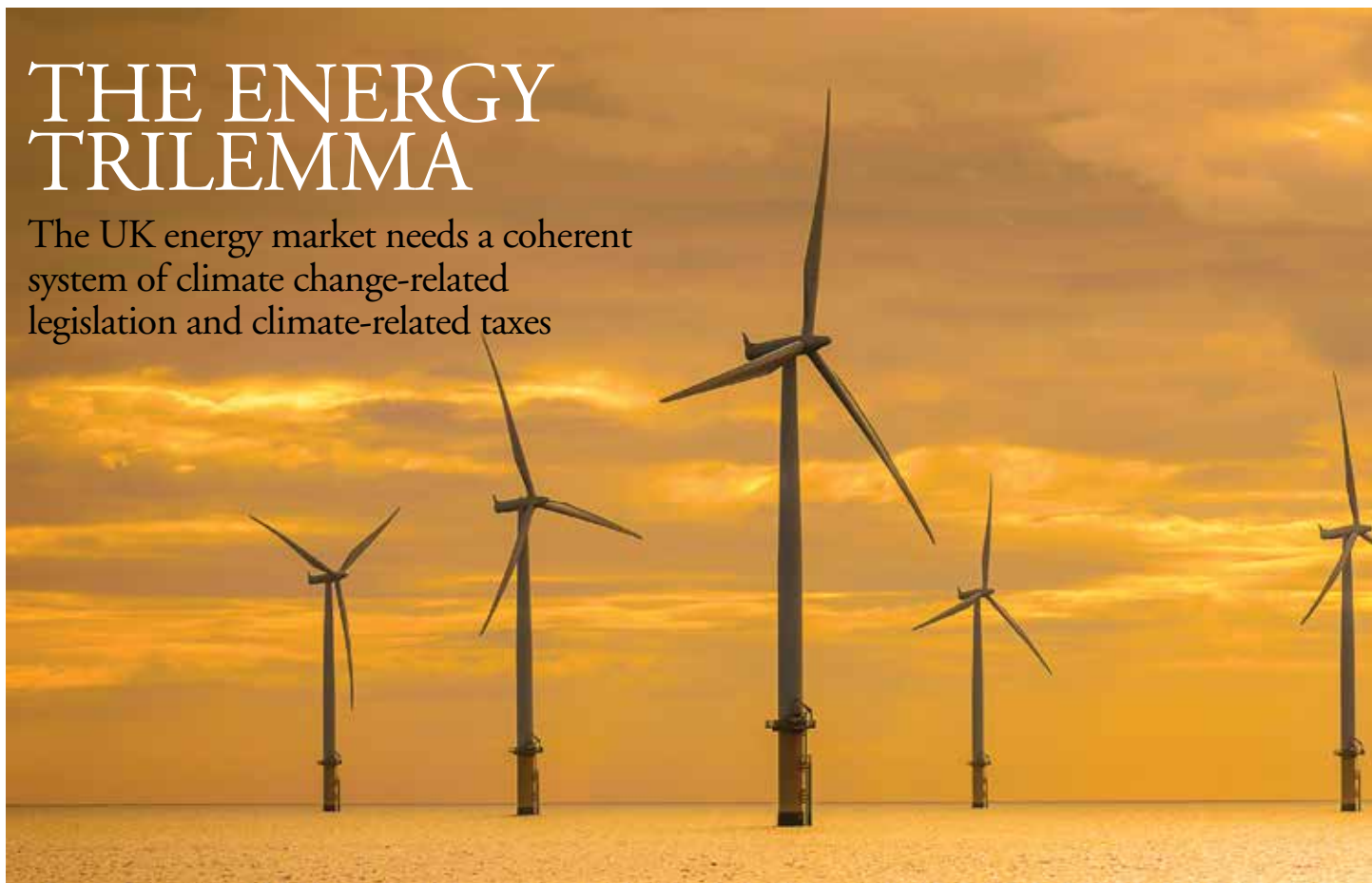
found that people (especially the poor) in non-tourism areas had the least access to the benefits of tourism, including employment opportunities. And even though roads and schools had been improved, many people had to change their livelihoods and become less dependent on the forest.

