

TRANSFORM

Environment ●
Economy ●
Society ●

FOR ENVIRONMENT AND SUSTAINABILITY PROFESSIONALS

October 2020
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Fuel for thought

Should we
be ramping up
energy-from-waste
capacity?



PLUS

Select few Philip Dunne on the Environmental Audit Committee's agenda

All at sea Why the clean energy revolution could come from the ocean

Planning ahead Rediscovering the art of 'cathedral thinking'

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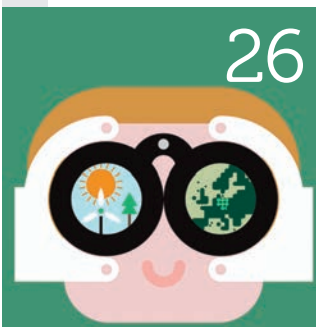
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SARAH MUKHERJEE, CEO, IEMA

Planning for the long term

Hello again, and welcome to the October edition of *Transform* magazine. I hope this finds you safe and well in these challenging times.

Autumn is a favourite season for me. As the nights begin to draw in here in the UK, the setting sun casts a golden glow, the shadows lengthen, and the boughs and branches hang heavy with stone fruit and berries.

One of my favourite journeys at this time of year is to take the train from Cambridge to Ely. The cathedral affords awe-inspiring views from miles away, dominating the flat Fenland country that surrounds it. I often imagine that the view is not dissimilar to the one that would have been seen hundreds of years ago by pilgrims and worshippers.

It took more than a century for Ely cathedral to be completed, not including the additions and renovations that have continued almost until the present day – nearly a thousand years of development. Many of those who started work on these architectural wonders did so knowing they would not live to see their completion, and indeed that the final stone may not be laid for two or three generations. This ‘cathedral thinking’ is considered by Nick King in a fascinating article about planning for the long term (p22).

One of the fantastic things about being CEO of IEMA is celebrating the passion and enthusiasm our members have for the work they do. I get to hear about some really ground-breaking technologies that will help us on our way to a zero-carbon economy. Alan Asbury writes this month about an exciting new innovation that could create boundless energy from sea water (p16).

One of IEMA's core functions is to support members on their professional journey, providing training, development and learning opportunities. However, Uchechukwu Okere poses a relevant question as the autumn term gets fully underway: should we be pushing for sustainable development as a compulsory part of the higher education curriculum (p30)?

I hope this month is a fruitful one for you, wherever you are in the world, and that this edition of the magazine provides plenty of food for thought!

"I get to hear about ground-breaking technologies that will help us on our way to a zero-carbon economy"



IEMA Transforming the world to sustainability

IEMA is the professional body for everyone working in environment and sustainability. We provide resources and tools, research and knowledge sharing along with high quality formal training and qualifications to meet the real-world needs of our members. We believe that together we're positively changing attitudes to sustainability as a progressive force for good. Together we're transforming the world to sustainability.

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AIR POLLUTION

Extreme carbon inequality uncovered

The carbon emissions of the richest 1% are more than double those of the three billion people in the poorest half of the world's population, Oxfam research has uncovered.

Fuelled by luxury lifestyles and overindulgence, the findings show that the wealthiest 1% account for 15% of global consumption emissions, while the poorest half of the population generate just 7%. Moreover, the increase in emissions over 25 years from the richest 1% has been three times more than the rise from the poorest 50%, who suffer most from climate-induced floods, famines and cyclones.

Former UN secretary-general Ban Ki-moon said that the findings provide further evidence that economic models have not only driven dangerous climate change, but have also been an enabler of "catastrophic inequality". "The COVID-19 pandemic provides an incontestable imperative to rebuild better and place the global economy on a more sustainable, resilient and fairer footing," he said. "Addressing the disproportionate carbon emissions from the wealthiest in society must be a key priority."

Oxfam's research involved assessing the consumption emissions of different income groups between 1990 and 2015, during which time the amount of CO₂ in the atmosphere doubled.

The findings also show that the world's richest 10% – approximately 630 million people – accounted for 52% of emissions, and one-third of the emissions that scientists believe will trigger catastrophic and irreversible climate change. The poorest half of humanity emitted just 4%.

Oxfam said that governments can tackle both extreme inequality and the climate crisis if they target the excessive emissions of the richest and invest in poor and vulnerable communities. The charity called for an increase in wealth taxes and new carbon levies on luxury items such as private jets and super-yachts, as well as SUVs and frequent flights.

It said that the revenue generated should be invested in low-carbon jobs, such as in the social care sector and in green public transport, and used to help poor communities around the world adapt to the changing climate.

"Extreme carbon inequality is a direct consequence of the decades-long pursuit by governments and businesses of grossly unequal and carbon-intensive economic growth whatever the cost," said Oxfam GB's chief executive Danny Sriskandarajah.

"As leaders make decisions about what a post-COVID recovery looks like, they should seize this opportunity to reshape our economy, encourage low-carbon living and create a better future for all."



IMAGE: ISTOCK



BIODIVERSITY

World fails to hit any 2020 biodiversity targets

The world has failed to meet any of the Aichi biodiversity targets for 2020 agreed 10 years ago, a UN report has revealed. Just six of the 20 goals have been partially achieved, and the health of the natural world has actually declined in many respects.

Some encouraging signs include falling deforestation rates and the increasing removal of invasive alien species from islands, while awareness of biodiversity appears to be rising. However, much of the success has been patchy. The aspects of Target 11 regarding the proportions of lands and seas protected was met, but elements related to the quality of protected areas were not. Similarly, for Target 19, biodiversity knowledge has improved but not been widely shared or applied.

"Humanity stands at a crossroads with regard to the legacy we wish to leave to future generations," said UN biodiversity lead Elizabeth Maruma Mrema. "As nature degrades, new opportunities emerge for the spread to humans and animals of devastating diseases like this year's coronavirus. The window of time available is short, but the pandemic has also demonstrated that transformative changes are possible."

The report outlines the eight major transitions needed to slow down and halt nature's decline, spanning land and forests, sustainable agriculture, food systems, fisheries and oceans, cities and infrastructure, freshwater, climate action and health.

Read the full report at cbd.int/gbo5

CLIMATE CHANGE

1bn people could be displaced by 2050

Climate change, conflict and civil unrest threaten to displace one billion people by 2050, triggering huge political and social impacts worldwide. The warning comes from a report by the Institute for Economics and Global Peace (IEP), which explains that 31 countries do not have sufficient resilience to withstand ecological shocks. Pakistan has the largest number of people at risk of mass displacements, followed by Ethiopia and Iran.

Moreover, some of the countries most threatened by ecological threats are among the least peaceful, with natural disasters, a lack of access to food, and water stress all posing significant risks to regional and global security. However, regions with high resilience – such as Europe and North America – are not immune from the looming crisis, and can expect a significant number of refugees from war-torn countries.

"This will have huge social and political impacts," said IEP founder Steve Killelea. "Ecological change is the next big global threat to our planet and people's lives, and we must unlock the power of business and government action to build resilience for the places most at risk."

Read the full report here: bit.ly/32DdAkj



BUSINESSWATCH



Google eliminates its carbon legacy

Google has become the first major company to eliminate its carbon legacy, having offset operational emissions generated before it became carbon neutral in 2007. It also aims to run on carbon-free energy everywhere by 2030, and to create more than 20,000 new jobs in clean energy and associated industries by 2025.

CEO Sundar Pichai said: "By harnessing new technologies, investing in the right infrastructure and tools, and empowering partners, nonprofits and people, this can be the most decisive decade for climate action yet."

🔗 bit.ly/3mxO3kl



Major airlines commit to net-zero

The Oneworld Alliance, a group of 13 major airlines that includes British Airways, has committed to achieving net-zero carbon emissions by 2050. Members will develop their own approaches, such as delivering carbon offsets and investing in sustainable fuels and fuel efficiency.

"Despite the challenges we are all facing amidst the COVID-19 pandemic, we have not lost sight of the responsibility we have to reduce emissions in the long term," said Oneworld chairman Alan Joyce.

🔗 bit.ly/35RBGdr



PwC unveils science-based goal

PricewaterhouseCoopers (PwC) has announced its aim to achieve carbon neutrality across global operations by 2030, using a science-based target.

One of the UK's 'big four' accounting firms, PwC said it would focus on sustained reductions in travel and increased use of zero-carbon energy, while also helping international clients to cut their emissions.

"A net-zero world is within reach," said Bob Moritz, global chairman of the PwC network. "We are determined to play our part in the way we support our clients to create a sustainable world."

🔗 bit.ly/32GRLjZ

IMAGES: SHUTTERSTOCK

IEMA SUSTAINABILITY IMPACT AWARDS

Virtual awards, real success



The COVID-19 pandemic failed to prevent IEMA from celebrating the winners of its Sustainability Impact Awards 2020 last month. A faultless ceremony took place online via a virtual event, clearly demonstrating our ability to adapt successfully to different realities in times of adversity.

In only its second year, the awards attracted an impressive range of shortlisted projects, organisations and individuals, including the world's first quantification of emissions for global healthcare systems. The achievements of businesses both big and small, and individuals with careers spanning five to 25 years, were on show during the hour-long ceremony. Judges had the unenviable task of singling out just 21 winners.

"All the winners can be proud of their achievements – action to tackle the climate and environmental crises we face requires business and industry, civil society and our politicians to step up and lead the transformation and change needed," said IEMA CEO Sarah Mukherjee. "IEMA's Sustainability Impact Awards 2020 provide a showcase for some of the best leadership and innovation from our members and the wider sustainability community."

"The winning entries highlight the vital role business and industry can and must play in transforming our world to a sustainable and green future – the leadership and inspiration provided by sustainability and environmental professionals is fundamental to that success."

Winners were announced at high-tempo pace, with hundreds tuning in from across the world to see whether they were among the winning entries. Viridian Logic, which won the New Product, Service or Technology award, was unable to contain its excitement, tweeting "WE WON! WE WON! WE WON! WE WON!"

"It's innovation and outside-the-box thinking that we are celebrating, which is something that we in sustainability do incredibly well," Mukherjee said. "Thank you to the fantastic businesses up and down the country and around the world for your passion commitment and innovation."

While this ceremony was not what we may have imagined eight months ago, the profession's ingenuity was clear, and attention now turns to next year's awards, where we hope to meet in better circumstances.

Turn to p34 to find a list of all this year's winners.

QUOTE UNQUOTE



Great to see a virtual event being held for this type of award reaching a bigger audience with a much reduced carbon footprint!

Well done! @iemanet
 #environment #Sustainability
 @MUKHERJEE_SARAH

Well done to all the winners at the #IEMAawards20 and all those shortlisted, inspiring to see so many high quality entries. Plus well done @iemanet for putting this together.

@BECTraining

Many congratulations to Kerrie, and to all the shortlisted candidates – it was such a pleasure to talk to you all. You are all inspirational!

@SHARONMAGUIRE9

Congratulations to all the winners of the #IEMAawards20 @iemanet the industry is doing really exciting stuff!

@VICTORIACHATERS

Congrats to all winners! Having won last year, we know how thrilled you would be right now! Well done!

