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FOR ENVIRONMENT AND SUSTAINABILITY PROFESSIONALS

Environment
Economy
Society

July/August 2018
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pollution in the developing
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“I have thoroughly enjoyed the course. It has been a great opportunity to expand my knowledge on a variety of sustainability topics outside those that I encounter on a daily basis and to engage with others working in the sector. I have taken a lot away that I will use throughout my career.”

Kimberley Lasi, Environment Officer | IEMA Diploma

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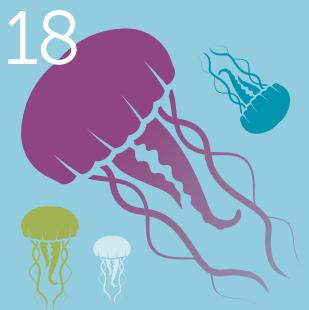
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Andrew Whitehorn FIEMA, general manager, ENGIE

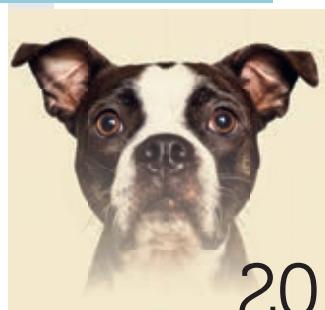


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TIM BALCON, CEO OF IEMA

Accepting the unacceptability

As you'd expect, we are extremely conscious of our material impact. From the paper we use in our publications to the water provided at our events, we are careful to source and serve the right materials – and only then where they have a clear purpose and benefit. But we've had a long-standing 'hardware' issue that has been difficult to tackle: the plastic wrap that your copy of TRANSFORM arrives in.

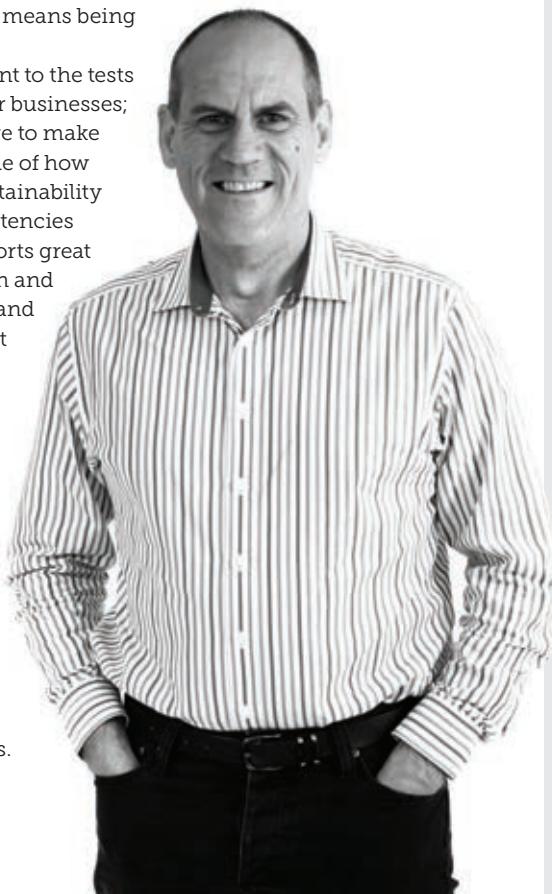
You told us that sending out a magazine which has been giving great coverage of the plastics debate bound in a polywrap was a clear mismatch. We got that, and accepted the unacceptability. But as you will know better than most, acknowledging the problem is easy – finding the right solution involves tough choices.

The most radical alternative was to abandon the print version and become a digital publication – but we know that for the many members who tell us they really value the physical magazine, that would have been the wrong resolution. We had to take a hard look at the limited packaging and mailing options open to us; most simply shifted the environmental burden around – which we're not happy to do – and some were prohibitively expensive. (I feel that addressing an environmental responsibility issue also means being responsible with members' money.)

Cracking this nut has been no different to the tests members face every day to change their businesses; a difficult, complex and urgent challenge to make a long-term change. It's a prime example of how individual trials make up the bigger sustainability picture, and how using all seven competencies on the outer ring of the Skills Map supports great decision making. Through collaboration and determination, we've found a solution, and I'm delighted to now show you your first 'naked' issue of TRANSFORM.

I'd like to thank you for your support while we sorted this, and for your tenacity in always pushing us to do better. Since we made the announcement on World Environment Day, I've seen lots of you calling on other publishers to follow our example, so we may just have started something that has a much wider impact than we intended.

Please keep letting us know what you want to see done differently and done better. You drive us to do exciting things.



IEMA Transforming the world to sustainability

IEMA is the worldwide alliance of environment and sustainability professionals, working to make our businesses and organisations future-proof. Belonging gives us the knowledge, connections and authority to lead collective change, with IEMA's global sustainability standards as our benchmark. By mobilising our expertise, we will continue to challenge norms, drive new kinds of enterprise and make measurable progress towards our bold vision: transforming the world to sustainability.

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ROUNDUP

ENVIRONMENT &
SUSTAINABILITY
NEWS AND VIEWS

SUSTAINABILITY DEVELOPMENT GOALS

Global warming could spark 'fish wars' across the world

Global warming is causing fish to migrate northward to colder waters faster than regulators can allocate new fishing quotas, potentially sparking conflicts across the world.

That is according to a study led by researchers at Rutgers University in New Jersey, which forecasts that new fisheries will appear in more than 70 countries due to climate change. This has led to fears that international disputes such as the ongoing 'mackerel war' between Iceland and the EU could become more frequent, resulting in trade embargoes and unsustainable fishing practices.

However, the researchers argue that lower greenhouse gas emissions, such as those outlined in the Paris Agreement, would reduce the potential for conflict and fractured international relations.

"We have a chance to avoid conflict over fisheries that could escalate international tensions, threaten our food supply and reduce profit and employment worldwide," said the study's lead author, Malin Pinsky.

Along with the Iceland/EU dispute, the researchers highlight how lobster fishers in the US and Canada have now come into conflict due to species moving north from New England.

The study warns that migrating fish as a result of climate change is "inevitable" to some extent, and that governing bodies such as the one overseeing EU fisheries must revamp their rules in response.

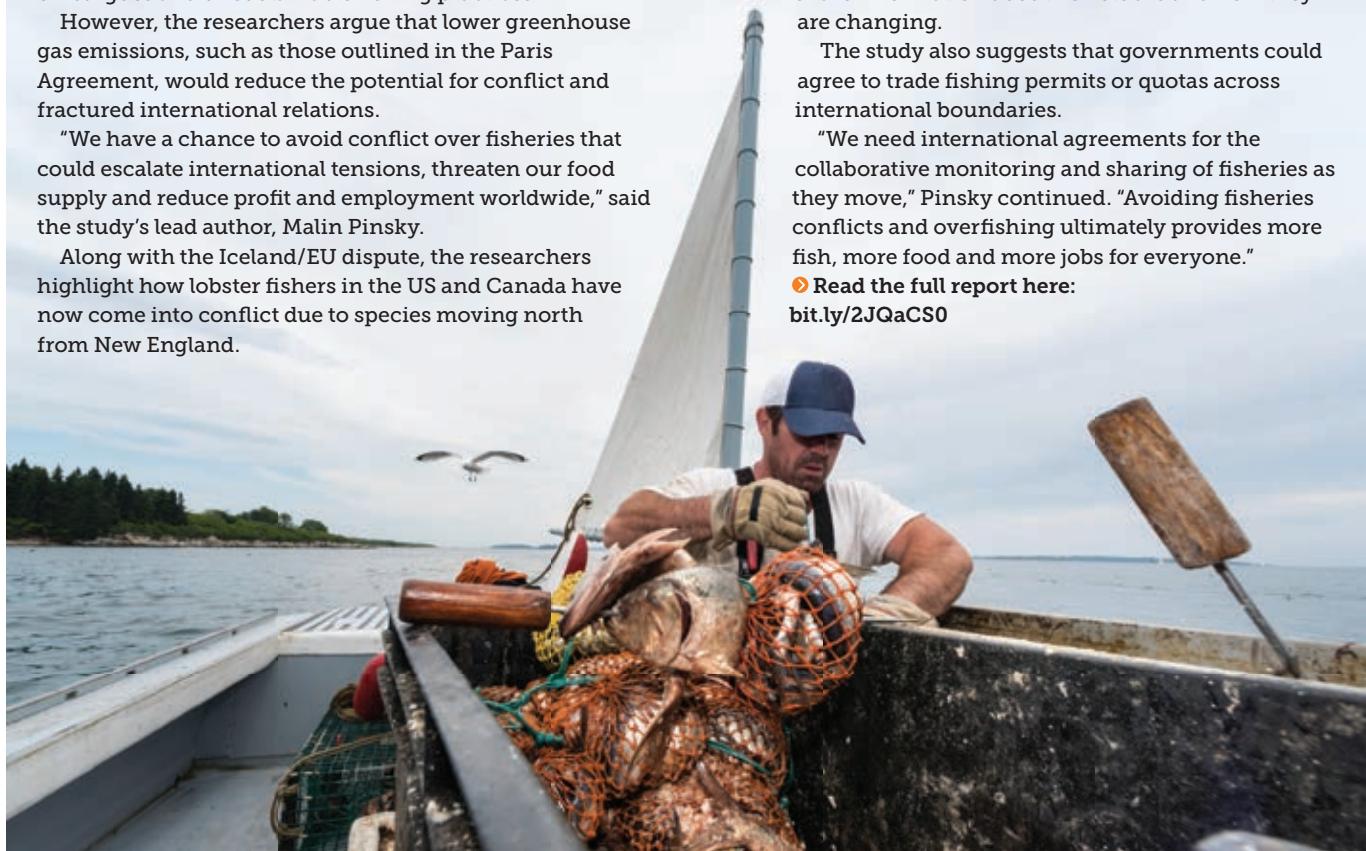
Pinsky said that the current rules are based on the notion that particular fish species live in certain waters and don't move much. "Well, they're moving now because climate change is warming ocean temperatures," he added.

The Antarctic conservation body CCAMLR provides an example of how governing bodies might be redesigned to share information about fish stocks and how they are changing.

The study also suggests that governments could agree to trade fishing permits or quotas across international boundaries.

"We need international agreements for the collaborative monitoring and sharing of fisheries as they move," Pinsky continued. "Avoiding fisheries conflicts and overfishing ultimately provides more fish, more food and more jobs for everyone."

● **Read the full report here:**
bit.ly/2JQaCS0



PHOTOGRAPH: GETTY IMAGES



SHORTCUTS



Carbon emissions rise for first time in four years

Rising energy demand fuelled by strong economic growth in the developed world saw carbon emissions increase last year for the first time since in 2013.

