TRANSFORM

Environment
Economy
Society

FOR ENVIRONMENT AND SUSTAINABILITY PROFESSIONALS

Jun/Jul 2022
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Worldly wisdom

PLUS

Moving performance Karla Jakeman on building a smarter transport system
Power steering How two Swedish projects are modelling energy flexibility
A global push Will the UN's new plastic treaty have a real impact?

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bit.ly/In3Dimensions

FEATURES

SARAH MUKHERJEE MBE, CEO, IEMA

Gains around the globe

Hello, and welcome to another edition of *Transform* magazine.

As we enter the summer here in the northern hemisphere, many countries are experiencing the first warm months without COVID-19 restrictions for two years. While the threat of infection is still very much with us, the increasing warmth will hopefully benefit the millions who are struggling with the cost of living crisis. The race is on in many countries to decarbonise and find renewable solutions to our energy needs and, in this issue, Oliver Ingwall-King has been finding out about two game-changing projects in Sweden.

Another way to reduce industrial energy use, as well as save on raw materials and (of course) cash, is to adopt the principles of the circular economy. Jelmer Hoogzaad, Daniel McGahey and Chris Smithies tell us about metabolic analysis and how it is helping Laos move towards a more circular method of working.

Many commentators take the view that economic development cannot take place without some harm to the environment – but is there a model for trade that supports both growth and the planet? Hannah Getachew makes the case for work taking place in Africa that could deliver both benefits.

During the past few years, there has been intense media interest in the use and disposal of plastics. The material is seen by many environmental campaigners as carbon intensive, clogging up ecosystems for hundreds of years. Others argue that plastics can help produce low-cost, lightweight solutions for industry and reduce food waste by helping to keep produce fresh for longer. David Burrows considers the arguments in light of the UN Environment Assembly's draft resolution on ending plastic pollution.

Our digital journalist Tom Pashby speaks with IEMA members about the recent reports from the Intergovernmental Panel on Climate Change, and also discusses the exciting new development of the new Natural History GCSE, which will be a crucial step forward for future generations.

I very much hope you enjoy this edition of *Transform*. As always, we welcome your comments and feedback, and ideas for articles that you may wish to see. Have a great couple of months!

"The race is on in many countries to decarbonise and find renewable solutions to our energy needs"

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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Published by
Redactive Publishing Ltd
9 Dallington Street, London, EC1V 0LN
www.redactive.co.uk

ISSN 14727625

MIX Paper from responsible sources FSC® C017177

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ROUNDUP

ENVIRONMENT & SUSTAINABILITY NEWS AND VIEWS

BUSINESS

Sustainability high among CEO priorities

Almost half of CEOs rank sustainability as one of the highest priorities for their organisations over the next three years, up from a third in 2021, according to a survey of over 3,000. It found that 70% are directly involved in defining their firm's sustainability strategy, 80% believe their sustainability investments will boost business results in the next five years, and 45% think they will accelerate growth.

Sustainability is ranked among the major challenges of the next three years by 51%, up from 32% in 2021, ahead of cyber risk, regulation, technology infrastructure and supply chain disruption. Unclear return on investment was cited as a leading challenge to achieving sustainability objectives by 60%; a lack of insights from data by 44% and regulatory barriers by 43%.

"CEOs are leading during one of the most complex environments ever, including war, inflation, talent shortages and the COVID-19 pandemic health crisis," said John Granger, senior vice president at IBM Consulting, which did the survey. "Despite these challenges, they aren't taking their foot off the gas when it comes to sustainability, and more now rank it among their top priorities. Yet many don't fully appreciate the extent to which data and technology can bridge the gap from strategy to impact."

CEOs received the most pressure to improve sustainability from board members (72%), followed by investors (57%), ecosystem partners (49), regulators (49%) and government (46%). Investment in sustainability has more than doubled as a percentage of revenue in the past five years, and 64% of respondents are confident they'll achieve their sustainability goals.

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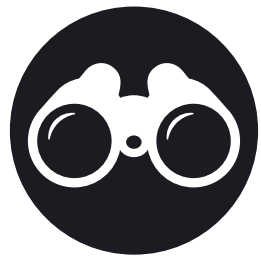
STANDARDS

BSI committee seeks volunteer members



Dr Ben Vivian FIEMA, chair of the British Standards Institution's environmental management standards committee SES/1/1, is asking IEMA members to volunteer for this group, which is seeking new members to take an active role in the future of environmental management standards. It particularly wants younger professionals from all backgrounds who work with environmental management systems to join this group of experts.

SES/1/1 is the UK committee responsible for the preparation of British Standards in the field of environmental management systems. It is also responsible for the UK's input to the international committee ISO/TC 207/SC 1 and its working groups.

If you are interested, please contact Ben at ben.vivian@coventry.ac.uk to discuss what is involved and begin the application

NET ZERO

'Critical mass' for science-based targets

The number of companies with emission reduction targets or commitments approved by the Science Based Targets initiative (SBTi) doubled to a record 2,253 last year, representing more than a third of global market capitalisation (US$38trn). The SBTi – which helps businesses set targets in line with climate science to achieve net-zero emissions by 2050 – said the world had reached the 20% "critical mass" of science-based targets adoption required among high-impact companies. Its progress report shows that an average of 110 new firms set or committed to targets every month in 2021, compared to 31 in 2020, and almost 500 have done so this year.

The SBTi is calling on businesses to adopt its Net-Zero Standard, which includes guidance, criteria and recommendations for setting science-based targets consistent with limiting a global temperature rise to 1.5°C.

GREEN JOBS

A blueprint for green workforce transformation

The April/May edition of *Transform* included an article that referred to some work IEMA and Deloitte had in train on the topic of green skills and jobs. That work has now reached its climax and a report, *Blueprint for a Green Workforce Transformation*, has been published, alongside a suite of tools to help organisations across the economy ensure their workforces are ready for a 'green economy'.

The report sets out the current state of play in terms of green skills and jobs in the UK, as well as the range of interventions that will be required to unlock the additional provision needed to meet the country's various climate, biodiversity and wider environmental commitments.

The tools that have been published alongside the report will help organisations to measure their maturity in terms of the green skills and knowledge they have across their core job families. Resources and training solutions for upskilling are also set out.

It is important to recognise that the report and tools are geared towards making all jobs greener, and that the focus isn't solely on creating more conventional sustainability jobs that will directly drive positive environmental outcomes. Jobs across the economy, from finance and procurement to communications and marketing, will all have a role to play in making environmental considerations mainstream.

This initiative comes at a crucial time, with public awareness of this agenda being relatively low. A recent YouGov survey found that 56% of British adults have never heard of the term 'green job', while 64% don't understand the term 'green skills'. In addition, 65% say they don't have access to green skills training through their employer.

The report and suite of tools can be found at **bit.ly/GreenBlueprint**

CIRCULAR ECONOMY

Extended resource ownership in the construction sector

Following the success of the circular economy Extended Resource Ownership (ERO) model for manufacturing, developed by IEMA's Circular Economy Network Steering Group in 2021, the group has initiated a new project to develop an ERO model for the construction sector.

The work is being led by the network's steering group chair Andy Whyle, with a highly skilled team of experienced members helping to develop the different elements of the ERO to show how they can be circular. From sustainable design to retrofit, material selection and deconstruction, the team has created a clear process flow to increase the life and value of materials and drive a circular economy construction sector.

On Monday 25 April, IEMA held a webinar to update members on the progress that has been made and to ask for any feedback and ideas. There were some great questions and offers of assistance, which are gratefully being taken up.

Moving into the final stages of model development, the focus is now on building in more case studies to show good practice, looking at the average carbon savings of each element of construction, where possible, and finalising a few of the critical steps to make sure they are clear.

The IEMA members leading the work are excited that it will soon be providing practitioners with a well-researched and developed process flow model for improving circularity in the construction sector.

The ERO model for construction is expected to be finalised later on in 2022 – watch this space for further details.

IEMA

Many thanks to a departing colleague

*By **Martin Baxter**, IEMA Policy and External Affairs Director*

At the end of March, our longstanding colleague Nick Blyth departed IEMA to take up the role of senior environment manager at the Agriculture and Horticulture Development Board.

Nick made important contributions on climate change and sustainability during his many years at IEMA, including: the development of the IEMA Greenhouse Gas Management Hierarchy; advocacy that led to greenhouse gas reporting becoming a mandatory requirement under the Companies Act; and work on sustainability, including publication of *Beyond the Perfect Storm: The Corporate Sustainability Challenge*. Nick was also actively involved in the development of international standards and was appointed as chair of the ISO Climate Coordination Committee – a position in which he continues.

All at IEMA wish Nick well in his new role. No doubt we'll continue to bump into each other through ISO work and links to the UN Framework Convention on Climate Change!

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CONSULTATION

IEMA responds to the Office for Environmental Protection consultation

The Office for Environmental Protection (OEP) ran a consultation earlier this year to gather stakeholders' views and insights on its strategy and enforcement policy. In its response, IEMA set out a range of recommendations for strengthening the OEP's remit and long-term impact.

Key among IEMA's recommendations was that there should be a contingency in place for the OEP to make the case for additional resourcing if it feels it cannot fulfil its role with the resources it has been granted. There are concerns that the OEP will struggle to have an impact with the budget and staff resources that have so far been made available to it.

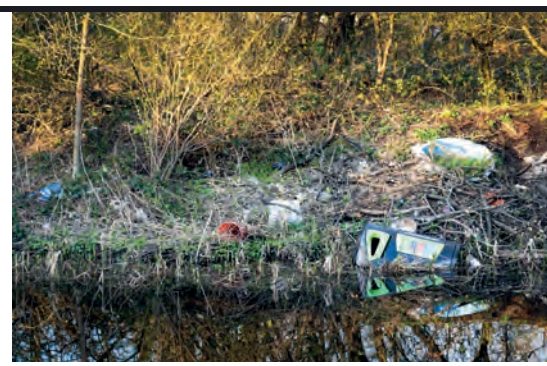
Another important recommendation focuses on how the OEP will work with others, and requests a clearer delineation of duties when it comes to organisations such as the Environment Agency, so that it is easier to understand how the government's environmental arm's-length bodies will work together.

IEMA's consultation response also set out the need for the OEP to not only successfully deliver its enforcement function, but also to focus its efforts on fostering a drive towards continuous environmental improvement among public authorities, going beyond a narrow focus on compliance and actually seeking to enhance the natural environment and public health.

The OEP is due to issue a summary of consultation responses and report on its next steps during June. IEMA's full consultation response is available at **bit.ly/DevelopingOEP**

PUBLICATION

Impact Assessment Outlook Journal Volume 13



*By **Rufus Howard***

Social impact assessment (SIA) is a key area of impact assessment practice. It has been described by the International Association of Impact Assessment as the process of identifying and managing the social issues of project development, and includes the effective engagement of affected communities in participatory processes of identification, assessment and management of social impacts.

IEMA is delighted to publish Volume 13 of the *Impact Assessment Outlook Journal* to inspire practitioners on SIA. It provides examples of practice and seeks to challenge practitioners to move their approaches forward, embracing opportunities for innovation.

SIA practice in the UK and Ireland has not kept pace with international practice, with variable or poor consideration of social impacts on communities and vulnerable groups. This volume explores examples to provide guidance on this area. Created with the IEMA SIA working group and guest edited by Eddie Smyth (Intersocial Limited (Ireland)), it is a welcome addition for anyone in SIA. Find it at **bit.ly/IEMA_OutlookJournal**

CONSULTATION

IEMA responds to Defra biodiversity net gain for planning consultation

Defra kickstarted 2022 with its January consultation on biodiversity net gain (BNG) regulations and implementation. Building on the Environment Act published last year, the consultation was rooted in the planning system and examined how BNG should be introduced to planning for developments. The proposals covered small and large-scale development, phased and temporary developments, and everything down to household applications. It also included Nationally Significant Infrastructure Projects (NSIPs). The suggestion for most (but not all) developments was that the BNG should last for 30 years and attain 10% net gain.

The consultation included a potential biodiversity plan for developers and planners to use, and tackled onsetting and offsetting options. It also built on the concept of biodiversity units as a tool for creating biodiversity credits to be sold through biodiversity banks, as introduced in the Environment Act.

To ensure a robust response to the consultation, IEMA hosted a webinar with Defra and Natural England, followed by two workshops with IEMA members. IEMA members supported the attempt to create BNG within the planning system, as long as relevant resources were created to effectively implement and maintain BNG. IEMA's recommendations included:

- Strong support for the use of the mitigation hierarchy and the exclusion of irreplaceable habitats as per the Planning Framework
- Resources are needed to carry out the proposals within the consultation, as well as upskilling and training
- Appropriate guidance for the use of the BNG plan document for developers and planners
- No *de minimus* for the size of habitat, and to make at least 10% net gain applicable for all developments except householder applications
- Inclusion of on-site compensation on the same register as offsets and credits to support monitoring and accountability
- That some NSIPs have net gain until their end of life.

The consultation involved 55 questions in total, and we now await a response from Defra, including on next steps.

IEMA's full response can be found at bit.ly/IEMA_DefraBNG

CONSULTATION

Nature Recovery Green Paper must focus on the real issues

In March, Defra launched the consultation on its Nature Recovery Green Paper, which set out proposals to deliver the 30/30 targets (30% of land and sea to be protected by 2030), protect species and deliver nature recovery. IEMA hosted two member workshops to discuss the key points and create a response. The broad conclusion was that the Green Paper is a missed opportunity. It focuses largely on reorganising the designation for terrestrial and marine protected areas, reorganising the arm's length bodies that oversee protected areas, rearranging the licensing for species, and reorganising who has decision-making power.

Our response noted that changing site and species protection frameworks is irrelevant unless management regimes are properly enforced and resourced. The government must understand what it aims to achieve. IEMA has suggested that more needs to be done to identify the best outcomes for nature recovery, and understand how existing structures do not meet their current roles in achieving this. We have offered help to facilitate this.

There was nothing in the Green Paper about how its proposals fit with other policies recently put forward. This meant there was not a sufficiently clear line of sight for IEMA members between this and other policy papers and their own organisations and processes.

The consultation included a request for information about improving environmental impact assessment (EIA) scope and regimes. IEMA was happy to share its response to Defra's survey on the post-implementation review of EIA regulations, our publications *Levelling up EIA to build back better* and *Delivering Proportionate EIA*, and our proposals for EIA improvement, including clear requirements and standards, better monitoring and management, evidence-based practice, formalised competency, and receptor-led assessment.

It is essential that nature protection is not lessened from its current state, that resources that will help business undertake nature protection measures remain in place and are improved, and that upskilling is undertaken.

The consultation closed on 11 May. Read IEMA's response at **bit.ly/IEMA_NatRecov**

Tom Pashby gauges IEMA members' reactions to recent IPCC reports

Time to be **bold**

It's only the second quarter of 2022 but we've already had two reports from the Intergovernmental Panel on Climate Change (IPCC) – *Impacts, Adaptation and Vulnerability* and *Mitigation of Climate Change* – both raising the urgency around taking action to tackle the climate emergency.