@iemanet #IEMAawards20
 @THELADYSOLAR

IEMA is privileged to have the support of so many wonderful volunteers! Harry was able to pip them to the post with a winning combination of events, advocacy, expertise and support for members in the Middle Eastern region and beyond. Congratulations Harry! #IEMAawards20 @IEMANET

WE WON! WE WON! WE WON!
 WE WON! #sustainability #flooding
 #naturebasedsolutions
 #happybunnies
 @VIRIDIANLOGIC

@iemanet and @TechBuyerGroup
 Delighted with this! What an excellent virtual awards show too @iemanet Well done all.
 @BIGGRATRICH

MEMBERSHIP

Full member digital workshops

We are holding a series of interactive upgrade workshops throughout the end of 2020 for IEMA members looking to become Full and Chartered Environmentalist members (MIEMA CEnv). These sessions offer the chance to explore the Full and CEnv membership competencies and understand the expectations and requirements for planning and writing the written application. It will also prepare attendees for their peer-review interview. Delivered by an experienced IEMA Full and Chartered Environmentalist assessor, attendees will gain the confidence needed to craft a high quality application.

To ensure that there is ample opportunity to dig into the process and standard, attendee numbers are limited



to 10 per workshop. Sessions are interactive, and the assessor will encourage contributions, sharing of opinions and questions throughout. Before the workshops, attendees will be asked to identify which of the 13 Full member competencies they'd like the assessor to focus on, along with three short activities. This prep work means the assessor can adapt the content of each workshop to the specific

requirements of attendees, providing a personalised session.

These sessions are worth two hours of IEMA recognised CPD for those whose goals are set on achieving Full membership and Chartered Environmentalist.

For those interested, contact the Membership and Standards Team at info@iema.net to book your place or find out more.

TECHNOLOGY

Disruptive Tech Working Group to look at smart cities



Following a positive response to the 2019 *Thought Piece on Disruptive Technologies and Sustainability*, the Fellows Working Group on Disruptive Technologies and the Digital Economy met again over the summer and agreed to take a deep dive, in collaboration with other IEMA networks, on the role smart cities could play in decarbonisation and sustainability.

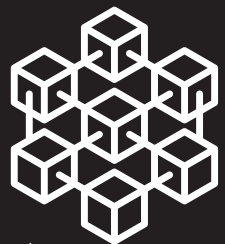
Responding to member feedback calling for practitioner level insight on disruptive

technologies, the group is currently seeking case study input for projects (completed or ongoing) that are connected to one of the four focus areas of the new briefing: the energy transition; food and smart agriculture; smart transportation; and green infrastructure. If you are interested in submitting, please email Marc Jourdan at m.jourdan@iema.net for more information.

A webinar on the role of blockchain in supporting

business resilience and the transformation to sustainability took place on 23 September. The session provided an overview of blockchain, case study examples highlighting best practices, and perspectives from industry professionals on the potential of blockchain to support IEMA disciplines.

To watch the session, please visit the IEMA Watch Again webpage.



**NICK BLYTH**

IEMA policy lead

IEMA and the climate emergency

In September 2019, the IEMA Board declared a climate and environmental emergency that “requires leadership at all levels, from government through to the individual”. IEMA members have been leading the way, supporting a summer climate change webinar series and new climate risk guidance on environmental impact assessment and the Task Force on Climate-related Financial Disclosures. IEMA’s head office has also responded with its own commitments.

IEMA has set its own science-based reduction target in line with the 1.5°C scenario and following an absolute contraction approach. Against a 2019 baseline, IEMA will need to reduce greenhouse gas (GHG) emissions by around 46% by 2030, and continue making reductions into the next decade. As a founding partner of Pledge to Net-Zero, IEMA is helping to provide a framework for other environmental organisations that want to make science-based transitions.

While pursuing direct energy and GHG reductions, IEMA has committed to be ‘Climate Neutral Now’, offsetting our residual carbon emissions using both the UK-based Woodland Carbon Code and UN’s Certified Emission Reductions. As outlined in IEMA’s GHG management hierarchy, action can be supported by both offsets now and real science-based reductions and transition by the business overall (the key goal)

We are also working to improve standards; I am collaborating with colleagues from the UN Framework Convention on Climate Change, Costa Rica, Sweden and more than 20 other countries on *ISO 14068: Greenhouse gas management and related activities – carbon neutrality*. This is an opportunity to internationally set the requirements and principles for those seeking to pursue, demonstrate or exceed ‘carbon neutrality’. There are many approaches, and a real need for standardisation. Carbon neutrality cannot be a simple and static balancing of GHG emissions, and must complement net-zero and support transitional change.

In a year disrupted by COVID-19, net-zero, resilience, adaptation and wider challenges are driving our focus on transition. The steering group for the Climate Change and Energy Network is developing programmes and reviewing the latest practice challenges. We are missing face-to-face meetings and events but continue to use online webinars, and to try new approaches such as ‘practice surgeries’. Please get in touch if you can support the network’s climate leadership.

**MARTIN BAXTER**

IEMA chief policy advisor

Due diligence on forest risk commodities

The government is consulting on proposals to make it illegal for businesses to use, either in production or trade within the UK, forest risk commodities that have not been produced in accordance with relevant laws in the country where they are grown. The aim is to prevent forests and other important natural areas from being illegally converted into agricultural land.

The commodities include those embedded within products such as beef, cocoa, leather, palm oil, rubber and soya. The proposals would require the businesses within their scope to conduct due diligence in order to ensure commodities that have not been legally produced do not enter their supply chain. They must also report on this exercise publicly. ‘Relevant laws’ would include those that protect natural forests and other natural ecosystems

from being converted into agricultural land.

Depending on the outcome of the consultation, it is likely the government would introduce an amendment to the Environment Bill to provide a framework, with powers given to the Secretary of State for implementing the proposals through secondary regulation.

The powers, if enacted, would allow the government to levy fines and other civil sanctions against businesses that continue to use forest risk commodities which have not been produced legally and/or that do not have a robust system of due diligence in place. It is likely that larger businesses, defined in terms of turnover and employee number threshold, would be within the scope of the law; small businesses would not.



NEW REGULATIONS

THE LATEST

■ LEGISLATION ■ GUIDANCE ■ CONSULTATION



PENDING

Air quality

The Draft Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020 will place restrictions on the sale of wet wood for domestic burning and limits on the emission of sulphur and smoke from manufactured solid fuels, and phases out the sale of bituminous coal.

➤ cedr.ec/768



31 DECEMBER 2020

General environment, Brexit

The Environment (Amendment etc.) (EU Exit) (Amendment) (England and Wales) Regulations SI 2020/603 make amendments to the Environment (Amendment etc.) (EU Exit) Regulations SI 2019/458, in order to make changes to amendments to the Pollution Prevention and Control Act 1999 and its list of relevant directives.

➤ cedr.ec/76c



19 AUGUST 2020

General environment

Defra has issued a policy paper that sets out possible legally binding environmental objectives. It provides a roadmap for developing the government's evidence base, signalling how stakeholders will be engaged. Once proposed targets are developed, the government will produce a consultation on them, expected in early 2022.

➤ cedr.ec/769



6 AUGUST 2020

Air

The Welsh government has published a Clean Air Plan for Wales to tackle poor air quality, which is the biggest environmental risk to public health and also has adverse effects on biodiversity and the natural environment. The plan aims to tackle air pollutants from sources including transport, industry, agriculture and home heating, during the next 10 years.

➤ cedr.ec/76a



4 AUGUST 2020

Waste, PPC

The guidance on oil storage regulations for businesses has been updated to clarify information on fitting isolating valves and filters downstream of integrally bundled tanks.

➤ cedr.ec/76b



25 AUGUST 2020

Deforestation

Defra is seeking views on a proposed new law designed to prevent important natural areas and forests from being illegally changed into agricultural land. It would require larger businesses to make sure that none of the commodities that can cause wide-scale deforestation have been produced illegally.

➤ cedr.ec/76e



3 AUGUST 2020

Environmental permitting

The Environment Agency has held a consultation on views on new standard rules set for operations storing PAS 107 certified shredded tyres. The new rules will allow a named operator to store PAS 107 certified tyre shred. No more than 5,000 tonnes can be stored at a facility at any one time, and it cannot be stored for more than three months.

➤ cedr.ec/783



20 AUGUST 2020

Waste

Defra is seeking views on its updated waste management plan for England. It wants to know if the public believes the updated waste management plan meets the obligations of the Waste (England and Wales) Regulations SI 2011/988, which requires the plan to be reviewed every six years and sets out the required content of the plan.

➤ cedr.ec/76d



30 JULY 2020

Waste

The Welsh government is seeking views on proposals to ban a range of single-use plastic items.

➤ cedr.ec/767

INCOURT

IN COURT

Tech firm's recycling blunder pays for mass tree-planting

A computer support company in Brentford that broke recycling law has paid money to charity to help fund several thousand new trees in Ilford, London.

EMC Computer Systems (UK) Ltd failed to register the packaging waste it produced between 2002 and 2003, and from 2008 to 2015. Companies with a turnover above £2m, handling more than 50 tonnes of packaging in the previous calendar year, must register with an accredited compliance scheme and recover and recycle packaging waste.

EMC paid £8,579.31 to Trees for Cities, which works to improve lives by planting trees in cities.

The Environment Agency dealt with EMC's failure to comply with the law through a civil sanction called an enforcement undertaking, instead of prosecution. To qualify, offenders must improve practices to avoid similar breaches, while also making a financial contribution to a relevant project.

Rory Field, corporate partnerships director for Trees for Cities, said: "This money contributed to the creation of a new woodland at Goodmayes Park in Ilford, where more than 500 members of the local community came out to help plant the trees. Urban tree-planting is a great way to benefit the environment and the community".



OTHER NEWS

College fined £50,000 for slurry pollution

Plumpton College in Sussex has been fined £50,000 and ordered to pay costs of almost £45,000 after pleading guilty to a pollution incident that killed more than 1,500 fish.

The Environment Agency prosecuted the agricultural college after management failings caused slurry to pollute a nearby stream.

In November 2016, a head herdsman spread water contaminated with cow slurry as fertiliser onto a field at a farm managed by the college. The volume was many times more than the field could absorb, and the ground was frozen, so much of the water ran off into ditches and land drains, which then flowed into the Plumpton Mill Stream.

The pollution was classified as a Category 1 incident by the Agency. The stream smelled strongly of slurry and the watercourse was visibly brown. Many of the fish that were killed were protected species.

A member of the public reported the incident to the Agency; the college itself did not report it or have a plan for dealing with slurry spillage. The Agency had contacted the college about its management and operations on several occasions since 2011, due to concerns over incidents.

The college admitted that the incident was the result of a mistake by a staff member and that spreading the slurry was wrong as the weather conditions and field were not suitable. The head herdsman accepted a formal caution.



CASE LAW

Application granted for judicial review on EIA decision

In *R (Swire) v Secretary of State for Housing, Communities and Local Government*, a local resident applied for judicial review of the Secretary of State's decision that an environmental impact assessment (EIA) was not required for a residential development.

The developer had applied to the local authority for planning permission for a residential development. The site had been used as an animal carcass rendering facility, and in the 1990s was one of four UK sites licensed to dispose of cattle infected with BSE (which resulted in the Creutzfeldt-Jakob disease outbreak in humans).

The developer confirmed that a comprehensive remediation scheme would have to be implemented. The planning officer's report indicated that the environmental benefits of improving the site's appearance and removing contamination, as

well as the economic and social benefits of housebuilding, were considerations of some weight.