The findings from oil and gas giant BP show demand grew by 2.2% in 2017 – significantly higher than the 10-year average of 1.7%.

Renewable power also grew by 17% – the largest increase on record – with BP describing the findings as “two steps forward and one step back”.

bit.ly/2yuyoxH



One in five British mammals face extinction

According to the first comprehensive review of animal populations for more than 20 years, approximately one-fifth of British mammal species – including the red squirrel – face a high risk of extinction. Climate change, habitat loss and pesticides are thought to be responsible.

The Mammal Society chair, Fiona Mathews, said: “It falls upon all of us to do what we can to ensure our threatened species do not go the way of the lynx, wolf and elk.”

bit.ly/2JZQzMf



Solar power grows by 30%

Global solar power capacity increased by 30% last year, growing faster than all traditional energy generating sources combined, according to a SolarPower Europe report. Solar capacity grew twice as much as wind – despite the UK cutting new installations by half in 2017.

China was responsible for 53.3% of the new capacity, with the rapid growth in solar power expected to continue during the next five years and exceed the 100GW level in 2018.

<http://bit.ly/2MHeRny>

CLIMATE CHANGE

Thousands of cities face “devastating” climate shocks by 2050

Billions of people living in thousands of cities across the world will face crippling heatwaves, droughts and flooding by mid-century if global warming continues on its current trajectory.

That is according to a report by C40 Cities, which reveals that approximately 1.6 billion will be regularly exposed to extremely high temperatures, including poor city dwellers who are the most vulnerable in the world to climate change.

A staggering 2.5 billion people could see their national food supply threatened, with around 650 million facing water shortages, while over 800 million could

experience coastal flooding caused by rising sea levels.

“The impacts of climate change are not a far-off threat,” said C40 board member, Antha Williams. “From Cape Town to Houston, mayors are seeing severe droughts, storms, fires and more.”

The report says “urgent” action is needed to reduce emissions, but that other climate solutions will also be required.

It highlights Seoul, which has planted 16 million trees, and London’s improvement of its drainage infrastructure to withstand heavy flooding, as examples of the type of action needed.

SEA LEVELS

Threefold increase in Antarctic ice melting recorded

Global warming has contributed to a threefold increase in the melting of Antarctic ice during the last five years, with sea levels rising faster today than at any time since 1993.

Scientists at the University of Leeds have found that the continent lost 219 billion tonnes of ice each year between 2012 and 2017, compared with a steady rate of 76 billion prior to that.

This has seen global sea levels rise from 2mm a year to 6mm since 2012, while a separate study from the Grantham Institute warns of a possible 25cm rise by 2070 without action to limit global warming.

Under a worst-case scenario of high greenhouse gas emissions, it is thought that ice melting could lead to

a collapse of the entire West Antarctic Ice Sheet, with sea levels rising by approximately 3.5 metres.

The researchers warn that some of the changes facing the Antarctic are already irreversible, and that decisions made over the next decade will determine the future of the continent’s ecosystem.

“This will rely on governments recognising that Antarctica is intimately coupled to the rest of the Earth system, and damage there will cause problems everywhere,” professor Martin Siegert from the Grantham Institute, said.



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REVISED REPORTING DEADLINES

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SUPPLY CHAIN PROGRAM — 16TH AUGUST 2018

Tony Summers,
GHG Lead Auditor,
Assurance

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www.lucideon.com/cdp



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IEMA CODE

New code of conduct approved

Thank you to all members who got involved in our Code of Professional Conduct consultation.

The new code has now been finalised and approved by the IEMA Board, which means it will be implemented very soon. From 1 September, every new and current IEMA member will be required to declare their commitment to the new Code of Professional Conduct.

We'll tell you much more before then so that you can see the finalised code and understand what you will be asked to sign up to.

• If you have any questions about the new Code of Conduct, visit iema.net

IEMA REPORT

Download the new report on environmental auditing

Following a programme of study carried out with members, IEMA has recently released its Future Challenges of Environmental Auditing report.

The report – which is free to download for all IEMA members – takes a detailed look at the increasingly complex environmental and sustainability landscape of environmental auditing. It also outlines key recommendations for IEMA, such as future strategy, reviews of the environmental auditor register grades, potential working groups and collaboration with other professional bodies and networks.



Between a 2017 round-table discussion of stakeholders, an online survey, four member workshops and input from other auditing experts, more than 600 individuals fed into the study. The report was written for IEMA by Nigel Leehane FIEMA. In addition to being an IEMA Principal Environmental Auditor, Nigel chairs the BSI and ISO sub-committees for environmental

auditing. As a result, the report was offered to the International Organization for Standardization's environmental auditing sub-committee ISO TC207/SC2.

• Go to iema.net now to access your free copy of Future Challenges of Environmental Auditing

MENTORS

New assessor and mentor opportunities

Those members who support others on their professional journey are the beating heart of IEMA.

The hundreds of volunteers who give their expertise and time not only help us to assess applications, mentor members who want to progress and upgrade and review others' CPD

submissions – they also add to their own development record and contacts book.

We are recruiting new CPD Review assessors and membership mentors to help members progress, succeed and achieve their goals.

• If you are keen to get involved, support other members and boost your own CPD, go to iema.net/about-us/vacancies, where you can find out more and apply



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WORDS WITH...

Peter Watts

Author of IEMA's new Environmental Sustainability Skills for the Workforce courses

The Environmental Sustainability Skills for the Workforce courses update IEMA's All Jobs Greener training scheme – so what are the biggest changes?

There has been great progress made globally with regards to sustainability issues since the original courses were released, including the Sustainable Development Goals and the signing of the Paris Agreement. I thought these were important to include in the training due to their consequences for many organisations and society at large.

I also wanted to better reflect the relationship between environmental issues and their links with people and economy – a more joined-up approach. I wanted there to be more content in general, as well as flexibility in how it can be delivered.

There are versions for workforce and management grades – what are the biggest differences between the two?

There is commonality up to a point – the first day of the managers' training is the same as the one-day workplace training – so people on both of these courses will learn about key environmental issues, their linked risks and opportunities and proposing improvements for their organisations. It is designed to inspire and engage all of the workforce in sustainability issues. The Environmental Sustainability Skills for Managers course goes on to take a more strategic view, assuming delegates are likely to have more influence on their organisations' sustainability

direction. It includes advice on communication and change management.

What would you say are the most immediate benefits that learners and their organisations can take away from these courses?

Having delivered a lot of this type of training in the past, I think one of the biggest immediate benefits is empowerment. Sustainability issues can sometimes make people feel a little powerless, and good training can show people how they can make changes in their organisations. The training also contains messages and useful statistics that can help with communicating sustainability issues to their colleagues.

The new suite has been designed to be easy to tailor for sectors and



"Sustainability issues can make people feel powerless, and good training can show them how they can make changes"

organisations. How have you been able to do that?

We made this a priority from the start because we knew this type of training would frequently be delivered in house. The trainers are free to add information that is specific to their organisation, and there are also a range of case studies that trainers can choose as appropriate. In my experience, delegates often find interest and inspiration in seeing what organisations in other sectors are doing.

As a trainer yourself, what do you most enjoy about training non-specialists in sustainability principles?

I think a lot of people I work with on this type of training are surprised by the breadth of the subject, and often get a lot more out of it than they expected to, such as being able to join the dots between what their organisation is doing and the wider picture. As a trainer, the most satisfying reward is where somebody has enjoyed your course and is going to be able to use it practically in their work.

► Go to iema.net/training to find out about these courses and find a training provider near you.

Peter Watts
is principal
consultant
of Watts
Sustainability
Ltd

NEW REGULATIONS

THE LATEST

■ GUIDANCE ■ CONSULTATIONS ■ LEGISLATION



22 MAY 2018

Renewables

The Renewable Heat Incentive Scheme Regulations 2018 make changes to the Non-Domestic Renewable Heat Incentive Scheme by revoking and replacing the previous 2011 Regulations. They enable owners of power plants which generate heat from specified renewable sources to receive payments for the heat used.

cedr.ec/591


7 JUNE 2018

Hazardous substances

Seven Directives have been published amending Directive 2011/65/EU on the restriction of hazardous substances in electrical and electronic equipment (RoHS). They set out a list of exemptions to the general ban on the use of the hazardous substances.

cedr.ec/592


15 JUNE 2018

Water quality

The Water Supply (Water Quality) Regulations 2018 revoke the previous 2010 Regulations, and deal with the quality of water supplied by water companies for drinking, washing, cooking, food preparation and food production.

cedr.ec/5a0


19 JUNE 2018

Water pollution

The Environmental Protection (Microbeads) (Scotland) Regulations 2018 prohibit the use of microbeads as an ingredient in the manufacture of rinse-off personal care products, and the sale of any such products containing microbeads.

cedr.ec/593


30 MAY 2018

Waste

An Environment Agency Regulatory Position Statement has been produced for businesses who deal with excavated waste from unplanned utilities installation and repair works. If you follow its conditions, you do not need to apply a hazardous waste classification for excavated wastes.

cedr.ec/595


1 MAY 2018

Flood management

The Scottish Environment Protection Agency seeks views on the Potentially Vulnerable Areas for Flood Risk Management in Scotland. The consultation takes into account climate change as a major flood risk factor which needs to be accounted for in the next National Flood Risk Assessment. It also asks for comments about the assessment methods used.

cedr.ec/55s


10 MAY 2018

Regulators

The Department for Environment, Food and Rural Affairs has developed a consultation on the proposed creation of an independent environmental watchdog to hold the Government accountable for the policies and decisions made in relation to environmental protection after the UK leaves the European Union.

cedr.ec/58w


22 MAY 2018

Air quality

The Department for Environment, Food and Rural Affairs is consulting on a new Clean Air Strategy, and on actions to improve air quality by reducing pollution from a wide range of sources.

cedr.ec/58x

IN COURT

WASTE FIRE

Recycling company racks up heavy fines

Lincolnshire-based recycling company Mid UK Recycling Ltd has been handed a fine of £100,000 following a serious fire at its premises at Barkston Heath, Ancaster, in July 2015.

The large fine comes in addition to an order to pay costs in the region of £50,000, and the company also agreed to pay £230,000 in compensation to Lincolnshire Fire and Rescue as a consequence of the blaze.

As a result of the fire, 90 firefighters were called to the scene, and nearby roads were closed due to the large amount of thick smoke. Residents were also advised to stay indoors and shut windows and doors. The blaze burned for nearly a week before finally being deemed extinguished.

