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Data dilemmas

SARAH MUKHERJEE MBE, CEO, IEMA

ORIANA FENWICK/SYNERGY ART

Hello, and welcome to the last *Transform* edition of 2023 and the first of 2024.

This is the time of year when the northern hemisphere is getting used to shorter days and colder weather, while colleagues in the south are welcoming spring and summer. However, wherever we are in the world, we are likely to be using data in our professional and personal lives, whether it's sending emails, writing reports or communicating with friends and family. We're probably very aware of the electricity we're using in our homes and offices, but do we ever include the carbon footprint of the data we are using and storing? Chris Seekings considers the costs to the planet of our inboxes, and what we can do to mitigate them.

The brilliant policy team here at IEMA have recently published, with the help and support of our incredible expert members, a '101' guide on the circular economy. It's a great way to understand the principles of the circular economy and how you can adapt them to your own sector. You can find it in the policy and practice pages of the website. But is 'circular economy' a synonym for greenwashing in some organisations? David Burrows investigates how to make the circular economy more meaningful.

Those of us who are fortunate enough to be able to invest, or put some money into a pension fund, have probably looked at ethical investments and how to ensure that your savings are doing good. But have you looked beyond what the fund managers are telling you and investigated the assumptions they are making on what a future economy stressed by climate change will look like? Huw Morris has some interesting and concerning information to share.

Well, that's it from me. May I wish you, on behalf of the whole IEMA team, a peaceful end to 2023, and a joyful and prosperous New Year.

"We're probably very aware of the electricity we're using in our homes and offices, but do we ever include the carbon footprint of the data we are using and storing?"

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.

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ROUNDUP

IEMA NEWS AND COMMENT

INQUIRY

IEMA responds to parliamentary inquiry on the role of natural capital in the green economy

BY LESLEY WILSON

In 2021, Sir Partha Dasgupta highlighted the essential role of natural capital in the green economy in his review, *The Economics of Biodiversity*. The review stated that our economies, livelihoods and wellbeing depend on nature, therefore making it one of our most precious assets.

Referencing this review, the parliamentary Environmental Audit Committee launched an inquiry on the role of natural capital in the green economy in July. The aim of this was to consider the current and future role of natural capital with a focus on financing the green economy.

The inquiry asked some really important questions about the contribution of private capital to secure nature recovery, plus the role of the green taxonomy and the risk of greenwashing. The inquiry also seemed to be asking how the UK could play an international role in establishing nature markets while attracting inward investment.

An IEMA workshop identified key points to develop a comprehensive response. The institute emphasised the importance of having an appropriate regulatory environment for nature markets to ensure transparency and success. This would include the government demonstrating what return on investment might look like to encourage outlay, helping to create capacity and good communications to support action such as case studies. Practical but robust, standardised ways to measure and monitor biodiversity credits and units over long periods are essential for both success and to avoid greenwashing.

Does nature affect the green economy?

The response also stated the need to deploy good operating principles based on the mitigation hierarchy, creating additionality, following the Lawton principles of the right thing in the right place, and an approach that is bigger, better and more joined-up. The response also pointed towards the Taskforce on Nature-related Financial Disclosures as a tool.

For IEMA's full response, visit www.bit.ly/NaturalCapitalResponse

CONSULTATION

Reforms to the Nationally Significant Infrastructure Projects consenting process

BY RUFUS HOWARD

IEMA responded in September to the UK government's consultation on the details of the operational reforms it is looking to make to the Nationally Significant Infrastructure Projects (NSIP) consenting process as put forward in the NSIP reform action plan (February 2023).

In its consultation response, IEMA welcomed many aspects of the proposals for operational reforms to the NSIP consenting process. The institute recognised that the demands of the system are changing, and the government's National Infrastructure Strategy (2020) and British Energy Security Strategy (2022) both called for the infrastructure consenting process to be made better, faster and greener.

IEMA welcomed proposals to improve and strengthen consultation and engagement with communities and councils, which will put them at the heart of the decision-making processes. It is also supportive of reforms that aim to make the process more transparent and easier for all stakeholders to navigate and, crucially from IEMA's point of view, to ensure that consultation and environmental requirements are 'proportionate and clearly understood'.

IEMA also called for the strengthening of public sector capacity and resources. It welcomed acknowledgement of capacity and competency constraints within the public sector, and recommended that a long-term and systematic approach is taken to improve capacity and competency through investment in staffing, recruitment, training, guidance and salary benchmarking to ensure adequate provision of competent experts.

You can read IEMA's full NSIP consultation response at www.bit.ly/NSIP-response

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PUBLICATION

Get up to speed on local nature recovery strategies (LNRS)

BY LESLEY WILSON

Local nature recovery strategies (LNRS) came into force through the 2021 Environment Act, bringing in new obligations for 48 'responsible authorities' (RAs) – typically county councils and mayoral combined authorities across England – to recover nature. The act requires RAs to prepare an LNRS for their areas in collaboration with partners from the private, public and voluntary sectors. Since then, information has been arriving slowly from government.

Local Nature Recovery Strategies – A Pathway To Prosperity is a new IEMA paper written by Andrew Clark, principal ecologist at the Merseyside Environmental Advisory Service. It provides an overview of what LNRSs are, what we know, policy context and what comes next so that all environmental professionals linked to LNRSs, land managers and local authorities are up to speed.

The paper looks at how to prepare an LNRS, key stakeholders in the process and wider environmental benefits, and considers the strategic significance of different locations for action. It also talks about different delivery mechanisms, including biodiversity net gain, statutory biodiversity duty and others such as available funds and grants, agri-environment schemes and emerging carbon and nutrient markets.

The paper is full of links to legislation, information and guidance from government, and primers and additional information from other organisations. Its aim is to help stakeholders feel confident about getting involved or getting started. **You can find the paper online in the IEMA reading room**

PUBLICATION

Guide to help businesses use circular strategies

BY ADAM BATCHELOR

The IEMA Circular Economy Network Steering Group has published a guide on how to integrate circular strategies into your business model.

In just six years leading up to 2023, the global economy extracted and used more resources than in the entire 20th century, according to the Circle Economy Foundation's *The Circularity Gap Report*. Traditional business models (take-make-use-dispose) drive our overconsumption of raw materials, energy, water and land, and thereby contribute to the increase of carbon emissions.

Organisations of all types will play a vital role in the transition to a circular economy. However, without a clear strategy to address an organisation's footprint and reduce our reliance on virgin materials, there is a risk that a circular business model won't make a significant positive impact and could result in rebound, which is when efficiency gains from new approaches fail to materialise. This means that the shift to circularity needs to happen before the business model stage.

This new guide builds on the six goals in the *Circular Economy 101* report (which IEMA published in July and is available from www.bit.ly/CE101) to show how these can help develop overarching circular strategies – for example, keeping products in use for longer. The guide aims to identify and answer key questions to help organisations use circular strategies to develop better, circular business models. The guide covers the following sections:

- Section 1 considers circular strategies and their importance for organisations.
- Section 2 explains what we mean by the term 'business model' and what makes a business model circular.
- Section 3 provides insight into circular business models in practice, including case studies.
- Section 4 sets out the imperative for circular business models, explaining why they are better than 'traditional' business models that generate negative impacts and lost value.
- Section 5 considers how to bring the whole organisation along with you.
- Section 6 explains how and where to find value and revenue in circular business models.
- Section 7 discusses the enablers that move circularity forward.
- Section 8 looks at the barriers to businesses that are wanting to adopt circularity.
- In sections 9 and 10, we provide further reading and key references.

The toolkit will be available to members as an interactive document or as a page-by-page PDF. It will be available online in the IEMA reading room

IEMA wins prestigious award

IEMA received top honours at the Cvent CONNECT Europe Awards held on Wednesday 8 November 2023. IEMA Connect 2023 won the Cvent Excellence Award for Best Virtual Experience for driving attendance, delivering compelling content and enabling valuable attendee engagement through virtual conferences, webinars or other digital events. This accolade further exemplifies IEMA's virtual event expertise and success. Pictured receiving the award are (centre) IEMA's Lisa Pool, Jocelyn Campbell Stark-Bright and Mariabelen Malaga-Hardy.

CONFERENCE

Putting green skills to the fore at COP28

BY BEN GOODWIN


Skills development is key to tackling the climate emergency

In the August/September edition of *Transform*, I wrote about a green skills campaign that IEMA has been running in the lead into COP28. As a reminder, the campaign is focused on ensuring that the negotiations taking place in the United Arab Emirates (UAE) effectively recognise the need to invest in and develop a global workforce that can tackle climate change.

The institute believes this will be best achieved if the COP28 cover text – the high-level record of the decisions that will be reached at the negotiations – mandates signatories to the Paris Agreement to include a detailed education and skills investment and development roadmap as part of their national strategies to tackle climate change. This is currently not a requirement.

IEMA has written a letter to the UK's energy minister, Graham Stuart, pressing him and the UK's delegation to COP28 to champion our campaign to key decision-makers and stakeholders in attendance in the UAE.

The letter was co-signed by several of IEMA's corporate partners, influential professional bodies, plus key business and interest groups. We hope our calls are heard and that the UK puts the green skills transition front and centre of its efforts during COP28.