The authority granted permission subject to the implementation of a scheme to deal with land and groundwater contamination, and the Secretary gave a screening direction under the Town and Country Planning (Environmental Impact Assessment) Regulations. He stated that the proposed mitigation measures meant the development was unlikely to have significant effects on the environment, so an EIA was not required. The resident argued that the Secretary had misunderstood the regulations.

When deciding whether the application should be granted, it was considered that the Secretary had been given the task of judging whether the development was likely to have significant effects on the environment, and the

court would only intervene if he erred in law. The Secretary had to have sufficient evidence of potential environmental impacts, and the effectiveness of proposed measures, in order to make an informed judgment. The problem was that there was little evidence on the presence and nature of contamination at the site, the potential hazards facing future homeowners, or any safe and effective methods of detecting, managing and eliminating such contamination and hazards.

By concluding that the mitigation measures would address potential contamination, the Secretary had assumed those measures would be successful without sufficient information. The application was granted.

At his Shropshire farm, Dunne has been making environmental improvements of the sort encouraged by the government's proposed Environmental Land Management scheme – including planting cover crops to boost water retention

Ludlow MP Philip Dunne's parliamentary career has mostly been focused on defence and health, but when the post of chair came up for the Environmental Audit Committee (EAC), which he has been a member of since 2018, he put himself forward. "One of the reasons was that this year would have been a fundamental year for the UK to show global leadership in improving the environment and in heading towards our climate change commitments," he says.

The select committee had planned work around the UN COP26 negotiations in Glasgow, to scrutinise what it was planning to achieve at the COP and the preparatory work it was conducting in the run-up. Instead, it has had to flip its focus to the green recovery from the



economic crisis caused by COVID-19. It held its first evidence session on the issue in July, and has scheduled further hearings for the autumn.

Green strings attached

Much of the criticism around the government's reaction to the green recovery agenda is misplaced, Dunne believes.

"The economic stimulus measures announced in July are an interim step to take us through this year," he says.

"The focus will be on the spending review, which will cover the rest of Parliament – that's the real opportunity for the government to take measures to stimulate the British economy, but to do so in a way that will try to capture some of the environmental benefits of the reduced activity and change the way we do things. That's the real prize."

The green recovery, biodiversity and economic opportunities from clean technology are all priorities for the Parliamentary Environmental Audit Committee, its latest chair Philip Dunne MP tells **Catherine Early**

Natural selection

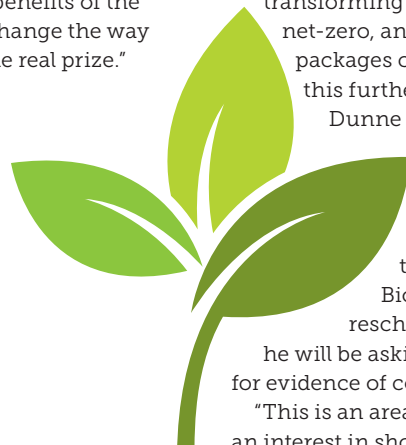
In terms of the short-term recovery measures announced so far, Dunne is particularly pleased with the £2bn for energy efficiency, an issue that he says has been a high priority for the committee. The intent is to retrofit 650,000 homes with better insulation, glazing and other energy efficiency features this fiscal year – which will be a big challenge, he says.

"The proof will be in the eating as to whether this works, but we absolutely have to do it. There are 19m properties leaking energy and we have to get as many of those as possible put right – and this is a very good start."

He is supportive of the idea of attaching green strings to government bail-outs. "Some of the major manufacturing sectors and the aviation sector need to take this opportunity and funding from government to rethink their business models." Some companies are already transforming very rapidly towards net-zero, and government stimulus packages can help incentivise this further, he continues.

Dunne is also hoping that the UK can collaborate with China, which is hosting the COP15 UN negotiations under the Convention on Biological Diversity, rescheduled for May. He says he will be asking the government for evidence of co-operation.

"This is an area where we both have an interest in showing global leadership. That's a real positive at a time when the relationship is going through some bumps in other areas." The committee's upcoming inquiry on biodiversity will report ahead of COP15 so as to inform the government's preparations, he adds.





"Some of the major manufacturing sectors and the aviation sector need to take this opportunity to rethink their business models"

Habitat protections

Dunne was brought up in rural Shropshire, on a mixed arable and livestock farm that he has managed since 1987. As such, he is well aware of the responsibilities and challenges involved in maintaining viable agricultural activity while enhancing wildlife, and is working to make sure the farm plays its part. This includes, for example, working with the Environment Agency to prevent run-off into rivers through better land management, such as planting cover crops to boost water retention. He is also creating wetland areas so excess water can be held over land rather than risk flooding downstream.

Dunne is convinced that the government's Environmental Land Management scheme (ELMS) – which will reward farmers for 'public goods' such as environmental improvements – will provide adequate protection for nature, when used in conjunction with nature recovery networks and other proposals in the 25 Year Environment Plan. He dismisses campaign groups' fears that the government will abandon protections under the EU Habitats Directive once the Brexit transition period is over at the end of the year. "I think some of the NGOs are rather stuck in the past – they should be looking forward to opportunities presented by the 25 Year Plan and the new legislation, which we couldn't have done if we stayed in the EU," he says.



Interview

➤ Dunne is promoting a private members' bill to combat the use of combined sewer overflows, which has shot up in recent years

"Looking back to the Habitats Directive as the best way of preserving habitat is, in my view, old-fashioned thinking. We should be looking forward to what the ELMS and the nature recovery networks could be doing."

These schemes will need to be coherent and well aligned. Dunne has been pressing for this through contributions on the Agriculture Bill, and plans to do so on the Environment Bill, he adds.

He also does not share concerns that the Environment Bill will not be enacted before the transition period ends. It is due to resume its passage through Parliament in September, having been delayed by COVID-19; however, the combination of an early return to Parliament after the summer break and a lack of party conferences will add a month of legislative time, he points out.

"The government certainly intends to get the act in place, and this extra time gives capacity to do so, so I'm not concerned. We need to ensure that it happens, but I'm reasonably reassured that it has every prospect of getting through."

Arrangements for the government's new watchdog, the Office for Environmental Protection (OEP) – which is legislated for in the bill – are proceeding on the assumption that the bill will pass, he says. Dunne expects to hold pre-appointment hearings for the OEP's chair before the end of the year.

Shining a spotlight

Dunne has a personal interest in water quality, and is promoting a private members' bill on combined sewer overflows (CSOs). When large volumes of rain build up in the system, water companies are permitted to release sewage into rivers through CSOs in order to reduce the risk of sewage backing up into homes, roads and open spaces.

However, the dumping of raw sewage into watercourses has been occurring increasingly



frequently – Freedom of Information requests by *The Guardian* revealed more than 200,000 occasions last year alone (bit.ly/34hVUfq).

Dunne's bill, which will be drafted in the autumn for debate in November, would place a duty on water companies to better manage the risks and stop untreated sewage being discharged into rivers and inland waterways.

"The Victorians were very good at introducing sewer systems across the country – but sadly we're still reliant on systems that were put in place 150 years ago, which is why they can't cope with the volumes the current population is putting through them," he says. "The infrastructure has not been upgraded adequately for decades.

"My bill will not be able to solve this overnight, but it's designed to raise awareness and public interest in what is otherwise a rather murky, mucky subject that people don't like to think about."

"Select committees can raise awareness of injustice or things that can do good"

Raising awareness of otherwise neglected topics can be one of the key strengths of select committees, Dunne believes. Though they cannot make the government act on their recommendations, they can focus minds on matters that the government would sometimes rather people were not talking about, he says.

A recent example of this is the EAC's inquiry on fast fashion, which it originally intended to highlight the amount of waste created by disposable clothing. "We also uncovered modern slavery in garment factories, particularly in Leicester, which has become topical now that they are also hotspots for COVID-19 infection."

A previous inquiry flagged up similar issues in hand car washes, he notes. "In both cases, the government made comfortable words but has done relatively little about it. So we will be looking again in the autumn at what follow-up we can do, and I hope that this time the government will act."

Dunne has also brought the committee a new focus on the opportunities for the UK in the transition to a net-zero economy through technology such as offshore wind and hydrogen. "That is a feature of a select committee, that we can raise awareness of injustice or things that can do good," he says. ①

CATHERINE EARLY is a freelance journalist.

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Oceans of potential

New innovations in the electrolysis of seawater could create almost unlimited clean energy, says **Alan Asbury**

The take-up of electric vehicles is increasing across the world, helped by government grants, incentives and the rapid expansion of battery range.

The UK government's consultation on the future of transport has already suggested an end to the sale of internal combustion engine and hybrid cars from 2035.

However, there are concerns that battery electric vehicles cannot, on their own, replace the internal combustion engine.

The reason for this is that, in the UK, transport currently accounts for only 1% of electrical energy. Already there are difficulties in locating sites for rapid (43kW+) electric charge points that can draw around 100 amps at the commencement of the charge. The UK has around 32m cars on its roads, and this number annually increases by around a million. Indeed, the case for

like-for-like replacement of all of these cars is flawed. Technology allows for the booking and collection of cars on a needs basis, and the idea of owning a car that is parked on a road or driveway most of the time is 20th century in its logic. Cars depreciate, and so calling on the right car for the task is surely the sustainable thing to do. COVID-19 has made it clear that reduced car ownership would have a beneficial effect on air quality.

Even with reduced ownership, the grid as it stands could not contend with a fleet calling on electrical power for all mobility needs. Waiting times at

charging stations cannot be sustained on a fleet of so many cars. Additionally, most of the 500,000-plus HGVs serving the UK's freight needs could not contend with the loss of payload capacity caused by the introduction of high-mass onboard batteries.

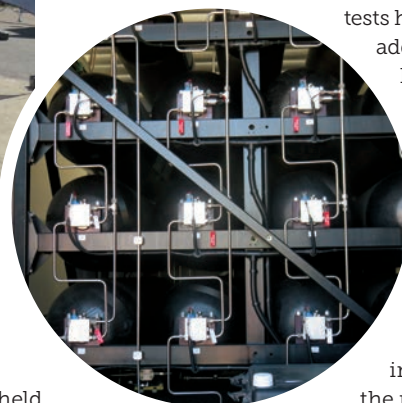
Clean, green hydrogen

Hydrogen has many beneficial transport and heating fuel properties. It fuels rapidly, can be stored in pressurised or solid form, and releases only water as an exhaust product. If it is to be used for heating and transport, it needs to be decoupled from fossil fuels, meaning it must not be derived from natural or landfill gas (predominantly methane). The reasons for this are plentiful: fossil fuels are finite, and their use deprives future generations of the opportunity to use them more wisely; they cause conflict within the destabilised regions where they are often found; and the degradation of the 'non-value environment' through the exploitation of this 'value resource' is unsustainable.





- Producing clean hydrogen from seawater via electrolysis could be the key to the widespread adoption of hydrogen-run vehicles
- Hydrogen fuelling canisters



CO₂ has an atomic weight of 44: the atomic weight of one carbon atom, which is 12, plus two oxygen atoms, each with an atomic weight of 16. The amount of carbon in a quantity of CO₂ can be found by multiplying the quantity of CO₂ by 0.27 (12 divided by 44). Therefore, 1kg of CO₂ can be expressed as 0.27kg of carbon.