The fire broke out spontaneously, destroying a stockpile of waste consisting of carpet, mattresses and plastic bottles. Inspectors had previously found that the stockpile was around several hundred tonnes, piled to nearly 10 metres in height and with no appropriate fire breaks. Mid UK did not remove the waste as requested, and

was served an enforcement notice in July 2014, with which it not comply.

The sentencing was passed by Judge John Pini QC. He stated that the company, which has contracts to collect recyclable waste with a range of local authorities, has a "history of not complying with guidance and enforcement notices."

Judge Pini spoke during the sentencing, saying that "the repeated guidance and the failure to heed it properly, with knowledge of the risks, is to a considerable extent what grounds recklessness as opposed to negligence."

The owner company of the site, MC Mountain and Sons Ltd, and managing director Mowbray Christopher Mountain, pleaded guilty to five charges of breaching planning and environmental legislation, and failing to comply with an enforcement notice, but no separate penalty was given.

Mountain said that, since the fire, the company had made changes and had a bespoke fire prevention plan from the Environment Agency.



CASE LAW

High Court dismisses appeal on waste operation

The case of *Mark Stone, Salhouse Norwich Ltd v Environment Agency*, an appeal to the Queen's Bench Division, has been dismissed.

Salhouse Norwich Ltd owned a site on which another person operated a waste business that recycled mattresses. The Environment Agency issued an enforcement notice to the person, who ceased trading, but approximately 471 tonnes of waste material remained on the site.

The Court ruled Salhouse Norwich Ltd knowingly permitted the operation of a regulated facility, namely a waste operation for waste storage, without an

environmental permit, breaching the Environmental Permitting (England and Wales) Regulations 2010, in force at the time of the breach. The director of Salhouse Norwich Ltd was also convicted on the basis the company had acted under his direction.

Mr Justice Andrew Nicol, when considering the appeal, felt that there had been a clear continuing "waste operation" and looked to the Preamble of Directive 2008/98/EC on waste, which was intended to implement

the precautionary principle and the principle of preventative action. Disposal and recovery operations under Annex 1 and Annex 2 to Directive 2008/98/EC also showed that storage pending disposal or recovery was a "waste operation".

It was also held that the Environmental Permitting (England and Wales) Regulations 2010 did not require Salhouse Norwich Ltd to have taken positive action to convict them – knowingly permitting a contravention to the Regulations was enough.



OTHER NEWS

Government to consult on waste crime

The fight against waste crime has taken a significant step forward with the announcement of a comprehensive review aimed at tightening the government's approach.

The launch of 'A call for evidence' will enable a wide discussion on ways to crack down further on organised crime groups who profit from waste crime.

Led by DEFRA non-executive director Lizzie Noel, the review will consider:

- The types of crimes being committed and the groups involved
- The environmental, community and economic impacts of waste crime
- How the Environment Agency, other organisations and the law enforcement system can work together
- Recommendations for a strategic approach.

Lizzie Noel commented: "The health of our communities, environment, and economy is being harmed by organised groups committing serious waste crimes.

"This review is an opportunity to properly understand the extent of this criminal activity, and I look forward to working with a range of partners to ensure our response is robust and effective."

The announcement builds on new measures introduced by the government to tackle waste crime. These include powers for the Environment Agency to lock the gates to problem waste sites to prevent waste illegally building up, and to force operators to clear all the waste at such sites.

In addition, extra powers have been given to councils to make it easier for them to stop, search and seize vehicles suspected of being used for fly-tipping, and to issue on-the-spot fines to fly-tippers.

NATURAL WORLD

Monkey business

Global warming could threaten the survival of endangered golden snubnosed monkeys in China, restricting the food supply needed for the animals to thrive in harsh winter months.

A unique study using thermal imaging to look at their diets has found that the monkeys consume approximately twice as many calories from fats and carbohydrates in winter as they do in spring.

That almost exactly matches the additional heat they lose during the colder months, with temperatures in their high-altitude forests in the Quinling Mountains often dipping below 0 °C.

However, cooler spells in late spring, caused by climate change, could restrict the availability of seeds – an important source of carbohydrates and lipids. Drier winters, meanwhile, may impact the nutritional balance in plants.

This would significantly affect the way the animals generate heat, altering the foraging strategy and habitat use of monkey populations, which have already seen their numbers threatened by habitat loss.

"The findings can help us understand the habitat needs of the monkeys as the climate changes, and predict changes in food choice and the food web," commented the study's co-author, Professor Baoguo Li of the Northwest University in China. [t](#)

In focus



The DENIM dilemma

The fashion industry is killing rivers in several developing countries, according to hard-hitting documentary *RiverBlue*. Producer **Roger Williams** talks to Huw Morris

Most people own at least one pair of jeans, but hardly anyone knows about the toxic techniques that are used to manufacture and treat those jeans. Fewer still realise the destructive impact such manufacturing has on the world's rivers.

This lack of awareness, however, is now being addressed in a documentary, *RiverBlue*. The film, which has won several awards, investigates the West's appetite for fast fashion and its production in developing countries. Its message is blunt: fashion is destroying some of the world's rivers. Denim is the villain of the piece, with manufacturers dumping the wastewater and toxic dyes involved in its production into rivers – in countries where environmental regulations are routinely ignored.

The film's producer and co-director, the Canadian Roger Williams, wanted to produce a water-themed, feature-length documentary. He had the concept, but not the story. The touchpaper was lit by a Google map and an image of a Chinese river, which supplied water to Hong Kong, flowing into a bay.

Within this river was a large streak of indigo blue – so prominent, it could be seen from outer space. The pollution

originated in an area that billed itself as "the blue jeans capital of the world", says Williams. The area manufactures around 200 million pairs a year for 60 brands, and sends them to North America. Further research revealed that, worldwide, a staggering nine billion pairs of jeans are made every year, with little regard for the environment. Williams had his story.

"Blue jeans are an iconic item that everybody owns, but they are actually a big problem," he says. "They are much 'dirtier' than you would ever guess. That 'distressed' denim look is down to several chemical-intensive washes, which are then just dumped into rivers."

RiverBlue follows the conservationist Mark Angelo around the world, focusing on rivers in Bangladesh, China, Indonesia and India. It features interviews with local conservationists, and images of discoloured rivers foaming with chemicals.

Highlighting river pollution as a problem is one thing, says Williams, but seeing its impact on people's lives is quite another. He was shocked at the volumes of toxic chemicals being dumped into the rivers that people swim in or drink from. "I wouldn't even dip a finger into the water," he says. "In some places, it was black and reeked of chemicals."

Water woes: Some rivers in China contain toxic heavy metals, due to the dumping of chemicals by jeans factories

PHOTOGRAPHY: PRESSMEDIA © LU GUANG - GREENPEACE



IN NUMBERS

The pollution caused by jeans production rapidly adds up



1.7 BILLION TONNES

In 2015, the global clothing industry generated 1.7bn tonnes of CO₂



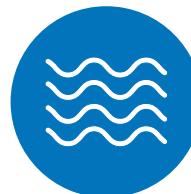
1.2 BILLION

The number of pairs of jeans that are produced annually worldwide



20KG

Manufacturing a pair of jeans creates the same CO₂ as driving a car for 50 miles



3,480 LITRES

The amount of water it takes to make a single pair of Levi's iconic 501 jeans

Dead in the water

The film is crammed with disturbing footage. In Dhaka, Bangladesh, tannery workers with no protective clothing treat leather with toxic chemicals. The nearby Buriganga is such a dumping repository that it is now incapable of supporting animal life. Downstream, people bathe in water that is pitch black, orange or purple. Some children have lost their sense of smell, and skin diseases are common. One local man cleans fish that he has found floating dead in the river, to feed his family and sell at the market.

Parts of the Ganges that are heavily polluted by tanneries are also used to irrigate farmland, where crops for human consumption are grown. Chromium has been found in cattle milk and agricultural produce here. In rural China, campaigners have discovered that certain rivers are polluted with heavy metals such as manganese, which has been associated with brain damage.

Interview

Feeling blue: The streak of indigo dye in one Chinese river is so large that it can be seen from outer space

Other heavy metals found in the rivers are neurotoxic and carcinogenic; 'cancer villages' have emerged along despoiled waterways. There is even a local joke in China – every year, you can predict the 'it' colour of the season by looking at the colour of the river.

The root cause of the problem is the North American Free Trade Agreement, which came into force in 1994. In search of increased corporate profits, clothing companies that were legally bound to manufacture in an environmentally responsible manner in North America have outsourced – to countries where environmental protections are woefully inadequate, or ignored altogether.

The stark message of *RiverBlue* is that much of this devastation is inflicted on people and places that are far from the Westerners who buy these products. Many fashion brands and manufacturers, says Williams, commission clothing without taking responsibility for looking at the factories and making sure they comply with environmental protections. "They're all about stakeholder value, and driving the product to the consumer."

However, there are signs of hope. François Girbaud, the designer known as the 'godfather of blue jeans', admits in the film that the techniques he invented for the distressed look are killing people. "If you knew that the spraying of permanganate on your jeans to give you that acid-wash look was killing the guy doing the spraying, would you still want that look?" he asks. Girbaud is working to accomplish the distressed look with laser and air technologies created by a Spanish company called Jeanologia. The film also features Italdenim, an Italian firm that uses shellfish exoskeletons discarded by the food industry as a fixing agent for jeans. Both technologies reduce the heavy water consumption used in the washing process for blue jeans, and take toxic chemicals out of the equation.

Consumers can help by learning more about where their clothing comes from, says Williams. "People can start shopping more ethically – then they know what they're actually buying. Consumers have power with their buying dollar."



"A local joke in China says that you can predict the 'it' colour of the season by looking at the colour of the river"

If they choose to buy sustainably made products, then the fashion industry will start to listen." To this end, *RiverBlue* has launched fashionheroes.eco, a website highlighting the work of brands and organisations that are taking large steps towards sustainable and environmentally friendly fashion.

RiverBlue has been accumulating accolades, winning awards and nominations at film festivals across

the world – including, notably, Best Documentary Feature at Raindance, an independent film festival in the UK. It also recently won the AFD Best Film Award and the Green Drop Award as part of World Water Forum celebrations in Brasilia, Brazil, a key global gathering about water. Williams is now considering a sequel.

"I'm often asked by people whether they should stop wearing jeans, but I say no," he says. "I wear jeans every day, but I know that there are new ways of making jeans and clothing through lasers, ozone and new technologies. I hope this film can help make change happen, with more people wearing jeans in an appropriate way."

"I've changed my habits when shopping for new clothes, and now wear vegan shoes and shirts made from merino wool – but I'm not a fashion guru. It's a process, and it's not going to change overnight." 