Access to spiritual sites and traditional foods and medicines from the forests was restricted, having an adverse impact on wellbeing, nutrition and health for the indigenous Twa community. Without widespread access to the park, traditional livelihood skills and practices were also lost and local people were concerned that their children did not have any opportunity to see the forest and its wildlife. The authorities were seen as having set the agenda for the way the park was run, ignoring issues that were important to local communities. ■

www.espa.ac.uk

THE ENERGY TRILEMMA

The UK energy market needs a coherent system of climate change-related legislation and climate-related taxes



Next time you are faced with a dilemma, spare a thought for those working in the energy sector. Every day, they are confronted with a 'trilemma'. This involves balancing three competing demands: keeping Britain's lights on, ensuring energy bills are affordable and cutting greenhouse gas emissions to prevent dangerous climate change. So critical is this trilemma, Amber Rudd, Secretary of State for Energy and Climate Change, made prominent reference to it in her inaugural speech in her new role, stating that her department is "committed to climate action; committed to economic security; committed to decarbonising at the least cost".

But, since the election, the Department for Energy and Climate Change has taken controversial steps to scale back subsidies and tax breaks for renewable energy. Subsidies for onshore wind farms have been removed and subsidies for biomass and small-scale solar power have been reduced. George Osborne also announced in the Summer Budget that renewable power would now be subject to the Climate Change Levy – a tax intended to reduce greenhouse gas emissions. It is no longer a levy for climate change, as such. Failing to

LIGHTS OUT?

Hearing warnings from the National Grid that we will 'run out' of electricity as demand exceeds supply is a yearly occurrence during the winter months. But when did the lights really last go out across the UK?

In October 1973 a war in the Middle East meant oil prices quadrupled. Coal prices were on the rise in the UK too and in November, unhappy miners and electricity workers began an overtime ban. The combination was unprecedented, the energy industry was in crisis and Prime Minister Edward Heath declared a state of emergency. Measures included:

- Banning the use of electricity for floodlighting, advertising and heating of shops, offices and restaurants.

Working by candlelight in the 1973 winter of discontent



- Petrol coupons were issued to car owners.
 - A 50mph speed limit was set on all roads.
 - There was a heating limit of 17°C in offices and commercial premises, and street lighting had to be reduced.
 - Power cuts became an everyday occurrence that winter, and candle supplies dwindled overnight.
 - A three-day working week was introduced.
- But Britain survived the blackout winter of 1973-74, and so did the economy.

How competitive can windfarms be now that the subsidies the industry receives have been scaled back?



THE PRICE OF HOT AIR

The energy debate - how much it costs and how can we afford another winter? - continues to be a prime concern for consumers. Here are some facts and figures about Britain's energy market

► How average yearly prices from larger suppliers, for a dual fuel bill, have changed since 2009*:

2009	£1,095
2010	£1,116
2011	£1,057
2012	£1,232
2013	£1,286
2014	£1,190

► **TARIFF¹**

Average available variable tariff is around £1,098 per year

Cheapest available tariff is around £831 per year

► **SUPPLIERS**

From January to July 2015, many customers changed suppliers:

Gas - 1.4 million
Electricity - 1.8 million

Source: www.ofgem.gov.uk

*Including VAT ¹For dual fuel bill, as of August 2015

discriminate between energy sources, it is a more general energy levy.

Renewables certainly appear to be receiving less favourable treatment than they did under the previous Coalition government. However, it is not clear whether onshore wind and solar are yet able to stand on their own two feet and compete on a level playing field with fossil fuels.

THE TRUE COST OF CARBON

The need to subsidise renewable energy is made all the more pressing by the low cost of greenhouse gas emissions. The price of high-carbon energy sources is artificially low and the real costs of burning fossil fuels are hidden. These low costs do not take account of climate change impacts and deaths due to air pollution, for example. Air pollution alone kills millions of people around the world each year, and 29,000 annually in the UK alone.

According to the International Energy Agency, global consumption of fossil fuels in 2013 resulted in subsidies to the sum of US\$548 billion. This is more than four times the US\$121 billion of subsidies spent on renewables. This market failure can be corrected by introducing a carbon price, which will pass

on the cost of emissions to the consumer. Further measures may be needed to take account of other unaccounted costs, such as local air pollution. The UK applies many prices for carbon emissions, through various taxes and the EU emissions trading system. But these prices are not high enough and they are too muddled to be effective.

A report published by the Institute for Fiscal Studies (IFS), ESRC Centre for Climate Change Economics and Policy and the Grantham Research Institute on Climate Change and the Environment found that the carbon pricing system is too complicated and inconsistent.