Methane (CH₄) has four hydrogen atoms for every carbon atom. On the surface, this makes methane look like a viable hydrogen generating gas. However, while methane is plentiful, its global warming potential (GWP) is up to 28 times greater than carbon; cracking it leads to the release of carbon that has a lower GWP but stays in the atmosphere for more than a century. The atomic weight of a carbon atom is 12 and the atomic weight of hydrogen is 1, meaning a methane atom's atomic weight is 16. The amount of carbon in a quantity of CH₄ can be found by multiplying the amount of methane by 0.75 (12 divided by 16); thus 1kg of methane releases 0.75kg of carbon.

As such, maintaining any future fuel linkage to oil and natural gas will do nothing to limit the effects of climate change. While methane (the major constituent of natural and landfill gas) is relatively plentiful and the carbon that is cracked could arguably be retained through carbon capture and storage, this is only a short-term measure (akin to vitrification and storage of spent nuclear fuels) and the technology is still in its infancy. This is problematic given that the world needs to act in the next 10 years.

Solutions in the sea

The most viable route for accessing hydrogen would be electrolysis from

water. While there are approximately 326 million trillion gallons of water on earth, only 3.5% is potable; of this, 68% is held in ice and glaciers, 30% is underground and just 2% is available to us in rivers, lakes and reservoirs. This makes it a scarce commodity, and the idea of fuelling all the world's vehicles from potable water is ludicrous.

"If hydrogen is to be used for heating and transport, it needs to be decoupled from fossil fuels, meaning it must not be derived from natural or landfill gas"

Seawater has generally been discounted as an option for hydrogen production. This is because electrolysis – the splitting of water into hydrogen and oxygen with electricity, using positive electrodes (anodes) and negative electrodes (cathodes) placed into water to produce hydrogen at the cathode and breathable oxygen at the anode – has always been problematic with saltwater. The negatively charged chloride in seawater salt corrodes the anode, which limits such a system's lifespan.

However, new research from Stanford University seems to have found a solution. Researchers found that by coating the anode with layers that were rich in negative charges, the layers repelled chloride and slowed down the decay of the submerged and underlying metal. In ordinary seawater electrolysis, the anode typically lasts up to 12 hours before crumbling. Laboratory

tests have shown that the addition of anode coatings helps the anode last for more than 1,000 hours.

In fact, without the risk of salt corrosion, the device matched current technologies that use purified water, operating at the same electrical currents used in industry today. Since the process produces breathable oxygen, divers or submarines could bring devices into the ocean and generate hydrogen and breathable oxygen deep below the surface of the sea, without having to surface for air.

Time to act

Naturally, the energy source required to conduct electrolysis on the scale required must be renewable. With swathes of wind and solar at overcapacity during evening and summer weekends respectively, the potential to generate and store energy as hydrogen is available and growing. Indeed, Ørsted and ITM Power have recently unveiled an offshore wind turbine that can electrolyse hydrogen offshore.

To stand any chance of avoiding runaway climate change, the time to commit to a technology is now. Short-term solutions that appease the oil and gas industry lobby are not the answer. Green electrolysed hydrogen is the necessary and traversable chasm to be navigated – but it can't be crossed in two short leaps. 

ALAN ASBURY, FIEMA CEnv, is a director of CLS Energy (Consultancy) Ltd.

The burning issue

Should the UK be ramping up its energy-from-waste capacity?

David Burrows
investigates



In July the government published its circular economy package, committing the country to recycle 65% of municipal waste by 2035. This “paves the way for more recyclable materials to be kept in circulation [...] instead of being burned or buried”.

What do we do with the other 35%? *No time to waste*, a new report by think tank Policy Connect, suggests burning it is the best option: “... energy-from-waste has an important role to play in the transition ahead of us: both as the lowest carbon solution for managing residual waste, but also by providing low carbon heat and supporting other sectors’ decarbonisation efforts.”

The authors called for a “move towards a Scandinavian style approach to

residual waste”, with more incinerators. The findings were backed by 13 cross-party MPs, but the issue is likely to divide opinion. “My heart sank a very long way as I read this report,” Eunomia chairman Dominic Hogg wrote on LinkedIn. A Greenpeace spokesman told *Transform* that it doesn’t support the report’s recommendations and has asked Policy Connect to remove its name from the list of contributors. Others, like the United Kingdom Without Incineration Network, said they had not been able to contribute to an initial consultation.

Major savings?

Deciding what to do with the UK’s residual waste – which could amount to 20m-30m tonnes per year by 2035 – is a tough gig. Campaigners, circular

economy thinkers, policymakers and the waste industry have been arguing about it for years. Defra has welcomed the Policy Connect report as a “timely contribution”, but Tom Murray, the department’s deputy head of resources and waste policy, sounded a warning at the launch webinar when he said: “We should not be making energy-from-waste a corner-piece on which we build the whole picture.”

Energy-from-waste (EfW) sits one step above landfill in the waste hierarchy – but how big is that step in terms of carbon emission savings? Policy Connect hangs its claims on a 2014 Green Investment Bank (GIB) report, which stated that EfW facilities “typically save up to 200kg CO₂e per tonne of waste on a lifecycle basis compared to landfill”. This was based on the anticipated performance of GIB’s portfolio of three

conventional EfW plants.

Research carried out last year by Tolvik Consulting puts the difference between landfill and EfW at just 32kgCO₂e per tonne. Work by Zero Waste Europe, a campaign group that has long criticised Europe’s reliance on EfW, shows that because of the plastics they’re burning, European incinerators have higher greenhouse gas emissions than electricity generated via conventional means such as fossil gas. As the grid is decarbonised, the gap could widen further.

Kimberley Pratt, environmental analyst at Zero Waste Scotland, has been working on figures for burning municipal solid waste in Scotland. The final results will be published in the next few weeks, but Pratt says the data she has “indicates the difference between

EfW and landfill is smaller than 200kgCO₂e per tonne and is dependent on a number of variable factors, particularly waste composition”.

Alternative options

There is a lot of plastic in residual waste, so the materials have high net-calorific value but release more fossil carbon. “Anything high in carbon needs to be removed before burning,” says Adam Read, external affairs director at Suez, which operates a number of EfW plants.

Removing plastics from the waste stream “should be prioritised”, says Policy Connect, and the UK government has policies designed to achieve this: deposit return schemes, standardised collection systems and extended producer responsibility. However, even with all those in play, there will still be millions of tonnes of waste to deal with. Incineration isn’t the only option.

Policy Connect considered advanced thermal treatments, but found little support for them on a large scale. Advanced material recovery biological treatment (MRBT) is also attracting interest among campaigners, who claim it has a lower carbon footprint than incineration and is much cheaper. The process involves ‘pre-treating’ mixed waste before landfilling; the remaining recyclables are captured along with ‘inert residuals’ that produce little to no landfill gas when buried. “Of the variants examined, the greatest environmental benefits occur when waste is treated at an MRBT plant and the stabilised waste is sent to landfill,” noted government advisors at Wrap in a 2012 report on landfill bans that compared MRBT with incineration.

Closing the capacity gap

The other debate is how much residual waste there will be. In 2017, Suez and Eunomia produced conflicting reports on the UK’s residual

20-30m

The UK’s residual waste could amount to **20-30m** tonnes per year by 2035



10 PLANTS

Of the UK’s **60 EfW plants**, only **10** are successfully using the heat generated



waste infrastructure. The latter suggested that planned capacity was more than enough – in fact, by 2020-21, if the plants were all working to capacity, it would limit the recycling rate to “no more than 63%”. Suez, on the other hand, insisted there would be a capacity gap for EfW and other non-landfill residual waste treatment facilities of 4.6m tonnes in 2025, and 2.4m tonnes in 2030. “Should you have enough capacity or not enough capacity?” asked Paul James, chair of the Chartered Institution of Waste Management, at the webinar. “The bigger risk is not having enough.”

The UK also exports residual waste: in 2018, 3.1m tonnes of refuse-derived fuel were sent to feed EfW plants overseas. This is no bad thing: European facilities are efficient, generating electricity and making use of the heat. Of the UK’s 60 plants, only 10 are thought to be successfully using the heat. Jacob Hayler, executive director at the Environmental Services Association, says this is a “product of our planning system and a lack of strategic coordination for EfW infrastructure”.

The primary challenge is finding the right sites for plants, located near to a potential heat offtake. There are calls for clearer direction from government, and not just on using this wasted heat – carbon capture and storage technology

should also be integrated into EfW, according to Policy Connect. “We need to guard against a proliferation of inefficient EfW plants that risk undermining rather than supporting government commitments,” admitted Defra’s Murray.

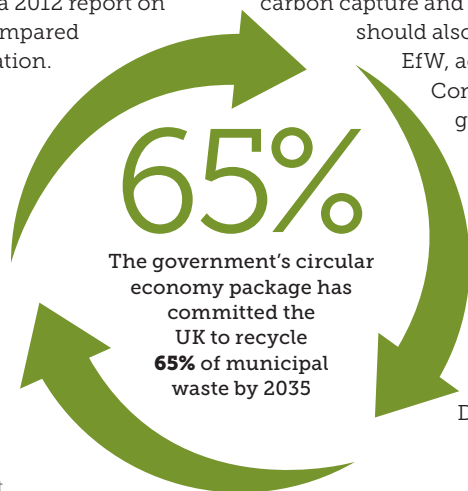
Recycling conflict

Could more EfW undermine recycling targets? Phil Williams, research analyst at Zero Waste Scotland, says long-term evidence suggests countries with high levels of EfW are not improving their municipal recycling rates in line with EU targets. Germany, in contrast, has already hit 68% recycling, with 31% incinerated (according to Eurostat figures in the Policy Connect report). The UK already has an EfW rate of 37%.

“Historical trends should be a good indicator that ‘Scandinavian-style’ incineration rates will make the EU 65% target unachievable,” Williams explains. In response to the 65% recycling rate within the EU’s circular economy package, the Nordic Council commissioned a study on waste policy in Denmark, Sweden, Norway, Finland and Iceland and concluded that the region will need “a significant shift away from incineration (and in Iceland, landfilling), towards recycling”.

With so many questions, calls in the Policy Connect report for a waste and resources roadmap have been welcomed. An assessment of the waste we generate and how we prevent and treat it is “beyond overdue”, says Libby Peake, head of resource policy at think tank Green Alliance. To date, the projections have a common flaw, she says. “They all take the baseline assumption that waste levels will stay the same or continue to rise, which means we are setting up infrastructure to deal with ever-growing levels of waste.” Her thinking is that in a genuinely circular economy, the 35% of waste left over should amount to a much smaller pile, meaning less EfW. “Focusing on incineration versus recycling forgets the most important thing: reduction.”

DAVID BURROWS is a freelance journalist and researcher.



Peter Newell is blunt about transforming the way we live now. "We are up against a clock," says the research director of the Rapid Transition

Alliance, a global network of around 50 mostly civil society organisations dedicated to changing economies, lives and jobs.

Launched in 2018, the alliance gathers and disseminates evidence as part of "a bigger conversation on the immediate possibilities of rapid transition and more sustainable behaviour". Its case studies are numerous – from social movements in Brazil and US companies making sustainable products, to the way urban farming tackles food security. Narratives matter to the alliance, and it wants to offer a narrative of hope. "We need to inspire alternatives," Newell says. "How can we move from 'what is' to 'what if'?"

Newell, who is also professor of international relations at Sussex University, cites the IPCC's landmark

report on the impact of global warming of 1.5°C, and last year's warning from the UN Environment Programme that relying only on current climate commitments under the Paris Agreement will mean temperatures rising by 3.2°C this century.