UN secretary-general António Guterres, declaring "a code red for humanity" in a statement, went on: "The alarm bells are deafening, and the evidence is irrefutable: greenhouse gas emissions from fossil-fuel burning and deforestation are choking our planet and putting billions of people at immediate risk. Global heating is affecting every region on Earth, with many of the changes becoming irreversible."

I spoke to IEMA members from across the community to get their reactions to the reports, and hear their thoughts on what they mean for the environment and sustainability profession.

"Recent IPCC reports outline what to do to tackle climate change, how to address rising greenhouse gas emissions and how to futureproof our planet, yet fossil fuel production continues," said Lianne Smith MIEMA, group integrated management systems and sustainability manager at The Senator Group. "We know what to do and how to do it, yet there is little or no action from so many. Now, more than ever, we can see a real demise in the quality of our world. It is time to use these IPCC reports, be bold, improve policy and legislation, and make climate mitigation mandatory. Time is running out."

Richard Lupo MIEMA, managing director at IEMA SME corporate partner SHIFT, said: "It was good that the IPCC's Sixth Assessment report made national headlines. It will eventually impact the way we do things as a profession. For me, one encouraging take-away from the IPCC work is that we will need to shift our economic model to promote a broader emphasis on human wellbeing."

Melissa Wellings PIEMA, ESG director at Harwich Haven Port Authority, had this take: "The report underlines the immense challenges we face to avert a climate disaster. As environmental and sustainability professionals, we have a duty to distil and utilise key findings of the report to fully integrate within business risk management processes while seeking opportunities to influence policymakers within our respective sectors. The opportunities available to us to reduce our emissions to zero are clear – we must now take the necessary action to implement without delay."

"No surprises that the latest IPCC report sounded dire warnings about the level of global greenhouse gas emissions, and yet the report still managed to simultaneously present hope to the world for climate stability," said Dan Hamza-Goodacre FIEMA, former adviser to the COP26 High-Level Champions Team. "What everyone needs to take away from this, the Sixth Assessment, is the need for speed. Emissions must peak by 2025 and nearly halve by 2030. Governments, businesses and organisations the world over should be asking themselves 'how fast can we run?'."

With the World Meteorological Organization saying that we may exceed 1.5°C of global heating within the next five years, it is likely that alarm bells from the IPCC will continue to ring ever louder, leaving our profession to address the issues our planet faces with increasing urgency.

"What everyone needs to take away from this is the need for speed"

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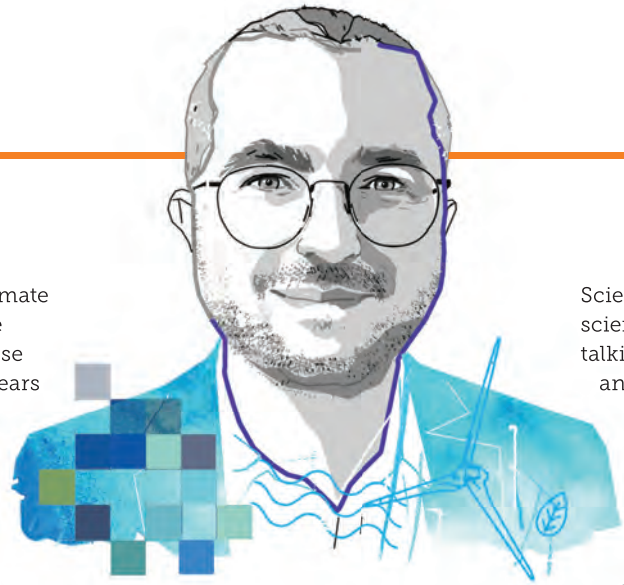


TOM PASHBY: IEMA DIGITAL JOURNALIST

Tom Pashby talks about why the new Natural History GCSE is such an important step forward for climate and biodiversity preservation

It's increasingly rare that climate writers get to cover positive news, and this is one of those few occasions. Thanks to years of campaigning from environmental activists, a Natural History GCSE will be available to students from 2025 onwards.

The government announced its commitment to the GCSE in its Sustainability and Climate Change Strategy, which also included the roll-out of carbon literacy in every locally maintained nursery, school, college and university; greater support for teaching climate change; accelerating the roll-out of 'ultra-low' carbon education buildings; the development of a National Education Nature Park; and the introduction of a new Climate Leaders award.

In explaining the rationale for the new qualification, the founder of the campaign, Mary Colwell, said it would "reconnect our young people with the natural world around them. Not just because it's fascinating, not just because it's got benefits for mental health, but because we'll need these young people to create a world we can all live in, a vibrant and healthy planet." The climate and biodiversity crisis really does demand that everyone has the skills needed to create a sustainable society – especially the young people who are inheriting a badly damaged natural environment.

Keeping up with the science

The qualification will cover a broad range of environmental issues, including climate change. Environment and sustainability professionals will be well aware that the scientific basis for our understanding of the natural world, in particular the climate, has evolved dramatically in recent years and decades. My mother and I happened to do the same undergraduate course at the same university – environmental science at the University of Plymouth – and she tells me that there was hardly any climate science in the degree when she did it, although there was content on weather. This makes a lot of sense, because most of our modern understanding of human-induced global heating has emerged since the 1970s.

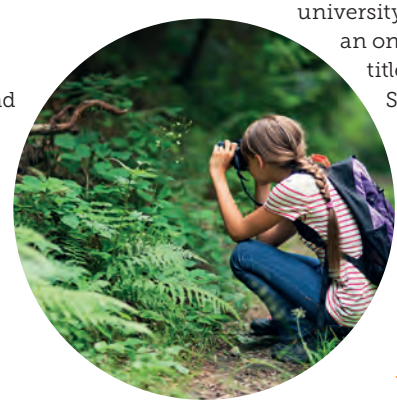
When I completed the same course in 2014, I did at least one whole module on climate science, plus other areas that overlapped with it. Immediately after my university course, I did an online course titled 'Making Sense of Climate Science Denial 101x'. Denial of climate science had only become a mainstream talking point in the preceding few years, and certainly wasn't covered by the mainstream media when my mother was at university.

This example highlights the rate of change in the scientific community's appreciation for humanity's impact on the planet, and shows that schooling needs to keep pace in order to properly equip young people to tackle the climate and biodiversity emergencies.

A crucial step

IEMA recently released a report on green jobs and skills in partnership with management consultancy Deloitte, alongside the results of an opinion poll we commissioned from YouGov. The report and poll demonstrated that far too many people lack access to the institutions and resources that are necessary to build their capacity as workers. We know that the government has committed to deliver net zero by 2050, but without the skilled workers available to build a climate-resilient and zero-carbon economy, this promise will be impossible to achieve.

Humanity has spent thousands of years recording its observations on the natural world, and there have been several revolutions in our ability to understand our relationship with it. This Natural History GCSE represents a crucial step in enabling us to prepare for the level of warming we're already locked into, and to limit any further warming and species destruction as much as possible.



"This GCSE represents a crucial step in enabling us to prepare for the level of warming we're locked into"

ILLUSTRATION: PADDY MILLS/SYNERGY ART

A home run

Chris Carus tells Joe Nisbet why a community-based retrofit approach could be key to decarbonising our homes

The increasing cost of heating and powering our homes is currently front of mind for many. UK households are feeling the effects of a global energy crisis, caused by a worldwide squeeze on energy supplies that quadrupled gas wholesale prices last year. In response, Ofgem increased the energy price cap by £693 on 1 April, meaning energy firms have been able to increase bills by 54%. Europe's dependence on Russian fossil fuels – to the sum of about US$1bn per day – means the war in Ukraine is likely to make the issue of increasing gas wholesale prices a pervasive one.

These crises may be muting climate scientists' warnings that we are heading for catastrophe unless we make deep and immediate emissions reductions across all sectors. The Intergovernmental Panel on Climate Change's Sixth Assessment Report states that it's now or never for avoiding profound consequences, and that global emissions must peak by 2025.

The need to transition away from fossil fuels is as pressing as it's ever been, but it is not without its challenges. Renewable alternatives such as solar panels and heat pumps have high upfront costs, limiting them to those who can afford them. They are also not suited to all building types.

Community-based retrofit

Chris Carus of Loco Home Retrofit, a Glasgow-based homeowner and trades co-operative, believes we should take a "fabric-first" approach to retrofitting homes, looking at housing stock holistically to reduce energy demand. "If we cut the heat demand then we won't require as much renewables generation, and we also won't require as much energy storage to cover the periods where we're not generating from renewables," he says. This means we must prioritise insulation and configure homes to maximise efficiency and heat retention.

However, energy upgrades of this type are difficult: complex, risky, costly and disruptive. Furthermore, homeowners struggle to find tradespeople they feel they can rely on. Loco Home Retrofit acts as a place-based intermediary, helping to build both the market and the local supply chain for quality retrofit. As a co-operative, it brings householders, local tradespeople and buildings professionals together to take collective action.

The company aims to be a one-stop shop for those wanting to upgrade their homes. Its approach manages the retrofit needs and desires of households to give them the confidence to start, and stimulates local supply chains and suppliers by providing opportunities for new skills in this emerging market.

Chris emphasises that this model is based heavily on trust: "Without good quality assurance schemes, how does a homeowner find people they feel comfortable enough to trust to make big changes to their house?". Again, a community-based approach is key – identifying and leveraging interpersonal networks, sharing lessons, and having face-to-face interactions with the people who are carrying out the work.

A nationwide approach

However, large-scale community retrofit will require more. "Nationwide expertise and efficiency standards need to be married up with community anchor organisations that have the trust of homeowners," says Chris.

In the first instance, this means setting a standard for how much efficiency is enough. Sufficient improvements are needed to realise the full benefits of retrofit while also optimising the cost of insulation against the cost of new renewable energy sources. A standard efficiency target would provide a foundation on which we can formulate retrofit aspirations. Experts such as the Association for Environment Conscious Building believe this could mean cutting energy demand by as much as 70% for older properties, and the Committee on Climate Change recommends bringing every home to at least Energy Performance Certificate level C by the mid-2030s. The next step would be to compile typical building archetypes and base approaches to improving their efficiency on an agreed standard.

A community-based approach is just part of the solution. The residential sector accounts for 20.8% of all UK carbon dioxide emissions, and we need to retrofit roughly 1,870 houses a day to reach net zero by 2050. Capacity and skill-building at a local level will be crucial if we are to achieve this, and could also help to build the necessary public support for ambitious government intervention.

JOE NISBET, GradIEMA is an environmental consultant at Arup and a member of IEMA Futures.

IMAGES: ISTOCK

IN COURT

Drinks giant fined for emissions breaches

Multinational drinks giant Diageo has been fined more than £1.2m by the Scottish government for breaches relating to the EU Emissions Trading Scheme (EU ETS), despite having an appeal partially upheld.

The company operates six installations in Scotland that were required to participate in the EU ETS under its third phase, which began in 2013. An investigation by the Scottish Environment Protection Agency (SEPA) found the firm had failed to apply for ETS permits at three sites on its Glen Ord complex in Muir of Ord, Inverness between 2013 and 2018.

The company corrected the error in 2019 after an external audit highlighted an issue relating to emissions released by burners used in malting. However, Diageo was ordered to pay civil penalties of just under £1.4m. Although reduced to £1.2m on appeal, a reporter appointed by Scottish ministers ruled on 8 March that it must be paid.

Under the ETS, companies must report their climate pollution every year. The scheme, designed around the polluter pays principle, aims to cut overall emissions by enabling companies to buy and sell pollution permits.

Diageo blamed "human error" for the reporting failure. It argued that the mathematical formula for determining the penalties is "unfair and disproportionate" and that the fines should have been £60,000. However, government reporter Paul Cackette found that SEPA had taken a "broadly correct" approach to judging the mitigating and aggravating factors of the offence, although he criticised the weight it placed on some of them.

Jamie McGeachy, carbon reduction, energy and industry manager at SEPA, said: "SEPA is clear that compliance is non-negotiable. The ETS is a crucial step towards achieving Scotland's goal of a 75% reduction in CO_2 emissions by 2030 and net zero emissions by 2045, and participation and full compliance is not optional."

"These civil penalties demonstrate SEPA's commitment to enforcement of obligations under the ETS. Our message is clear: if you do not follow the regulations designed to protect and improve our environment, there are consequences. These penalties should serve as a warning to not only the company involved, but all others in Scotland, that we will take the appropriate action to ensure compliance."

IMAGES: ALAMY

CASE LAW

Costs limit application for individual in 'Save the Northern Meadows' group granted

In *R. (on the application of Lewis) v Welsh Ministers*, following a costs order against the claimant, the claimant applied for a costs limit in accordance with the Aarhus Convention 2001 and the Civil Procedure Rules (CPR) 1998/3132.

The defendant Welsh Ministers had approved the interested party's outline case to build a new cancer centre on a site in Cardiff. The claimant was a member of 'Save the Northern Meadows', a group of citizens who wanted to protect the site from development.

The claimant had issued proceedings in her own name and sought to challenge the decision on three grounds, including a breach of the defendant's duty to seek to maintain and enhance biodiversity and related matters under the Environment (Wales) Act 2016. She was refused permission to seek judicial review and the court ordered that she should pay the defendant's and interested party's costs. She argued that she was entitled to a costs limit as the claim was an Aarhus Convention Claim within the meaning of the CPR 1998/3132.

CPR 1998/3132 sets out limits on the costs a claimant might be ordered to pay in an Aarhus Convention Claim, providing a limit of £5,000 where the claimant claims as an individual, not as or on behalf of a business or other legal persons. 'Save the Northern Meadows' was not a group with a defined membership structure, so the cost limit applied.

Under the CPR, a claimant who confirms that their claim is an Aarhus Convention Claim is required to file and serve a schedule setting out

their significant assets, liabilities, income and expenditure, together with the aggregate amount of the financial support that has been and is likely to be provided by others. The claimant provided details of the amounts received on a crowdfunding site and indicated that her target was to raise a total of £35,000, the amount she could reasonably expect to receive from the public. The information she provided therefore met the CPR requirements.

The defendant argued that, of the three proposed grounds for judicial review, only one was potentially within the scope of the Convention. This was the one clearly alleging a breach of the Environment (Wales) Act 2016, which was provisions of national law relating to the environment and therefore in scope.

Nevertheless, the court was satisfied that the third ground had been included in the claim in good faith and not for any illegitimate purpose, so the cost limit applied and the application was granted.

NEW REGULATIONS

THE LATEST
LEGISLATION **GUIDANCE** **CONSULTATION**

LEGISLATION

Deposit and return scheme

The Deposit and Return Scheme for Scotland Amendment Regulations 2022 amend the main Regulations, changing the scheme's implementation date to 16 August 2023. An independent review had found that, due to the COVID-19 pandemic, the previous date of July 2022 was no longer practical.