Cinematic champion

Roger Williams is an award-winning producer, director and cinematographer who has worked for broadcasters and studios around the world. His portfolio includes both documentaries and drama. A constant theme running through Williams's work is his philosophy to create productions with compelling content and purpose that matters to viewers.

HUW MORRIS is a freelance journalist

Further information

Watch the *RiverBlue* documentary riverbluemovie.eco

Read Greenpeace's Toxic Threads: The Big Fashion Stitch-Up report at bit.ly/2IFtpPh

Download Global Fashion Agenda's Pulse of the Fashion Industry 2018 report at www.globalfashionagenda.com/pulse

Read Chemical & Engineering News' report on fast fashion at bit.ly/2kZPV7g

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Designing in resilience to biological phenomena can help organisations to prepare more generally for the impacts of climate change, writes **Tom Wycherley**

Biology Lessons

The potential impacts of climate change, and their effects on the way we live, are high on the agenda for international governments, businesses and academia. The World Economic Forum's 2016 Global Risks Report listed the failure to mitigate and adapt to climate change as its top risk to countries and industries, in terms of impact – above weapons of mass destruction and terrorism. The report calls for action to build resilience against climate change and the other global risks that it identifies, including water crises, biodiversity loss and ecosystem collapse – all of which are themselves likely to be exacerbated by climate change.

While there is some uncertainty around every outcome that could result from climate change, a large proportion of the scientific community agrees that the climate is getting warmer, glaciers and ice sheets are shrinking and sea levels are rising. Human influence on climate change – via greenhouse gas emissions and other drivers – is the highest it has been in history. This is 'extremely likely' to be the dominant cause of global warming, according to the Intergovernmental Panel on Climate Change's Fifth Assessment Report 2014.

To reduce and manage the effects of climate change, it will be necessary to tackle and mitigate its root causes – but we will also need to adapt existing systems to meet the challenges posed by a changing environment. To do this, we must design resilience to climate change into our infrastructure, in both the shorter and the longer term.

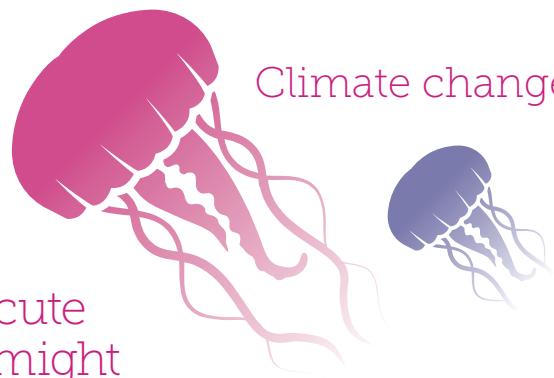
Building defences to natural hazards has traditionally focused on ensuring that infrastructure can withstand a high level of physical change or risk, such as floods and heat. While this provides resistance

to some of the potential impacts of climate change, thought-leading organisations are widening their design scope to include building in resistance to biological phenomena or extreme biological events that could arise from climatic change. The ability of an organisation to mitigate the risks and manage the impacts from existing biological phenomena provides an indication of how resilient an organisation might be to climate change, what measures can be put in place and what can be achieved.

What are biological phenomena?

Biological phenomena are remarkable events – in the sense that they are uncommon and extraordinary – which test the resilience of organisations' infrastructure and resources. In many sectors, such as the civil nuclear industry, biological phenomena are considered to be within the scope of natural hazard safety cases. However, since the release of the revised ISO 14001:2015 standard, they should become more prevalent within organisations' environmental risk registers.

In the UK, many types of biological phenomena pose a credible risk to organisations in a range of industries. These include insect swarms, toxic algal blooms, increased biofouling, jellyfish swarms, rodent infestations and bacterial or viral epidemics. Any of these can lead to a variety of hazards and related consequences. While the impacts of climate change on ecological systems will vary greatly, there is evidence to suggest a growing correlation between biological phenomena events and a warming climate. Consequently, under-predicted climate change scenarios, the frequency of their occurrence and the severity of what are defined as



"Ability to withstand acute biological phenomena might serve as a measure of ability to endure future climatic change"

(acute) biological phenomena are likely to increase.

Holistic aspects

The parallels between today's biological phenomena and tomorrow's climate change impacts are uncertain, but there are enough similarities to suggest that an organisation's ability to withstand acute biological phenomena might serve as a measure of its ability to endure future climatic change. For an organisation to develop strategies to withstand the effects of damaging environmental hazards, a holistic approach is needed.

If an organisation recognises that the biological phenomena posing a risk to it today indicate where future risks from climate

change may arise, it can start to test its resilience measures.

In the marine environment, for example, rising sea temperatures might contribute towards an increase in biological hazards, such as excessive vegetation growth or biofouling on marine structures. Mitigation to protect the asset from biological fouling should already be in place, but would significantly more biological fouling – due to warmer water, for example – undermine or overwhelm the effectiveness of current measures?

For instance, an increase in biological fouling could create additional drag that results in structural integrity problems for undersea pipelines and marine platforms. This could be

compounded when combined with other natural hazards, such as extreme weather. For such assets, an organisation would need to identify how much growth the asset could take within increasingly prevalent extreme weather scenarios before it failed or was no longer safe. In effect, the organisation would be identifying how much redundancy was in place to protect the asset against predicted climate change scenarios.

By recognising the potential risks that natural hazards create, companies can reduce their risk, ensure continuity of operations, safeguard infrastructure and protect their business.

TOM WYCHERLEY is an environmental consultant at Frazer-Nash Consultancy and a specialist in marine biology and coastal ecology

CASE STUDY: HMNB CLYDE

Engineering company Babcock Marine undertook a project to design resilience to biological phenomena into a naval base in Scotland. HMNB Clyde was authored and up-issued design guidance documents (DGD) detailing its engineering design strategy for hazards.

Babcock Marine asked systems and engineering technology firm Frazer-Nash Consultancy to produce DGD appendices on: naturally occurring biological phenomena such as jellyfish swarms, insect swarms and rodent infestations; extreme precipitation; and accelerated seawater corrosion.

Frazer-Nash researched these biological phenomena to understand what might influence their occurrence and scale. The research also considered the potential consequences of biological phenomena for the naval base's structures, systems and operations. Frazer-Nash produced design guidance that offered best-practice engineering techniques, operational processes, and engineered and administrative safeguards that could manage the risks of biological phenomena. It included a recommended strategy for compliance with safety, management and design principles.



BUILDING IN RESILIENCE

- Testing a facility's resilience to biological phenomena can result in resilient design changes and new procedures.

- Organisations that consider the results of today's natural hazards are better placed to achieve climate resilience, manage external risks, and support a more sustainable future for themselves.

- Planning for an uncertain future needs to be more than a tick-box retrospective exercise; it should be considered from the outset of any new project.



All bark, no bite

It's essential that any new environmental watchdog can genuinely hold the government to account after Brexit, writes **Neil Howe**

As the UK's exit from the EU continues to be negotiated, we are starting to gain some insight into how the country's environment will look post-Brexit. The latest glimpse comes from the UK government's consultation on Environmental Principles and Governance after EU Exit.

Running until August 2018, the consultation proposes the creation of an independent watchdog to hold the government to account for the decisions it makes on environmental protection. Currently, the European Commission, supported by the European Environment Agency, monitors the implementation of EU environmental legislation across member states. Where necessary, cases of non-compliance are brought to the European Court of Justice to ensure appropriate application of the law.

Addressing the issues

Once the UK leaves the EU, it will need an independent body to take over the monitoring of the UK government, in place of European jurisdiction. The consultation attempts to address this, by examining:

- The current environmental principles in international and EU law, and how they can be implemented into domestic policy
- The creation of a new watchdog to hold the government accountable, including development and implementation of policies
- The role of the watchdog in the wider environmental context, and how it will work with the government and other authorities, such as the Environment Agency and Natural England.

Long time coming

Proposals for a new environmental watchdog were first suggested by environment secretary Michael Gove in November 2017. Amid concerns that the environmental legislation enshrined in EU law could be lost, and that the UK would be prepared to relax environmental policies post-Brexit, he suggested creating a "green Brexit" in which the environment would have a powerful voice.

However, the suggested consultation did not materialise – something that has been picked up on by the House of Lords.

Modest proposals

Several months on, we finally saw some initial published proposals, although they appeared to reflect current

governmental divisions. It was a compromise. There would be a new watchdog, but it would be without any real power. No means to initiate legal action against the government. No obligation to continue to operate key environmental elements, such as the precautionary and 'polluter pays' principles. Nothing to do with climate change.

'Holding the government accountable' wouldn't mean taking it to court if it flouted environmental standards; it would mean serving it with 'advisory notices' that request compliance and identify corrective actions.

House rules

Initially, criticism of the proposals came from environmental campaigners, who almost universally condemned them; more recently, the Houses of Parliament have increased

political scrutiny around the proposals.

On 13 June, during an intense session on the EU Withdrawal Bill, the Commons passed an amendment by 320 votes to 296 that ensure the watchdog will have the power to take "proportionate enforcement action – including legal proceedings if necessary". There were also reassurances that existing EU environmental principles would be set in primary legislation. However, its powers

would be limited to central government, and not public bodies such as local authorities and the Environment Agency. Despite the amendments, it still means the UK will have less protection than it currently has.

"Despite the amendments, the UK will have less protection than it currently has"

Mind the gap

In a time of uncertainty for our profession, concrete proposals on filling the environmental 'governance gap' once the UK exits the EU are a positive step. However, it seems doubtful that, in its proposed form, the new environmental watchdog will be able to do the task that has successfully been carried out by the European Commission and the European Court of Justice. Gove claimed the watchdog would have "real bite" – but without the power EU authorities currently enjoy, it lacks teeth. It's essential that any new body can genuinely hold the government to account in the same way that European institutions have been able to do in the past. T

NEIL HOWE is senior legal author at Cedrec Information Systems



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Life in...

Companies need to step up and take responsibility for the plastic pollution they create – and soon, says **David Burrows**

Liz Goodwin was CEO at the widely respected Waste and Resources Action Programme (Wrap) for almost a decade, and currently leads the food waste programme at the World Resources Institute. If anyone can appraise the food sector's performance on waste management, it's her. In January, at a Westminster energy, environment and transport forum in London, she said: "The issues and potential benefits don't feel real to individual companies. They don't see the urgency, they still don't see the business case and they don't feel a burning platform."

Six months on, I wonder if this is still the case?