As Paul Johnson, Director of the IFS, explains in the *Financial Times*, the UK has "an alphabet soup of climate-related taxes". At the last count, the UK had 22 separate pieces of climate change-related legislation, as well as a great range of climate-related taxes. "Sadly they fail just about every test of coherence," Johnson adds. The result is that carbon emissions are taxed at different rates depending on how the energy was produced and who ends up using it. Emissions from electricity production are taxed much more heavily than emissions from burning gas. Businesses pay more than

households, and different types of business are taxed at different rates too. A more uniform carbon price is needed.

George Osborne announced in the 2015 Summer Budget a review of green taxes for businesses. Aiming to simplify and improve the system, the review began this autumn with a consultation and it will continue throughout 2016. While the UK's green tax regime will likely be improved by being simplified, there is no ignoring the low price of carbon that it implies. And it's worth considering that the International Monetary Fund considers a low carbon price to be a form of subsidy for fossil fuels, to the sum of more than US\$5 trillion in 2015.

As UK policymakers make sense of the alphabet soup in 2016, the costs of emissions will continue to pile up. Resolving the energy trilemma never appeared easy and, with the need to act on climate change becoming all the more urgent, there is a great deal at stake. ■

www.cccep.ac.uk

Ben Parfitt is a Senior Media Officer at the Grantham Research Institute on Climate Change and the Environment.

Wind turbines don't just create energy, they help make people happier, too



GREEN, HEALTHY & HAPPY

Do people living in environmentally-friendly households feel more content with life?

WE LIVE IN AN AGE where we are reminded of our environment every day of our lives. It was not always so. Once, the concern about the environment and the appreciation of nature were considered to follow only after the satisfaction of our material needs (the so-called post-materialist thesis). Since the early 1980s there has been a surge in the use of phrases like 'climate change' and 'global warming' in the millions of published books searched by Google.

At the same time there is an increasing interest in the impact of environment and environmental attitudes on health and wellbeing. There are two pathways through which this impact can be felt: a positive effect of nature on wellbeing and a negative effect of human activities on environment like pollution. In the American context, these paths have been called 'green' and 'brown' respectively. In Britain, we can trace the origins of the green environmentalism to the social historian, G M Trevelyan's *The Calls and Claims of Natural Beauty*, and of the brown to John Simpson's indictment of the Thames, 'contaminated by the outscourings of the metropolis', in the cholera epidemics.

Although researchers have studied the effect of environmentalism on human wellbeing, they did so looking at individuals without reference to the households in which they lived. Our research addressed the questions of whether environmentally friendly households influence the happiness and health of its members. Our study used the first two waves of the

Understanding Society study: the environmental exposure variables from the first wave and the health, and happiness outcomes from the second wave. If a household used renewable sources of energy like solar panels and wind turbines and practised recycling properly and regularly it was designated as a green household. Similarly we measured individual environmentalism based on the individual's opinions about environmental matters like climate change and the need to act on it. People living in green households reported greater, statistically significant satisfaction with their lives. This effect was maintained even after adjusting for general variables like age, gender and education, and also after taking into account environmental beliefs of the person and those of other people in the household. We found similar results for self-rated health: people living in green households rated their health better, a result

which was robust against adjustments with general variables as well as those for environmentalism.

HAPPY HOUSEHOLDS

As expected, there was an inverse relationship between common mental disorders and living in a green household. Environmentalism of other members of the

household had effects on happiness, self-rated health and common mental disorders equal to or more than the green household effects. Therefore living in green households and living with people concerned about the environment improved health and happiness.

We also had a paradoxical result: individuals' own environmentalism had no effect or had negative effect on health and happiness. We explored this under different conditions, in singleton households so as to rule out any effect of other members in the household and in multi-member household to test the role of the individual as self (influencing own outcomes) and other (influencing the outcomes of other members of the household). In all analyses the difference in the direction of association between green households and individual environmentalism remained the same.

There are competing explanations such as that the green households are actually reflecting neighbourhood social capital or that environmentalism is motivated through biophilia, which refers to the sense of wellbeing humans have when connected with nature. Whatever the explanation, the beneficial impacts of green households we have found suggest that policies that encourage green households should be prioritised and protected. ■

www.ucl.ac.uk/icls

Professor Gopal Netuveli, *International Centre for Lifecourse Studies in Health and Society*.

HOW GOOD ARE WE AT RECYCLING?

▶ Around 600 million tonnes of products and materials enter the UK economy each year... only 115 million tonnes of this are recycled.