There are also some changes to the operation of the scheme itself, which now states that a retailer selling through a distance sale can refuse to accept the return, in a single transaction, of a disproportionately large number of containers by a consumer.

cedr.ec/8aw

LEGISLATION

Greenhouse gas emissions

The Greenhouse Gas Emissions Trading Scheme (Amendment) Order 2022 makes various technical and operational amendments to the UK Emissions Trading Scheme (ETS). They intend to ensure consistent and effective enforcement of scheme rules by strengthening and clarifying provisions relating to scheme penalties and notices to enforce scheme rules, and powers of entry and inspection for the scheme regulators.

The UK ETS was established as a policy replacement for the UK's participation in the EU ETS by the four administrations in 2021.

cedr.ec/8ax

LEGISLATION

Hazardous substances

The European Commission has published 12 amendments to the EU RoHS Directive 2011/65/EU. These aim to end a wide range of exemptions for the use of mercury in lamps, as alternatives are widely available. Exemptions are still granted where alternatives are technically impracticable. The new rules aim to increase the protection of health and the environment, boost innovation and promote cleaner products.

cedr.ec/8av

GUIDANCE

Energy strategy

The Department for Business, Energy and Industrial Strategy and the UK government have published a strategy that aims to help the UK accelerate homegrown power for greater energy independence. It aims to support other policy papers, including *Net Zero Strategy: Build Back Greener*, which aims to help wean the UK off fossil fuels and alleviate pressure from global factors that can influence energy supply and price in the UK.

cedr.ec/8as

GUIDANCE

Digital waste tracking

The government plans to introduce mandatory digital waste tracking across the UK as part of its commitment under the Resources and Waste Strategy. This policy paper outlines the visions and mission, as well as the key strategies the service will contribute to. It also looks at the benefits of the change, how the service is being developed and the expected delivery timelines.

cedr.ec/8au

CONSULTATION

Storm overflow

The government is consulting on the Storm Overflow Discharge Reduction Plan, which outlines a change in how water companies tackle the number of discharges of untreated sewage. Tackling storm overflows in England is a government priority, and the issue has received significant public attention. The government intends to produce a plan by September 2022, which will set clear and enforceable targets for the water industry. This consultation seeks views on the targets and other core elements of the plan in advance of its publication.

cedr.ec/8ar

CONSULTATION

Environmental targets

Defra has launched a consultation on new targets to improve the environment under the Environment Act 2021. Proposals are set out for biodiversity, water quality and availability, resource efficiency and waste reduction, and air quality. It also requires targets for fine particulate matter and species abundance.

cedr.ec/8at

Agent of change

Karla Jakeman tells Huw Morris how her interest in the past informs her determination to shape a sustainable future for transport and mobility

Karla Jakeman's fascination with the past has led to the uncovering of some notable relatives. A keen amateur genealogist, she has discovered, amid the miners, agricultural labourers and watchmakers, that she is related to the Queen – albeit as 27th cousin, five times removed – and the family of George Dance, architect for London's Mansion House. Learning more about the past makes her think about the future – what will her descendants think about her?

Jakeman is the innovation lead for connected transport and mobility at Innovate UK, the government's arms-length innovation agency. Its aim is to encourage growth through productivity, or, as Jakeman says, "how we can drive forward technology and innovation to meet the UK's social and environmental challenges". Her organisation creates £8 in return for every £1 it invests through a combination of connecting and funding.

Innovate UK holds funding competitions directly and also manages those held by other organisations, such as National Highways and the Department for Transport. On the connecting side, "the best projects are collaborative, and we help pull consortia together, linking small businesses with large companies, academia, the Catapults [a network of technology and innovation centres] and charities to get that rounded project," she says.

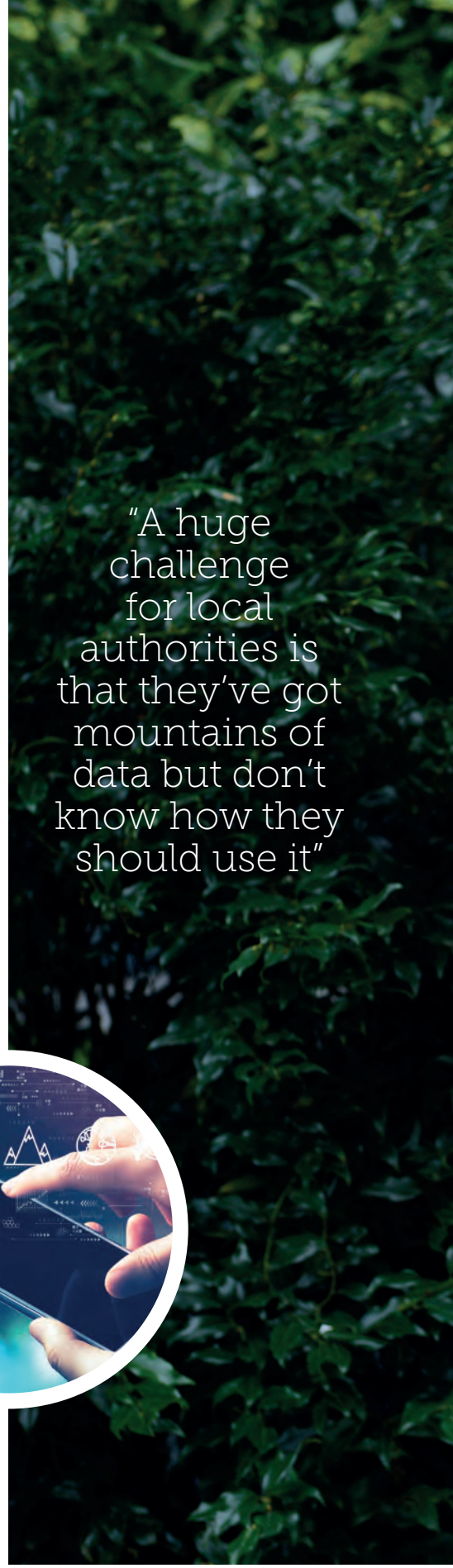
On the move

A significant part of Jakeman's job involves searching for technologies that can leverage smarter, more sustainable mobility for people and goods; she describes her role as "modal-agnostic". She is not interested in cars, HGVs, bikes or planes themselves, but "the systems between them and their connectivity". It's a panoramic brief, and one that is both frustrating and rewarding.

"I look after everything from active travel to rural transport, highways, freight, the geospatial aspects of transport and the data digital aspects," she says. "There's a lot of crossover with transport hubs, smart ticketing accessibility and fair transport.

"There is so much we want to do but there's a limit to what we can do, and how many people we have to do it – so we have to prioritise, which can be frustrating. But we get to see some amazing technology and innovation."

One such innovation came out of a conversation between officials who were



"A huge challenge for local authorities is that they've got mountains of data but don't know how they should use it"

PHOTOGRAPHY: JESSICA MARSH/IMAGES: SHUTTERSTOCK

KARLA JAKEMAN: BACKGROUND

Karla Jakeman was at a Sheffield University open day, learning about its degree in business and French, when an administrator called out for candidates applying for Japanese studies to come forward. "I gatecrashed and tagged along," she says. "I was so fascinated by the Japanese library that I went home and changed my application."

Her degree left her with a deep appreciation of Japan's history, politics and business landscape, as well as its formidable language. After university, she spent 15 years working as a design engineer for Honda's UK and European subsidiaries. Part of her job involved sending 'trouble reports' in Japanese back to HQ for the company's boffins to ponder.

"Many people think making a car is: you do a sketch, get the parts together and it comes off the end of a sausage machine line. But designing a car takes years and years and it's meticulous, particularly in responding to customer feedback and trying to understand what customers didn't like about the cars so we could improve them.

"I became an expert in squeaks and rattles, which drives my husband mad. If there is a squeak in the car, I've got to work out what it is, and I've never got out of that habit."

She also tries to keep up her Japanese. "I can have a conversation and read and write. I have an app on my phone to read news articles, to keep my hand in, but I'm nowhere near that level anymore because I'm not using it. But if I go to an event and see Japanese people on the attendance list, I make a beeline for them to have a chat."

pulling together data for the government's five o'clock pandemic. It led to a funding competition run for the Geospatial Commission, looking for projects using transport location data to promote active travel, enable mobility, manage supply chains and increase capacity. "The projects that got through to the final phase created up to 20 jobs – which doesn't sound a lot, but those would have been lost if we hadn't run the competition."

The Liverpool-Humber Optimisation of Freight Transport project is another example. It brings together major cargo owner Unilever with the Mersey and Humber port operators, which sit at either end of the M62 corridor. Part of the project involves working with rail industry experts on a Hull University Logistics Institute study; the study aims to develop an end-to-end journey model to divert freight from long-distance North-South routes to the Humber and Mersey ports, massively reducing the number of freight miles on UK roads. The project looks at how cargo owners can pool freight, including on ferry services to mainland Europe and container services on the M62 corridor.

A third example is the Grid project, which uses technology and smart solutions to connect communities with transport, parking, goods and services through kerb space. It allows freight and commercial operators to book loading and unloading slots, rather than circling around and creating congestion. Even local market traders benefit, using Grid technology to transport boxes of fruit and vegetables to customers who order their produce via an app.

Goosebump moments

Jakeman describes the moments when projects start to succeed as "goosebump moments". They also contribute to her sense of optimism – an attitude reinforced by the lessons she learned about behavioural change during the pandemic. "Things have changed massively," she says. "If you'd gone back before the pandemic and said, 'we've got to get everybody on their bikes', you'd have thought, 'people don't like change that much'.

"But look how quickly people changed when they needed to. People will start getting used to new forms of transport, cycle lanes, using their cars less and planning more. Look how much things have changed since people could use mobile phones for planning their travel."

Jakeman is a leading advocate of 'combo travel'. This is a concept she developed with Glenn Lyons, future mobility professor at the University of the West of England, and Scott Cain, chief executive of Active Things. "It's a combination of active and passive transport – or, instead, of being just active or passive, why can't you be both? It struck me when everyone got on their bikes during COVID-19. We thought, we need to sustain this – what about the people who can't commute all the way to work on their bikes but might be able to go a little bit of the way and put the bike on a bus for the rest of the journey?

"For people in a rural community, it might be too far to cycle into a town or city, but can they cycle a bit of the way and then get the bus?"

"It's about enabling active travel for everybody, regardless of their physical shape, age, mental health, economic situation or geographical situation. For people in a rural community, it might be too far to cycle into a town or city, but can they cycle a bit of the way and then get the bus?"

Changing patterns

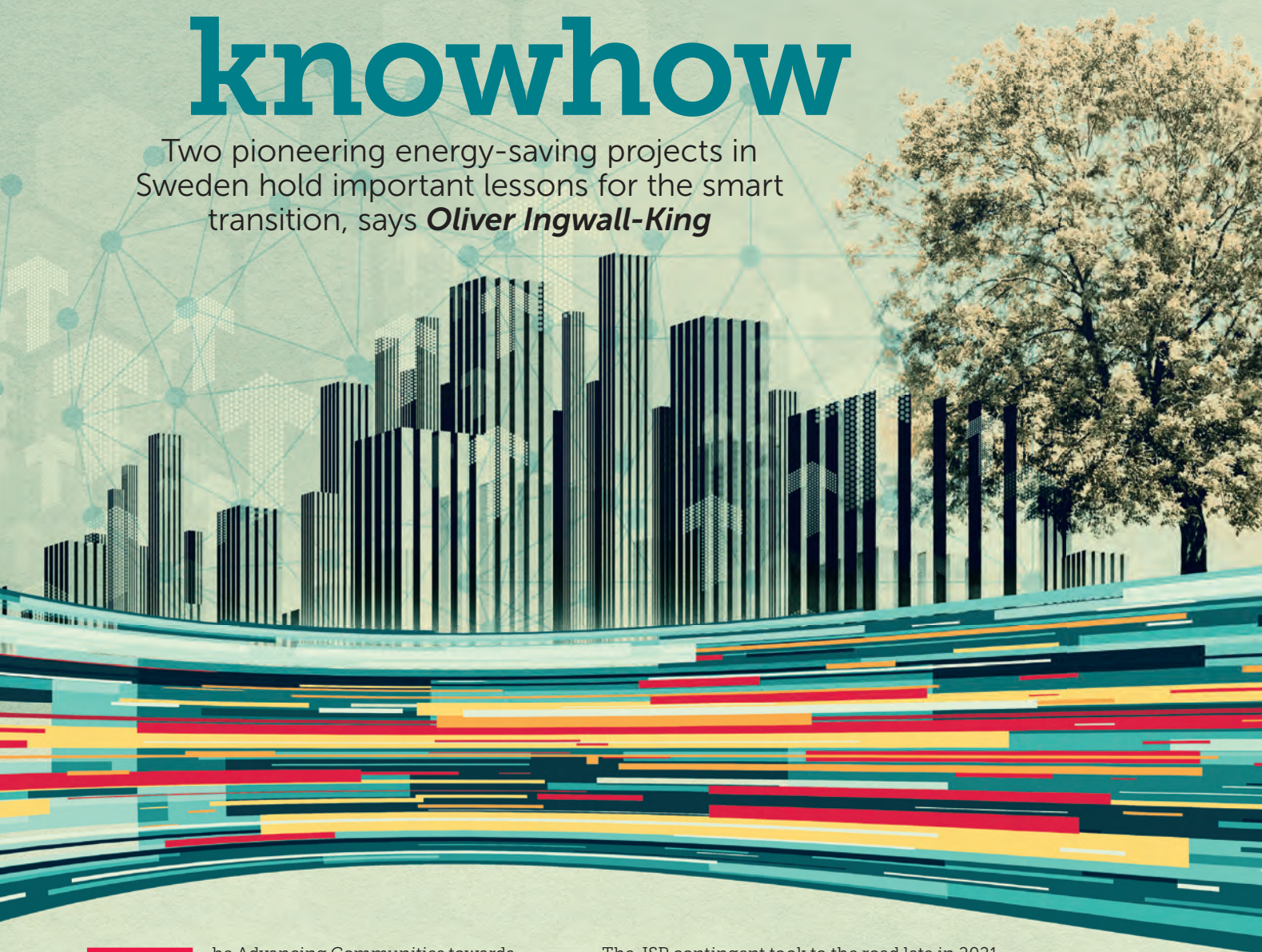
Certain challenges remain daunting, not least the silo mentality that prevents different professionals and experts from talking to one another. Jakeman cites the example of transport planners who need to talk to data specialists so they can use information for simulations, "to understand which routes need the most support, at what time of day and who needs that support" – all crucial for the movement of people and goods.

"A huge challenge for local authorities is that they've got mountains of data but don't know how they should use it," she continues. "They need to understand the value of what they've got. We are still at the mercy of a legacy transport system left by the Victorians, and it's not easy to convert some of those systems into something that is environmentally friendly and sustainable."

What does Jakeman think her descendants will make of her? "I hope they will see me as someone who contributed to the paradigm shift in transport from a polluting and dirty industry, and how I contributed to changing thought patterns as well as behaviour patterns in terms of how we travel and think about transport."