Pressure to act on plastics had been steadily building, but the BBC's *Blue Planet II* lit the touchpaper. Since then, we've had the government's 25-year environment plan, along with consultations for new taxes on some single-use plastics. Companies have also been quick to commit to recycling more, using more recycled materials and even phasing out 'avoidable' single-use plastics. In some cases, they're going plastic-free for all packaging (Iceland in the UK) or in dedicated aisles (Ezoplaza in the Netherlands).

'Plastic' has even been declared Children's Word of the Year, following

an analysis of the stories sent in to BBC Radio 2's writing contest. "It's been extraordinary to watch it unfold," Goodwin tells me. "We've been banging this drum for years."

Some might say Goodwin has been banging her head against a brick wall. Plastic pollution hasn't happened overnight. It's been more than two years since the Ellen MacArthur Foundation estimated there will be (by weight) more plastic than fish in the sea come 2050 and, according to a report in June's National Geographic, virtually half of the plastic ever manufactured has been made in the past 15 years. Plastic is cheaper than the chips it cradles, so who cares what happens to it once your fingers are licked?

"The status quo is one of producer irresponsibility"

As little as a decade ago, the plastics industry's attitude was – shockingly – that incineration remained the best bet for plastics. "I remember when I first started at Wrap in 2007, one of the first meetings I went to was with the British Plastics Federation and they told me exactly that – all plastics should be burnt."

said Goodwin in January. "I think if you went back to them now they would have a different story."

Undoubtedly. Look at the BPF's website and it proudly boasts of a 15% rise in recycling of plastic packaging in 2016, compared to 2015. "Our vision is to see 100% of plastic packaging reused, recycled or recovered," the organisation's director general Philip Law recently said. And we can expect to hear more about this positive side to plastics in the coming weeks and months: the BPF has just run a 'Public relations for plastics' event for its members, with presentations from experts in crisis management, social media and PR. I've been told a lobbying group has also been hired, most likely to bend the ear of politicians who are currently being swayed by public opinion on plastics.

Laissez-faire attitude

It's important to note that I don't have a problem with plastics. I don't believe that all plastics are bad, and knee-jerk reactions to simply switch to an alternative can come at a cost (both economic and environmental).



"Plastics aren't inherently bad – it's what we do, or don't do, with them that counts," suggested Sylvia Earle, *National Geographic's* explorer in residence. I agree – though at some point we will need other solutions, because plastics aren't infinitely recyclable and we can't keep using oil to make more. Indeed, it's the laissez-faire attitude that I have a problem with – the failure to think about the life cycle of materials, as well as the complete lack of transparency.

Having seen the stick Coca-Cola has received since acknowledging that it makes 128 billion plastic bottles each year, others have been reluctant to reveal their plastic footprints. In a recent investigation for Just-Food.com, I asked Mars, PepsiCo, Unilever and Nestlé how much plastic packaging they use; not one of them could (or would) say (though Nestlé has since promised to report the figure in its next annual report).

Supermarkets have been equally coy. *The Guardian* and consultants at Eunomia have estimated that the UK's biggest eight supermarkets create more than 800,000 tonnes of plastic packaging waste every year. According to the charity Recoup, which promotes plastic recycling, 512,475 tonnes of plastic was collected from UK households in 2016, 512,000 tonnes of which was bottles, pots, tubs and trays. That leaves 287,525 tonnes somewhere else. (In fact, it's far more than that, given Eunomia's figures are likely an "underestimate" and don't consider smaller stores or the food service and hospitality sector). "The status quo is one of producer irresponsibility – packaging that's unnecessarily wasteful, some that has no hope of being recycled, and too much being littered on land and sea," said Eunomia chairman Dominic Hogg.

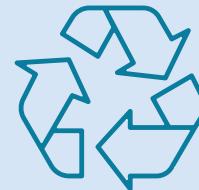
Poor recycling infrastructure hasn't helped, of course. However, with a tight squeeze on council budgets and the emergence of 300 or so different collection systems, you could say collecting half a million tonnes of plastic is a remarkable achievement. In fact, local authorities are covering 90% of the cost of recovering packaging, according to the Environmental Audit Committee, which

is why everyone is talking about extended producer responsibility.

Hit them hard, I say. For too long, food and drink companies have got away with doing very little, hiding behind (or completely ignoring) voluntary agreements such as Wrap's Courtauld Commitment and fiercely opposing any form of new regulation. Look how long it took to introduce the carrier bag tax here; the to-ing and fro-ing must have cost the public sector millions. We can't afford to dilly-dally again, but unpick the rhetoric and look more closely at some of the commitments and that's exactly what is happening (and the sharp suits at BPF's lobby firm will be told to press hard on the brakes of policy). Others will be doing the same when it comes to other potentially game-changing policies, such as a 'latte levy' on disposable cups or a national deposit return scheme.

"All this 'low' and 'careful' language is nonsense," says Sian Sutherland, co-founder of A Plastic Planet, which is pushing supermarkets to introduce plastic-free aisles. Even Iceland, which is now seen as a pioneer when it comes to plastic reduction, could go faster (the retailer has committed to having entirely plastic-free packaging within five years) – and as for the UK Plastics Pact, that's full of guff, she suggests. Even Goodwin, a fan of voluntary agreements, says it's not yet clear what the companies involved will do and how they'll get there.

The pact sets four targets for 2025. The first three are: 100% of plastic packaging (food and non-food) to be made reusable, recyclable or compostable; 70% of plastic packaging must be effectively recycled or composted; and plastic packaging should contain at least 30% recycled content. How 'recyclable' is defined



THE UK PLASTICS PACT – BY 2025...

- 100% of plastic packaging to be reusable, recyclable or compostable
- 70% of plastic packaging to be effectively recycled or composted
- Unnecessary single-use packaging eliminated through innovation
- All plastic packaging to contain 30% average recycled content

will be key – 'technically recyclable' and 'economically recyclable' are two very different concepts. A switch to compostables, meanwhile, will require significant investment in infrastructure.

Low-hanging fruit

However, it's the fourth – and some might say most critical – commitment where the pact really comes unstuck. By 2025, it states, the signatories should "take actions to eliminate problematic or unnecessary single-use packaging items through redesign, innovation or alternative delivery models". In other words, it's a promise to reduce plastic but with no accountable target. Wrap apparently didn't know what number to put – but without one, how can we believe the sector is committed to reducing plastic use? And without a target, where's the incentive to go further than tackling low-hanging fruit, such as plastic straws and film-wrapped coconuts?

BPF's new vision states that "the plastics industry, government and wider society all want the same thing: to reduce plastic waste so we leave the environment in a better place for generations to come". Fine words, but now it's time to get on with it and deliver meaningful change. T

DAVID BURROWS is a freelance journalist

The big question

THIS MONTH WE ASK...

Is a four-day
working week
a good idea for
the UK?



Let us know at iema-editor@redactive.co.uk if you have any questions you want answering in a future issue.

The big question



AIDAN HARPER

4DayWeek Campaign spokesman

"We must share the gains of productivity more evenly"

The time we spend in work is not natural; it is an artificial construct that was a site of significant political contestation for well over a century. When addressing work-time reduction, it helps to ask why we have a five-day week in the first place.

Before the five-day week, it was common for people to work six-day, 60-hour weeks in appalling conditions. Many of the arguments then made in support of the eight-hour day sound familiar: we spend too much time in work, which negatively impacts physical and mental health, worker productivity, and the ability for an individual to have a personal, family and social life.

These issues still apply: the biggest cause of absence in the UK is work-related stress, 10.5 million UK workers say they'd like to work fewer hours, and productivity lags behind countries like Germany – people there work fewer hours, yet it has a higher GDP per capita.

Technological advancement and increases in productivity since the 1970s mean that it is entirely feasible to work fewer hours – and yet we have barely changed our working patterns. With automation looming, we urgently need to look at how work is distributed. We must share the gains of productivity more evenly with workers in the form of work-time reduction. The rationale is clear; what is lacking is political will. If we believe the tenet that 'power cedes nothing without a demand', however, that can change.



JONATHAN BARTLEY

Co-leader of the Green party of England and Wales

"Wealth and benefits are concentrated in too few hands"

When I was a kid, we were promised that technological advances would bring radical change, and generate vast wealth – so we would all be able to work fewer hours. Well, the economy has trebled in size. The biggest computer from my childhood would not keep up with the phone in my pocket. But the utopia we were promised has not come to pass. Why? It's because the wealth and benefits are concentrated in too few hands.

It doesn't have to be this way. Already, companies are showing how we can re-programme our economy and share the benefits. Ormiston Wire, a specialist wire manufacturer in Middlesex, and Normally Studio, a London-based tech company, both work a shorter week while paying workers for five days. This gives workers time to spend with their families, follow their passions and re-energise. One employee told me that working fewer hours meant he could spend more time with his son, taking him out for bike rides.

The Four Day Week campaign has made the case that it would help to deal with under-employment, as work would become more evenly distributed between the overworked and the underworked.

By taking hours away from some employees (while still paying them the same), companies would have to allocate them elsewhere – a win-win for all.

The future we were promised is within our grasp. Let's take it with both hands!



MATT KILCOYNE

Head of communications, Adam Smith Institute

"The law should concern itself with the expansion of choice"

The issue is whether Britons have the choice to spend their time as they wish. I might want to earn more by working overtime. You might want to work odd hours on a zero-hours contract. Others may want to trade lower earnings for more free time. The point is to make it easy to meet employees' preferences, and easy for businesses to hire workers on contracts that suit both parties. The law should concern itself with the expansion of choice – just ask those workers in Venezuela who were given a four-day week (and in some cases allowed to work just two days a week).

Many of us would like to work different hours and have more choice. It would be great if policies allowed us to prioritise our time better – but all too often it is government regulation that holds us back, whether that's planning laws that mean we're living further from our jobs than we'd like to, childcare laws that cost families their jobs, or the cost of tax.

Some companies are experimenting with four-day weeks. If they're right and it's profitable and productive, then they and their workers will thrive, and others will follow their lead. If they're wrong, they'll fall behind. The free market is about experimentation – progress through trial, error and competition.

The question shouldn't be whether a four-day week is good for the UK, but whether it is good for you. The only person who should answer that is you.

Clearing the air

Change is afoot in the energy supply market, with the introduction of legislation to control combustion plant emissions. But how prepared are operators and regulators? **John Dickson** and **Jane Hall** investigate

The EU has raised concerns in recent years over the use of medium-sized combustion plant (i.e. plant with a thermal input of 1-50 MW), particularly diesel engines, in the energy supply market and other applications. The polluting gases emitted by combustion plant – including oxides of nitrogen (NO_x), particulates and sulphur dioxide (SO_2) – have serious effects on air quality, which have led to calls for better control.