IEMA will be represented at COP28 by Sarah Mukherjee MBE and Martin Baxter (IEMA CEO and deputy CEO, respectively). They will be speaking about our campaign aims at a range of events during the negotiations. **The institute will be hosting a webinar on 13 December exploring the outcomes of COP28. To sign up and to find out more, visit www.bit.ly/COP28webinar**

PUBLICATION

Report explains 'stacking and bundling' and the importance of nature markets

BY LESLEY WILSON

Everybody is talking about nature markets. In July, the government published its statutory biodiversity credit (distinct from a biodiversity unit) guide prices and information for calculating costs.

Also in July, the parliamentary Environmental Audit Committee launched the nature finance-focused inquiry on the role of natural capital in the green economy. IEMA responded to the inquiry – our key recommendations are also covered in these pages.

Earlier this year, the government also published *Nature Markets: A Framework for Scaling Up Private Investment In Nature Recovery And Sustainable Farming*.

Nature markets are a relatively new concept and are seen as a way to deliver environmental policy on reducing greenhouse gas emissions and improve nature by pulling private finance into the biodiversity sector. Nature markets enable land managers (typically) to sell benefits from nature to individuals or organisations. These sales provide an incentive for markets to protect and enhance nature. A key part of this is stacking and bundling.

Stacking and bundling of nature, where nature can provide multiple benefits simultaneously over time, is seen as an essential part of nature markets. Stacking refers to when different ecosystem services on a piece of land are sold as separate units of trade or credits. Bundling refers to when more than one ecosystem service produced on a piece of land is sold as a single trade or credit to a single buyer.

In October, IEMA published a paper that explains what nature markets are and why they are important, what stacking and bundling means, the role of additionality in the process, and the pros and cons of stacking and bundling. It has a list of recommendations to ensure that nature markets are set up in a way that can be most effective and transparent. The paper also includes a useful glossary of terms, a list of examples where different revenues can be stacked, referring to legislation where relevant, and includes two case study examples.

This is an essential document for all environment professionals, especially land managers and project developers who want to better understand the value of nature markets, what stacking and bundling looks like, regulation and opportunities.

The paper is available to read at www.bit.ly/StackingAndBundlingReport

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SOFT POWER

Lisa Pool on how IEMA is shaping a sustainable future with impact assessment

For more than three decades, IEMA has been setting standards in the complex realm of impact assessment (IA). In a field where legislation often sets the boundaries but lacks specificity, IEMA's guidance has demonstrated influence and expertise when environmental impact assessment (EIA) was a budding field (it only gained substantial recognition in the late 1980s).

IEMA's guidance carries significant weight with key stakeholders, experts and regulators. It possesses a unique soft power – its ability to fill the gaps left by legislation. Planning officers, inspectors and statutory consultees frequently advise applicants that IEMA's guidance should be followed.

In April 2022, the secretary of state for transport made extensive reference to IEMA's IA and greenhouse gas (GHG) emissions guidance in the decision letter for the M54-to-M6 link road application. This endorsement underscores the trust placed in IEMA's expertise, transforming its recommendations into a *de facto* industry standard. More recently, in a landmark Supreme Court case over the expansion of oil wells in Surrey, the lawyer representing the appeal referenced the guidance. In the absence of stringent laws, professionals turn to IEMA as an authoritative source.

A growing influence

Another example is the *Landscape and Visual Impact Assessment* guidance, first published in 1995 by IEMA and the Landscape Institute. This document has become a recognised framework, with updated editions published in 2002 and 2013. It is still used by professionals today, with a recent volume of the *Impact Assessment Outlook Journal* providing thought pieces from UK practice. This illustrates the essential role that IEMA plays in standardising practices.

Moreover, IEMA's guidance goes beyond professional circles. Non-governmental organisations (NGOs) as well as government advisory bodies such as Natural England have embraced IEMA's recommendations. Members of the public are empowered to question why IEMA guidance hasn't been followed.

Internationally, IEMA's IA guidance has become a touchstone for nations striving to develop robust EIA frameworks. Governments from Iceland to Jordan have used the guidance, appreciating its international thought leadership. In the digital realm, IEMA's influence continues to grow; both Nigerian and Danish governments have adopted aspects of IEMA's *Digital Impact Assessment* primer, attesting to the adaptability and relevance of the guidance in an increasingly digital world.

STAY INFORMED

If you're passionate about impact assessment, log in to iema.net/myiema now to subscribe to IEMA's Impact Assessment Network. Through newsletters, announcements and active engagement, members keep abreast of developments. Joining means becoming part of a vibrant community, where knowledge is shared, insights are exchanged and each member contributes to shaping environmental assessment.

The global reach of IEMA's influence was exemplified during the formulation of the European EIA regulations in 2017. During the call for evidence, IEMA led a consultation exercise. The sheer scale of participation from IEMA members eclipsed the collective response from the rest of Europe. This strong voice had a tangible impact, with IEMA's submission being referenced and adopted in 28 EU states, making a significant mark on European environmental policies.

Crucially, IEMA's guidance is not crafted in an isolated office; it's a collaborative effort from IEMA members, who invest their time and expertise to ensure it remains relevant and practical.

Telling a story

A remarkable example of this dedication is *A New Perspective on Land and Soil in Environmental Impact Assessment*, a pioneering document that marks a paradigm shift in the IA landscape. This guidance has the potential to influence projects for the next two decades or more.

IEMA's work in IA is not just a set of recommendations; it's a story of how dedicated individuals have, over three decades, shaped the fabric of IA. IEMA's guidance will continue to serve as a compass, guiding professionals and policymakers toward a sustainable, environmentally conscious future. Each project, recommendation and policy contribution by IEMA and its members resonates far beyond the documents – they echo in the decisions made, the policies formulated and the landscapes preserved, ensuring a greener world for generations to come.

LISA POOL AIEMA is head of marketing at IEMA

An inclusive community

Caris Graham explains how the Diverse Sustainability Initiative came about

Welcome to the first article from the Diverse Sustainability Initiative (DSI). For those unfamiliar with the DSI, I'm thrilled to offer you a warm introduction. For those who have followed the DSI's journey, this is a reminder of the strides we've made.

I'm Caris and I joined IEMA in August 2021, following a career in the civil service and a stint in equality, diversity and inclusion (EDI) consulting. My passion revolves around nurturing inclusive environments, where each individual experiences a profound sense of belonging and safety. This commitment is deeply personal, as I, too, have encountered barriers prior to joining IEMA.

The genesis of DSI began in 2017 when the Policy Exchange report, *The Two Sides of Diversity*, revealed that the environmental profession was the second-least diverse out of 202 UK professions. That shocking statistic and the realisation of the urgent need for change led to the birth of the DSI. Under the leadership of IEMA CEO Sarah Mukherjee MBE, its initial aim was to raise awareness about the industry's diversity deficit to urge organisations to join as partners and to publicly commit to improving these statistics. We hold our partners to account by requesting updates on their commitments.

Our initiative has since undergone a transformation, marked by an agency called The Better Org, which carried out research and conversations with partners that led us to creating a new strategy, vision and mission, all accessible on our website. In October 2021, we launched the People of Colour Network. It began as an inclusive community for people of colour working with our partner organisations. It has since evolved into an open network for anyone in the environment and sustainability profession identifying as a person of colour.

Diverse Sustainability Initiative

This community convenes monthly for casual coffee chats, providing a safe space to address barriers. Additionally, quarterly formal meetings, led by Sarah Mukherjee MBE, offer a structured platform for vital discussions. The network also has a Microsoft Teams channel for members to connect and an anonymous form for discreet inquiries or suggestions, or to express concerns, which we can then address as a group.

"This community convenes monthly for casual coffee chats, providing a safe space to address barriers"

In 2023, we introduced the LGBTQIA+ Network, designed to operate in a manner similar to the People of Colour Network. Our vision includes continued growth, with the potential of opening them up to allies, fostering support for marginalised individuals within the profession.

Throughout 2023, our focus has been on education. IEMA has provided funding to external agencies to conduct workshops and webinars on various EDI topics. These resources have been instrumental in addressing the concerns of our partners and network members. Furthermore, our partners actively share their best practice and improvement methods through webinars, encouraging a culture of learning. We understand that there is no one-size-fits-all solution in EDI, and our initiative embraces the ongoing learning journey.

Participation in our initiative is open to any organisation or consultant within the profession. There are no membership fees for partners; we simply ask for a public commitment to champion diversity. Partners are encouraged to take an active role by offering funding or resources, engaging in discussions or contributing insightful commentary and observations to support our cause.

Those not officially affiliated as partners can also make a difference through amplifying our work and networks, dedicating time to volunteer or by sharing resources. Your contributions, no matter the size, are vital in our collective endeavour to foster EDI within the sustainability profession.

A FORCE FOR TRANSFORMATION

The Diverse Sustainability Initiative is not just another initiative; it's a tranformative force that unites professionals from various backgrounds in a collective effort to create an inclusive, equitable and diverse sustainability profession.

Keep an eye out for further details across our print and digital channels.