Nordic knowhow

Two pioneering energy-saving projects in Sweden hold important lessons for the smart transition, says ***Oliver Ingwall-King***



IMAGES: GETTY

The Advancing Communities towards low-Carbon Energy Smart Systems (ACCESS) project was launched in 2019. It aims to deliver energy and emissions savings from its pilot projects, and to generate lessons and tools that will cut development times for energy transition projects.

Knowledge partners from Aarhus University in Denmark, the Institute for Manufacturing in the UK, Johanneberg Science Park (JSP) in Sweden and VITO in Belgium are supporting four pilot projects with the aim of establishing strategic lessons that support upscaling and replication within the pilots and their networks.

The JSP contingent took to the road late in 2021, visiting the city of Örebro and the Stockholm district of Hammarby Sjöstad, both in Sweden. These two areas are taking bold strides in the energy transition, and the ACCESS team wanted to learn about the successes and challenges Örebro and Hammarby Sjöstad experienced while optimising and reducing energy consumption, integrating renewable energy generation and providing energy system flexibility.

Learning from doing

The team's first stop was Örebro, where the housing company ÖrebroBostäder (ÖBO) has analysed its

portfolio of 23,000 homes to reduce emissions, minimise energy usage and develop energy-efficient solutions.

"In 2005, ÖBO's energy usage was 59.7GWh/year," says head of electricity and automation Jonas Tannerstad. "In 2007, Örebro municipality decided that energy usage should be reduced by 25% in terms of electricity and 15% in terms of heating over 10 years, without exceeding the regular budget or requiring extra resources – which meant we had to optimise operations."

Reality has surpassed the original goal – 13 years later, the company had lowered energy consumption by 50%, despite having added hundreds of new flats to its housing portfolio. Today, it aims for usage of 23GWh/year by 2029.

Tannerstad believes property owners can achieve a lot by looking for ways to reduce energy usage; ÖBO's efforts save it 82m krona (around £6.6m) per year. "Analysing and taking measures to optimise energy consumption is great for business – and for the planet," he says.

"When we started analysing our portfolio, we assumed 10 technical systems would be responsible for 90% of our energy usage, which turned out to be a good guess. We spent a lot of time analysing those systems, the major culprits being communal laundry rooms (22%), ventilation systems (20%), lighting (19%) and collective electricity metering, whereby electricity was part of people's rent (16%).

"We left no stone unturned to come up with smarter and more efficient solutions. After a while, we could predict the energy savings that measures would lead to. Adjusting and optimising when lights would be turned on or off, for example, allowed us to save 300,000kWh."

Tannerstad and his colleagues used this in-depth understanding to then take the next step: ÖBO has systematically invested in solar PV generation and sought funding mechanisms to explore how battery storage and electric vehicle charging could enable it to take a systems-level approach to aggregating energy systems and their management. The project has enabled better-automated monitoring and consumption across the portfolio, maximised use of solar PV, and provided aggregated national grid services to improve revenue streams.

"We have had to take difficult decisions," says Tannerstad. "Sometimes, laws or other forces oppose systemic change, which makes it difficult to shift to more climate-friendly ways. But we have to dare to rethink the system."

Scaling up and rolling out

ÖBO's lessons will be scaled up in Örebro's new Tamarinden neighbourhood, where five property developers will build 700 homes.

Construction is expected to start in the autumn of 2022, with the first residents moving in around 2024–2025. It will integrate smart energy systems that can generate, store and share energy – even between different building owners.

Örebro municipality has developed the 'Örebro model', which is based on the municipality owning the land and thus being able to set a high bar for construction. It has high ambitions for Tamarinden in terms of issues such as energy, and the new buildings will need to help achieve its climate and energy goals.

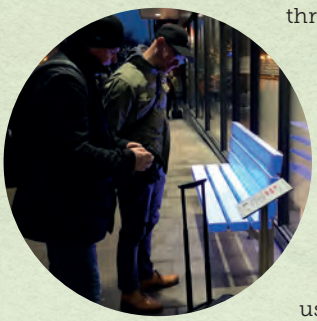
"Any growth that construction results in should be sustainable," says Jenny Källmén, who works at Örebro's City Planning Office. "Buildings lead to high emissions, both when they are constructed and when they are lived in. We're aiming for systemic change that establishes new norms. Our ambition is to evaluate and scale up the Örebro model and apply it to other projects. The way we work makes the climate transition feel manageable – like an exciting challenge, not something that will hamper growth. The property sector needs to rethink its ways and not let technological developments hinder it."

Developers working on Tamarinden are creating cutting-edge energy solutions by building in ways that use as little energy as possible. The buildings will need to generate, store and distribute energy, both inside the buildings and throughout the neighbourhood. The ultimate goal is to create a local energy network.

"A new ordinance came into force in Sweden on 1 January 2022, exempting certain actors from paying the network concessions stipulated in Sweden's Electricity Act (1997:857), thereby making it legal to share energy within and between properties," says

"The way we work makes the climate transition feel manageable – like an exciting challenge"

Källmén. "This makes it possible for us to conduct the Tamarinden project the way we wanted to."



Taking charge of sustainable development

Stop two took the team to the ElectriCITY Innovation/Hammarby Sjöstad 2.0 project. Hammarby Sjöstad district covers two square kilometres in Stockholm and is home to around 25,000 people; since plans for the area were drawn up in the 1990s, the idea has been to develop a sustainable district that prioritises climate solutions. The City of Stockholm has worked with a range of actors, from energy and water companies to architects and developers, to develop the 'Hammarby model', in which the area's rubbish, food waste, wastewater and water is recycled to reduce its energy usage and environmental footprint. Today, the district's climate ambitions live on through the citizens' initiative ElectriCITY Innovation and the Hammarby Sjöstad 2.0 project.

The initiative has been around since 2014 and unites 55 co-operative housing associations (representing 13,000 residents), plus around 70 partners from the business sector, academia and Stockholm municipality. Together, they run various sustainability and climate projects. District inhabitants are driving the climate transition through real-life testbeds in their buildings. Their efforts have brought about systemic change in terms of energy, deliveries, digitalisation and the sharing economy.

One of the reasons the initiative has been successful is because it has actively worked with the boards of co-operative housing associations to map residents' needs and implement new services and innovations. By designating representatives from each association, ElectriCITY established natural points of contact with them, allowing it to help them make the shift.

"The local energy solutions we develop have made our district more energy efficient and allowed us to reduce our energy costs by 20%," says Jörgen Lööf, CEO of ElectriCITY. "We've also co-invested in energy solutions like exhaust air heat pumps, solar PV, geothermal energy and control systems, slashing costs by another 50%. We want to produce even more energy via solar PV and bio-gas, and build a local micro network to store and share energy. The goal is to create a business solution that all stakeholders will benefit from by setting up a flexibility market, with co-op housing associations sharing energy through a 'citizen energy community'.

"In this case, the building blocks are a partnership between housing associations, a local system operator and the owner of the electricity network. Enstar is working to develop business models and an offer for co-operative housing associations to invest in new technology. Today's technology lets us measure, store and share energy, creating a local flexibility market."

Smart systems

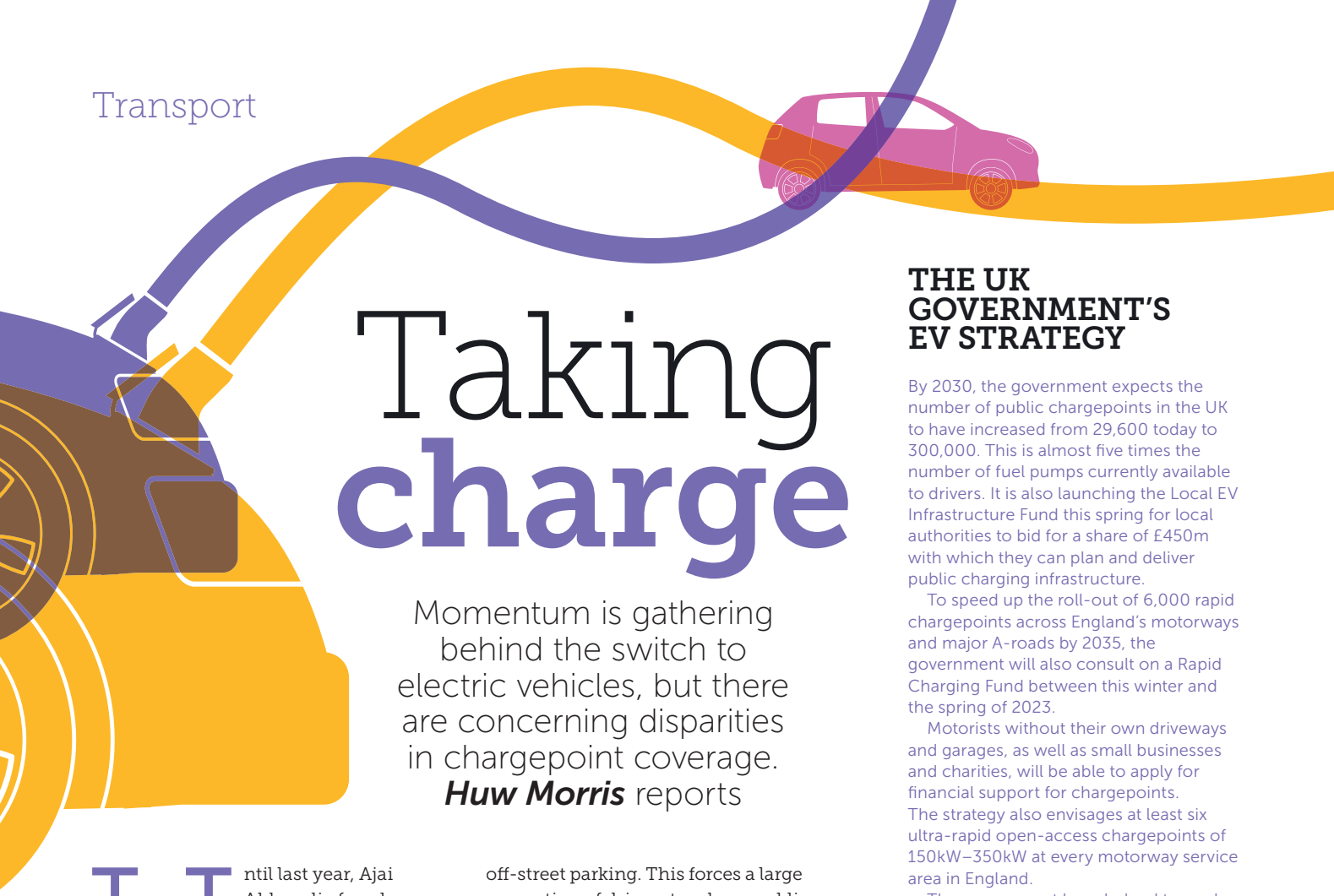
To make the energy system more efficient and enable greater flexibility, we need increased integration between different energy carriers (such as heating or electricity) and different domains (such as the property and mobility sectors). These fields are developing rapidly, but the management of different systems, as well as the funding and selection of different technologies, remains a challenge. The ACCESS project's pilots are exploring these issues.

"They all use different smart energy solutions, so they face different challenges," says Linnea Johansson, ACCESS project manager at Johanneberg Science Park. "But we can learn a great deal from each other despite national and regional differences, which is why it's so exciting to discover two projects in Sweden that have different approaches but are both successful. I believe that these projects will inspire us all to come up with additional solutions to accelerate the energy transition."

ÖBO and ElectriCITY have shown the central role of energy management, as well as how we can develop smart energy systems that generate, store, deliver and consume energy in flexible ways that reduce peak demands and create revenue streams. The technology is there; we need the energy managers to apply it.

This field visit was conducted within the framework of ACCESS, a EU North Sea Interreg funded project that includes IEMA members from Johanneberg Science Park, West Suffolk Council, Suffolk County Council and the Greater South East Energy Hub.

OLIVER INGWALL-KING, MIEMA is an energy specialist.



Taking charge

Momentum is gathering behind the switch to electric vehicles, but there are concerning disparities in chargepoint coverage. ***Huw Morris*** reports

Until last year, Ajai Ahluwalia faced a common dilemma. A resident of the south London borough of Lambeth, he is a driver who worries about the environment – but switching to an electric vehicle (EV) was out of the question.

"Living in a home without off-street parking makes this difficult," he says. "The nearest chargers were a 15-minute walk away and it wasn't guaranteed that I would be able to get a spot – this was a real nuisance, and I am sure it puts a lot of local people off making the switch."

Plenty to gain

Under a deal with Lambeth Council and EV charging specialist Connected Kerb, Ahluwalia has now taken the plunge. The project comprises 22 on-street EV chargers across 11 council estates to provide easy access to public charging, even for those without off-street parking. It forms part of the council's wider strategy of working with multiple operators to install over 200 chargepoints.

Around a third of Lambeth's residents live on council estates, with most lacking off-street parking. This forces a large proportion of drivers to rely on public EV charging infrastructure.

"People think EVs are the preserve of a fortunate few with detached houses and driveways, but this couldn't be further from the truth," said Connected Kerb chief executive Chris Pateman-Jones. "With running costs much lower than petrol and diesel cars, all communities, regardless of where they live, their social background or whether they have a driveway or not, have lots to gain.

"Unfortunately, some communities are being failed by a classic chicken and egg scenario. Without high EV adoption, chargepoint operators won't build public charging, and without reliable charging, why would anyone go electric?"

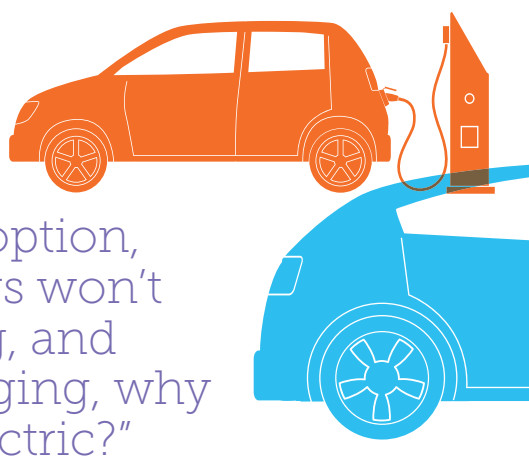
THE UK GOVERNMENT'S EV STRATEGY

By 2030, the government expects the number of public chargepoints in the UK to have increased from 29,600 today to 300,000. This is almost five times the number of fuel pumps currently available to drivers. It is also launching the Local EV Infrastructure Fund this spring for local authorities to bid for a share of £450m with which they can plan and deliver public charging infrastructure.