▶ Between now and the end of 2020, electronic products purchased in the UK will total around 10 million tonnes - a quarter of this will be IT equipment, consumer electronics and display screens.

▶ Nearly 25% of waste electrical and electronic equipment that's taken to household waste recycling centres could be re-used, worth around £200m gross a year.

▶ We throw away more than 7 million tonnes of food and drink every year from our homes - most of which could have been safely consumed.

▶ Doubling the number of sofas re-used could save 52,000 tonnes of CO₂ equivalent. At the moment, 83% of sofas are not re-used and are sent to landfill or recycled.

Source: ¹ Figures according to WRAP, the Waste and Resources Action Programme; www.wrap.org.uk

ETHICS

High standards

Creating more responsible and sustainable supply chains

THE PROVENANCE OF our materials or the working conditions in our factories used to be largely invisible. To some extent it still is, but global news media, now amplified by social media, means that a disaster can be revealed quickly, rapidly resulting in a consumer boycott or legal intervention. To try and understand this, the emerging field of Sustainable Supply Chain Management studies how companies can and should improve standards to reduce these risks. Recent research conducted in the Logistics and Operations Management group at Cardiff Business School examines the extent to which companies are able to create change, and are prevented from doing so.

Simple measures are now quite well established, such as legal drivers that demand that companies account for where their materials come from. The 2010 US Dodd-Frank Act disclosure requirements on conflict minerals or the UK's 2015 Anti-Slavery Law puts pressure on companies to increase their understanding of who they and their suppliers are purchasing materials from.

MIXED RESPONSES

Accountants demand that information is specific, measurable and accurate, but often these metrics are not available or standardised so that one company can be compared to another. Thus the implementation of Dodd-Frank has been mixed. Some companies have

stopped using conflict minerals and substituted cheaper alternatives. Others have engaged in improving the welfare of communities in the Central African conflict regions.

The research has found that some companies are acting on these issues and seek to drive change in their external supply chain. Others are reactive to external pressures such as from consumers, legislators or investors. But problems exist. The proactive pioneers may find it hard to compete against their less inspired rivals. Those merely reacting to pressure may focus solely on their legal liability and contractual compliance.

The pressure for change can come from investors or governments

The unique context that firms find themselves in has a big impact on what they do, in part as a result of how sensitive they are to risk. Firms that sell directly to consumers are more likely to be active in promoting that they care about ethics and reducing their carbon footprint, as public reputation can have an immediate impact on sales. Other companies with no public-facing brands can have far larger impacts and yet go almost unnoticed. Here, the main pressure for change can come from investors or governments. Whether internally or externally driven, companies' top management teams are recognising their role and the potential they have to create change. ■

business.cardiff.ac.uk/people/staff/anthony-alexander



Not all companies want to help improve the welfare of workers who toil to supply them

NEWS IN BRIEF

GRASSROOTS

Older generations of allotment holders continue to garden happily, but a new wave of younger people are being drawn towards 'urban agriculture' - the wide range of initiatives aimed at growing, processing and distributing food in and around cities. In a two-year project, Dr Tornaghi from the University of Leeds investigated emerging forms of urban agriculture in the UK and their impact on social cohesion and environmental justice. Based on these findings and the experiences of urban food growers in the Leeds City Region, researchers have published two guides explaining to users and policymakers how to set up an urban agricultural project with a socio-environmental justice perspective. The project also supported the development of an umbrella organisation (Feed Leeds) and informed a supporting document proposal presented to Leeds City Council, asking to initiate a local Sustainable Food Strategy in which urban agriculture will play a key role. www.urbanfoodjustice.org

*Dr Chiara Tornaghi,
University
of Leeds*



EMISSION REDUCTIONS

Research finds that the EU Emissions Trading System (EUETS) is not the failure many have suggested. In place since 2005, EUETS is the EU's flagship policy to reduce greenhouse gas emissions and hence the risk of dangerous climate change. Through this system, more than 11,400 participating power and industrial plants in 31 countries, and airlines, are given or sold a certain number of emissions allowances that they can then trade among each other. Contrary to beliefs that the low price of carbon of the EUETS suggests it is a failing policy, firm- and plant-level data for more than 4,500 French manufacturing firms indicates it has led to reductions of 15-20 per cent in CO₂ emissions in EUETS-regulated plants. www.aeaweb.org/articles.php?doi=10.1257/aer.104.8.2482