And to explore the ways in which you can participate and support our initiative as a partner or an individual advocate, please email: info@diversesustainability.org

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CARIS GRAHAM ***(she/her)*** **is Diverse Sustainability Initiative officer, IEMA www.diversesustainability.net**

The UK's renewables industry is being used to extend the life of the sector that is driving us towards climate breakdown. **Tom Pashby** reports

Illustrations of green energy often show wind farms with turbines turning, accompanied by upbeat music and optimistic images of greenery and low- or zero-carbon technologies. The aesthetics are supposed to inspire hope for a climate-friendly future that has left fossil fuels to the history books.

We have accepted that wind and other forms of low- or zero-carbon power generation will fuel the transition to a net-zero carbon economy. So it might come as a surprise that Norwegian energy giant Equinor's new Rosebank oil field in the North Sea, which has the potential to delay or stall that transition, was at one stage to be powered by a wind farm on the Shetland Islands.

The fossil fuel sector has recently got into the habit of publishing its attempts to decarbonise – particularly its scope 1 (operational) and scope 2 (supply chain) emissions. Scope 3 covers end-user emissions, such as burning coal, lignite, oil and gas.

In summer 2023, Equinor issued a statement to the UK government in which it said it was considering powering operations at Rosebank with electricity generated by on- and offshore wind turbines on the Shetland Islands.

The situation presents a series of contradictions and muddled priorities. It raises questions about the credibility of trying to decarbonise the fossil fuel sector, given that its massive scope 3 emissions are effectively unavoidable and so avoided in carbon accounting.

It is possible to significantly decrease the fossil fuel industry's scope 3 emissions by nationalising the sector and imposing conditions on purchase contracts stipulating that fossil fuels are used exclusively to manufacture non-combustion-related products. That would mean eliminating petroleum and diesel, and instead focusing on synthetic materials, plastics, cosmetics, clothing and other polymers.

But that's not going to happen any time soon because of the money that can still be made in petrol station forecourts, despite the forthcoming ban on new combustion engine cars.

Rosebank potentially being powered by a wind farm doesn't represent a huge departure from other fossil fuel projects in the UK. Renewables are increasingly connected to the grid and are subsequently being used to power fossil fuel extraction activities.

Most of us still rely heavily on oil and gas in our daily lives. The electricity grid has substantially decarbonised (away from coal) over the past two decades, in part because of increased use of gas and the expansion of offshore wind.

In the UK and beyond, there is plenty of demand for oil and gas. The brutal economics have convinced the UK government to approve Rosebank, despite protests from its climate advisers about exceeding the carbon budgets set according to the Climate Change Act 2008.

Choosing to abide by the vagaries of economics is just that – a choice. Governments and companies could choose instead to transition quickly to a net-zero and carbon-negative economy. It would require financial investment and taking on some risks. However, the risks associated with not transitioning quickly are far greater, but markets have not priced in those longer-term risks, in part because they expect governments to keep making transitioning a problem for the next government.

We have a values contradiction at the core of these conundrums. Renewables represent an optimistic, progressive, sometimes even liberal image of the type of society we want to live in. Whereas fossil fuels represent regressive, elitist, centralised and traditional values.

Boards of directors, shareholders, employees, law-makers and communities should be considering whether the economics 'making sense' is enough of an argument to warrant using renewables capacity to delay the transition to a net-zero economy.

Is it okay that our post-imperial collection of islands, which claims to be a global leader in climate action, can go on as though the climate emergency was a flash in the pan during the 2019 uprising inspired by Greta Thunberg and Sir David Attenborough?

There are skilled professionals working towards a sustainable future across industries and it does them a disservice to use the UK's renewables industry to extend the life of the sector that is driving us towards climate breakdown.

"Renewables are increasingly connected to the grid and are being used to power fossil fuel extraction activities"

SHUTTERSTOCK

TOM PASHBY AIEMA is a digital journalist at IEMA

FINDING OUR FOCUS

Individual action or systems change? Which is the best route to net zero? **Sophia Mwema** weighs up the options

The difficulty of inspiring sufficient individual action versus the complexity of implementing systems change – does one take precedence over the other? Can both be a focus for us? If so, the key questions are 'why' and 'how'.

The debate underscores an essential element in our track record of deflecting responsibility on climate action. For example, a fossil fuel company's popularisation of 'carbon footprint' infamously shifts the blame to individuals and distracts attention from its own accountability.

Despite the agreement on the 'what' – which is the need to act – there is significant divergence in the modalities. Questions like who needs to take responsibility often distract us from the agreement and the urgency required. I will attempt to demonstrate the importance of both individual action and systems change as well as the possibility of not having to choose between the two and implementing both to achieve the same goal.

Systemic change

The sheer scale and complexity of the climate challenge requires systems change, driven by governments, industries and international collaborations. We need large-scale transformations across sectors, industries and societies. Transforming energy systems, transportation networks and industrial processes requires structural interventions. It entails transitioning to renewable energy sources, redesigning transportation modes and implementing circular economies. These actions go beyond the scope of individual behaviour.

Individual efforts undoubtedly contribute, although are often localised. Scaling them to the needed magnitude is logistically challenging and time intensive. Confined within the systems in which they exist, the impact of personal choice is incremental rather than transformational.

SHUTTERSTOCK

Systems create the infrastructure and incentives for broader sustainable practices. Investment in research and development, large-scale infrastructure projects and industry-wide adoption of sustainable technologies require coordination. It is a systemic pursuit to drive innovation and deploy green technologies at scale. The impact of individual adaptation is limited without the broader systemic changes that drive technological advancements and accessibility. We need systemic changes to address social, economic and environmental inequalities, so that climate action benefits everyone. The social implications of the net-zero transition, protecting vulnerable communities and promoting inclusivity, are policy considerations.

Although admirable, individual efforts are insufficient to tackle the systemic inequities deeply embedded in our societies. At the systemic level, policies and programmes address structural inequalities, while individual actions promote inclusivity.

Individual action

Individual actions empower people, raise awareness and drive behavioural and cultural change. Being informed and engaged citizens, individuals vote for eco-conscious leaders and hold officials accountable for climate policies.

In the political reality, the system could be more effective. Therefore, we need to hear from all community members, in addition to technocratic solutions. Individual actions are strong economic, cultural and political signals.

Even in less-than-ideal systems, individuals are not too small to act, especially if they inspire and motivate others to join and drive social change. Grassroots movements often emerge from individual concerns and passions – for instance, energy communities, where concerned citizens pull together financial and technical resources to produce and consume renewable energy within their locality. This illustrates how climate solutions are best implemented at the individual level, in modularity.

Although systems provide the framework to support and amplify individual efforts, it is individuals who initiate them. Government regulations create a level playing field for businesses by motivating climate-conscious consumers to choose low-carbon products. The demand for eco-friendly alternatives influences companies to innovate and meet consumer preferences.

Combining the two

Individual actions or systems change is not a binary choice. A balanced approach that combines individual action with systemic transformation is the way to address the climate crisis comprehensively.

Individuals raise awareness and foster a sense of responsibility, while systemic changes set policies, regulations and incentives to achieve widespread emissions reductions. Simply put, individual actions inspire systemic changes, while systemic changes empower and enable individuals to act effectively. We need both. And urgently.

SOPHIA MWEMA is a sustainability marketing associate and an IEMA graduate member

University challenge

How can the next generation of leaders steer sustainable change in a turbulent future?

The rapidly changing landscape of the 21st century – characterised by accelerating climate change and global ecosystem disruption – represents a fundamentally new set of conditions in which leaders must steer sustainable change. This cascading set of interacting risks has been termed a global polycrisis. As we confront an urgent need to transform economic systems, food production, transportation and energy consumption to align with our planet's limits, a central question emerges: how can emerging sustainability leaders enable profound change in the face of unprecedented complexity and uncertainty?

IEMA university partner, the University of Nottingham, developed the MSc in Environmental Leadership and Management to prepare graduates to respond to this challenge. In spring 2023, students explored the knowledge and competencies essential for effective sustainability leadership in the 21st century through targeted conversations with IEMA members. The project aimed to investigate environmental practitioners' mental models of the future, the challenges they encounter while navigating change in uncertain times and the competencies essential for effective leadership in 2040.

The students interviewed 18 IEMA members from diverse contexts on threats, opportunities and challenges to sustainability, as well as a horizon scan of future leadership skills that will be required to deliver change. Analysis of the interviews as a class revealed what IEMA members consider to be important for effecting change and areas that the environmental sustainability sector needs to explore further.

Interviewees sought change in a variety of areas, including policy implementation, sustainable business practices, education, collaboration and communication. Most expressed deep concern about the planet's future and all agreed on the importance of action, yet many believed that the pace of change will be complex, unpredictable and non-linear in the future.

Conversations covered the personal qualities, leadership skills and professional skills needed by future leaders. Positivity, collaboration and communication were seen as the most essential traits. However, technical green skills are not sufficient to meet the scale and complexity of future environmental challenges – collective transformative change will require the ability to connect with one another at a human level and motivate collaborative action.

Skills, qualities and competencies that will be needed in the future

The skills, qualities and competencies identified by interviewees resonate with established frameworks such as Unesco's Competencies in Education for Sustainable Development and IEMA's Sustainability Skills Map, which covers areas such as analytical and systems thinking, communication, collaboration and self-awareness. Despite respondents' realisation of the likelihood of a turbulent future, there was limited recognition of how such future realities may change the conditions of environmental practice or how cascading impacts of climate change may influence the environmental sector. Conversations remained focused on driving change in the current economic, social and political climate.