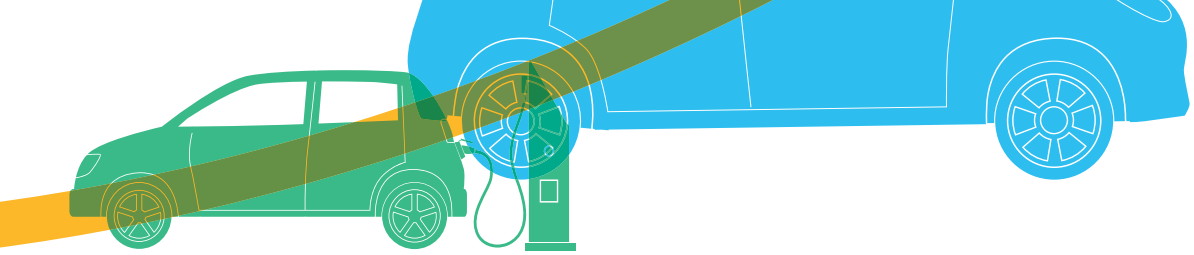
To speed up the roll-out of 6,000 rapid chargepoints across England's motorways and major A-roads by 2035, the government will also consult on a Rapid Charging Fund between this winter and the spring of 2023.

Motorists without their own driveways and garages, as well as small businesses and charities, will be able to apply for financial support for chargepoints. The strategy also envisages at least six ultra-rapid open-access chargepoints of 150kW–350kW at every motorway service area in England.

The government has pledged to work with Ofgem to encourage off-peak charging and keep connection costs low, with an electricity networks strategic framework to be published this year. It is also proposing new legislation to enable drivers to access open data and real-time information about public chargepoints, a single pricing metric of pence per kWh, and all public rapid chargepoints of 50kW and above to meet 99% minimum reliability standards by the end of 2023 to combat 'range anxiety' – the fear of driving an EV and running out of power.



"Without high EV adoption, chargepoint operators won't build public charging, and without reliable charging, why would anyone go electric?"



A postcode lottery

Research published by Connected Kerb, with insight from experts at EY, UK Power Networks, Motability and the Mitie Group, reveals that EV registrations are exploding in the UK – up 154% in the year to February 2022, compared to 2021. They are expected to outstrip diesel and hybrid sales by the end of this year.

However, public charging is not keeping up, with the chargepoint-to-car ratio deteriorating by 31% in 2020 alone. This puts the UK's ratio (16:1) behind other countries such as South Korea (3:1), the Netherlands (5:1), France (10:1), Belgium and Japan (both 13:1). It is estimated that the number of chargepoints will need to increase 10-fold by 2030 to cater for new EV drivers.

The transition to EVs is exposing disparities across communities. People in urban centres, high-rise flats and social housing estates are significantly less likely to have a private driveway, making it difficult to install a home chargepoint.

Not surprisingly, households that have access to a driveway make up 80% of EV owners, with the remaining 20% owned by those in houses or flats with no access to off-street parking, according to the Government Office for Science. At the same time, these communities have the most to gain from a clean transport revolution due to their exposure to the highest levels of toxic exhaust emissions and poorer air quality.

The Competition and Markets Authority warned last year of a "postcode lottery" in the UK's EV charging network, amid major inequalities of chargepoint access. It forecasted that around eight million homes will have an EV by 2030 but will be unable to charge it at home.

IMAGES: ISTOCK

Big ambitions

The UK installs around 7,000 EV chargepoints a year, and moves are under way across Whitehall and the private sector to scale this up. The government has decided that all new homes and workplaces built in England from 2022 must have EV chargepoints as standard.

This will apply to new residential, office and retail development, as well as renovations where there are 10 or more parking spaces. The government expects this mandate to propel the installation of up to 145,000 EV chargepoints a year until 2030 – when the ban on new petrol and diesel car sales is enforced. Whitehall has also unveiled a EV infrastructure strategy to hit the target (*see 'The UK government's EV strategy', left*).

Momentum is gathering elsewhere, too. In March, Innovation Gateway launched an initiative to share best practice on rolling out EV infrastructure, with Tesco, NatWest Group, LeasePlan UK, Defra and the Environment Agency spearheading the drive. EV charging business BP Pulse is investing £1bn in the UK over the next decade in a drive to roll out more rapid and ultra-fast chargers while expanding products and services to fleet and home users. This will triple the number of public chargepoints in the company's network and accelerate the roll-out of 300kW and 150kW ultra-fast chargepoints, which give EVs power for up to 100 miles of range in 10 minutes.

"We're investing to build a world-class network," says senior vice president Richard Bartlett. "This allows us to deliver more high-speed charging in dedicated hubs and on existing fuel and convenience sites, more home charging services, and crucial enhancements to our digital technology that will make charging fast, easy and reliable."

For Ahluwalia, the difference is palpable. "I've spoken to neighbours who have made the switch to an EV because of the chargers going in and they are reassured they can easily charge outside their flat. The more boroughs and estates this type of project can happen in, the better."

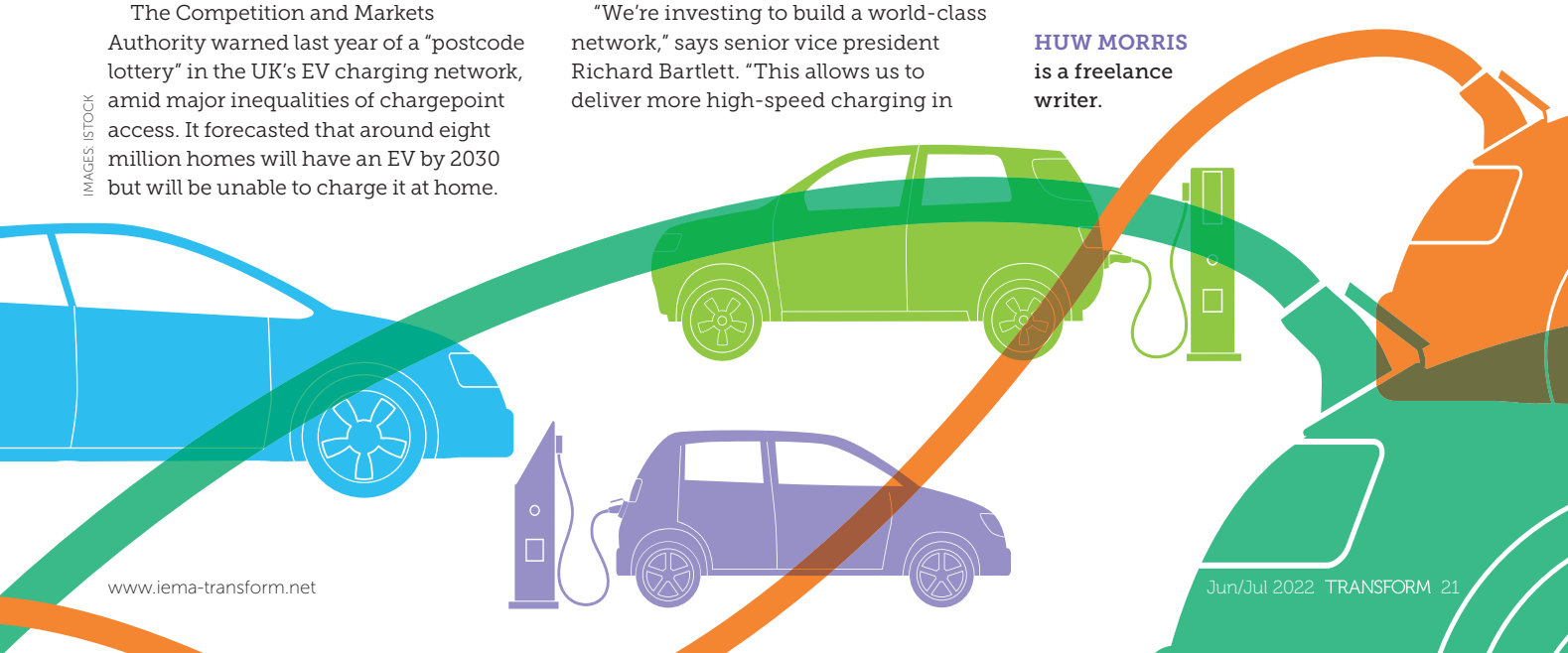
HUW MORRIS is a freelance writer.

THE BEST AND WORST PLACES FOR ELECTRIC CHARGEPOINTS

Milton Keynes is the best area in the UK to own an EV, according to CarGuide.co.uk, which analysed the number of chargepoints on the ZapMap app and Office for National Statistics data. It has 137.3 chargepoints per 100,000 people, while Coventry lies second, with 127.8. Brighton is third, with 117.9.

Bolton is the worst area to own an EV, with 8.3 chargepoints per 100,000 people, followed by Walsall, with 8.4, and Southend-on-Sea, which has 9.8.

"Creating a charging infrastructure sufficient to keep up with EV demand will likely prove challenging, given that sales have exceeded many expectations," says CarGuide founder Olli Astley.



A tunnel through the curve

Africa could show the rest of the world how to achieve economic development without harming the environment, argues ***Hannah Getachew***

Although the entire African continent only produces about 2%–3% of global carbon dioxide (CO_2) emissions, it will be gravely affected by the adverse effects of climate change. According to the Intergovernmental Panel on Climate Change, Africa is likely to experience greater rises in land surface temperatures than the global average, increasing the risks of reduced crop productivity, coral reef destruction, species extinction, the degradation of fishery stocks, and changes in the incidence and geographic range of diseases, among other consequences.

To cope with the stresses of climate change, it is expected that Africa will need to invest tens of billions of US dollars a year into mitigation and adaptation. Estimates on the precise amount of funds required vary depending on the temperature increase being modelled. If temperatures increase by 3.5°C–4°C, data from the UN Environmental Programme and its partners suggests that the continent will need to invest US$45-US$50bn a year by 2050, and US$350bn a year by 2070. This financial burden, coupled with Africa's comparatively low GDP, renders it particularly vulnerable to the effects of climate change. It is therefore imperative for Africa's development that it both mitigates against and adapts to climate change at the same time.

What's trade got to do with it?

Africa's urgent need for economic development, in part due to the current and worsening effects of climate change on its economy, is what spurred the 2019 African Continental Free Trade Area Agreement (AfCFTA), the largest free trade area in the world. It is anticipated that AfCFTA's implementation will transform the entire continent; studies suggest it will increase intra-African trade by 52.3%, add US$450bn to Africa's income by 2035, and expand its economy to US$29trn by 2050. It is crucial to seize this opportunity to put the continent on a pathway of economic

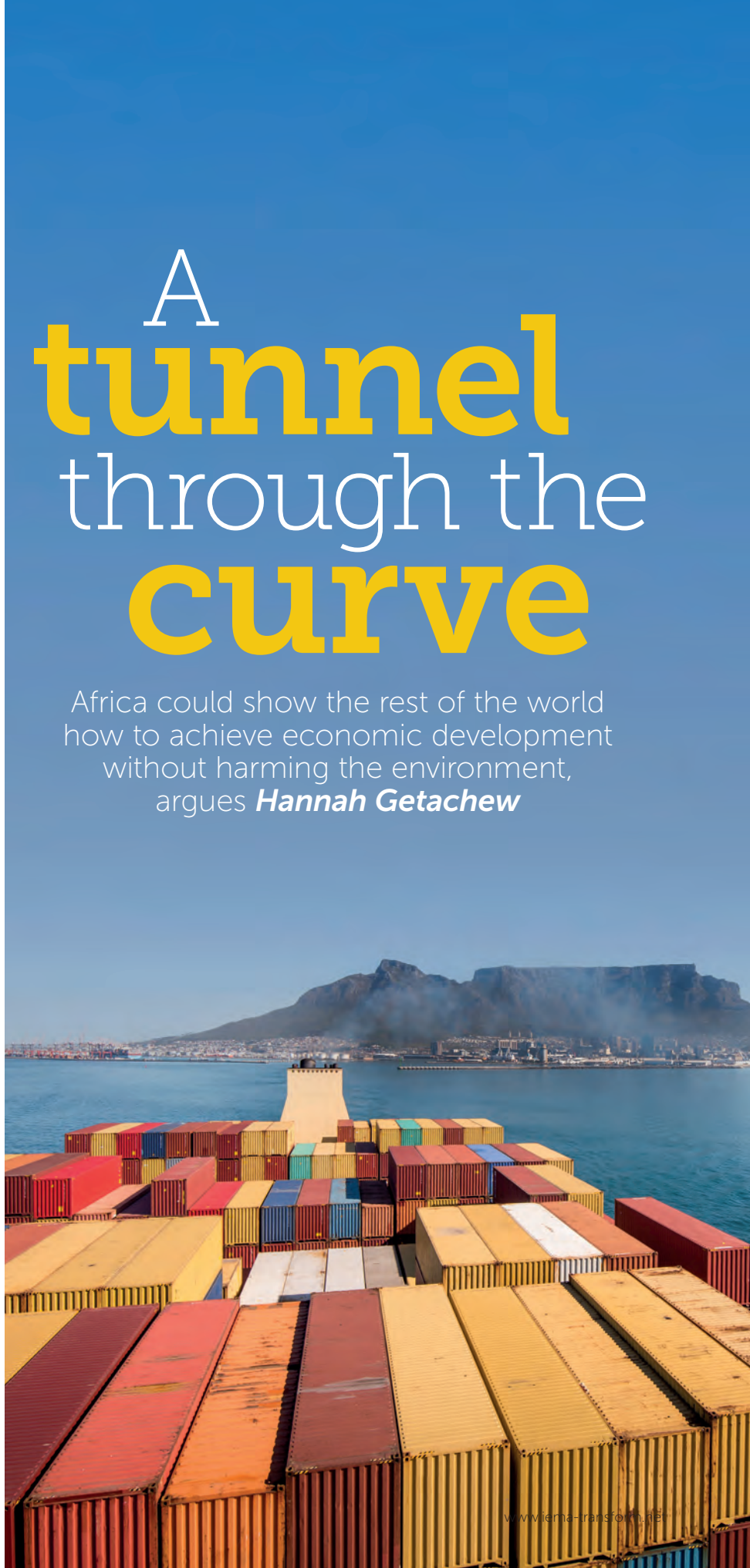


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Figure 1: The environmental Kuznet's curve.
Source: Panayotou (1993).

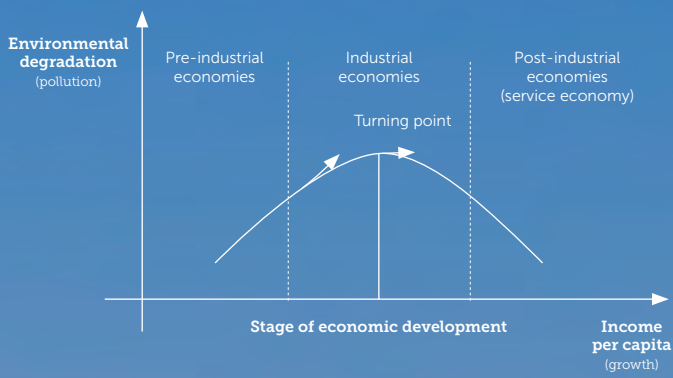
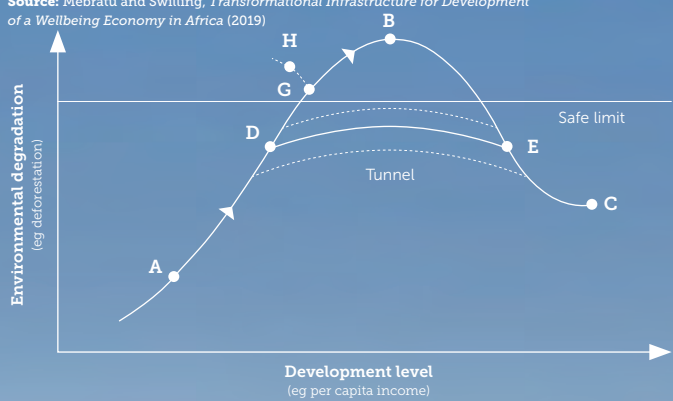


Figure 2: Avoiding the environmental Kuznet's curve.
Source: Mebratu and Swilling, *Transformational Infrastructure for Development of a Wellbeing Economy in Africa* (2019)



growth that is climate-compatible – in other words, that operates within planetary boundaries.