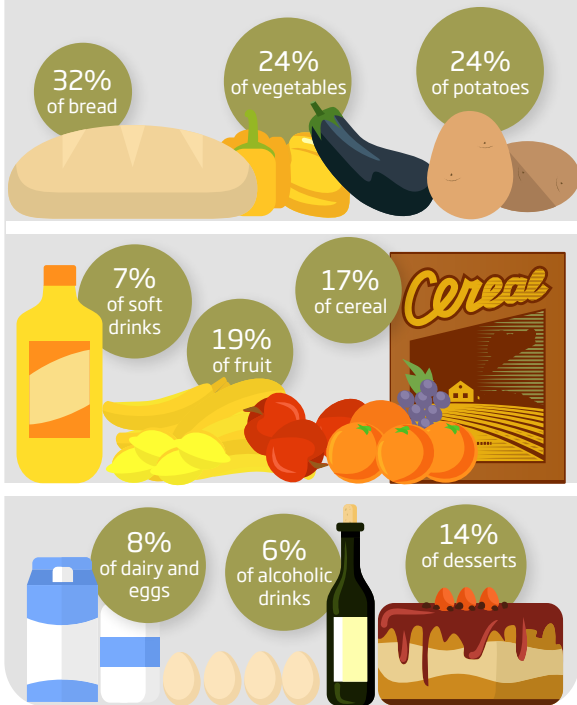
*Dr Mirabelle Muûls, Imperial College
Business School*

WHAT A WASTE

How much food do we really throw away in the UK?

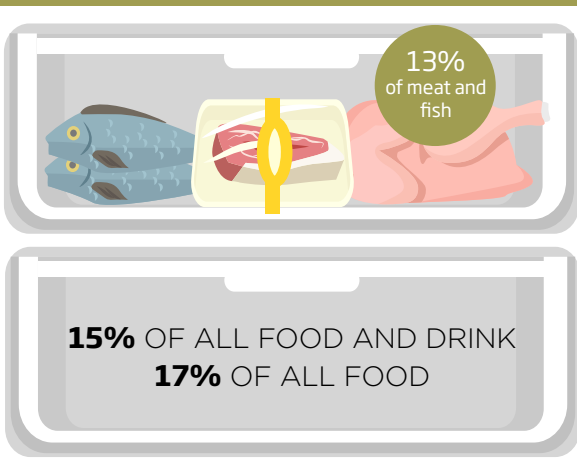
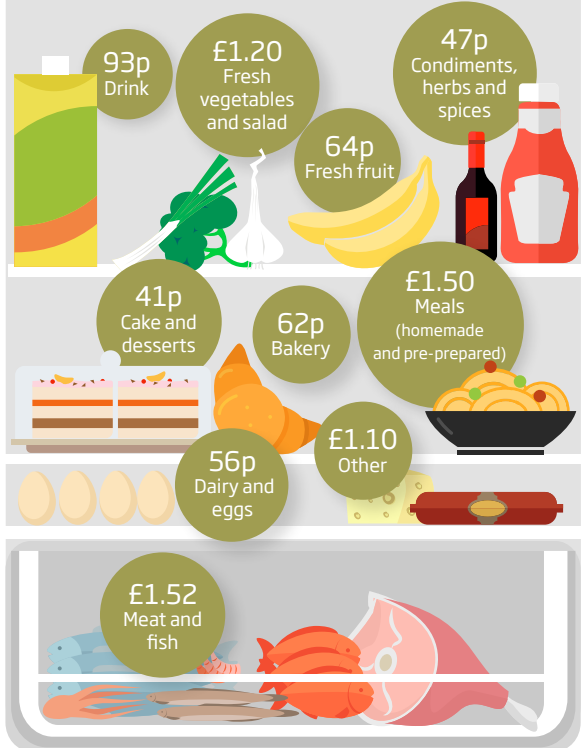
PROPORTION OF FOOD WASTED¹

ACCORDING TO WRAP, THE CIRCULAR ECONOMY & RESOURCE EFFICIENCY EXPERTS, THE COST OF AVOIDABLE² FOOD AND DRINK WASTE IS **£480 PER HOUSEHOLD OR £12 BILLION PER YEAR FOR THE UK.**



HOW MUCH WASTED FOOD COSTS YOU PER WEEK³

THE RETAIL COST OF AVOIDABLE FOOD AND DRINK WASTE FROM UK HOMES WAS AROUND **£9 PER HOUSEHOLD PER WEEK OR 14 PER CENT OF THE AVERAGE £66 THAT HOUSEHOLDS SPEND PER WEEK.**