This project revealed the value of exploring future environmental imaginations among sustainability professionals to cultivate anticipatory thinking. It would enable the environmental sector to be on the front foot as the impacts of climate and environmental change accelerate.

Environmental organisations can also help practitioners to be more explicit about the mental models of change that link individual roles with broader social and environmental transformation. We suggest identifying how public, private and third sectors might interact and accelerate ambition for sustainability through the lens of systems change.

Lastly, professional bodies such as IEMA are increasingly important for cultivating the skills, competencies and qualities needed for future environmental change.

CHRISTOPHER IVES is an associate professor in the School of Geography at the University of Nottingham. TAHSIN RAHMAN, OTAVIO FERRARINI, MADELEINE LARTER and MOLLIE COX are graduates on the university's MSc Environmental Leadership and Management course

Digital tracking, packaging data delays and new collections provide a waste focus for this edition's environmental round-up by legislation expert **Neil Howe**

As we head into the parliamentary Christmas recess, there's been a flurry of notable developments to end 2023, and some to keep an eye on for 2024 and beyond. Everything you need to know is discussed below.

Retained law reclassified

The Retained EU Law (Revocation and Reform) Act 2023 comes into force fully at the end of the year, removing the special status given to retained EU laws following Brexit. When the UK withdrew from the EU, it retained the majority of EU laws that directly applied into domestic legislation. This included EU regulations and decisions. However, the government argued that the special status given to retained law made it harder to amend, repeal or replace. The act therefore sets out a revocation or 'sunsetting' of specified retained legislation and national legislation derived from the EU, and reclassifies all EU-based laws that have been retained by the UK. They are now to be known as assimilated laws.

tinyurl.com/2nfbfxzn

Digital waste tracking

Defra has confirmed plans to introduce mandatory digital waste tracking across the UK from April 2025. This will give the government information on where and how waste is created, who is handling it, what is done to it and where it ends up. The UK-wide scheme will also help move towards a circular economy and transform the way environmental regulators monitor compliance, prioritise regulatory activities and help prevent waste crime. Next steps are regulations to set out the exact details and amendments to legislation on the waste duty of care, hazardous waste, transfrontier shipments of waste, waste permitting and licensing. The waste duty of care codes of practice will also be revised.

tinyurl.com/mrfc9xbx

Packaging reporting deferred

The packaging data reporting requirements and related fees for large producers under the recent Packaging Waste (Data Reporting) Regulations have been delayed by a year. Government talks and pressure from the industry concluded that the delay will help to reduce the impact on inflation, as enforcing this scheme could push up produce prices, which is not desirable in the current economic climate. A new regulatory position statement has been published that will allow large producers to delay the reporting of data without being liable to a fine, as long as they comply with certain conditions.

tinyurl.com/muupd28u

NEIL HOWE PIEMA is head of writing at Barbour EHS

IN COURT

A director and his waste company that had failed to obtain an environmental permit have been ordered to pay nearly £110,000 following a case brought by the Environment Agency for illegal waste activities.

tinyurl.com/s8rw6dzb

Lastly, in case law, in *ABX Air Inc v Environment Agency*, aircraft operator ABX's appeal against an excessive emissions penalty under the Greenhouse Gas Emissions Trading Scheme Order 2020 has been dismissed.

tinyurl.com/22ahrr3d

ON THE WATCHLIST

Waste collection reforms

The government has announced reforms to household and business bin collections in a bid to boost recycling rates and move to a "common-sense" approach to recycling. The new plan will mean everyone across England can recycle the same things at home, work, school etc. A timeline for implementation has been set out and includes revised waste collections.

tinyurl.com/3jd9hrx2

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Vehicle emissions

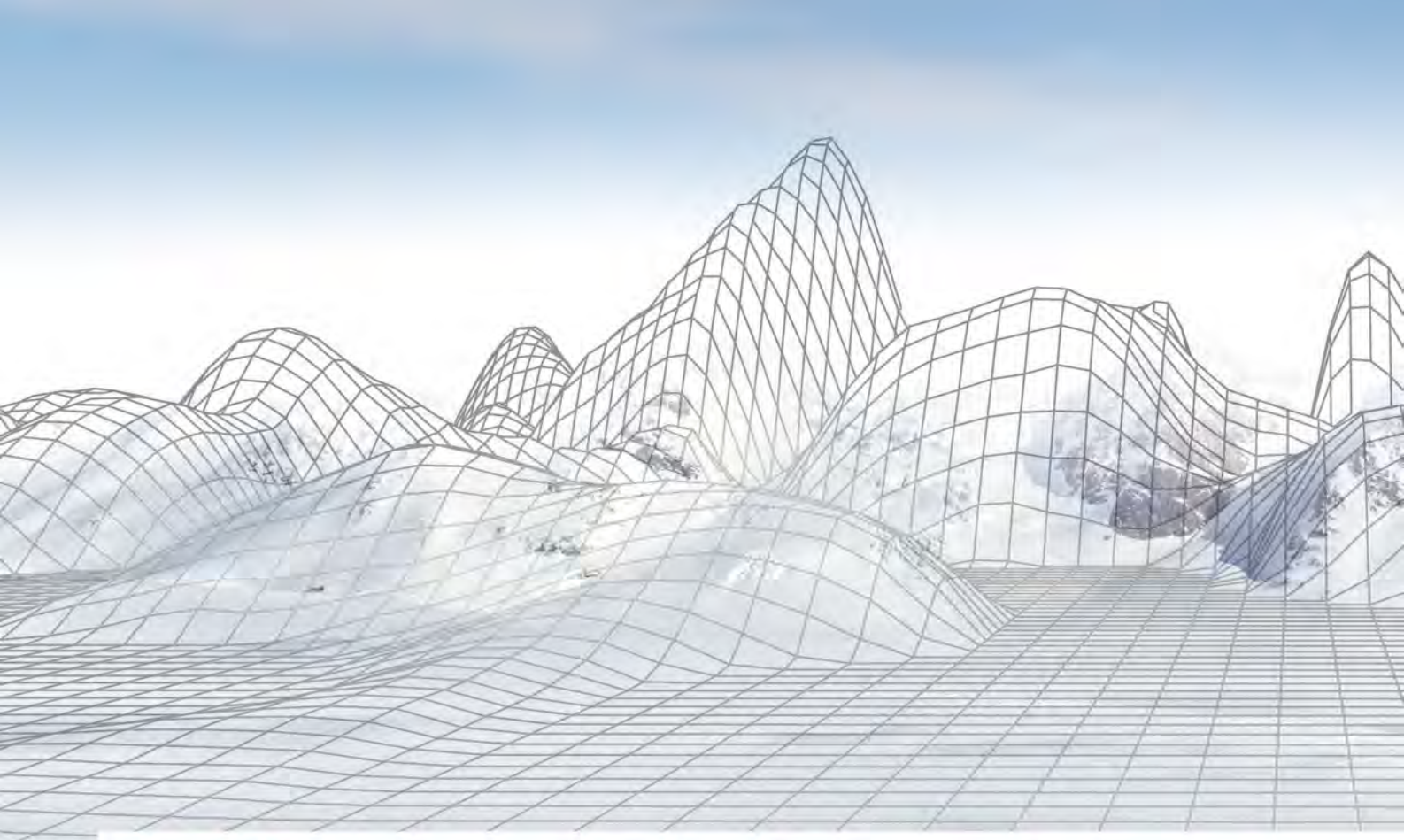
The Draft Vehicle Emissions Trading Schemes Order 2023 aims to establish four new trading schemes, which limit CO_2 emissions resulting from the registration of new cars and light commercial vehicles (vans). They will contribute to the UK's emissions reduction targets and net-zero goal, and form part of the transition to zero-emission vehicles that is underpinned by the commitment to end the sale of new non-zero-emission cars and vans in 2035.

tinyurl.com/bde2tmbt

Wet wipe ban

Defra has consulted on a proposed ban on the manufacture, supply and sale of wet wipes that contain plastic, in a bid to tackle plastic pollution and clean up waterways. Wet wipes containing plastic break down into microplastics over time, which can be harmful to the environment and human health. Banning them would help alleviate this issue, and reduce the volume of microplastics entering wastewater treatment plants when wrongly flushed.

tinyurl.com/mvdjvw5t



A(I) FORCE FOR GOOD?

Scott Hosking, environmental data scientist at the Alan Turing Institute and British Antarctic Survey, tells Chris Seekings how artificial intelligence is helping governments understand and predict the impacts of climate change

From the automation of jobs and the spread of fake news, to the manipulation of elections and erosion of privacy rights, the threats posed by artificial intelligence (AI) are enough to keep anyone awake at night. The technology is also transforming our society in amazing ways, bringing an end to mundane work, giving rise to life-saving medical advances, and helping to solve the world's most pressing challenges, including climate change.