Evidence-based hope

Newell describes the alliance as a "resource for learning to generate evidence-based hope" – holding up not a mirror to the world, but a window revealing what it could be. "How do we tell positive stories about the possibility of rapid transition, which is clearly now required to get near to a whole range of sustainability goals? We need these positive stories about the possibility of change around infrastructure, energy, finance, water – the whole gamut."

Some transition is happening, he acknowledges, "but it needs to be upscaled, and quickly". Another pressing aim is "to call out inaction by companies, governments, by whoever says this is impossible. We have stories to show what can be achieved if the political will is there."

Many governments still plan for a fossil fuel future "when it's clear most fossil fuels will have to stay in the ground if we to meet the Paris Agreement". Government subsidies to fossil fuels globally are around \$10m a minute; redirecting this money is a priority.

"A lot of it needs to shift towards more sustainable transport and energy

The Rapid Transition Alliance wants to tell stories to inspire a sustainable future. **Peter Newell** talks to Huw Morris about moving from 'what is' to 'what if'

Rapid-fire change



systems, making services more affordable, redirecting planning rules and embedding alternative infrastructure," Newell says.

He describes this as "the elephant in the room", citing International Energy Agency projections that fossil fuel use will rise for decades to come. Carbon Tracker suggests restraining temperature rises to below 2°C means that 80% of coal, oil and gas reserves are now "un-burnable".

Some governments are taking bold action to leave fossil fuels in the ground. New Zealand, France, Belize and Costa Rica have announced moratoria on new oil exploration and production. This informs the alliance's radical call for a "fossil fuel non-proliferation treaty", which is similar to the diplomatic initiatives for controlling nuclear warheads during the Cold War.

"Even if people think a treaty is too ambitious, it at least asks the question of which countries still need to access fossil fuels, while acknowledging the responsibility of richer countries that have more than used their share," he says. "There will be plenty of opposition, but some countries are seeing this as a registry of commitment which they can claim against climate change pledges. Over time, countries will be pushed or embarrassed into making concessions."

Delay tactics

Companies are expected to use technological innovation, new finance models and operations shifts to adjust to the climate emergency – yet many move slowly because they profit from the status quo. Others are moving ahead. More than 760 businesses, including BT, Unilever, Carlsberg and Tesco, are committed to meeting the 2°C target via Science-Based Targets, while more than 1,100 have promised 'bold action' via the We Mean Business global coalition.



RAPID TRANSITION IN THE PAST

History is full of examples where the seemingly impossible has been achieved quickly. Newell points to the UK's railway expansion in the mid-1800s, in which 4,400 miles of track – more than seven times the length of the country – were laid within seven years. In 1892, railway workers upgraded more than 200 miles of track in a weekend, with the line reopened on Monday morning.

President Roosevelt's New Deal spent \$21bn over seven years and put millions to

work on public and environmental schemes, with much of the preliminaries sorted out in his first 100 days in office, while the Moon landings turned science fiction into reality within seven years.

Governments will always find money if they need to. £400bn was pumped into the UK economy after the 2007 financial crash, and \$3.7trn into that of the US.

More recently, Iceland's volcanic eruption in 2010 grounded airlines and forced supermarkets to switch to



local produce instead of flying in fruit and vegetables from across the globe. Video-conferencing took off and then prime minister of Norway, Jens Stoltenberg, ran the government from his iPad as he was stranded in New York.

Dutch materials company DSM has transitioned from engineering to health and zero-carbon materials; Danish ex-oil company Ørsted plans to slash carbon by 97% by 2023 and has shifted entirely to renewable energy; and Unilever is committed to zero-carbon by 2030. The Global Commission on the Economy and Climate says \$26bn could be earned by businesses that transition rapidly.

"Some businesses or business models may no longer be viable in a zero-carbon society," says Newell. "We can no longer rely on having to make a 'business case' for climate change and sustainability action. A moral case should suffice."

This means difficult conversations with stakeholders, customers and staff. Yet businesses are accustomed to technological and cultural disruption, he argues, and constantly adapt to threats from competitors and shifts in the commercial landscape.

Climate change adds to such pressures, but also redefines many of them.

Cultural shift

Meanwhile, sustainability challenges – from water to biodiversity, land and food – will force businesses to rethink their corporate

strategies. COVID-19 has highlighted the need for urgency, Newell adds.

"We are seeing a chance to rethink some of these things, but we are also quickly seeing the danger of slipping back into business-as-usual in other respects. How do we want to design our food systems, energy systems, transport systems to make them sustainable and resilient? COVID-19 has exposed how vulnerable those systems are, how dependent they are on 'just in time' and how prone they are to disruption."

He is not overly impressed by UK government's post-COVID-19 New Deal. "Positively, there are plans for 4,000 zero-carbon buses and new cycle-ways. But some moves go in the wrong direction by locking in higher carbon pathways, such as the £100m for new road projects. The emphasis on 'jet-zero' is also a distraction from the need to focus on high-speed rail and electric car infrastructure."

Underlying transition is a cultural shift, he says. Job sharing, four-day working weeks and the way things are produced will all be considered. "Some of this means potentially slower cultural and social shifts, particularly as we need to look beyond questions of regulation, infrastructure and finance," he adds. 🗳️

HUW MORRIS is a freelance journalist.

Far-reaching vision

Nick King asks if cathedral thinking still exists in the modern world

Interest in 'cathedral thinking' has surged recently, yet it remains an obscure concept for many. What is it, do modern societies demonstrate it, and why could it be particularly significant at this moment?

The Macmillan dictionary defines cathedral thinking as 'long-term projects or goals realised for the sake of or for benefit of future generations'. More specifically, it is the collective mindset of certain groups in the past that led them to plan and initiate large-scale projects

which would take a very long time to complete. Most contributors toiled knowing that they would never see the fruits of their labours. The projects used labour, resources and capabilities that were needed for their own time, but the benefits would mainly go to future generations.

Cathedral thinking was therefore both a mindset and a set of actions that considered the future not as vague and abstract, but

as something that mattered as much as contemporary wants and needs. It manifested as conscious efforts to pass 'gifts' down the river of time. The naming and invocation of the concept is of course linked to the religiously-driven cathedral builders of medieval Europe, but they are not the only groups that brought the future into their efforts – the Iroquois of North America historically practiced a 'Great Law' that accounted for the consequences of their collective decisions down seven generations hence.

Discounting the future

How does the modern era stack up against these historical examples? One example of a government policy that is akin to cathedral thinking is the Welsh parliament's recent appointment of a 'future generations commissioner'. This is the first instance of a government enshrining the rights of future citizens in law (through the 'Well-being of Future Generations Act (Wales) 2015').

However, the mindset of most 21st-century societies contrasts starkly with historical cathedral thinking. The globalised, consumption-driven neoliberal capitalism that dominates the global economic system requires, and is defined by, a very different view of its place on the continuum of time. The relentless pursuit of economic growth, which is central to this system, explicitly discounts the future by placing an imperative on the consumption of non-renewable resources and use of debt at ever-growing rates, in order to satisfy

✦ The cathedral builders of the past built for following generations, knowing they themselves would not see the outcomes of their work





the needs and wants of the present and very near-term.

There is a growing body of evidence to show that this economic system and mindset is perturbing our planetary systems, and building up a multi-faceted set of slow-burning 'wicked problems'. Climate change, ecological destruction, resource depletion and unmanageable complexity are only the most visible. It is clear that our political and cultural structure does not account for the needs of future generations, and certainly does not look to leave 'gifts' for the future. Rather, it seems an efficient mechanism to bequeath a poisoned, degraded and poorer world to our descendants.

If some localised cathedral thinking-inspired laws does not effectively buck this bleak picture, are there any major examples of attitudes and initiatives explicitly demonstrating that cathedral thinking does exist? There is one set of large-scale projects under way in a number of countries, conceived to tackle one particular environmental challenge, that could robustly be described as being a product of cathedral thinking. These projects, which operate well outside the experience of most people, are the international efforts to implement the geological disposal of nuclear waste.

Avoiding a toxic legacy

Nuclear technology has been used for approximately 75 years, and has resulted in the creation of a complex legacy of radioactive/toxic waste products, stored in a wide variety of locations and facilities. Management of waste, considered little in the early days of nuclear technology, has come to the fore as a primary concern and represents a truly unique challenge. The most dangerous forms of radioactive waste will remain hazardous for more than 100,000 years (for comparison, the agricultural revolution started approximately 12,000 years ago), and the economic and technically feasible solution that has emerged in multiple countries is

"Cathedral thinking considers the future not as vague and abstract, but as something that matters as much as contemporary wants and needs"

'geological disposal' – isolation in dedicated mined facilities within stable rock masses 500 or more metres underground. These facilities will be carefully designed to use a combination of engineered barriers around the waste and the mass of overlying rock to minimise long-term risks to the biosphere without the need for active monitoring and control.

The nature of these projects makes them unique and significant for several reasons. First, the concept is explicitly built around the consideration of extended timeframes and the protection of future generations. Second, the countries undertaking these huge civil engineering projects have devoted, and will continue to devote, considerable resources to what will inevitably be a multi-generational effort (likely well in excess of a century) to plan, build, operate and close them. Although they are less a gift to the future and more of an exercise in responsibility and damage limitation, these projects are almost certainly the closest thing we have to modern cathedral thinking, and are all the more significant because of their

🕒 The geological disposal of nuclear waste is one of few modern-day examples of cathedral thinking

contrast with the doggedly short-termist global society in which they are nested.

The way forward

What is the broader significance of this example of modern cathedral thinking? On one hand, geological disposal is a response to a fairly well-defined and discrete problem that is also visible and understandably egregious, so perhaps lends itself to the application of cathedral thinking. On the other hand, this example of perspective and adaptive thinking clearly shows that it is possible for inspiration and political energy to emerge and vigorously tackle 'wicked problems'. We must call upon this second perspective if we are to invoke renewed cathedral thinking to tackle the broader threats that we face.

Global society has procrastinated over how to address environmental challenges for decades, and we now stand at a crossroads. Poor choices arising from inertia and business-as-usual threaten to set in motion systemic effects that could echo for centuries or longer – yet there are degrees of freedom we still have available to tackle this unfolding situation. The main missing elements are collective political will, understanding among populations, and a means to escape the 'tramlines' of current mindsets.

Geological disposal may be the key example and precedent for modern cathedral thinking, and could be an inspiration for concerted and determined efforts to demote our short-term wants and instead think about what we should be passing on to those inhabiting the future. Such thinking would require the hard work, sacrifice and sobriety of the ancient cathedral builders, but could result in us passing on the ultimate cathedral: a habitable planet and the chance for a long-term future for our civilisation. 🕒

NICK KING, MIEMA CENV, is a visiting research fellow at the Global Sustainability Institute at Anglia Ruskin University, with interests in nuclear energy and sustainability.

As the impacts of COVID-19 spread, fears grew that the momentum on tackling climate change would be lost. However, businesses in the environmental sector are finding it has given them an opportunity to accelerate action they were already considering as part of their Pledge to Net Zero.

Launched in November 2019, the pledge aims to galvanise action in the environmental services sector and make it a leader in the transition to a low-carbon economy. It commits organisations to cut greenhouse gas emissions by at least 2.5%, in line with what climate scientists have said is needed to keep temperature rises well below 2°C, as agreed by

governments under the Paris Agreement. Targets must cover at least buildings and travel by UK teams.