315,000

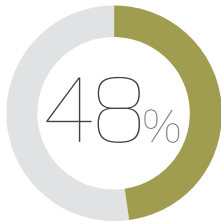
IN 2012, LOCAL AUTHORITIES COLLECTED OVER 315,000 TONNES OF SEPARATELY COLLECTED FOOD WASTE FOR RECYCLING FROM HOUSEHOLDS, A 29% INCREASE ON 2011

WHY WE WASTE FOOD

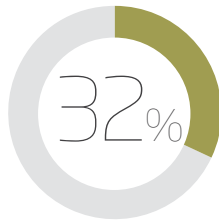
IN 2012

4.2 MILLION

TONNES OF AVOIDABLE FOOD WASTE WAS DISPOSED OF BY HOUSEHOLDS.



48%
WAS NOT USED IN TIME



32%
WAS DUE TO TOO MUCH BEING COOKED OR SERVED

2 MILLION TONNES

OF FOOD WAS NOT USED IN TIME



OF THIS, **25%** WAS FRESH VEGETABLES AND SALAD



FRESH FRUIT AND BAKERY MADE UP ANOTHER **15%** EACH



FOOD WAS ALSO CHUCKED AWAY BECAUSE OF PERSONAL PREFERENCE AND ACCIDENTS (CONTAMINATED, BURNT OR SPOILT)



FRESH VEGETABLES AND SALADS
500,000 TONNES NOT USED IN TIME



FRESH FRUIT
300,000 TONNES NOT USED IN TIME



DRINK
400,000 TONNES BECAUSE SERVED TOO MUCH



MEAT AND FISH
100,000 TONNES COOKED, PREPARED OR SERVED TOO MUCH



BAKERY
300,000 TONNES NOT USED IN TIME



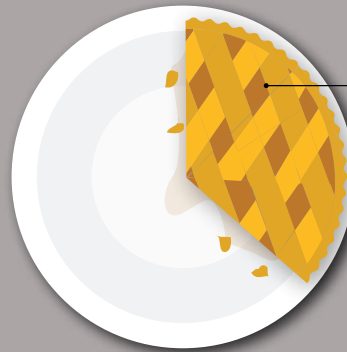
CAKES AND DESSERTS
90,000 TONNES NOT USED IN TIME



DAIRY AND EGGS
250,000 TONNES NOT USED IN TIME

From Digest of Waste and Resource Statistics, 2015 Edition. Sources: www.gov.uk, www.wrap.org.uk
 1 Figures rounded up/down, 2010 figures. 2 Avoidable waste is food and drink thrown away because it is no longer wanted or has been allowed to go past its best. The vast majority of avoidable food is composed of material that was, at some point prior to disposal, edible. 3 2012 figures

WHERE FOOD AND DRINK IS WASTED

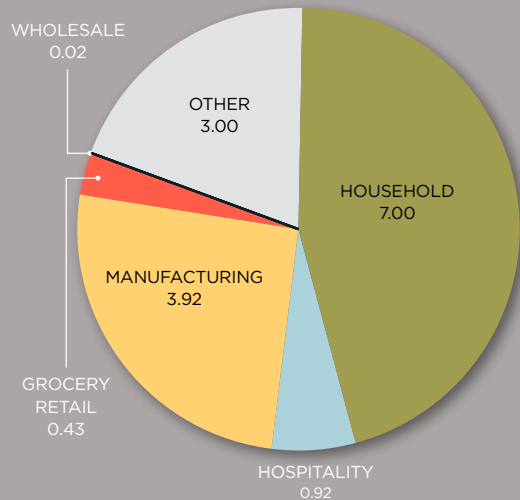


15 million tonnes of food and drink was wasted in the food chain in 2011-12.

This is equivalent to around **1/3** of the **41 million tonnes** of food that is bought annually in the UK.

The highest proportion of this waste in the food chain was wasted in households, with **7 million tonnes** being thrown away in the UK in 2012, or just under half of the **15 million tonnes** that is thrown away.

Of the **7 million tonnes** of household food and drink waste, **4.2 million tonnes** was avoidable, **1.2 million tonnes** was possibly avoidable and just **1.8 million tonnes** was unavoidable.



WHY PEOPLE WASTE FOOD OUT OF HOME

PEOPLE'S REASONS WHY THEY WASTE FOOD IN PUBS AND RESTAURANTS