"If we can harness AI as a force for good, it could be transformational in how we reduce our carbon emissions, mitigate and adapt to climate change, support those most in need, and protect biodiversity," explains Scott Hosking, an environmental data scientist and AI expert at the Alan Turing Institute and the British Antarctic Survey.

"This is a pivotal moment with AI – often seen as the fourth industrial revolution – and we've really got to make sure it supports our civilisation as we go into future decades."

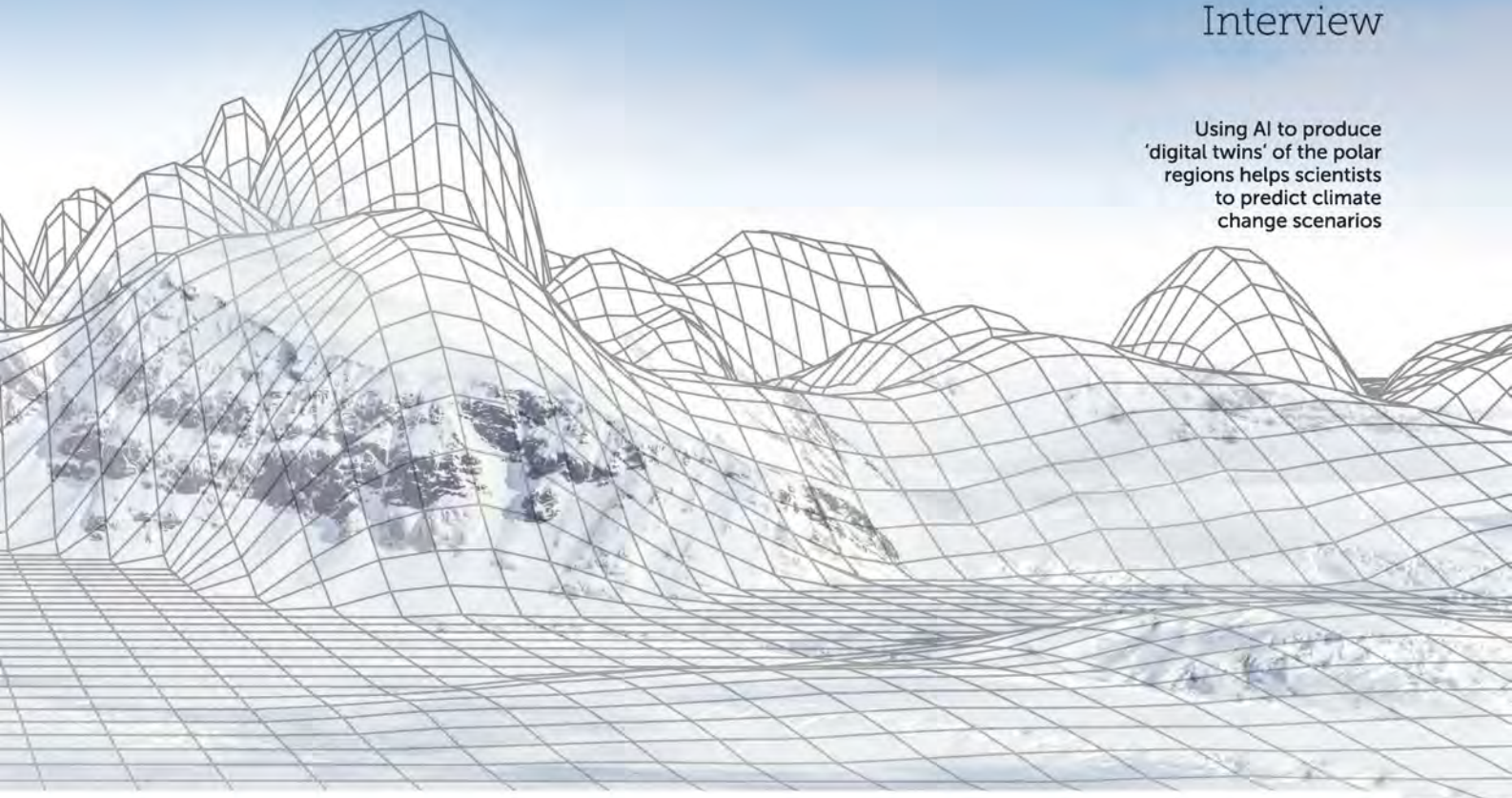
Digital twins

Hosking's area of expertise is monitoring and predicting environmental changes, which he does as head of the British Antarctic Survey's AI Lab, and co-director for the Turing Research and Innovation Cluster in Digital Twins, leading a team of scientists and engineers.

'Digital twins' are simulations, or copies, of what the physical world looks like, which, using AI and machine learning, can be manipulated to test different future scenarios and forecast changes. "We're building a digital twin of Antarctica to understand global sea level rise," Hosking explains. "Antarctica has 60 metres of sea level rise locked up in ice, and although it's not all going to melt at once, even if a small part were to melt or break away and collapse, that could have significant implications for global coastal infrastructure and communities."

Modelling something as complex as environmental changes in Antarctica requires a huge number of data inputs and considerations. Radars, satellites, underwater vehicles, ocean floats, aircraft, drones and ground sensors all collect information to help create a digital version of the physical world.

"They all have their strengths and weaknesses, so we need to bring those



Using AI to produce 'digital twins' of the polar regions helps scientists to predict climate change scenarios

different datasets together, and fill in gaps using AI and machine learning approaches where possible," Hosking says. "With a digital twin we can ask what would happen if a piece of ice sheet breaks off? How would ice flow faster to the ocean? What would that mean for the global sea level in a few years' or decades' time?"

He tells me how, in January this year, a huge part of ice broke away from Antarctica, and that it took around eight months to identify the resulting increase in ice flow. "With a digital twin, you'd get that update in a much speedier manner, which can also act as an early warning system for decision-makers and governments. It can be a hugely powerful and important tool."

A glimpse of the future

When it comes to predicting sea level rise, the Antarctic Ice Sheet contribution remains the biggest uncertainty, and its deterioration is considered a climate system 'tipping point'. Under a worst-case scenario, the West Antarctic Ice Sheet is lost by 2300, sea levels rise by 16 metres, over a billion people face coastal flooding and emperor penguins are long extinct.

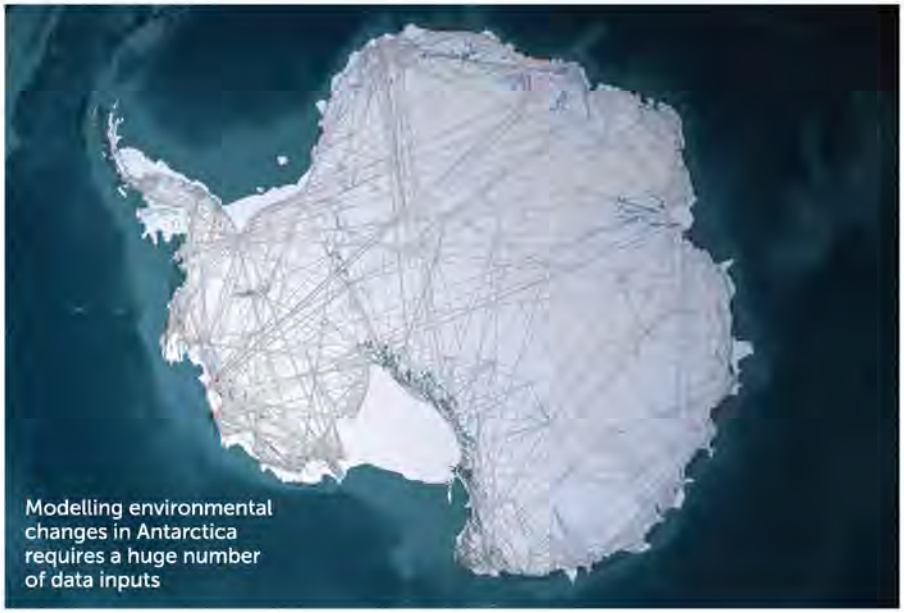
"There are also climate model scenarios that show ice-free summers in the Arctic by the middle of this century, so understanding that process is important for supporting indigenous communities that rely on sea ice for hunting, fishing and migration, and for supporting wildlife like polar bears and caribou," Hosking explains.

"With a digital twin we can ask what would happen if a piece of ice sheet breaks off? What would that mean for the sea level?"

SCOTT HOSKING

However, there are more positive scenarios where we reach net zero by 2050, the climate stabilises during this century, extreme weather events stop becoming more frequent, and summer sea ice extent remains in the Arctic. "There is still a great deal of uncertainty, which is why bringing together the different sensors and data that we have is so important for tightening those forecasts. If we can close that uncertainty gap, we can make better decisions in the future with regards to coastal infrastructure to ensure we don't over-engineer solutions or under-engineer coastal defence systems to cope with sea level rise."

Harnessing AI and vast quantities of data to predict climate changes and the numerous additional uses is extremely carbon intensive. Researchers at the University of Massachusetts, Amherst, have found that training a single AI model can emit more than 283,949kg of CO_2, which is around the same amount



Modelling environmental changes in Antarctica requires a huge number of data inputs

of greenhouse gas that would be emitted by 62 petrol-powered passenger vehicles driven for a whole year.