As the world grapples with climate change, all new international agreements should be looked at through an environmental lens to test their effects on the environment. This begs the question: how can AfCFTA be harnessed to boost economic growth in a way that is environmentally sustainable, given that there is a global climate emergency?

Trade and environmental policy have historically been tackled independently of one another. One line of reasoning argues that trade and environment should be linked under international trade agreements due to the cross-border nature of planetary boundaries. A healthy environment is valued by all – and if South Africa builds another coal plant, neighbouring Zimbabweans will also suffer from the pollution. Taking it one step further, the increased greenhouse gases caused by a new South African coal plant would also endanger low-lying countries further afield that are affected by rising sea levels, such as Bangladesh. On the other hand, some economists describe this separation as an efficient allocation of resources, stating that linking trade and the environment could allow special interest groups to lobby for trade barriers.

At the end of the day, the links between trade and climate change are hard to dismiss. Chen and Woodland's 2013 paper 'International trade and climate change' (among others) argues that there is a "causal, and empirically verifiable, link between international trade and climate change" – when GDP increases, so, too, do CO_2 emissions.

Tunnelling through

The correlation between GDP and CO_2 emissions is captured by what is known as the environmental Kuznet's curve, or EKC (*Figure 1*). This shows that when income per capita in pre-industrial economies increases, so too does environmental degradation (measured by pollution), until the economy is fully industrialised. At this point, the economy moves towards post-industrial activities and the pollution decreases.

However, it doesn't have to be this way – countries can boost their economies and develop without harming the planet. In *Transformational Infrastructure for Development of a Wellbeing Economy in Africa*, Desta Mebratu and Mark Swilling argue that climate-compatible economic development can create a 'tunnel' through the EKC (*Figure 2*) if lower-income countries are able to grow their economies in an environmentally sustainable way.

3.5°C–4°C

If temperatures increase by 3.5°C–4°C, Africa will need to invest US$45-US$50bn in climate mitigation and adaptation per year by 2050

US$29trn

AfCFTA will increase intra-African trade by 52.3%, add US$450bn to its income by 2035 and expand its economy to US$29trn by 2050

"It is crucial to seize this opportunity to put Africa on a pathway of economic growth that is climate-compatible"

What could AfCFTA do?

Despite the links between trade and climate change, there is, as it stands, no explicit mention of climate change or environmentally sustainable green growth in the text of the AfCFTA itself. This is surprising, as AfCFTA was born of the African Union's blueprint *Agenda 2063: The Africa We Want*, in which member states recognise the devastation caused by climate change and commit to mainstream climate change adaptation and mitigation into all activities. Since then, the African Union has released its *Green Recovery Action Plan* in response to the economic challenges posed by the COVID-19 pandemic. The plan is designed to promote "a clean and resilient recovery" that favours climate-compatible growth across the continent. African countries also actively contributed to the UN's Sustainable Development Goals; Goal 13, in particular, addresses the need to "take urgent action to combat climate change and its impacts".

AfCFTA's most significant environment provision is Article 3, which contains a broad clause on its aspiration for "sustainable and inclusive socio-economic development" – but without defining those terms or the means to attain them. It allows for exceptions to be made in certain instances for the sake of environmental protection; however, the Brookings Institution theorises that if future court cases are ruled in the same manner as those under the World Trade Organization, not all environmental measures would be covered. This indicates that AfCFTA will not chart a course of economic development that minimises harm to the environment while maximising the many human development opportunities presented by a low-emissions economic growth model.

Forging a new path

Research by The Economist Intelligence Unit identifies seven opportunities for boosting climate-friendly trade flows: removal of tariff barriers on environmental goods and services; removal of non-tariff barriers on environmental goods and services; explicit limits on fossil fuel subsidies; border adjustment carbon taxes; green procurement; approval of non-discriminatory renewable energy subsidies; and international co-operation on climate change goals.

In practice, these policy recommendations could be incorporated into the AfCFTA through an additional protocol dedicated to the environment, which may be drafted in a way that includes each of these seven measures. Financial support for the research required on how to integrate environmental concerns into the AfCFTA could be obtained through the African Union and its funding partners. Fortunately, Article 8(3) of AfCFTA allows for the addition of new instruments over time, based on the needs of member states. Through this provision, AfCFTA can adopt the aforementioned mechanisms for climate-compatible trade. If African countries choose this route, they can transform the continent into a model for green development and set a shining example for the rest of the world to follow.

HANNAH GETACHEW is a PhD researcher on AfCFTA at King's College London.

A state of flow

Jelmer Hoogzaad, ***Daniel McGahey*** and ***Chris Smithies***

describe how a metabolic analysis approach is helping Laos to build a more circular economy

The south-east Asian country of Laos, like many lower-middle-income Paris Agreement signatories, faces the challenge of maintaining economic growth to improve standards of living while reducing the footprint of its natural resource-dependent linear economy. The country lies at the crossroads of China, Vietnam and Thailand, and demand from these markets drives its linear economy in many ways – particularly regarding the extraction and export of raw materials such as metal ores, wood and electricity for hydropower.

In 2021, Laos decided to bypass linear carbon-intensive economic growth, and became only the third country to complete a comprehensive metabolic analysis process to help raise its greenhouse gas (GHG) mitigation ambition, take stock of material stocks and flows, and move towards a circular economy. This process was supported by the UN Development Programme, with donor finance from the EU and the governments of Germany and Spain through the Nationally Determined Contributions (NDCs) support programme. It resulted in a report published in November 2021, *Circular economy opportunities in Lao PDR – A metabolic approach to defining a resource-efficient and low-carbon future*.

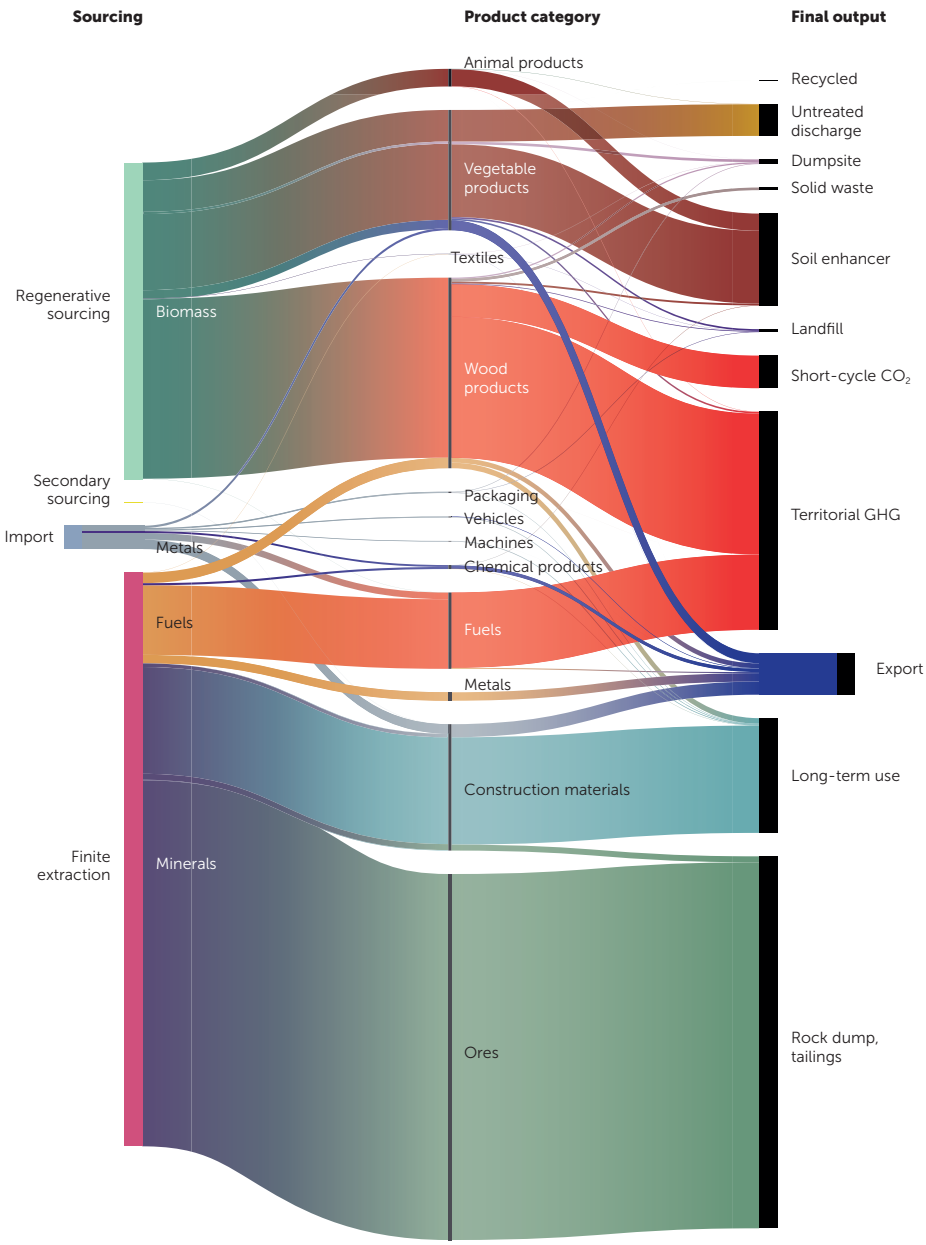
In addition to adopting a metabolic analysis, the government of Laos requested a detailed policy analysis, the development of a community of practice that engaged the private sector with policymakers, and the creation of a long-term low-carbon development strategy. Laos now has an opportunity in its next NDC update to outline a clear strategy for deploying circular economy GHG interventions that could ensure net-zero carbon emissions by 2040.

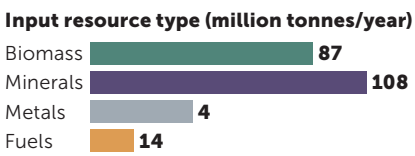
The metabolic approach

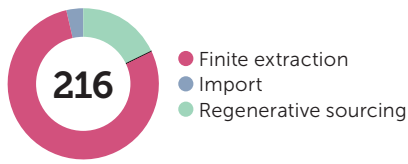
Metabolic analysis as part of a circular economy assessment involves analysing an economy's resource flows in order to identify opportunities for circular economy interventions and GHG mitigation. It shifts the focus from environmental issues and short-term priorities to an economic system's overall performance and ability to provide needs such as housing, nutrition and mobility in a low-carbon, resource-efficient way. Metabolic analysis identifies circular economy opportunities with high mitigation potential and shows the impact of current resource flows and their effects on natural assets at the point of extraction and disposal.

Laos's metabolic analysis identified 332 national material flows (*Figure 1, overleaf*) and determined whether each one was inherently circular or linear. For example, a consumption-based circularity gap for Laos identified the share of domestic

Figure 1: All products and materials used in Laos in 2019, excluding water but including waste rock from mining.







consumption that come from renewable or secondary resources, and which of these have materials that are recovered at end-of-life. The country's consumption economy is estimated to be 27% circular thanks to inherent levels of sustainability within its rural agricultural systems, management of food waste throughout food value chains, and use of renewable firewood. Production is far less circular, at 16% – largely due to the mining economy.

Raising the NDC ambition

The assessment identified 17 possible circular economy intervention areas. These included six enabling interventions that support the 11 sector-specific interventions offering most of the GHG mitigation and sequestration potential. Sector-specific interventions include increasing wood-based construction to reduce the construction sector's carbon footprint, improving livestock efficiency, prioritising active, shared, public and electric transport, and reducing food loss.

The resulting benefits would include the creation of more than 1.6m green jobs by 2040 – mostly in wood-based construction, climate-smart agriculture and preventing food loss. Combined, the GHG mitigation potential of the interventions is estimated to be 66m tonnes of carbon dioxide equivalent (tCO_2e) per year by 2050, enabling Laos to build on current NDC interventions and ensure net carbon neutrality by 2040.

This approach also makes economic sense. An assessment of the business potential of the 11 core interventions found that six are commercially viable on their own, 89% of the circular GHG mitigation and sequestration potential has a positive net present value, and 85% would provide a payback in less than six years. These six areas comprise:

- Reducing losses and waste in food value chains
- Expanding climate-smart agriculture combined with organic certification
- Producing bio-gas and organic fertiliser at smallholder and industrial scale
- Prioritising and producing industrial wood-based construction materials

JELMER HOOGZAAD is director and founder of Shifting Paradigms. **DANIEL MCGAHEY** is an environmental consultant at Earth Systems and works on environmental management and assessment projects across Africa and Southeast Asia. **CHRIS SMITHIES** is a director at Earth Systems and leads the company's south-east Asia projects.

- Implementing industrial symbiosis and remanufacturing
- Accelerating the electrification of the transport sector with service models.

The remaining interventions may require financial incentives. With a carbon price of US$25 per tonne, 98% of the circular mitigation and sequestration potential has a positive return, or negative marginal abatement costs (*Figure 2*). Circular economy interventions could create US$16bn in GDP by 2050.

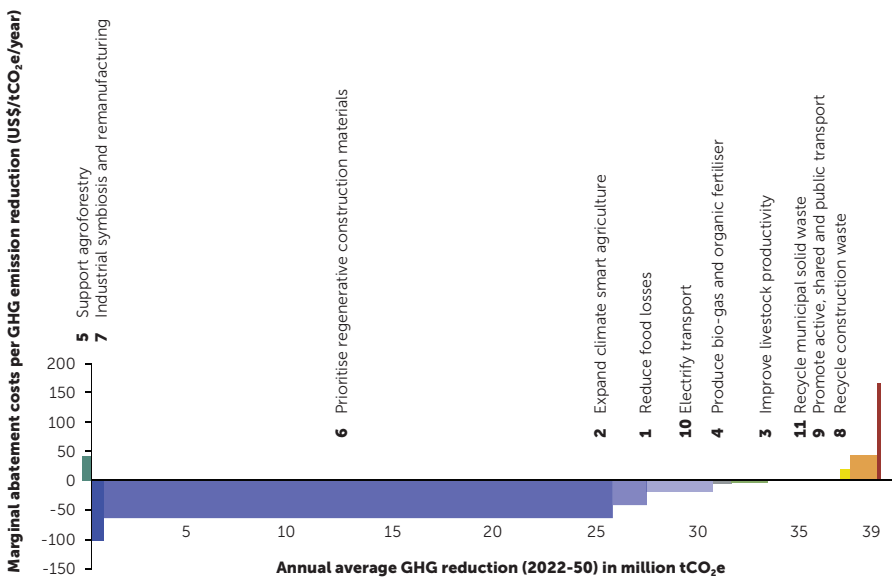
Lessons for action

Transitioning to a circular economy will involve a fundamental change in the current economic model. It will require us to shift to a system in which materials are used such that they can be cycled indefinitely and on the smallest scale possible, durable products are designed to last longer and used more intensively, and development and wellbeing are decoupled from the use of natural resources. Laos has a unique opportunity to lead low-carbon development in Southeast Asia. In doing so, it can create additional benefits for surrounding countries: for example, GHG emission reductions from Lao's circular economy transition for foreign trade partners are estimated to be approximately 2.2mtCO_2e/year.