The pledge is underpinned by the approach approved by the Science-Based Targets Initiative (SBTI), a mechanism by which companies can develop and officially validate targets. While offsets can be used for residual emissions, they must not count towards organisations' 2.5% reduction targets. Each year, signatories must publicly report their progress and publish thought leadership sharing best practice.

Showing leadership

The pledge is led by IEMA, the Society for the Environment, the Association for Consultancy and Engineering, the Environmental Industries Commission, and consultancies AECOM and WSP. More than 50 companies of all sizes have signed up.

The environmental services sector is playing catch-up on the issue, acknowledges Ryan Burrows, AECOM's

sustainability and safety, health and environment manager. "By the time the pledge got under way, there were similar movements in existence. Some companies in the sector had made progress on reducing emissions, but others thought of it as something they talked about to clients but didn't do themselves. It's important that we show leadership – if we show we're doing the work ourselves, it has more legitimacy when we talk to clients about it."

Joe Hague, quality and environment manager at Land Use Consultants (LUC), says that clients are increasingly asking the business about its response to the climate emergency. "Specific questions are starting to come through in tenders. Thankfully, we already had an answer – it could have caught us on the hop if we hadn't already signed up to the pledge, we would have had to get our house in order more quickly. I'd imagine that will redouble, particularly from local authorities, but also the private sector."

Accelerated responses

Surveys have revealed mixed responses from businesses in terms of whether the pandemic will maintain their drive to make operations more sustainable or cause them to backtrack. A poll of 200 UK-based businesses carried out by cloud finance firm Ivalua revealed that 60% either decreased their investment in

COVID-19 has catalysed emissions reduction efforts under the environmental sector's Pledge to Net Zero.

Catherine Early reports

Spurred into **action**



initiatives as a result of COVID-19, or were planning to, while the Climate Group found that 97% of employers were sticking to existing goals.

Signatories to the pledge report that emissions reductions from operations changes due to COVID-19 have accelerated measures they were already considering. Along with the obvious cuts associated with working from home and holding meetings online, they foresee that these benefits could have a much deeper impact if they become mainstream working practices.

Natalie Cropp, sustainability director at Tony Gee and Partners, says that the pandemic has led the engineering consultancy to become "pretty much paper-free". "Working from home has pushed us to work more digitally across all parts of the business in terms of drawing mark-ups and approving invoices and purchases."

The practice had already initiated a procedure for marking up drawings digitally, following suggestions from a student competition a couple of years ago, Cropp explains. It was starting to gain momentum, but since COVID-19 people have had to get used to it, and feedback has been positive. "It's an example of one of the things that we had already begun, but COVID has kick-started a much bigger effect."

The pandemic forced LUC to accelerate plans to roll out video-conferencing to client work, rather than just using it internally, says Hague. "The pandemic has shown us what is possible if we have to force ourselves to reduce movement –

it is still possible to run a business and keep society going. It's only now that we're starting to get the breathing space to see what lessons we can learn from this, and what adaptations we could build in the long-term while still having a fruitful working society."

The firm has calculated that if its operations carry on in a similar way for the rest of the year, it will reach emissions reductions it had not expected to achieve till 2035. "But would you want to be in a situation where you couldn't travel at all?" he asks. "It's a tricky one." While COVID-19 has started to have real policy change effects within the business, the jury is out on which parts will be locked in longer term, he adds.

"It's important that we show leadership – if we show we're doing the work ourselves, it has more legitimacy when we talk to clients about it"

Difficult calculations

Pledge signatories are also asking about how to account for home working emissions. Data for office emissions is already tricky to collect because many businesses rent their space, rather than owning it. "Energy use is controlled by our landlords – we're trying to ask them for green tariffs but we can't do much more, other than moving elsewhere," says AECOM's Burrows.

The firm is working out how to account for home working emissions. Offices can be more efficient than homes, as that is what they are designed for; much depends on how staff travel to work. Home working can be beneficial if it replaces a long commute by car, but not if replaces a short commute on foot or bike, Burrows points out. It is hard to find best practice guidance on this issue, so he thinks companies will deal with it in different ways.

Tony Gee is in a similar position, Cropp reports. It surveyed staff about their work set-ups and energy supplies, and plans to extrapolate that data to estimate emissions. "You can't use people's energy meters, as they'll be used for things other than working, but it's the best way that we've got at the moment."

Nick Blyth, policy and engagement lead at IEMA, says that organisations need to work out what is fair when calculating emissions for the post-COVID-19 situation. "There are some core principles, and one is to be transparent about what you're doing and how you're communicating it."

IEMA is aiming to restrict emissions in line with what is required to keep

warming below 1.5°C, says Blyth. Its emissions baseline is 2019, when some home working occurred but it was not mainstream. However, the practice might become more permanent for IEMA's team of 35, he says.

"If we can make some of those changes stick, that'll be interesting. A lot of organisations will have been looking to bring in new ways of doing things over a five-year period, but COVID-19 is forcing them to bring that forward and suddenly they're doing it now, the year after the baseline was set. We can either all go back to the office and the emissions associated with that, or come up with a new approach to capture these gains. Hundreds of organisations will be thinking about that." 

CATHERINE EARLY is a freelance journalist.

The government's 25 Year Plan for the Environment and the National Planning Policy Framework (NPPF) have set the agenda that new development must

identify and pursue opportunities to secure measurable net gains in terms of biodiversity and the wider environment.

The Environment Bill introduces a mandatory requirement for new developments to have a biodiversity net gain (BNG) of 10%, calculated using the Biodiversity Metric 2.0 tool. However, we can also use this mandate to create new green spaces for local communities to enjoy, and to drive a wider environmental net gain. Integrating BNG into the planning system will provide a transformation in the way planning and development is delivered.

Biodiversity and ecosystem function are linked to a host of other UN Sustainable Development Goals (SDGs). Defra's net gain consultation proposals state that: "A broader environmental net gain approach which helps to deliver cleaner air and water, increased flood resilience and greater energy efficiency could have the potential, in time, to transform our environment and support healthier lives".

Achieving a minimum 10% BNG, at no or minimal cost, needs to be effectively planned for and integrated into the evolution of a development.

Vision, targets and objectives

While new development will be driven by the requirements of the NPPF and the Environment Bill, projects are also influenced by many other strategies, visions and objectives, such as SDGs, environmental and social governance, and corporate strategies involving key performance indicators (KPIs). BNG should be one of the project objectives, and it must be clear how it works with other KPIs to maximise the benefits. Scheme evolution should be tested regularly for performance against agreed objectives. Vision and objectives should also be regularly reviewed in order to capture new opportunities and collaborators.

Realising the green vision

Martina Girvan and *Nicky Hartley* set out how biodiversity net gain may be maximised within new developments



Feasibility and options development

Decisions at the optioneering and feasibility stage are critical to a project's success, and for demonstrating compliance – for example within the 'Alternatives' chapter of an environmental statement. Stakeholder benefit mapping is great for identifying collaboration opportunities that could maximise the benefits of any design intervention, offsetting or community scheme.

You can maximise value by following the 'mitigation hierarchy': avoidance, mitigation and, if necessary, compensation (formalised in *BS 42020:2013 Biodiversity – Code of practice for planning and development*).

1. Avoidance

- Retain the most valuable areas of biodiversity for their intrinsic habitat value and ability to support species and deliver ecosystem services
- Buffer the most valuable habitats with features such as species-rich wildflower grassland, woodlands, hedgerows, trees and ditches
- Include quality green space that encourages less recreational use, which can degrade more sensitive habitat
- Connect new and existing habitats in order to provide corridors for wildlife and facilitate non-car movement.

“Decisions at the optioneering and feasibility stage are critical to the success of a project”

2. Mitigation and enhancement

- Create new habitats. Some of these can be dedicated to biodiversity, others can co-deliver ecosystem services such as water management, amenity, food from street trees and allotments, social cohesion, recreation and sports.

3. Compensation

- Should there be any residual adverse effects on species or habitats that cannot be fully mitigated, offsite compensation can be provided. For example, the site could have an overall enhancement in biodiversity but there may still be adverse effects on farmland birds. This could be compensated for by enhancing areas offsite, such as improving the biodiversity of agricultural land. Benefits can be combined with natural flood attenuation and watercourse protection, and may be eligible for funding for ongoing management. There is also the potential for funding for carbon sequestration, or money can be donated to local wildlife groups for specific projects.

Scheme development and planning submission

Data collection for the Biodiversity Metric 2.0 should be undertaken while collecting baseline data for the site. While it provides a structured way of accounting for biodiversity losses and gains associated with a development, it shouldn't just simply be a number; the type of BNG provided for the preferred scheme design should provide targeted, multi-functional and locally appropriate benefits.

Integrated workshops with the design team and environmental topic specialists should drive delivery of multi-functional benefits. One barrier to delivery can be the other open space quotas such as sports pitches, which may conflict with delivery of more biodiversity-rich designs. Maximise recreational and sporting opportunities that can coincide with biodiversity-rich spaces, such as trim trails for running, outdoor gyms, and quality children's parks incorporating natural play. To

support the consenting process, a project-specific biodiversity action plan (BAP) can be used to capture the quantum, type and design quality parameters of the habitat required.

BNG should ideally be delivered on site so that local people and biodiversity both benefit. Where this is not viable – for example because of extremely high land value, limitations on compulsory purchase, or better value for nature elsewhere – stakeholder benefits should still be delivered. This could be via involving locals in scheme design, making the scheme available for educational visits, or providing smaller community spaces within the local area.

Implementation, compliance and action plans

Following scheme consent there needs to be a handover to the detailed design team. As well as handing over the BNG report and calculator, an accompanying BAP with clear targets can ensure that this vision is delivered. An outline landscape and ecological management plan (LEMP) can also ensure the quality legacy of the habitat.

Delivery legacy

The BAP and LEMP must be maintained and evolved, with roles, responsibilities and funding clearly defined. A potential barrier is that maintaining green infrastructure is still seen as a financial burden. While the government's proposed conservation covenants (bit.ly/2E9kKn6) will hopefully incentivise the long-term legacy value of green infrastructure, capital and operational funding opportunities should be sought by incorporating exemplary design standards, standardising costs and demonstrating the benefits of green infrastructure. ①

MARTINA GIRVAN is head of ecology and arboriculture at Arcadis.

NICKY HARTLEY is head of capability, environment, safety and industry at Arcadis.

Air pollution

Furnace temperatures in glass factories require peaks as high as 1,575°C as molten glass is moulded into solids. Fuelled by gas or oil, it is no wonder they are a key target in the UK government's industrial decarbonisation challenge to reach net-zero emissions by 2050.

A £50m plant planned at St Helens, Merseyside by non-profit industrial consortium Glass Futures is due to review the process. Trials at the plant will consider alternative fuel systems such as hydrogen, biofuels and hybrid fuel melting technologies, and could reconfigure aspects of the system linked to fossil fuel use. If the findings prove viable, it could radically alter traditional glass industry processes. The plant has received £7.1m in government funding, with more expected from Liverpool City Region Combined Authority.

Researchers need to resolve a range of questions before making the fuel switch, as Richard Katz, founding director of Glass Futures, explains: "Running a glass factory on an alternative fuel could affect raw materials used as well as production efficiencies, changing the fundamentals of manufacturing techniques."