The EU and UK governments have recognised the impact that medium combustion plant can have on air quality, and brought in legislation to control emissions. But what is driving the regulation? What are the impacts on operators? And are regulators ready for this entry to the regulatory framework?

The UK's Department for Environment, Food and Rural Affairs considers that "poor air quality is the largest environmental risk to public health in the UK" (see Defra's impact assessment on amendments to environmental permitting regulations to improve air quality, December 2017). The combined impact of pollution from NO_2 and particulates is estimated to lead to 50,000 premature deaths each year, at a cost of around £30bn. Air pollution also has detrimental effects on biodiversity and crop yields (see Defra's impact assessment 2039, November 2016).

Medium-sized combustion plant is used for a variety of applications, including space heating, electricity generation, and provision of heat and steam for industrial

processes. An EU report found that medium combustion plant is a significant source of air pollutants (see bit.ly/2s5RBiN).

The EU developed the Medium Combustion Plant Directive (MCPD) to bring this plant under legislative control, improve air quality, help achieve national emissions ceilings and address non-compliance with existing ambient air quality standards (see EU directive 2015/2193, 25 November 2015). The EU considered that controls on medium combustion plant could deliver 10%-20% of its required reductions in SO_2 , NO_x and particulate emissions (see bit.ly/2s5RBiN).

In the UK, there has been growth in the use of small and medium-sized generators to provide capacity and balancing services for the energy supply market. The forecasted growth of high NO_x -emitting generators was thought to have the potential to lead to breaches of air quality objectives in some areas. The increase in emissions, taken together, could affect the UK's ability to achieve national emissions ceilings (see Defra's impact assessment 2039, November 2016). For these reasons, the UK government introduced further controls on generators when it transposed the MCPD into UK legislation.

In England and Wales, the MCPD was transposed into UK legislation through a

2018 amendment to the environmental permitting regulations (England and Wales) 2016 (EPR), which inserted schedule 25A, concerning medium combustion plant, and schedule 25B, concerning additional generator controls. The directive was transposed through the pollution prevention and control (PPC) regulations in Scotland and Northern Ireland, with similar requirements. However, in Scotland, the additional generator controls were not included.

The detailed requirements of the directive and amended regulations are complex, and the regulators are due to produce application forms and guidance in the near future. The first deadlines for holding permits are in December 2018, so operators of medium combustion plant and generators should ensure they understand the implications of the regulations and plan compliance measures, if they have not done so already.

Operators should take steps to:

- Develop an inventory of combustion plant and its operating characteristics, such as type, size and operating hours
- Determine what applies to their operation, and when it applies
- Determine when they need to apply for a permit, and secure the resources to do so
- Check emissions from current plant,

Which type of plant does the regulation cover?

Medium combustion plant with thermal input between 1 and 50 MW and specific controls on generators (which can include generators below 1 MWth in some instances) are within the scope of the amended regulations. Operators will have to obtain a permit (or in some cases, register plant), which will control emissions and require monitoring, reporting and records to be kept.

What is energy balancing, and what role does medium combustion plant play?

The National Grid procures energy balancing services to ensure the security and quality of the electricity supply. It must be able to respond rapidly to changes in demand for electricity; this is achieved in part by using small, fast-start electricity generating plant. Diesel has traditionally been a favoured technology as it is reliable, and can start operating quickly and at a relatively low cost.

and identify whether upgrades are required
 ● Develop systems to address the requirements for monitoring and reporting, and incorporate them into their energy management system.

There is uncertainty about some detailed requirements, but it is hoped that these will be clarified when guidance is issued.

In terms of the impact on industry, the government has held consultations with interested parties in recent years on MCPD implementation. In response to its communications with consultees, it has made several developments, which have resulted in complex amendments to UK regulations. One theme in the consultation responses was a call for greater clarity (see Defra's impact assessment on amendments to environmental permitting regulations to improve air quality, December 2017).

This uncertainty has had a negative impact on operators, with the overall

costs of compliance increasing owing to the large number of combustion plant that is now captured by the regulations – and particularly due to the removal of a minimum threshold for some 'specified generators'. The MCPD allows most older plant a transitional period, giving operators time to respond to the requirements.

However, the England, Wales and Northern Ireland legislation has taken a more stringent approach and requires certain 'specified generators' to achieve compliance by January 2019. This leaves limited time to upgrade existing plant.

Furthermore, in England and Wales, it was anticipated that most facilities would be captured by a simplified 'standard rules' permitting approach. However, based on the draft screening criteria that regulators have produced, many operators are likely to need to secure a permit through the more complex regulatory approach, which may

require them to produce an air quality assessment.

The changes will also impose a burden on the regulators. The MCPD and generator controls are expected to bring around 25,000 items of plant into regulation in England and Wales (see the Department for Business, Energy and Industrial Strategy's impact assessment on the medium combustion plant directive transposition, 5 May 2017) and 1,200 in Northern Ireland (see bit.ly/2KMxSvZ). This will place extra resource requirements on the regulators at a time when resourcing is under pressure.

Commenting on the regulations, environment minister Thérèse Coffey has said: "These regulations will help deliver further substantial reductions in emissions, while minimising the impact on energy security and costs to businesses." However, the question remains: are regulators and operators resourced to implement and meet the regulations' requirements within the tight deadlines? 

JOHN DICKSON CENV, MIEMA and **JANE HALL CENV, MIEMA** are associates at Atkins, both specialising in environmental permitting and regulatory compliance

THE KEYS TO SUCCESS

How the regulators can ensure the directive is achieved



STRATEGY
Set the regulatory strategy and approach to enforcement



GUIDANCE
Produce detailed guidance and application forms



TRAINING
Train staff in regulation requirements and interpretation



COMMUNICATION
Communicate regulation requirements to operators



PLANNING
Plan for the efficient determination of applications



MANAGING
Manage significant peaks in demand ahead of deadlines

Air pollution

Twiggling the

Researchers are increasingly recognising the health and economic advantages of tree planting, especially in cities, writes **Rick Gould**

BENEFITS



Earlier this year, researchers reported that 'urban forests' in 86 Canadian cities had removed 16,500 tonnes of air pollutants, potentially averting 22,000 cases of severe respiratory illness. Then, at the start of May, the World Health Organisation (WHO) published data showing that around 80% of people living in cities are exposed to harmful levels of air pollution. Later that month, the UK government published its latest Air Quality Strategy, in which tree planting was included as one way to improve air quality.

Cleaner air is one of the many benefits that trees provide, but it is only during the past decade that researchers have begun to better understand and quantify the multiple benefits – now often called 'ecosystem services' – that trees give us. A detailed, global mapping of the types and numbers of trees is an even more recent achievement. This particular project revealed that our planet plays host to about three trillion trees, and has space for another 1.3 trillion. So how valuable are the world's trees, and what benefits would an extra trillion or so bring in terms of air quality and climate change mitigation?

If levels of air pollution are not bad enough to seriously harm trees, their leaves can do a great job of mopping up pollutants. This was shown in 2009, when researchers in London examined an urban 10km x 10km grid and found that trees removed about 90 tonnes of respirable particulate matter (PM), helping to avoid two premature deaths and two hospital admissions.

IMAGES SHUTTERSTOCK

The following year, a team at the US Department of Agriculture (USDA) Forest Service in Syracuse, New York, examined how much PM trees removed in 10 US cities. The results showed that the trees in each city captured pollution by the tonne, with the health benefits for the largest city valued at up to \$60m (£44.9m). In 2014, the same team quantified the benefits to air quality of forests across the US, and found that trees and forests removed around 17.4 million tonnes of air pollutants in total. This effect, in turn, avoided 850 premature deaths and 670,000 cases of acute respiratory symptoms.

economic savings: \$482m in health benefits due to pollution removal; \$11m as a result of the trees' water absorption decreasing the need for processing at wastewater treatment plants; \$8m from carbon capture, and \$500,000 from their cooling effect, which led to lower energy usage. Moreover, the team estimated that if all 10 of the megacities were to plant available spaces with more trees, these benefits would double.

These are the rewards of planting trees in 10 megacities; how many more trees could be planted worldwide to expand these benefits? To answer this question, we need to know how many trees there are already – but until relatively recently, an accurate answer to this question eluded researchers.

Estimating global forest cover from aerial photographs and satellite images is straightforward enough. In 2015, the UN Food and Agriculture Organisation (FAO), for example, relied on such techniques, reporting that 31.6% of land was forested. By 2015, the forested area had dropped by around 1% – equivalent to the size of South Africa.

Despite improvements in technology, tree number estimates have varied wildly. In 2015, a report in the journal *Nature* described the first research programme to successfully characterise and map global tree density worldwide. It was published by a team led by professor Tom Crowther at Yale University in the US. The research was inspired by Plant-for-the-Planet, an organisation that coordinates and motivates young schoolchildren worldwide to plant trees.

"We estimated that we are losing 10 to 15 billion trees per year"

Green shoots

A growing number of other studies are finding strikingly comparable results. In one of these, carried out in 2017, a team from Syracuse in the US and the University of Naples, Italy, used the same methods to assess the benefits of trees in 10 'megacities' – those with a population of at least 10 million. Based on current trends, 10% of the world's population will live in 40 or so of these megacities by 2030. The researchers found that trees provided several annual



Air pollution

It was started in 2007 by a nine-year-old German boy called Felix Finkbeiner, who wanted to counter climate change with a global campaign of tree planting through a network of children. He soon attracted the attention of the German Environment Ministry and then the United Nations Environment Programme (UNEP). Plant-for-the-Planet then took on UNEP's Billion Tree campaign to encourage tree planting, and, 10 years on, the organisation's global register of planting records more than 15 billion trees. It has now set a target of a trillion trees, and the pace of planting is rising as more people get involved – from government bodies through to small groups and individuals.

"Plant-for-the-Planet found that environmental stewardship, and especially tree planting, were great ways to get people involved in tackling climate change – but at the same time, it did not know how many trees there were," says Crowther. He was working in functional geography, so he and a large team of international collaborators set about compiling a global map of tree distribution and density.

"We developed a model using input data from forest surveys, soil types, topography, climate data and satellite images," he says. Data from more than 400,000 local forest surveys worldwide, providing records of tree species and forest density, was then used to validate the model, allowing the team to extrapolate the results globally. "It was a case of adding up the pixels to get a global picture," says Crowther.

In 2015, there were found to be around three trillion trees globally, the previous estimate having been 400 billion. When combined with historical data, the team found that the worldwide tree population had fallen by about 46% since the beginning of human civilisation. "We estimated that we are losing 10 to 15 billion trees per year," says Crowther. The new tree density maps were invaluable to Plant-for-the-Planet, transforming the campaign by providing a context.