"As environmental scientists, that's something we need to keep a very close eye on. But by bringing scientific and machine learning expertise close together, you can reduce the computational and carbon burn from models," Hosking says. "We can design models that make efficient use of data and don't have to be so big and complex."

Sustainable models

Machine learning is often seen as a 'black box' process, which produces useful information without revealing the internal workings and how that information is calculated. "We've done a lot of work to understand how the models actually work and to untangle what we are doing to create simpler processes – there's no point over-engineering a model when a simpler model will do it and will also reduce carbon and improve the interpretability."

However, a lack of access to cross-disciplinary expertise remains a significant barrier to streamlining models and harnessing the true potential of AI. "There are great AI and machine learning experts who would struggle to understand the application in certain areas, whether that's health, the environment or astrophysics," Hosking explains. "There is a communication barrier, and the only way to get over that is to have deep conversations, ask lots of questions and get to know each other, and part of my role is bringing these groups together."

> "We've got to make sure that the whole of society benefits [from AI] and it doesn't just benefit the top 1%"

He says that virtual and augmented reality are also going to be an important communication tool and will help stakeholders visualise the changes in the environment. "Environmental sustainability requires us to think broadly, including social sciences, environmental sciences, infrastructure for net-zero cities etc., and we really need to find a better way to explore the breadth and complexity that lies across the environment and sustainability space."

This raises the question of how far AI can be used as a tool for tackling some of the broader social challenges we face. Could it be used for determining government budgets for health services and house building, for example? Could it be used for identifying corruption, or potentially even replace politicians?

"I see AI and machine learning as tools that can support decision-making, but the ultimate decisions should be made by people," Hosking reasons. "However, there are a lot of processes that go on in governments, research labs and industries that are repetitive and time-consuming, which can be automated. The more we can use AI to do that, the more we can get our politicians, business leaders and scientists to focus on what they are trained to do."

Safeguards and ethics

Earlier this year, more than 1,000 tech leaders, researchers and others, including Elon Musk and Steve Wozniak, signed an open letter warning that AI tools present "profound risks to society and humanity", arguing that developers are "locked in an out-of-control race to develop and deploy ever more powerful digital minds that no one – not even their creators – can understand, predict or reliably control."

Last month, 28 governments agreed to work together to combat these risks after signing up to the Bletchley declaration at the AI Safety Summit in the UK.

Hosking says it is important to put safeguards in place and explains how specialist groups are looking at the ethics of AI. He continues: "We are seeing a J-curve in the capabilities of AI, and huge acceleration with this technology month by month, and so we've got to make sure that the whole of society benefits and it doesn't just benefit the top 1%."

To democratise AI and digital twinning technology, his team are developing open-source toolkits to make sure they can be adopted by the wider research community and other stakeholders.

"AI can be used to generate great pictures and content, but we need to make sure we have factchecking in place, and that governments and industry step up to ensure they are transparent about where that content comes from, otherwise it becomes untrustworthy and the benefits are lost," he explains. "AI can be a gamechanger as a force for good, but without the necessary safeguards, governments could leave it in the hands of a few tech companies, and that is just too dangerous."

FROM RUBBISH TO REFUSE

David Burrows on the stolen concept of a circular economy, and how reduction must be at the heart of product design

Do we know what a circular economy is any more? The question was posed in an article in *Grist*, a non-profit online magazine focused on climate change, following Circularity 2023, an annual US conference aimed at accelerating the circular economy. Most of the activity among the global corporates gathered in Seattle reportedly focused on recycling and specifically on recycling plastics. "I came away feeling like circularity has become synonymous with recycling," said Sarah King, head of Greenpeace Canada's oceans and plastics campaign. "[It's] like we've lost the true definition," she added.

Her concerns apparently reflected a "broader uneasiness" within the environmental community about the way corporations have embraced circularity in their communications but are not necessarily living up to its standards in practice. Is this really the case? In short, yes. Who is to blame and whether this is necessarily a bad thing are more complicated to answer.

The *Grist* article raises concerns that resonate with experts in the UK. The think tanks, NGOs and consultancies we spoke to all said the circular economy has become synonymous with recycling. Debbie Hitchen, director of sustainable production and consumption at consultancy Anthesis, captured the zeitgeist when she said: "The concept of circular economy has long been abbreviated down to the lowest common form of interpretation, because it's a complex subject to communicate. Many organisations talk about circularity when they mean recyclable, or, at best, recycled content and recyclable. This doesn't mean these initiatives are not achieving some sustainability benefits, but the real social and environmental gain is to be found in the territories of the other 're' solutions: reduction, repair, reuse, remanufacture, for example."

In responding to *Grist*'s takedown of its conference, GreenBiz noted that the circular economy "can't be an exclusive club" and that "progress on recyclability is incremental but progress nonetheless". Fair points. But there was little evidence of a way forward or recognition of how slowly things are moving (even on recycling of packaging).

Many fast-moving consumer goods companies are content for recycling to remain the focus because it means their business models barely change. This also leads to a peaceful life for politicians keen not to rock the market too much. But to deliver the circular economy required to meet net zero, business models have to be broken and policymakers must make painful choices. And soon.

Shouting the c-word

Recycling is actually the least-best option within the circular economy. So, when you hear the words, 'We can't recycle our way out of this', it actually means we need to focus on reduction and reuse. These are tougher nuts to crack because of the c-word that everyone wants to ignore. "Reduction needs to be at the very heart of the circular economy," explains Libby Peake, head of resource policy at Green Alliance, "[but] that brings you to the question of consumption."

Some limit the lifespan of products to make money

How can selling less be good for business or GDP? It is a topic *The Economist* grappled with five years ago. There were details of the light bulb manufacturers that agreed to ensure their products only last a maximum of 1,000 hours, and companies that made it difficult to mend or repair their products. "The question is how to persuade those firms to go against their apparent self-interest [of selling more] to create a more circular economy," the report reads.

There is plenty of evidence showing the financial and environmental benefits of the circular economy – from job creation and more efficient use of resources to greenhouse gas (GHG) emission savings. In the UK alone, the circular economy could add £82bn to the economy and create 99,000 jobs, as well as save 33 metric tons of carbon dioxide-equivalent (MTCO2e) associated with consumption.

Globally, emissions from the production of materials like metals, minerals, woods and plastics more than doubled between 1995 and 2015, accounting for almost 25% of all GHG emissions worldwide; but the

"In the UK alone, the circular economy could add £82bn to the economy"

issue receives far less attention in climate discussions than food, energy or transport. Consider food waste, for example: reducing it is an economic and environmental win, and yet we are struggling to do so. Or how few reusable options there are for collecting groceries or even takeaway coffee.

CO2 and the circular economy

In a 2022 report, Green Alliance noted that developing the circular economy is an "underutilised solution" for the UK's net-zero transition and post-Covid economic recovery. It also highlighted that the extraction and processing of resources go "far beyond" carbon, causing over 90% of nature loss and water scarcity, with negative impacts on local communities and biodiversity alike.

Peake is among those crying out for ministers to intervene and encourage more circular thinking. The UK government is "really falling short" when it comes to resource productivity policies, adds Adam Batchelor, policy and engagement lead for circular economy and environmental management at IEMA. We are lacking the policy drivers for people to operate on those 'higher Rs' in the waste hierarchy, he adds.

The government's waste prevention programme – 'Maximising resources, minimising waste' – relies heavily on voluntary agreements, for example. There is a long-term target in place, set under the Environment Act, to reduce residual waste, measured in kilograms per capita, by 50% by 2042 from 2019 levels (574kg per capita). But this is far less ambitious than the original plans, which also included a resource efficiency target. "If there is no resource efficiency target then what are the constraints on reducing the stuff we use," Colin Church, CEO at the Institute of Materials, Minerals and Mining (IoM3), told me when the target was announced. A case of the c-word being ignored again, it seems.

Also ignored in the target are major mineral wastes. An ENDS Report analysis of the latest figures says England produced 133 million tonnes of waste in 2020, and packaging accounted for just 6%.

Construction/demolition waste accounted for 40% of mineral waste in England in 2020

Municipal and household waste accounted for another 25%. However, the remainder was commercial and industrial waste (25%) and, significantly, construction and demolition waste (40%). The latter, constituting 53 million tonnes, is the portion not included in the target.

New policies tend to focus on the easier portion of our waste, and on recycling rather than higher up the waste hierarchy at reuse and reduction. It is clearly not enough. Can businesses step up alone?

Green Alliance research suggests it won't be easy. Net-zero commitments are forcing companies to look at circular models in order to reduce emissions; increasing scrutiny of business impacts on biodiversity will add further pressure to consider resource impacts. A level playing field would accelerate change, though. The Treasury, as detailed in a Green Alliance report, may well have a unique role to play. It could address parts of the tax system that actively discourage greater circularity – for example, by making it zero VAT rated, including on parts and labour.

IEMA has been working on a new *Circular Economy 101* guide, which offers six goals for businesses or policymakers wanting to implement a circular economy. "They need some kind of framework," explains Batchelor, and the guide helps to "demystify" some of the thinking around the concept. There are also priorities for design, at the top of which is 'refuse' – the product may not need to exist in the first place. Companies also need to think about reuse and how to repair the products (something we are seeing from EU policymakers and potentially through Scotland's Circular Economy Bill).