Important lessons can be drawn from Laos's example – for instance, bringing local and international private sector stakeholders and policymakers together within a community of practice to collaborate enabled it to overcome potential barriers. Additionally, the country will need to co-operate closely with trade partners to ensure circularity is embedded across whole value chains. For example, its construction sector is too small to use all the wood-based materials it could produce; tapping into foreign demand for these materials could ensure permanent storage of sequestered carbon within the built environment. And while the economic case is clear for most of the interventions identified, Laos may need to introduce incentives such as a carbon tax to ensure that some options become commercially viable, and that the negative externalities of linear value chains are accounted for in policy.

This article is based on the outcomes of a national project led by Shifting Paradigms from the Netherlands, in collaboration with Earth Systems (Laos), Rebel Group (the Netherlands), Circle Economy (the Netherlands) and DFDL (Laos). The project was commissioned by the UN Development Programme and realised thanks to the support of the EU and the governments of Germany and Spain under the UN Development Programme NDC support programme. You can download the full report, Circular GHG mitigation opportunities in Lao PDR: a metabolic approach, *at* ***www.shiftingparadigms.nl/projects/circular-lao***

Figure 2: Marginal abatement cost curve with the economic and climate impact of the 11 core circular interventions.



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A continuing crisis

Alice Mah tells Chris Seekings how plastics and chemical companies are taking control of the circular economy narrative

The plastic waste crisis has fallen slightly off the radar in recent years, with manufacturers ramping up production of vaccine packaging, face masks and other PPE equipment to keep people safe during the COVID-19 pandemic. While this has been important, the issue has not gone away and the volume of plastic waste produced for unnecessary single-use products continues to rise, despite growing awareness of the environmental damage they cause.

In her new book *Plastic Unlimited: How Corporations Are Fuelling the Ecological Crisis and What We Can Do About It*, Dr Alice Mah, professor of sociology at the University of Warwick, shines a light on how petrochemical and plastics corporations have driven demand for plastic while deflecting attention from the key solution: bringing down its production.

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Why did you first start researching the drivers behind the plastic crisis?

My original doctoral research was on the long-term impacts of deindustrialisation on old industrial communities, and I became interested in the unequal impacts of toxic petrochemical industry pollution while working on a large EU-funded project. The industry was going through a crisis due to the attention on marine plastic in 2017 and 2018, and I saw its tremendous response to deal with this crisis. My research began to shift towards how these corporations are reacting to rapidly escalating public attention to overlapping crises, such as plastic waste, the climate emergency and, more recently, the pandemic.

"The industry is on board with recycling because it does not challenge production levels"

How have petrochemical companies dealt with the reaction to plastic waste?

They got on board with the circular economy, which sounds super – but there is a hierarchy of circular economy principles in terms of the three 'Rs': recycling, reuse and reduction. Recycling is low on the hierarchy and reduction is high up, but the industry quickly came on board with recycling because it does not challenge overall production levels. It can be a 'guilt eraser' for the consumer and the industry. By reframing the crisis as a recycling issue, the industry can keep producing 500bn plastic bottles a year. It has also reframed the argument in terms of changing recycling systems.

What do you mean by that?

One of the main problems with conventional recycling is contamination. The industry's argument is that, to make 'virgin quality' grade plastics, it needs to do chemical recycling – breaking plastic down to its molecular ingredients. It is effectively incineration, because it's carbon intensive and toxic, and has to be done at a huge scale. So the industry says that the real solution to plastic waste is chemical recycling innovation, which it is working on and getting loads of funding to do, because that's where the money is. It says it is the primary innovator, and it has the expertise and hold the keys to the changing infrastructure, buying up all the recycling outfits and partnering with waste firms to take technical control over what the circular economy looks like in practice. It is about continuing to produce as much as it likes but changing the inputs and the technologies.

Your book also talks about corporations denying the toxic health effects of plastic – tell me more about that.

The most notorious, well documented examples were historically the vinyl chloride scandals in the 1960s and

1970s, where it was a case of collusion after a number of leading European and American chemical companies found out that the vinyl chloride monomer made in their factories seemed to be causing a rare degenerative bone illness and angiosarcoma, and hid it. The industry has done the same with Bisphenol A and phthalates, which are used in a number of different plastics. It says they're perfectly safe at certain thresholds, but they're demonstrably carcinogenic. More recently, there are the ongoing disputes around so-called 'forever chemicals' in things like non-stick cookware. There is also growing evidence of microplastics in our bodies, and scientists are still finding out what the health effects are.

How is the plastic waste crisis affecting communities differently worldwide?

Communities of colour, many in Asia and Africa, are exposed to the greatest levels of toxic threats through the open burning of plastic waste next to the petrochemical facilities they live close to. One of the things that made me angry while researching the book was how large corporations blame the very countries they are flooding with plastic waste exports. They rely on that unequal trade, which results in beaches filled with towering toxic waste and open incineration. The corporations then say it's due to poor infrastructure and education, and come in philanthropically to clean up, or offer to sell the communities recycling solutions!

Should consumers take more responsibility?

The narrative is that the consumers are to blame because they throw away all their litter. That obviously conflicts with the fact that these companies are flooding markets with unrecyclable single-use sachet portions, for example. However, consumer lifestyles do enable this, and I think tough decisions have to be made about convenient commodities and how they might be seen as an infringement on individual liberties, and whether we should be entitled to have all these things.

Has COVID-19 affected the situation?

Many industries work by turning a crisis into an opportunity, and I think COVID-19 was quite a relief for petrochemical companies when it comes to the public perception of plastic. Everyone was saying plastics were bad, but now they are good again, or at least necessary. I think the industry was surprised by the windfall that came for particular kinds of plastics during the pandemic. Single-use plastic did really well, particularly with the shift towards online deliveries and takeaway food containers. In the early days of the pandemic there was also a huge industry lobbying effort to reverse the plastic bag bans, deposit return schemes and other circular economy-related initiatives, using contamination from virus transmission as an excuse. It's hard to say what the long term effect will be, since the UN has agreed a global treaty to tackle plastic pollution.

What are your thoughts on the UN treaty, and what other solutions are there to the crisis?

I was happy about the announcement because there is now an international space for negotiation on this important issue – but it's going to be politically fraught and contested. When it comes to solutions, it also can't be about vilifying one material over another – so it's not just that everything should be replaced by paper, which causes deforestation, or by aluminium, which is a carbon-intensive and problematic mining material. This must be about reducing production and living sustainably with the resources that we have, and designing an equitable, sustainable transition away from wasteful, toxic and carbon-intensive materials. The Break Free from Plastic Movement is one reason for optimism, bringing people together in solidarity to help tackle the unequal impacts being felt in frontline communities.

Turning off the tap

David Burrows considers the UN Environment Assembly's draft resolution on ending plastic pollution, and its chances of success

In her book *Plastic: A Toxic Love Story*, Susan Frankel writes that it's "not always easy to see when a relationship is in trouble", noting that plastic and humans have "been together for so long it's difficult to imagine a different world". However, on 2 March, environmental campaigners started to dream that such a world could exist.

The UN Environment Assembly cajoled 175 countries into agreeing to a legally binding global treaty on ending plastic pollution. The four-page draft resolution, 'End Plastic Pollution: Towards an internationally legally binding instrument', checks everything that was on the wishlists tucked under NGOs' arms as they arrived in Nairobi, Kenya, for the February-March meeting.

The fact that the treaty references vulnerable and marginalised waste collectors, whose labour would form the backbone of a circular economy, is significant. So too is its mention of the health impacts associated with plastic – the concentration of chemicals and additives in plastic and other packaging is a growing concern. Another notable inclusion is the treaty's desire to take a "full lifecycle approach" to tackling plastic pollution. The importance of considering everything, from production and design to waste prevention and management, was highlighted in reports by both the Nordic Council and the Environmental Investigation Agency when they started detailing what such a treaty might look like a couple of years ago.

Industry and NGO responses

Environmnental Investigation Agency ocean campaigner Tom Gammage calls the new agreement "remarkable". To have all the asks in the draft resolution is "stunning", adds Paula Chin, senior policy adviser (consumption) at WWF.

People who are on the ground, living the problem and facing these challenges day-to-day have been involved from the start – which represents a shift in the negotiating ecosystem. The focus could be as much on people as it is on waste, and that may keep developed nations, businesses and trade representatives in check as they attempt to sell silver-bullet solutions to the crisis and avoid the necessary system change.

Indeed, while NGOs are cock-a-hoop, industry is wary. Barry Turner from the British Plastics Federation is supportive of measures that will reduce the amount of plastic released into the environment, and is keen to see a "well-thought" and "science-based" approach to achieve this. Eric Greenberg, contributing editor at *Packaging World*, offered a more ominous reaction: "In short, uh-oh".

His concern is that the agreement could result in a "supercharged version of anti-plastics measures of the type we've seen for years". Ministers in the UK seem keen to live up to such prophesying. Those listening to International Environment Minister Lord Zac Goldsmith speak at a March webinar held by campaign group A Plastic Planet may have thought he was once again editor of *The Ecologist*, as he urged campaign groups to maintain pressure and dismissed the inevitable "squeals" from some sections of industry.

His words will encourage campaigners who see the treaty as an opportunity to "turn off the plastics tap", as A Plastic Planet puts it – whether that's the tap leaking plastic into oceans and soils or the tap linked to fossil fuel extraction.

A net-zero villain

In its report *Breaking the plastic wave*, Pew Charitable Trusts estimated that lifecycle plastic-related emissions will double from one gigatonne of carbon dioxide equivalent ($GtCO_2e$) in 2016 to $2.1GtCO_2e$ by 2040, accounting for 19% of the total annual emissions budget required to limit global heating to 1.5°C. At present, it accounts for 3%.

In the third instalment of its Sixth Assessment Report, published in April, the Intergovernmental Panel on Climate Change (IPCC) pointed to plastic's "current <99% reliance on fossil feedstock, very low recycling, and high emissions from petrochemical processes", which makes it a net-zero villain. It did note that plastic can also save emissions, for example in making cars lighter and thus cutting fuel consumption. However, as Carbon Brief noted in its Q&A on the IPCC report, the report also warned that "careful evaluation is needed from a life cycle perspective since

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some recycling activities may be energy- and emission-intensive, for example, chemical recycling of plastics".

Production caps, bans and new targets are all possibilities, but the UN treaty (and contributing policies) must be science-led. The intergovernmental negotiating committee working on the treaty will consider "the best available science, traditional knowledge, knowledge of indigenous peoples and local knowledge systems". This is encouraging.

Parallels with climate change are important when thinking about the shape and content of this new treaty, says Professor Chris Hilson, an environmental law expert at the University of Reading. "As with climate change, we have seen plastics denialism and scepticism face similar levels of misinformation," he explains. "We need something like the plastics equivalent of the IPCC – an authoritative scientific advisory body that can advise on the science of plastics mitigation and harm, and one that is not just staffed by industry insiders but is truly independent like the IPCC."

There is a feeling the UK could help lead this; some NGOs have praised the government for its interventions to keep the treaty water-tight as others looked to water it down. "What matters is what happens next," said Goldsmith, adding that the UK government will be "at the forefront" of designing the treaty.

Goldsmith has talked of more "bullish" policies, but the government's own ambitions to tackle plastic pollution have stumbled. A plastic packaging tax came into force in April, but policies such as extended producer responsibility for packaging and a deposit return scheme have been delayed. Implementation of bans on the most-littered single-use plastic items lags behind that of the EU, while a manifesto commitment to ban plastic waste exports to non-OECD countries has failed to materialise.

Fleshing out the details

Under the treaty, there will be national plans that could work similarly to the way Nationally Determined Contributions (NDCs) work for greenhouse gas emissions under the Paris Agreement – although, unlike the NDCs, they would be legally binding. Better reporting on plastic will be key. "Monitoring of plastic in the environment is important and we need to be good at that," explains Gammage. However, he continues, we also need to understand "what we have, what we're producing, what we're designing and what we have moving through the economy".

Fiona Ross, environmental lawyer at Pinsent Masons, says the impact of the treaty and national plans will have to be monitored if they are to be effective. Given the ground covered, she thinks it's unlikely there will be a single target on, say, plastic use. "I think there would have to be a range of targets," she says.

The fact that it's all rather vague means there is everything to play for. This scares plastic producers, as well as the fossil fuel companies that have become reliant on plastic demand. The oil industry wants to keep the world addicted to plastic, says Hilson, calling it "their plan B for when their fuel markets run out in the energy transition". Production must be the focus, he adds. "We need a net zero for plastic."

> "Plastic is the oil industry's plan B for when its fuel markets run out in the energy transition"

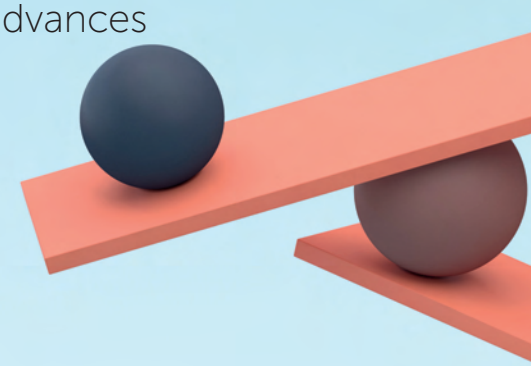
Two million tonnes of plastic were produced in 1950; in 2017, that figure was 348m tonnes, and this is expected to double by 2040. The draft resolution finally recognises that addressing plastics in the oceans and on land isn't possible without intervening at the source.