Crowther now heads a laboratory of researchers at the Swiss Federal Institute

of Technology in Zurich. "Working at a global scale, our aim is to provide as much data, information, guidelines and tools as possible for reforestation, in a targeted, ecologically relevant way," he says.

For example, there is a clear relationship between diversity and sustainability. Many believe fast-growing monocultures are a good investment and effective for rapid carbon sequestration – but research says otherwise. "The world's forests generate about \$600bn annually for the world's timber industry," says Crowther. "If we replaced those forests with fast-growing monocultures, we calculated that they would be worth about \$400bn annually." So diverse forests are better both economically and environmentally.

The Zurich team's research also indicates that there is room for another 1.3 trillion or so trees globally. "We estimate these extra trees have the potential to absorb 6 gigatonnes (Gt) of carbon annually, while human activities are responsible for around 9Gt of carbon emissions each year." So the extra trees could make a massive contribution to counter climate change.

Meanwhile, Crowther is heartened by the growing pace of tree planting, especially at local level, and says it's important to protect what's already there. "Smaller groups and individuals collectively have a huge impact and inspire others to plant trees, but we also need to take better care of the forests we already have," he says. [¶]

RICK GOULD, MIEMA CENV is a technical advisor at the Environment Agency. He first planted a tree in 1976, and most recently in April, with trees provided by the Woodland Trust

Digging in: organisations involved in tree planting

- ➲ The Woodland Trust www.woodlandtrust.org.uk/plant-trees/
- ➲ The Tree Council bit.ly/15ZcjUN
- ➲ The Conservation Volunteers bit.ly/2HEc5ot
- ➲ Tree for Cities treesforcities.org/
- ➲ Trees for Life treesforlife.org.uk/
- ➲ The Wildlife Trusts www.wildlifetrusts.org/

FOREST FACTS

Global tree numbers – and the many benefits they bring



Forests cover about 30% of the world's land mass; net tree losses are 10-15 billion a year



Diverse forests are significantly more economically productive than monocultures



Planting 1.3 trillion more trees could absorb more than half of our annual CO₂ emissions



Trees boost wildlife diversity, shade, mental wellbeing, air quality and carbon storage



Trees in urban areas can improve physical health, reducing incidences of respiratory illness



100 million new trees could lower the US's air-conditioning costs by \$4bn (£2.98bn) annually



Trees absorb sound waves – belts of mature trees can reduce road-noise by up to 50%



By absorbing and deflecting falling rain, trees can prevent floods or reduce their severity



Mark Serreze

The director of the National Snow and Ice Data Center in Colorado talks exclusively to TRANSFORM about his 'front row seat' to changes in the Arctic's sea ice

How has the Arctic changed since you first visited, back in 1982?

I was there before things really started to change, when it still looked like the Arctic of old – the Arctic that the explorers of the past would have been familiar with. We have since seen this tremendous decline in sea ice cover in just a short space of time; the ice caps I once studied as a young graduate are now gone. What is really visceral is when you go somewhere like Point Barrow, Alaska, at the end of summer and look north – all you will see is open ocean as far as the eye can see, in a place where the ice used to come very close to the shore. Now it's just endless open water, and it's that kind of thing that really hits me.

You once predicted the Arctic would be ice-free by 2030 – do you stand by that? I said that in 2007, which was a watershed year: we recorded the lowest sea ice extent ever, blowing away the previous record. It removed any shred of doubt about what was going on. There is a growing view within the scientific community that we could be looking at a seasonally ice-free Arctic somewhere in the mid 2040s, but I am going to stick with 2030, give or take a few years. We have already lost something like 40% of the ice cover we had in the early 1980s. It has been a remarkable reduction and there is no evidence that it is going to stop.

What are the ramifications, should your predictions come true? We are already seeing the impact it is having on life up there, on polar bears and seals, for example, which use the ice as a platform for travelling. But the big thing is whether losing sea ice can influence weather patterns in lower



"The ice caps I once studied as a young graduate are now gone"

latitudes. The sea ice acts as a 'lid' for most of the year, separating a cold atmosphere from a warmer Arctic ocean, but once you have removed that cover, all that heat from the sea can go into the atmosphere. We have observed temperature rises in the Arctic that are much greater than in the northern hemisphere as a whole, and this could be messing with the global weather system. The loss of Arctic sea ice is probably the single most prominent signal of climate change on the planet.

You were once a sceptic when it came to human influence on climate. Yes – we saw these changes emerging, but it looked like some sort of natural cycle to me for a long time, and I

wasn't convinced. It was never a question of the physics or whether greenhouse gas concentrations in the atmosphere would cause warming, I just wasn't sure we had witnessed it yet. I believed greenhouse warming was still open to debate as late as 2000, so I was a bit of a latecomer – but as scientists we are supposed to be sceptical, and I certainly was for a long time.

Was there a 'eureka' moment, where you changed your mind? I would like to say there was, but it was just the overwhelming weight of evidence. We saw the Arctic changing in the 1990s, but a lot of it looked like a natural cycle. As the years continued to pass, the evidence that we were looking at something more than natural variability started to grow, and it was probably in 2003 that I changed my mind. However, there is still conflicting evidence that scientists are trying to understand – we don't know everything.

Does that conflicting evidence put any doubt in your mind about humanity's impact on climate change? Oh, no. The way I look at it is this: imagine painting a picture with a broad brush. You see the outline of what is happening but you are missing the details, and some of those can be important and can come back to bite you. We know where things are going – the Arctic is going to continue to lose its sea ice cover, that's certainly going to have a lot of important ramifications – but what are the surprises that we haven't foreseen? That is what a lot of people are concerned about, the known unknowns. We know the broad picture absolutely. 

 [Read more about Mark's experiences and work in his book, *Brave New Arctic: The Untold Story of the Melting North*](#)

CONNECT

SOCIAL AND COMMUNITY NEWS FROM IEMA

MEMBER NEWS

Rewilding in practice

- Thursday 12 July ● 1pm to 4pm ● Venue: Ramside Hall Hotel – The Marquee, Carrville, County Durham

This is the second in a series of rewilding-focused IEMA events in the northeast. The afternoon will focus on practical projects and the benefits and opportunities of rewilding – in particular, on working in collaboration with other stakeholders and partners. The ideal delegate is anyone who wants to find out more about applying basic practical principles to projects in order to promote biodiversity and conservation. Participants will hopefully take away knowledge of rewilding in practice, the different projects in existence and the challenges, opportunities and benefits of working in collaboration, both practically and strategically. Speakers include the Kielder Wildwood Project, Mahouts Elephant Foundation (MEF) and North East England Nature Partnership.

● To register, visit bit.ly/2K7yYmd



MEMBER NEWS

The future of management systems

Management systems, if used correctly, are powerful tools for driving compliance and improvement. They can translate a complex world into something simple. To bring systems into the 21st century, it is vital that a solution is found to overcome problems. Sadly, I've not yet found a company or software solution offering something that might look at the future of systems in a different way. Are there any companies that have an existing software solution or are considering developing software that would take a different approach? I am keen to discuss this topic further. To read more of Emma Pye's article visit: bit.ly/2LtrBqc

● Contact emma.pye@aggregate.com or linkedin.com/in/emma-pye-37113928

EVENT

Leeds Recycling and Energy Recovery Facility

- 12 July 2018 16:50-19:30

See how Leeds City Council is working to improve waste management at its new Recycling and Energy Recovery Facility – designed to remove recyclable waste from black bins and retrieve energy from what is left over. Register now to secure your place.

● bit.ly/2I9N5pp

WEBINAR

IEMA's Book Club: Doughnut Economics

- 23 August 2018 12:30-1:30 PM

How can you influence a change of focus in your organisation, preparing it for a future where low or zero growth is the norm? Join us for our second IEMA Book Club webinar, in which we'll discuss the revolutionary *Doughnut Economics* by Kate Raworth.

● bit.ly/2I9NWx9

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“

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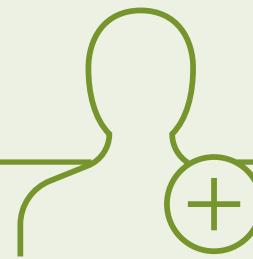


I pledge to:
Move beyond a pledge to business practice by training all IEMA staff in sustainability. #PledgeLessPlastic
TIM BALCON, CEO, IEMA



Our first mention in @iemonet @ IEMA_Transform magazine.
A fantastic issue full of tech and innovation.
@BLUEDOTAUG





Connect

NETWORK NEWS

Co-hosted meeting discusses role of psychology in creating change

Sustainable change requires a shift in behaviour. We are often told that sustainability is about baby steps, but the big issues of the day require radical and speedy change. Is any of this possible? Which is more important? The joint meeting of the IEMA Climate Change and Energy Network and the British Psychological Society's Going Green Working Group, 'All About Change: understanding motivation and how values influence behaviour', set out to answer these questions. Jan Maskell introduced the meeting enlightening the environmentalists on what occupational psychologists do. She was followed by Nick Blyth, who drew attention to the need for different skill sets.

Andrew Simms spoke about rapid transition, giving examples of great change brought about in years rather than decades, such as the NHS, rationing and four-day working weeks in Utah. In the afternoon, Penny Walker produced a workshop using the Influencer Model approach to create specific behaviour change goals and actions. Vincent Neate brought the day to an end, talking about relationship binders – consistent narratives, compatible purpose and meaningful encounters as the starter for a change in behaviour. The day encouraged networking and is hopefully the start of more co-hosted meetings.

For more information, please visit bit.ly/2tviOMe

LATEST MEMBER UPGRADES

ASSOCIATE (AIEMA)

Andrew Campbell
Sean Dunphy
Stewart Mardle, BT (British Telecom) plc
Phillip Smith
Richard Sands
Neil Penn, ITC Concepts Ltd

PRACTITIONER (PIEMA)

Elisha Hearn, Arup
Kevin McGillycuddy, Golder Associates Ireland
Lucy Donnelly-Gallagher, Environment Agency

FULL MEMBERSHIP WITH CHARTERED ENVIRONMENTALIST

Declan Conley, Lynemouth Power Limited

FELLOW (FIEMA)

Catherine Tilley, University of Cambridge
Andy Horne, Employer – EDF Energy

NETWORK NEWS

GESA event examines the use of Social Impact Assessments

The Emerging Social Impact Assessment Approaches, Challenges and Opportunities event took place on 17 May at Mott MacDonald's offices in central London, one of the scheduled events of IEMA's Global Environmental and Social Assessment Group (GESA). It began with a speech from Mott MacDonald's Tom Streather, reflecting on three lines of inquiry put forward for discussion: **What are emerging SIA themes/priorities? How can SIAs contribute to projects sharing benefits more widely? What are the preferred ESIA approaches – integrated assessment versus standalone social specialisation?**

These questions provided the framework for an open panel discussion, with social specialists offering varying perspectives.