Legislation takes time, though, which leaves businesses needing to make "big moves" on circularity, according to Sian Sutherland, co-founder at NGO A Plastic Planet. "This starts at the design stage, because they may be responsible for products beyond their end of life and into second, third and fourth lives," she says.

Movers and shakers

Those that understand the significance of resource efficiency and act now will be the resilient businesses (and economies) of the future. There are signs of progress, albeit piecemeal. "Typically, it's easier to start a company with circularity embedded at the heart of the operating model than it is to retrofit it," explains Hitchen at Anthesis.

There is excitement around platforms such as Vinted and Thrift for secondhand clothes, but there are also tool libraries and companies that 'sell light' rather than light bulbs and fixtures; and even an entire building that can be reused. The Ellen MacArthur Foundation has a growing library of startups that demonstrate one or more principles of the circular economy. "These startups are all on a journey and collectively contributing to the circular economy transition," the foundation notes.

As GreenBiz argues, collaboration will be key. Lessons will also be learned. Some businesses have already headed down cul-de-sacs (such as downcycling plastic bottles into clothing rather than 'new' bottles). As the European Parliament notes in its definition of the circular economy, it is a model of consumption and production that involves "sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In practice, it implies reducing waste to a minimum." The sooner businesses and policymakers realise that, the sooner the benefits of circular thinking can be maximised.

DAVID BURROWS is a freelance writer and researcher

"It's easier to start a company with circularity embedded at the heart of the operating model than it is to retrofit it"

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THE TRUE COST

Groundbreaking research warns that the models used by the finance sector to predict climate scenarios could easily sink our retirement pots... and the global economy. **Huw Morris** reports

Economists would call it a perfect storm and the worst since the Great Depression of 1929.

Predatory lending to low-income home buyers, suicidal risk-taking by some financial institutions and the collapse of the US housing market combined to send the global economy into free-fall.

Ultimately, the International Monetary Fund estimated that US and European banks lost around $1trn in toxic assets. Some of those institutions had to be bailed out. This strangled credit, causing businesses to falter, some to crash and unemployment to soar. Evictions went through the roof.

At one point, the UK's then chancellor Alistair Darling thought the country was within hours of "a breakdown of law and order". Later on, Iceland's three major banks went bust. So did Greece.

This was the global financial crisis that started in 2007, was still reverberating into 2011, and wiped more than $2trn from the global economy. Steve Keen thinks it could happen again.

The distinguished honorary economics professor and research fellow at University College London warns that financial institutions, regulators, central banks and governments are ignoring another impending collapse. Climate change could be the culprit this time.

His study for financial think tank Carbon Tracker points to an overnight crisis that has been years in the making. Economists are modelling future markets on "flawed data" that fails to consider climate tipping points, with investment decisions ignoring the economic and physical impact of climate change. Pension funds in particular are risking the retirement pots of millions of people.

Temperature rises and GDP

Keen's research reveals how many pension funds use investment models that predict that global warming of 2°C to 4.3°C will have a minimal impact on gross domestic product (GDP) and portfolios. Some institutional modelling even claims a 7°C rise in average temperatures would see continuing economic growth. In his review of 738 climate economics papers in leading academic journals, the median prediction was that a 3°C temperature rise would reduce global GDP by 5%. A 5°C rise would see a 10% fall in GDP.

Yet more intense heatwaves, floods and storms will throttle crops, create uninsurable areas and damage infrastructure, Keen's study says, pointing to warnings in scientific literature that exceeding the 1.5°C target set by the Paris Agreement would be "dangerous". Breaching 3°C would be

OF RETIREMENT

"catastrophic". Hitting 5°C would pose "existential threats".

Tipping points, such as the loss of winter ice in the Barents Sea off Norway and Russia or the disintegration of deep convection in the Labrador Sea, could mean more extreme weather. Economists have yet to take these into account, he warns.

"Global warming is not a minor cost-benefit problem that will mainly affect future generations, as the economic literature asserts, but a potentially existential threat to the economy that could occur within the lifespan of pensioners alive today," Keen says. "We are talking about the financial futures of millions of people."

His work is one of three major studies this summer to warn that the global financial sector is asleep at the wheel. The University of Exeter is responsible for the other two, one of them with the Institute and Faculty of Actuaries (IFoA).

The first Exeter study warns that plans to transition pension funds to a net-zero future are "dramatically underestimating" the range of risks posed by the climate crisis and failing to account for various "decision-useful" climate scenarios.

Net-zero transition models currently used by pension funds assume that climate-related trends will continue gradually, but – in line with Keen's study – fail to account for various tipping points that could trigger severe climate and ecological breakdown.

The second Exeter study with the IFoA warns that economic models underpinning climate scenarios in financial services fail to reflect the scale of the environmental threat. This blames a "disconnect" between climate scientists, economists, those building economic models and the financial service professionals using them.

> "Net-zero models used by pension funds... fail to account for tipping points"

Some current scenarios do not adequately communicate the level of risk if the world fails to decarbonise quickly enough, it argues. They also exclude "second-order impacts", such as civil unrest and involuntary mass migration, which could significantly disrupt the global economy.

Missing factors

Major factors are also missing from models, this research says, pointing to the assessment of GDP loss in a "hothouse" world of 3°C higher temperatures used by Network for Greening the Financial System (NGFS), a group of 114 central banks and financial supervisors. This does not include "impacts related to extreme weather, sea level rise or wider societal impacts from migration or conflict".

Firms naturally begin with regulatory scenarios, the study acknowledges, but this may lead to herd mentality and "hiding behind" NGFS thinking, rather than developing a full understanding of climate change. "Benign" models have led financial institutions to believe they

Pension schemes and the environment

UK-based pension schemes have more than £88bn invested in fossil fuels, the equivalent of £3,000 per policyholder, according to campaigners.

An analysis by Make My Money Matter of more than 50 of the nation's largest schemes reveals that while many have net-zero targets, more than half have Shell and BP in their top holdings. The campaign is calling on pension funds to tell fossil fuel firms to end plans for expansion and set out credible targets for reducing emissions.

However, the problem goes further than polluting industries. Make My Money Matter also looked at the policies and pledges of 77 pension funds and providers that take part in the UN-backed Race to Zero campaign and the Glasgow Financial Alliance for Net Zero. This reveals that just 19% have comprehensive plans to tackle deforestation, both at a top-line level and for specific commodities such as soy, palm oil, leather, beef and timber.

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"Put bluntly, financial institutions are climate illiterate... This beggars belief"

would suffer minimal economic impact if the world warmed by significantly more than 1.5°C.

Put bluntly, financial institutions are climate illiterate. For University of Exeter's climate change and earth system science professor Tim Lenton, who co-authored the study, this beggars belief.

"Some economists have predicted relatively low economic damage – even from extreme levels of climate change," he says. "It is concerning to see these same economic models being used to underpin climate-change scenario analysis in financial services. It is essential that financial services institutions and regulators move towards realistic climate scenarios that recognise the potentially catastrophic risks posed by climate change.

"We have left it too late to tackle climate change incrementally. It now requires transformational change and a dramatic acceleration of progress."

So, what's the answer? The University of Exeter and the IFoA point to three ways of moving forward (see 'Reforming financial models', below).

For Lenton, a rapid drive towards decarbonisation desperately needs the support of the capital and insurance markets. Actuaries have a crucial contribution to make here, he argues.

Actuaries set assumptions in a model using past data. They look at mortality rates to set assumptions for life insurance or pensions. If mortality improves, they adjust those assumptions accordingly. They also estimate future economic volatility from stock market returns.

A true reflection of risk

Besides actuaries' role in insurance markets, Lenton says, "their work in pensions means they can impact capital allocation in long-term savings in a way few other professions can".

Sandy Trust, past chair of the IFoA's sustainability board and the study's lead author, points to the urgent demand to develop "realistic downside scenarios that reflect the level of risk we face, as this will inform the level of effort we put into decarbonising". He adds: "In the context of climate change, it is as if we are modelling the scenario of the Titanic hitting an iceberg but excluding from the impacts the possibility that the ship could sink.

"It is crucial that model users understand the limitations and assumptions of models, take action to break down silos and develop techniques to understand how different combinations of risks will impact future solvency and what actions can help to mitigate this."

HUW MORRIS is a freelance journalist

Reforming financial models

Exeter University and the IFoA outline three pathways for tackling climate illiteracy in the finance industry.

Education on the assumptions underpinning the models and their limitations

This aims to tackle silo thinking and the disconnect between climate scientists, financial services and the models the industry uses. Economic models do not reflect climate science. All those involved in climate-scenario modelling – including model providers, professional advisers, governance positions and regulators – need to develop a proper understanding of the science and break down silos.

Realistic qualitative and quantitative climate scenarios

Financial institutions should be encouraged to develop plausible qualitative and quantitative scenarios. One quantitative approach is using reverse stress-testing based on a "ruin scenario" of 100% loss of GDP at a certain temperature limit. This should be supported by robust internal debate within financial institutions around their assumptions and climate-related risks to tackle group think.