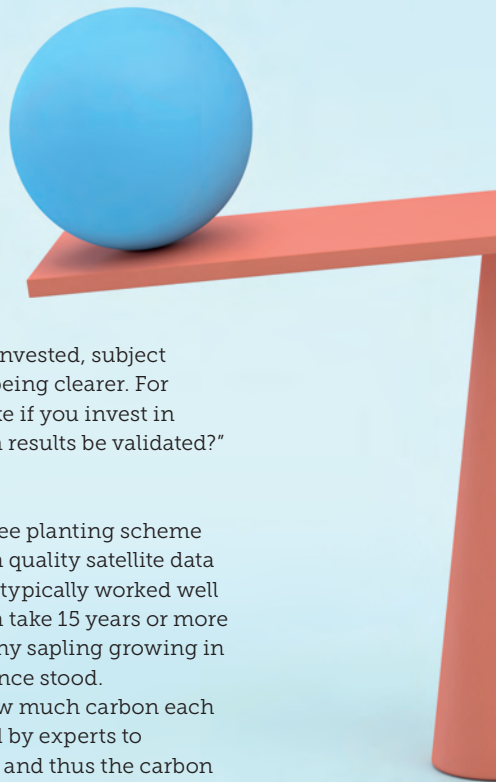
David Azoulay, managing attorney at the Center for International Environment Law, believes it comes down to what happens in the next two years. "We've all seen how international processes can be derailed," he said during A Plastic Planet's webinar. However, he is "rather confident" about this treaty's chance of delivering, saying that the momentum behind it gives him "a lot of hope".

DAVID BURROWS is a freelance journalist and researcher.

How can corporates looking to offset emissions ensure that the project they invest in will deliver? Technological advances may be part of the answer, says ***Catherine Early***

Delivering the goods





No field of corporate climate action has attracted more controversy than offsets, with countless headlines associating the carbon credits with greenwashing. However, carbon sequestration in natural ecosystems is now endorsed by the Paris Agreement, the Intergovernmental Panel on Climate Change and certification schemes such as the Science-Based Targets Initiative in recognition of the difficulties some sectors have in removing carbon, and only after cutting or halting emissions wherever possible.

From June 2021–January 2022, offset prices increased more than threefold to around US$14.40, according to S&P Global Platts. Interest has grown alongside the proliferation of corporate net-zero emission pledges since COP26. But with corporates under pressure to hit targets and avoid greenwashing scandals, they want proof of what they have paid for.

"With the Clean Development Mechanism [the UN's carbon offset programme], the focus was getting government money into the tropics to save the rainforest," says Ed Milbank, owner of the UK's largest private woodland at the Barningham Estate in County Durham and director of carbon measurement platform CSX Carbon. "When giving money philanthropically, businesses were happy as long as that work was done." However, the numbers now have to add up. "When a corporate buys an offset for 1,000 tonnes of carbon, it wants hard evidence of that 1,000 tonnes, not an estimate towards it. But that level of detail isn't available with current systems."

Many corporates fear that a project they have invested in might turn out to be environmentally or socially damaging, he continues. "The corporate world is holding back from investing in nature-based solutions until there are projects that can give them the assurance that what they're investing in is doing good."

Tushita Ranchan, trustee of the Green Purposes Company, set up by the UK government to safeguard the purposes of the Green Investment Bank, agrees. "Most of the projects financed today are small. There are large amounts of money waiting to be invested, subject to the metrics and the outcomes being clearer. For example, what does 'good' look like if you invest in peatland restoration, and how can results be validated?"

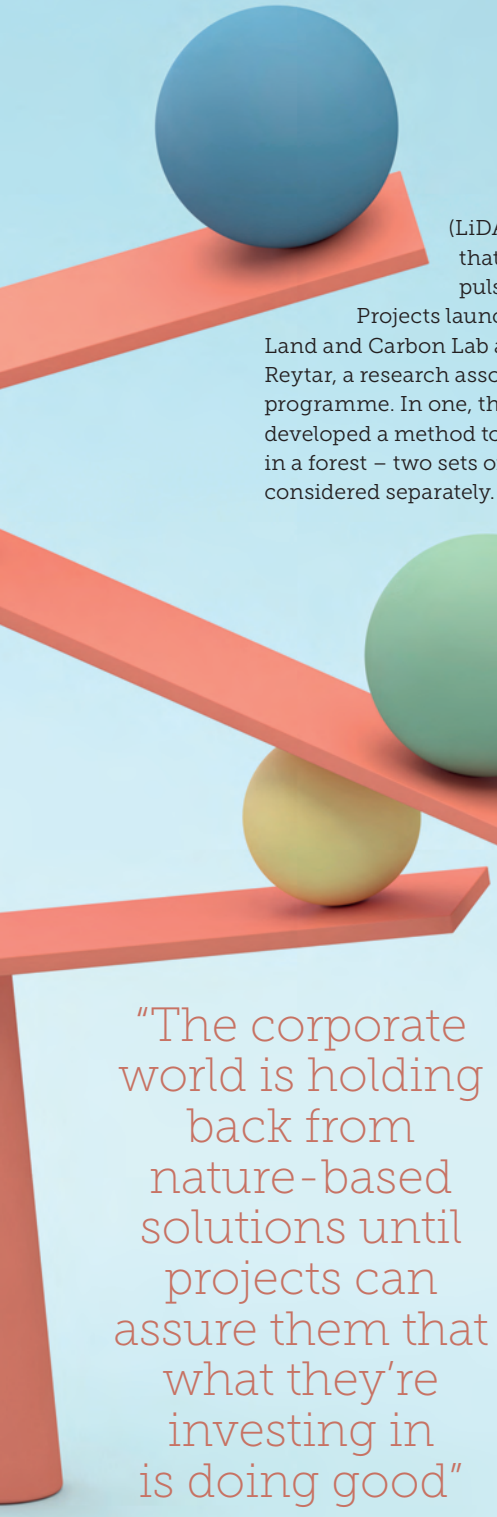
Tree cover and carbon

It is hard to find evidence that a tree planting scheme has been successful. Though high quality satellite data can track deforestation, it has not typically worked well for tracking tree growth; trees can take 15 years or more to grow, and it is harder to see a tiny sapling growing in a field than a space where a tree once stood.

There is also the question of how much carbon each tree contains. The technique used by experts to calculate trees' biomass content – and thus the carbon – is often rudimentary, involving measuring the tree's diameter with a tape measure, estimating the height and using an equation dating from the 1960s. The result is an underestimate, since it calculates only the biomass of the trunk, not all the branches.

Technological developments could make tracking nature restoration easier and more accurate. The World Resources Institute (WRI) is developing techniques to measure both tree cover and tree carbon using higher resolution satellite data and light detection and ranging

IMAGES: ISTOCK



(LiDAR), a remote sensing method that uses light in the form of a pulsed laser to measure distances.

Projects launched in November by the WRI's Land and Carbon Lab are showing promise, says Katie Reytar, a research associate in the organisation's forests programme. In one, the University of Maryland has developed a method to calculate both gains and losses in a forest – two sets of data that are typically considered separately. This shows net change in forest cover for the first time.

Another dataset uses artificial intelligence and satellite data to detect tree cover outside forests, such as on farms.

Measuring carbon in trees is also an evolving field, says Nancy Harris, research manager at WRI's Global Forest Watch. "Are the measurements that we're taking from space on changes in height good enough to be able to predict changes in biomass? We can count the number of trees or estimate the amount of tree canopy in a given area from space, but we still need to correlate that with how much carbon is in that tree."

> "The corporate world is holding back from nature-based solutions until projects can assure them that what they're investing in is doing good"

CSX is working with scientists from Ghent and Oxford universities to solve this problem. Using terrestrial laser scanning (TLS) – which creates three-dimensional trees measurements – and geometric modelling, they can calculate the volume of a tree, and thus its biomass and carbon. The data is then matched with optical and LiDAR images acquired from drones. The idea is to build a database of tree carbon across all species and ages using TLS, and use it to make drone data more accurate, so that drones can eventually collect accurate assessments of any tree carbon. Researchers elsewhere in the world are also collecting data using this method.

"To inform a system such as the UK's Woodland Carbon Code, you need to work very quickly and efficiently," says Milbank. "If you're relying on someone walking into a wood with a tape measure, it's just not efficient." Technology has two benefits over traditional methods, he adds – it improves accuracy, and is a cost-effective way to measure large areas.

Estimating peatland health

Other natural carbon sinks are also undergoing research. In Scotland, government nature conservation body NatureScot is using a technique developed with Terra Motion, a spinout company from the University of Nottingham, to monitor the success of peatland restoration. This uses satellite interferometric synthetic aperture radar (InSAR) to map bog surface movement. Healthy peatland is wet, with soft and spongy sphagnum mosses that swell and retain water, making it move. Drier peatlands are stiffer, and unresponsive to the addition of water. NatureScot can thus assess peatland condition and the effectiveness of the restoration techniques it is using in Peatland ACTION, a project to restore more than 25,000 hectares of degraded peatland.

Researchers hope the method could provide a better estimate of the amount, distribution, condition and associated carbon inventories of Scotland's peatland, and a way to assess the impact of restoration. It could also identify areas at high risk of peat instability, fire and erosion, and show where urgent action might be needed. The researchers are growing more confident in terms of what the technique tells them about peatland condition, but are still investigating how it could be used as a reporting tool in terms of greenhouse gas uptake and re-establishment of vegetation, says Peatland ACTION's Dr Henk Pieter Sterk.

However, there is already interest in using InSAR technology in this way from both within the UK and overseas, he continues. "InSAR was initially thought not to work as well on vegetated areas, but all those limitations have been removed and validated in the field. It's showing us information that even a decade ago was deemed impossible."

Unlocking investment

While these technologies do not answer all questions, such as whether an ecosystem improvement occurred due to a project or to other factors, they could provide the confidence needed to unlock larger-scale investment.

"The public interest in climate change and the importance of forests and trees has spurred action in a way that perhaps wouldn't have happened before. Researchers have been working on these issues for decades, but there is now more funding and more focus on these areas, and more progress," says Harris.

CATHERINE EARLY is a freelance journalist.

CAREER PROFILE

Marek Bidwell

FIEMA CEnv

Director and environmental consultant at Bidwell Management Systems

Why did you become an environment/ sustainability professional?
My favourite subject at school was geography. I learnt that improvements to the health of people living in cities were made due to sanitation, drinking water and clean air.

What was your first job in this field?
For Northern Electric, evaluating the environmental risk of substations in north-east England.

How did you get your first role?
My MSc tutor at Newcastle University, Sue Haile, had industry links in the region and opened the door to an interview.

What does your current role involve?
Winning work, managing and delivering projects. Consulting, teaching and auditing. Learning, reading and writing.

How has your role changed/ progressed over the past few years?
My work has gradually shifted from pollution prevention and environmental management systems to carbon management and data verification. I expect this is the case for many environmental professionals. My work has also become more strategic on some projects, discussing environmental risks and opportunities with directors.

What's the best part of your work?
Teaching on a course when the delegates are buzzing with new ideas and knowledge. Also, I still love site audits: the rainbow trace of oil pollution heading towards a drain, the hiss of a compressed-air leak wasting energy, off-cuts in a skip that could be reused.

What's the hardest part of your job?
Chasing late payments.

What was the last development event you attended?
IEMA Connect in December 2021.

What did you bring back to your job?
Never stop aspiring to make a difference.

What is/are the most important skill(s) for your job?
Project management: understanding what the client wants, translating it into a plan, delivering it on time and to budget. Psychology: I work with different people every week. Enthusiasm: especially when teaching. Self-containment: I contribute to the success of others.

Where do you see the profession going?
It should integrate sustainability into mainstream business to the extent that it is no longer needed.

Where would you like to be in five years' time?
Just before COVID-19 hit I was working in Oman, reviewing the environmental performance of the electricity distribution industry. I would like to do more projects overseas.

"Never stop aspiring to make a difference"

What advice would you give to someone entering the profession?
To be a successful environmental consultant over a long period, you need to have the opposite qualities of those sought by Alan Sugar on *The Apprentice*.

How do you use the IEMA Skills Map?
We discuss it on every IEMA Foundation course I teach. Delegates find it valuable for identifying strengths and weaknesses. My strengths are core knowledge, assessment tools, facilitation and communication, but I need to keep looking for chances to create change.

If you had to describe yourself in three words, what would they be?
Assiduous, curious and biophilic.

What motivates you?
Learning something new. Helping people solve problems. Completing projects.

What would be your personal motto?
'Shy bairns get nowt.'

Greatest risk you have ever taken?
I once left a job where I was unhappy without another position lined up. It felt like jumping into a black hole but resulted in me working for myself, which is one of the best decisions I've ever made.

If you could go back in history, who would you like to meet?
The first family who settled in Northumberland after the last ice age. They built a roundhouse on the coast at Howick around 7600 BC, which was discovered a few years ago. I would love to know how they lived and where they came from.

IMAGES: ALAMY/SHUTTERSTOCK

DATES FOR YOUR DIARY

iema.net/events

FRIDAY 27 MAY

ONLINE EVENT

IEMA Future: Measuring Social Value – A Panel Discussion

After our event 'An introduction to Social Value', there was significant interest in the topic of measuring social value. This event will provide the opportunity to ask questions of and discuss this issue with social value practitioners, and hear about real-life applications of measurement methods.

bit.ly/Futures_SocialValue

MONDAY 1 JUNE

WEBINAR

How To: Become a Practitioner – Learning Outcome 5 – Management and Assessment Tools

Delivered by Keith Whitehead, this webinar explains the relevant tools, techniques, systems, practices and applications, and how they can be used to develop sustainable products and services and improve sustainability performance. It also covers the *ISO 14001* family of standards, and other standards that organisations use to improve their performance.

bit.ly/BecomePrac_LO5

MONDAY 1 JUNE

WEBINAR

Digital Environmental Impact Assessment: Benefits, Opportunities and Challenges for Nigeria

In Nigeria, EIA practitioners are already applying digital-based technology for data collection via drones and remote sensing. Other under-used potential and expertise needs to be harnessed to bridge the digitisation knowledge gap between the current and next generations of EIA practitioners in Nigeria.

bit.ly/DEIA_Nigeria

WEDNESDAY 8 JUNE

WEBINAR

IEMA Mid-Year Policy Update

This webinar will provide insights into the key policy issues affecting members, plus an update on the steps being taken to engage with government to ensure that policy, regulatory and legislative development is being done in a way that leads to better environmental and societal outcomes over the longer term. It also explores the latest developments from the Environment Act including target frameworks, principles and next steps for the Office of Environmental Protection

bit.ly/IEMA_PolUpdate

WEDNESDAY 15 JUNE

WEBINAR

How To: Become a Practitioner – Learning Outcome 6 – Innovative and Leading Practices

This webinar will be delivered by Uche Okere and will cover approaches to innovative thinking. It will explore the importance of innovation in developing sustainable products and providing solutions, using a range of examples. It will also discuss the role of sustainability professionals in driving change within organisations through innovative thinking.

bit.ly/BecomePrac_LO6

THURSDAY 23 JUNE

VIRTUAL FORUM

Air Quality Forum 2022

Gain insight into the latest policies and solutions for meeting air quality targets. Hear from leading air quality experts as they explore the different measures that can be used, from the implementation of clean air zones to the role of urban design and planning that can improve air quality. You will also hear how to engage with communities in this public health issue, resulting in behaviour changes.

bit.ly/AQF2022

If undelivered please return to:
IEMA
The Old School House
Dartford Road
March
PE15 8AE