Reducing industry's natural gas use is critical if the UK is to reach national net-zero targets by 2050, so the glass sector's procedures have come under close examination. Though larger than the cement industry by turnover, it has received less attention in terms of carbon intensity. Strategists at UK Research and Innovation (UKRI), which channels much

of the government's decarbonisation research funding relating, now include the industry as a key target. "It's a foundation industry and widely used across the UK economy," points out Bruce Adderley, director of the Industrial Strategy Challenge Fund.

Along with industries such as steel and cement, as well as the energy sector, the team aims to revisit a range of renewable and low-carbon sources or vectors that are appropriate for carbon-intensive players. The aim is to pinpoint collaborative opportunities and synergies at Britain's main industrial clusters, such

as Grangemouth, Teesside, Merseyside, Humberside, and the manufacturing valleys of South Wales.

Blue hydrogen

The use of hydrogen for energy production is one key option. Norwegian oil company Equinor is leading the Hydrogen to Humber Saltend project, which aims to develop a full-scale facility for producing hydrogen from natural gas in combination with carbon capture and storage (CCS). The project will enable industrial customers in Saltend Chemicals Park, where the plant is based, to fully switch over to hydrogen, while the park's power plant moves to a 30% hydrogen-to-natural gas blend. Equinor states that, as a result, the park's CO₂ emissions will reduce by nearly 900,000 tonnes per year.

Industrial cleaning

Elisabeth Jeffries explores various methods that could help decarbonise UK heavy industry



£7.1m

A pilot plant in St Helens has received £7.1m from the government to trial alternative fuel systems in glassmaking



900k

Hydrogen to Humber Saltend is predicted to reduce Saltend Chemicals Park's CO₂ emissions by 900,000 tonnes per year



£55m

The Faraday Institution is funding the £55m LiSTAR project investigating the potential of lithium-sulphur batteries

Air pollution

One of the more established hydrogen production procedures, 'blue hydrogen', involves reforming methane into hydrogen and CO₂. Though it could make a contribution to the net-zero target, it has sparked controversy over its reliance on fossil gas, as well as its dependence on CCS – a technology not yet widely available. Blue hydrogen is being given a major push by the UK government. A key challenge for scientists is optimising CCS processes – at least until hydrogen can be made more cheaply from renewable energy ('green hydrogen'). That means reviewing the gas infrastructure, as well as the CCS technologies themselves.

Of course, CCS is possible directly from gas sources, but hydrogen could be appropriate for other reasons. "Capturing CO₂ from natural gas is certainly possible, and indeed forms part of the portfolio of projects associated with the industrial decarbonisation challenge," says Bryony Livesey, challenge director at UKRI. "That will work well for power production using gas to produce electricity." However, she emphasises the need for hydrogen to provide an alternative fuel for various heating processes (including domestic heating) for which capture of the CO₂ is impractical: "The current infrastructure is intended to move gas, so we need to ensure it can be designed appropriately to incorporate hydrogen." That requires not only allowing the potential for hydrogen made from gas, but also designing in the eventual distribution of hydrogen from renewables in future.

Improving CCS

Though a few oil companies have run pilots or applied CCS in specific settings, it is not yet available at large scale, nor immediately adaptable across industry. Improving CCS is thus a major consideration for full decarbonisation.

"To go from pilot scale to capturing hundreds of thousands of tonnes of CO₂ each year is a big step," notes Sheena Hindocha, knowledge transfer manager in materials chemistry at UK innovation organisation the Knowledge Transfer Network.

A key part of improving CCS is optimising solvents. A class of solvents called liquid amines is considered suitable for CCS use, but further progress is required for its wider use. "The amount of CO₂ captured using the solvents is not high enough," says Hindocha. "Scientists are looking at new ways to capture more CO₂ in a concentrated form." Major players such as the power group Drax are among the companies and organisations investigating ways to improve solvents or find other applications.

"Reducing industry's natural gas use is critical if the UK is to reach national net-zero targets by 2050"

Deep Branch Biotechnology, a tech start-up based at Nottingham University, plans to build a pilot plant within Drax's Carbon Capture Usage and Storage Incubation Area at its power station in North Yorkshire. This will extract flue gases from the power station's renewable electricity generation; the gases will be fed to microbes, which can make single-cell proteins for use in fish food and agricultural livestock feeds.

Lithium-sulphur batteries

In the transport and energy sector, researchers are trying to continually improve energy charging and storage systems in order to keep up with the demand for renewable energy infrastructure, as well as the requirement for cleaner mobility.

According to Professor Paul Shearing, chemical engineering principal investigator at University College London (UCL), lithium-sulphur batteries will follow lithium-ion batteries to help meet energy storage and distribution requirements: "Lithium-sulphur batteries provide particularly compelling benefits around cost, energy density per unit weight and safety." Among the factors that need to improve, he suggests, are recyclability, cost, energy density, power density and safety.

Lithium-ion batteries may have reached capacity when it comes to fulfilling societal needs, Shearing adds. He suggests that lithium-sulphur could provide useful logistical solutions: "When you consider the shipment of large quantities of lithium-ion batteries, which has some challenges, there are improved safety aspects when it comes to lithium-sulphur because we can ship these cells at zero state of charge."

UCL is working with seven industrial partners and six other universities in a £55m project known as LiSTAR, funded by the Faraday Institution. It is a considerable sum for a research project; coupled with private sector investment and the increased research funding announced by the government in 2017 (bit.ly/325bFDM), it shows that major resources are now being funnelled into the transformation of industry. 🌱

ELISABETH JEFFRIES is a freelance journalist.

The greatest contribution higher education institutions (HEIs) can make to society is to equip learners with the knowledge, skills and attitudes needed to contribute solutions to the world's problems. Sustainable development has come to represent the future we all want – one where global challenges have been dealt with through collective effort. Fortunately, the major drivers of higher education agenda, such as employability and the desire to offer a transformational education, provide a rationale for education on sustainable development.

Employer pressure

People seek higher education for multiple reasons, including passion for a subject and intellectual stimulation, but preparing people for work is also a significant factor. This is widely acknowledged by professional bodies, employers and students. Pressure from these stakeholders has resulted in HEIs

taking active steps to equip students with subject-specific knowledge for different job roles and the 'soft' skills needed for career success.

Employers increasingly want graduates who are capable of sustainable practice. This is an important progression from the not-too-distant past, when some professions did not think they had much to do with sustainability. HEIs must go beyond equipping students for traditional employment – they must embed in their curricula the knowledge, skills and

attributes required for sustainable practice. All students should be encouraged to appreciate the implications of sustainable practice in their chosen field.

Many students will consider sustainable professional practice an important part of their education – especially as their age group is probably the most vocal when it comes to sustainability issues.

Transformational change

Of the four purposes of education identified by Stephen Sterling – socialisation, vocational, humanist and transformational – the latter resonates

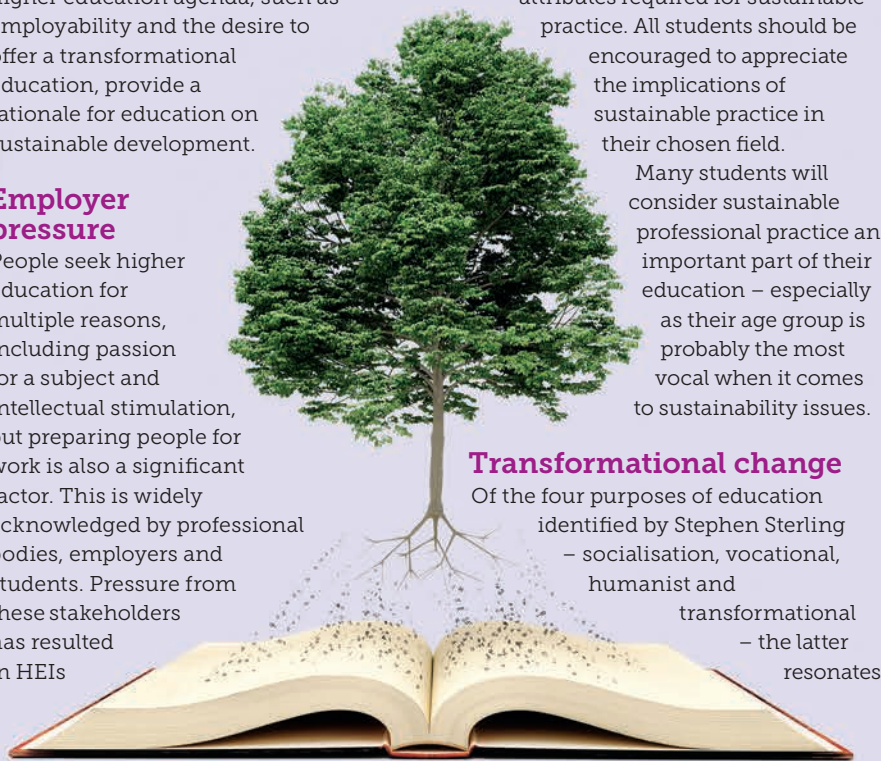
"It would be a lost opportunity if HEIs did not intentionally equip learners with the skills to change business culture"

with many people involved in higher education. The opportunity to be part of a system that equips learners with the tools to make transformational changes is one that many consider a calling, and motivation to remain in the system.

In addition, consider that the most significant impacts on our society and environment are caused by businesses through unsustainable supply chains, poor resource and environmental management practices, unethical trade and employment laws and so on. HEIs supply the future workforce of these businesses – it would be a lost opportunity if they did not intentionally equip learners with the skills to change business culture. We must ask whether we are truly offering transformational education if our students cannot or do not know that they can contribute to an equal and sustainable future.

Many programmes equip students for sustainable development, but without the use of relevant terminology, students may not have the confidence to put themselves forward when presented with opportunities for sustainable change. Deliberate focus on education for sustainable development will focus students' minds on sustainability challenges in their fields of study, and help them think through complex solutions. For many HEIs, embedding sustainability across the curriculum is now a given – the rationale for all institutions to follow suit is strong. 

DR UCHECHUKWU OKERE is academic lead for environmental management, University of Derby Online Learning.



Sustainable schooling

Uchechukwu Okere asks: is education on sustainable development still an optional extra in higher education institutions?

The Cycling Diaries

Our children have just gone back to school, and we are back into the swing of the cycle commute – our kids rarely go anywhere if it isn't on two wheels. We live in a town where everything we need is within a 20-minute bike ride. Not everyone is so lucky, but the pandemic has had ministers musing over whether they could be.

"The concept of a '20-minute neighbourhood', where people have everything they need – schools, shops, recreation and work – within a 20-minute walk is gaining traction across government," says Mark Kemp, chair of the transport board and at the Association of Directors of Environment, Economy, Planning and Transport (ADEPT).

As ADEPT noted in July, the climate emergency and COVID-19 have presented us with a "golden opportunity" to push active travel. "All of us, cyclists and non-cyclists alike, have suddenly found out what it is like to have streets where you can breathe clean air, hear the birds singing at noon, and walk or ride in safety," said Boris Johnson recently, as he committed £2bn to a cycling and walking "revolution".

The money will be used to create thousands of miles of protected bike lanes and low-traffic neighbourhoods. There are £50 bike repair vouchers, which were snapped up so quickly that payments to repair shops are taking twice as long as promised.

During lockdown, millions have caught the cycling bug. Local authorities are making it easier and safer to cycle – and should be supported to make this permanent. Sustrans has an interactive map showing new protected cycle lanes, wider footways and reduced speed limits.