Themes discussed included

land acquisition and livelihood restoration, labour and supply chain management, gender-inclusive consultation, community engagement processes and human rights. The panellists also discussed the role of SIAs in benefit sharing.

The primary objective of SIAs should be to mitigate impacts and provide a voice to affected and often marginalised communities, but SIA management plans can also extend to community development initiatives which share project benefits.

Participants' event feedback was overwhelmingly positive, with particular praise given to the diverse perspectives of the panellists, as well as opportunities given to the audience to share their own perspectives.

To read the full report of the day visit: bit.ly/2ttE59m

NETWORK NEWS

IEMA Futures: Building recycling habits

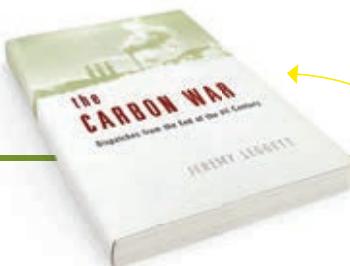
In an online article, IEMA Futures members Laura Archer and Hannah Lesbirel discuss why recycling is so important, and how we can make it the norm.

Taking the Waste Management

Hierarchy as a starting point, they suggest ways in which the primary and secondary education systems can help to instil the recycling habit into children and teenagers.

To read the article, visit: bit.ly/2lgk8bi





Why did you become an environment/sustainability professional? In 2000, I read **The Carbon War** by Jeremy Leggett. I had recently left the army and was planning to pursue a medical career, but this book changed my view of the world. I was awakened to what our species was doing to the planet. I signed up with the Open University soon after to do my degree in environmental studies.

What was your first job in this field? Technical assistant to the board director of a quarrying and waste management business.

How did you get your first role? In 2001, I contacted around 40 public and private organisations, hoping to secure an entry-level role in environmental management. I had many replies but only one interview offer, which led to the above role. After only nine months, the company was acquired by national waste and resource management company Viridor. Within 10 years, and after a number of different environmental and operational roles, I became head of sustainable business.

What does your current role involve? Since 2014, I have been the general manager responsible for a Tier 1 contract partner at EDF's Hinkley Point B Nuclear Power Station. My organisation provides facilities management services to the power station, including the management of non-radioactive waste.

How has your role changed/progressed over the past few years? I have moved from a senior corporate level sustainability role into a senior operations role. I spent many years in my previous role trying to encourage my colleagues to adopt more sustainable business practices; in hindsight, I may not have understood the extent of their day-to-day pressures and what was important to them.



CAREER PROFILE



Visit www.iema-transform.net for the full member profile

Where do you see the profession going? I'm really pleased that IEMA is aiming for chartership. There are some outstanding sustainability thought leaders within IEMA, who are just as valuable to a business as skilled accountants, engineers and lawyers.

Where would you like to be in five years' time?

Post-Brexit is going to be a very important period for the environment and sustainability in the UK – I would like in some way to be able to influence this at a significant level, to ensure we remain a world leader in environmental protection.



What advice would you give to someone entering the profession?

Don't focus on a job title – do sustainability alongside something you're passionate about.

How do you use the IEMA Skills Map? I used it a lot on my way to becoming a Fellow.



What did you bring back to your job? I was reinvigorated by the passion of the sustainability profession, and brought back ideas on how I might continue to support my own organisation and client by implementing sustainable business practices.

What is/are the most important skill(s) for your job? Not viewing sustainability as an isolated discipline, focused on the next initiative for the CR Report – sustainability has to become part of the DNA of business. It's okay to be passionate, but avoid becoming a 'high priest of sustainability' at all costs, as you will switch people off.

If you had to describe yourself in three words, what would they be? Gets things done.

What motivates you? The human spirit and the good in people.

What would be your personal motto? Make a start, don't procrastinate.

Greatest risk you have ever taken? A **180-foot bungee jump** and a Grade IV ice climb on Ben Nevis – both in my 20s.

If you could go back in history, who would you like to meet? **Sir Ernest Shackleton**, to discuss his approach to leadership, which was ahead of its time. ↗

IEMA Annual General Meeting 2018

Company Name: The Institute of Environmental Management and Assessment
Company Number: 03690916

NOTICE IS HEREBY GIVEN that the 18th Annual General Meeting of the Institute of Environmental Management and Assessment ("IEMA") will be held at 17:30hrs on Wednesday 12th September 2018 at The Good Hotel London, Western Gateway, Royal Victoria Dock, London, E16 1FA.

Ordinary Business:

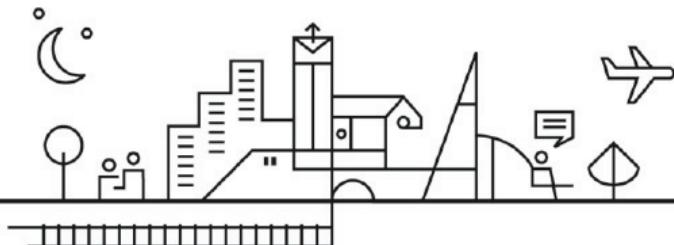
1. To confirm the Minutes of the previous Meeting which was held on 20th September 2017
2. To confirm the recently appointed Non-Executive Directors of IEMA
3. To reconfirm Ian Bamford as a Non-Executive Director of the Institute
4. To receive and accept the Directors' Report and Accounts of the Institute for the financial year ending 31st December 2017
5. To appoint hayesmacintyre as Auditors of IEMA until the conclusion of the next general meeting at which accounts are laid
6. To authorise the Board to fix the remuneration of the Auditors

Martin Baxter
Company Secretary
IEMA, City Office Park, Tritton Road, Lincoln, LN6 7AS, United Kingdom

Notes

Any Member will be entitled to speak on any matters arising out of the Directors' Report and Accounts, but no other business other than that given in the notice will be transacted at the meeting.

Every Member entitled to attend and vote at the meeting is entitled to appoint a proxy or proxies to attend and, on a poll, vote on his/ her behalf. A proxy must be a Member of IEMA. A template form for submitting proxy votes can be found on the IEMA Website www.iema.net/agm2018 and shows all the information that is required by IEMA in this circumstance. Completion and return of a form of proxy will not prevent a Member from attending and voting at the meeting in person should he/ she wish to do so. All proxies so appointed should be notified in writing, by no later than noon on Tuesday 20th September 2016, to the following name and address: Governance Officer, IEMA, City Office Park, Tritton Road, Lincoln, LN6 7AS, United Kingdom.



IEMA

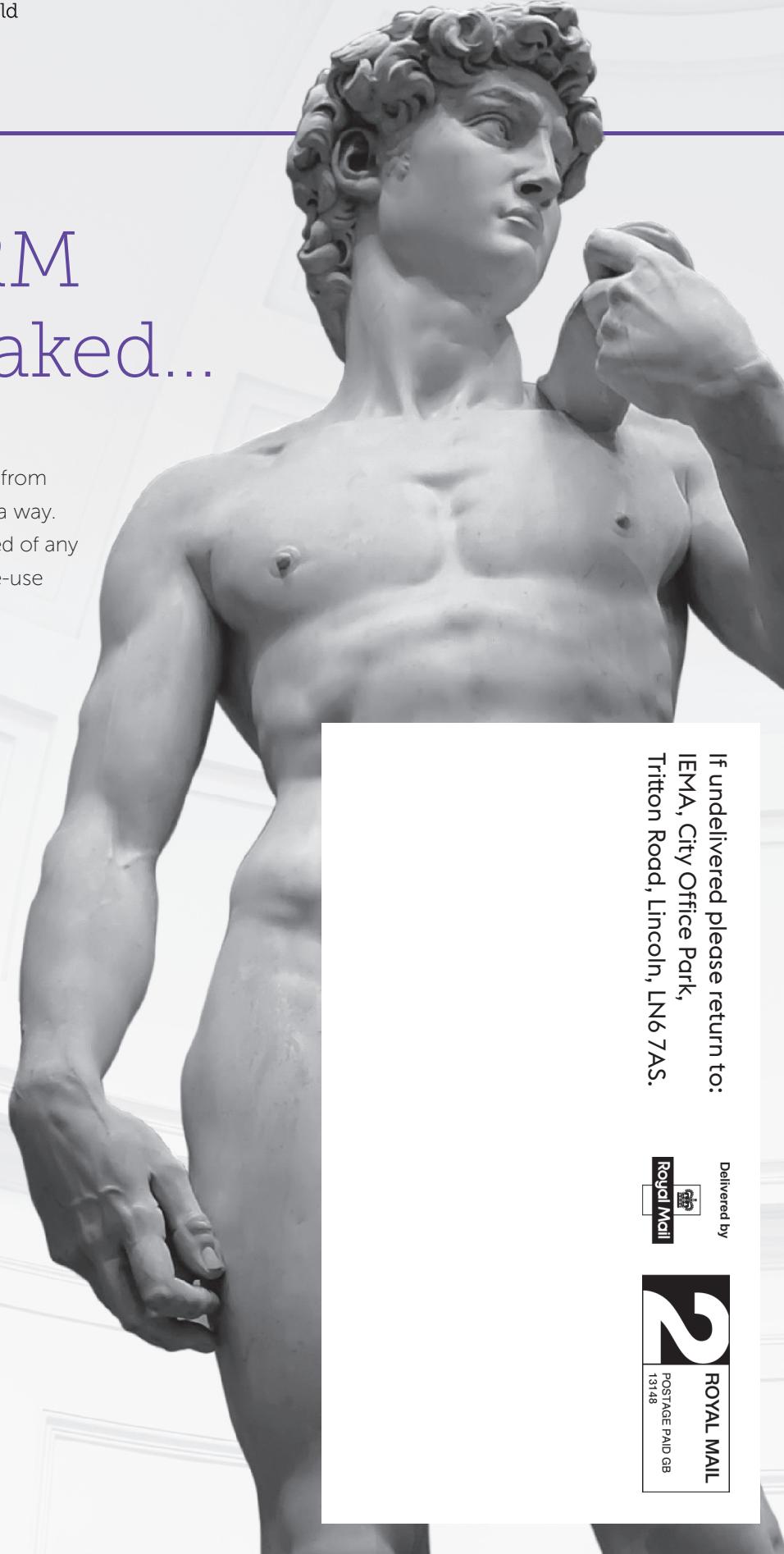
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