A number of councils have introduced school street closures – during drop-off and pick-up times, streets are open to pedestrians and people on bikes but closed to cars. Edinburgh Napier University recently found that, in almost all cases, the total number of motor vehicles reduced across school street closures and neighbouring streets.

Department for Transport statistics show a 100% increase in weekday

cycling between March and July. This is the first promising data for a government that, in 2017, set a target to "double cycling activity by 2025", but found things going backwards. Miles ridden per person per year have increased, but the number of trips has dropped from 18 in 2002 to 17 in 2018.

As Ryan Georgiades, managing director at cycle insurance firm Yellow Jersey, wrote in an open letter to the prime minister: "This is about turning people from fairweather do-it-in-lockdown-when-there-are-no-cars-or-commuting cyclists to the cycling-everyday sort." This means moving millions of journeys from four wheels to two. In urban areas, more than

40% of journeys are less than two miles. In London, just 5% of these urban trips are completed by bike.

A new national programme to help people buy e-bikes could be crucial. "E-bikes increase the appeal of cycling to groups who are less likely to cycle – women, older groups, those who live more than three miles from work, people from non-white ethnic backgrounds, car owners or those who are inactive," said Frauke Behrendt of the University of Brighton, principal investigator in the smart e-bikes project.

Physical inactivity costs the NHS £1bn annually. All those extra walkers and cyclists would also save £567m every year thanks to improved air quality, and the risk of workers developing depression would be reduced. "The opportunity is huge, but it is also time limited – without intervention, people will likely slip back to old behaviours," the government said. With schools reopening, a sense of normality has returned – but change is in the (fresh) air. 🚲

DAVID BURROWS is a researcher and freelance writer.

"WITHOUT INTERVENTION, PEOPLE WILL SLIP BACK TO OLD BEHAVIOURS"



CONNECT

SOCIAL AND COMMUNITY NEWS FROM IEMA

Brothers in arms

Stephen and Alan Asbury led very different lives and careers until an interesting convergence – they were surprised to hear that they had become the first pair of brothers to have IEMA Fellowships.

Stephen Asbury (*right, bottom*) studied law, handling employer's liability insurance cases at international blue-chip companies. He became interested in environmental management at the time of the Environmental Protection Act in 1990, and was awarded Fellowship in 1999. He was made a Chartered Environmentalist in 2006.

Alan Asbury (*right, top*) travelled the world before studying environmental science and management at BSc and MSc levels. After a spell in the public sector – where he delivered energy, fuel and carbon savings – he founded CLS Energy, which provides energy and fleet audits to manufacturing and logistics firms. Since 2018, he has been employed at the University of Greenwich and Middlesex University, tutoring those studying for masters degrees in climate



change and sustainability.

"I was surprised and delighted to be recognised by my peers in this manner," said Alan of his Fellowship. Stephen said he was very happy to hear Alan's news: "I am sure that our late parents would be proud of our respective career successes."

Read the full article at bit.ly/2FSGzYM

The reading room

What three books have informed your thinking, broadened your horizon, and influenced your actions? This month, **Marek Bidwell** presents his selection...

My Family and Other Animals

Gerald Durrell

My favourite childhood book. Durrell writes vividly about nature in Corfu, an island where I fell in love with the sea. Roaming from hills to shore, he collects and observes, experiments and touches. The fight scene between his pet praying mantis and a gecko on the bedroom ceiling is mesmerising.

The God Species

Mark Lynas

Inspired by Rockström's concept of planetary boundaries, Lynas paints a picture of the environmental challenges facing humanity. But this is not your typical serving of doom and gloom. Formerly an anti-GM campaigner, the 'reformed' writer makes a case for greater use of controversial technologies, from genetic engineering to nuclear power. And I love a good debate!

Doughnut Economics

Kate Raworth

Environmentalists must engage with economics to make a difference. Raworth explodes longstanding myths and rewrites the economic textbook, adding the word 'ethics' into 'economics'. She completes the planetary boundaries model by incorporating social issues, and shows that inequality and environmental degradation are not necessary for progress.

The lowdown on net-zero

Simone Codrington of IEMA Futures examines the confusion around different carbon reduction terms

During the past few years, many councils, companies and industries have declared climate emergencies and pledged to become 'net-zero'. Of 408 UK councils, 65% had declared a climate emergency as of October 2019. Many companies have signed up to Pledge to Net Zero or the Transform to Net Zero initiative, and businesses from a whole mix of industries are announcing commitments and setting targets.

However, the exact definitions of these terms can vary, which can lead to uncertainty around expectations. The issue is often that every business, council or industry interprets terms such as 'net-zero', 'zero carbon' and 'carbon neutral' differently. Pledge To Net Zero states: "To be net zero is to quantify emissions and set a plan for reducing emissions in a meaningful manner which is in line with the Paris Agreement and includes investing in carbon removal projects to generate offsets. This is slightly different to the commonly used term of carbon neutrality, which is more focused on purchasing carbon offsets versus authentically reducing emissions."

With these definitions in mind, what areas do we need to focus on in order to become a net-zero carbon economy?

- Design: Passive design principles for buildings, and designing for operational performance
- Collaboration: Cross-sector sharing of ideas and technology, for example hybrid equipment
- Cost-effective technological advances, for example SMART metering, efficient energy systems
- Suitable infrastructure in urban and rural areas: Renewable energy and alternative sources of power and heat, technology, good sustainable transport and public transport systems
- Education: Educating people on how to use buildings and cities in the most efficient way
- Impactful and diverse carbon offset schemes.

Read the full version of this article at bit.ly/33FGRKv



Visit www.iema-transform.net
for more member profiles

Connect

Why did you become an environment/sustainability professional?

I've always been interested in the way the natural world works to sustain life. Studying the interaction between humans and nature, and how nature evolves, is fascinating.

What was your first job in this field?

I worked for the Suffolk Trust for Nature Conservation, leading a small team conducting an ecological survey of the eastern part of **Suffolk** – learning by doing in the great outdoors.

How did you get your first role?

I applied for an ecological survey role and was lucky enough to be offered the team leader role.

What does your current role involve?

My team and I focus on how to develop and use environmental technology to advance the energy transition. We help inform BP's long-term strategy by building an understanding of complex, interrelated environmental and societal systems, climate science and resilience. I am privileged to work with some of the greatest experts in the field.

How has your role changed/progressed over the past few years?

We have all seen the pace with which the climate agenda has progressed in recent years. That's why the role of sustainability professionals has never been more critical and exciting.

What's the best part of your work?

Science around the natural world and the environment is continuously advancing and there are always new things to explore – and I get to do this with very diverse and fantastic people.

What's the hardest part of your job?

Prioritising - there aren't enough hours in the day to do all the things I'd like to!



CAREER PROFILE

Dr Liz Rogers

FIEMA

Employment: VP environmental technology, BP



What was the last development event you attended?

I've recently attended the annual meeting of the BP-funded Carbon Mitigation Initiative with Princeton University and learned about hydrogen sinks.

What did you bring back to your job?

Potential engineering and operational implications for the hydrogen energy system.

What are the most important skills for your job?

Technical grounding and empathy. If you want to work in a profession where you're applying your environmental sustainability knowledge in a beneficial way, having empathy and really good listening skills is key to generate solutions.

Where do you see the profession going?

I see the role of the environmental professional growing and becoming



even more important. We must help decision-makers understand science and invest in the right sustainable solutions.

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

BP has just launched our new business strategy, moving us from an international oil company to an integrated energy company. Sustainability needs to be at the heart of the energy transition and I see myself continuing to contribute.

What advice would you give to someone entering the profession?

Don't just focus on technical skills – build softer but equally important skills such as empathy, listening and communication, and use these skills to **build solutions**.

How do you use the IEMA Skills Map?

I use the Skills Map at the different levels to refresh and guide my continued professional development.

If you had to describe yourself in three words, what would they be?

Passionate and results-focused.

What motivates you?

The opportunity to bring environmental science to shape sustainability and help others develop their careers.

What would be your personal motto?

Live life. Learn lessons. Liberate yourself.

Greatest risk you have ever taken?

In 1994, when I was still quite junior in BP, I was offered the environmental manager role for BP's emerging business in **Azerbaijan**. This was a big risk, moving to a country that not many had even heard of back then! It turned out to be a fantastic country and a hugely enjoyable experience.

If you could go back in history, who would you like to meet?

William Wilberforce, who persevered against all the odds in abolishing the slave trade in 1807.



IMAGES: ISTOCK/SHUTTERSTOCK

IEMA Sustainability Impact Awards 2020

Inspiration | Innovation | Transformation

The IEMA Sustainability Impact Awards are committed to showcasing change drivers and championing the inspiring work our IEMA members have done and continue to do to transform the world to sustainability.

Congratulations to our 2020 winners



CONSULTANCY AND COLLABORATION

Arup and Health Care Without Harm



CLIMATE RESILIENCE AND ADAPTATION

Adaptation Scotland's Adaptation
Capability Framework - Sniffer



NEW PRODUCT, SERVICE OR TECHNOLOGY

HydroloGIS: Optimising Nature-based
Solutions - Viridian Logic



CIRCULAR ECONOMY

Techbuyer



SUSTAINABLE PROCUREMENT

Embedding Sustainability in
Procurement - Bank of England



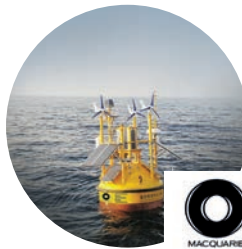
COMMUNITY OR SOCIAL VALUE

Reconomy Social Value Programme
(RSVP) - Reconomy



ENERGY AND CARBON TRANSITION

Crystal Doors



SUSTAINABLE FINANCE

Green Impact Advisory - Green
Investment Group



CONSTRUCTION PROJECT

One and Five Bank Street - Canary
Wharf Group

Announcing the 2021 IEMA Sustainability Impact Awards soon!



TRANSPORT AND INFRASTRUCTURE PROJECT

Network Rail Decarbonisation Programme WS1 - Mott MacDonald



SUSTAINABILITY STRATEGY TO ACHIEVE NET ZERO

Flightpath net zero - IAG
(International Airlines Group)



BIODIVERSITY AND ENVIRONMENTAL NET GAIN

Our Approach to Biodiversity Net Gain
- SSEN Transmission



SUSTAINABILITY CAMPAIGN (PUBLIC SECTOR)

Bird Aware Solent - Bird Aware



IEMA BEST VOLUNTEER

Harry Sealy, Environmental Sustainability Manager, Jacobs



BEST TEAM (SMALL ORGANISATION)

Advance London - London Waste and Recycling Board



SUSTAINABILITY CAMPAIGN (PRIVATE SECTOR)

Breaking the Plastic Habit
- Canary Wharf Group



FUTURE SUSTAINABILITY LEADER

Kerrie Craig, Environmental Consultant, Royal HaskoningDHV



BEST TEAM (LARGE ORGANISATION)

Environmental and Planning Services
- Wessex Water



SUSTAINABILITY CAMPAIGN (NOT-FOR-PROFIT / CHARITY)

Growing Space - Arcadia Charitable Trust



SUSTAINABILITY LEADER

Rowan Byrne, Technical Principal Marine Ecology & Marine Plastics Leader, Mott MacDonald



SUSTAINABLE ORGANISATION

Ignition DG

If undelivered please return to:

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City Office Park
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Lincoln
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to sustainability

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