Models should be reformed to better capture risk drivers, uncertainties and impacts

The University of Exeter and the IFoA warn that "time is too short to wait for models that are perfect". Financial institutions should look beyond today's "general equilibrium economic models" and aim to realistically capture risk drivers and the links between policy, technology, the real economy and markets. A practical fix would be using qualitative scenarios, which look at possible futures and reflect the emerging reality of climate change.

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INSPIRING THE WORLD TO ACT SUSTAINABLY

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As an international leader in sustainability training and consulting, Act Sustainably Limited stands at the vanguard of this movement. We're on a mission to empower individuals and organisations to take a frontline role in our collective transition to a more sustainable future. Our cutting-edge, IEMA-accredited blended learning courses offer an engaging pathway for individuals looking to bolster their environmental credentials. Whether you're a seasoned sustainability professional seeking continuous development, or you're stepping onto this path for the first time, we are here to help.

The journey towards sustainability should be easy to access. That's why, for eligible residents in Wales, we're utilising full funding for the IEMA Foundation Certificate in Environmental Management, IEMA Certificate in Environmental Management, and IEMA Pathways to Net Zero training courses.

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We provide a suite of consultancy services, including ESOS auditing, carbon footprinting, decarbonisation planning, SBTi, SECR, management systems, sustainable procurement, ecological surveys, and B Corp preparation.

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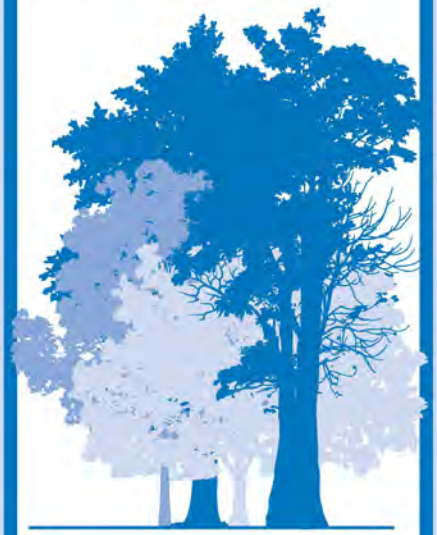

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RECIPE FOR SUCCESS

IEMA CEO Sarah Mukherjee MBE talks to food campaigner **Henry Dimbleby MBE** about improving the UK's health, tackling poverty, shaping government policy and transforming agriculture

As a former business consultant, restaurateur, cookery writer and government adviser, there are few who understand the workings of the UK's food system as well as Henry Dimbleby.

The co-founder of Leon Restaurants was instrumental in the government's decision to provide infants with free school lunches and to include practical cooking and nutrition in the national curriculum.

He also led the UK's National Food Strategy in 2020, proposing various actions to help disadvantaged children and promote higher environmental and animal welfare standards.

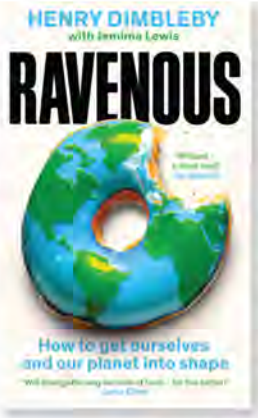
"Diet-related disease is putting an intolerable strain on our nation's health and finances," he explains in the report's foreword. "For our own health, and that of our planet, we must act now."

Why did you take the career path that you did?

It's been a bit of a random walk, but always towards something that interested me. At a party at university, I happened to meet Bruno Loubet – an amazing French chef, who had a Michelin star at the Four Seasons, Inn on the Park. As a joke, I asked what I should do if I wanted to be a cook, and he said "Why don't you come and cook for me?".

So, I used to go up to London on a bus and cook for him while I was doing my finals. I was studying physics and philosophy at Oxford, but I wasn't someone like Boris Johnson with massive self-confidence. My father had a small family newspaper business in south-west London, so I became a gossip columnist at *The Daily Telegraph*. Later, having always loved food, I started Leon.

There have been two transitions in my life – the first was when people stopped asking if I was David Dimbleby's son and started asking if I was cookery writer Josceline Dimbleby's son. Then came a point recently when people just stopped asking me who my parents are.



Tell us some more about why you started Leon.

Again, it was accidental and followed my interests. John Vincent and I set up Leon as a selfish endeavour – we couldn't get food on the go that didn't make us fall asleep and wasn't disgusting. Because of the way we talked, the tone of voice we used at Leon, people assumed we were organic, which we weren't. They assumed we were high animal welfare, which we hadn't really thought about. So, we felt a responsibility to think more about what we were and weren't doing.

Michael Gove: asked Dimbleby to independently review UK school meals

Liz Truss: a "lightning rod for my ire" over her trade deal with Australia

How did you get involved in influencing government policy?

I met Michael Gove, then education secretary, at someone's house, and we spent a long time talking about school food, because he was being smashed over the head about it by chef Jamie Oliver. He got in touch a week later and asked if I would do an independent review of UK school meals.

Some good things came from it – universal free school meals for infants happened, some decent stuff on food in the curriculum, and we set up the charity Chefs in Schools. After we left the EU's common agricultural policy, there was a desire to create a farming system that was more environmentally friendly and net zero, so Defra asked me to do another review, the National Food Strategy.

It was an amazing set of people you got together, which says a lot about your convening power. However, there was always a danger that it would sound like preachy, upper-class people wagging their fingers, telling people to eat properly. How did you deal with that?

Funnily enough, it's only ever educated, rich people who have occasionally asked me why an Eton and Oxford-educated whatever should be able to tell people what to eat. We visited people all over the country, and they were fed up with the way the food system works. You have to acknowledge that poverty in this country has

Henry Dimbleby has helped put school meals, farming and poverty on the menu for discussion at the top table

NEIL SPENCE / ALAMY

"People all over the country ... were fed up with the way the food system works"

been partially solved with cheap, unsustainable food.

We have the cheapest food, other than America, in the world, and a lot of that food is harmful to the environment – and our health. People have to realise it's possible to create a better diet for the majority of the people that doesn't do those things. If we don't, our food literally isn't sustainable. It is the biggest cause of biodiversity collapse, the biggest cause of freshwater stress, freshwater pollution and deforestation, and the second-biggest cause of climate change. You have to say that we cannot carry on that way, and then explain what the transition looks like.

Everybody in the food industry said what a well-researched piece of work it was, yet only 20% of what you suggested has actually come to fruition. How frustrating was that?

The government is going backwards on health. The junk-food cycle has stuck. But on the poverty side, thanks to footballer Marcus Rashford, who campaigned for some of the recommendations, there is progress on the way we create safety nets.

I knew the food strategy wasn't going to be possible to deliver immediately. We set out to create a series of ideas, because you can't fix the system unless you understand why it's gone wrong. I also knew that people weren't going to read all the recommendations on the government website, which is why I turned it into a book, *Ravenous*.

You write about the appetite-suppressing drug, Ozempic, in the book. Is that a feasible method for reducing our collective weight?

It makes people feel full, and the whole food brain shuts down, so you are not worrying about food all the time. For people who have been struggling with their weight all their lives, it is better to take it than not. However, there will be side effects. Doctors say if you try to hack a complex system by just doing one thing, almost certainly that will cause problems down the line. So, I don't think it is a responsible solution. It's also expensive, and not dealing with the root cause.

There's a lot of anger that comes through in the book. Where does that come from?

One lightning rod for my ire was former PM Liz Truss, when she was doing the Australian trade deal, which was incoherent with what Defra was trying to do. I was talking with one of her special advisers and halfway through the conversation it became clear that she hadn't read the draft of the deal, which made me really angry.

There are a lot of people in politics who are enormously talented and work incredibly hard, but others are deeply tribal and ideological and spend too much time in their tribes without testing their thinking. But it's not all gloom and doom. There's no going back on the agricultural transition, and there's still a good chance we will end up being the first country to create a form of farming that is producing enough food while restoring biodiversity and sequestering carbon.

There are all sorts of ways we can go wrong, but compared with health – where there's a good chance we'll end up drugging a third of our population – I'm optimistic on the environmental side.

INFORMATION OVERLOAD

The huge quantities of data we generate online every day is having an increasingly negative impact on the environment. **Chris Seekings** examines what is being done to tackle the problem

In an era of artificial intelligence (AI) and machine learning, the amount of data we generate is growing faster than ever. People are also spending more time on the internet, and many are coming online for the first time as developing countries gain greater access.

This is all made possible by power-hungry data centres – some spanning millions of square feet – which store, process and distribute vast quantities of data for billions of people each day. Indeed, it's estimated that every person will have at least one interaction with a data centre every 18 seconds by 2025 as demand for bandwidth continues to grow.

The owners of this critical infrastructure – such as Facebook, Amazon, Microsoft and Google – are often tight-lipped when it comes to discussing their data centres as they look to gain a competitive advantage, and the location of these facilities can be shrouded in secrecy. However, with the environmental impact an increasing concern, discussions around the sustainability of data centres are now becoming widespread and transparent.

A growing concern

Debbie Seibold-Egeland, environmental specialist at Jacobs, which acts as a consultant to many data centre owners and co-location providers, has written a report outlining some key sustainability considerations to help shape a green future for the industry. "With the way they are designed, they release a lot of heat, consume a lot of power and, in some locations, use a lot of water," she says.

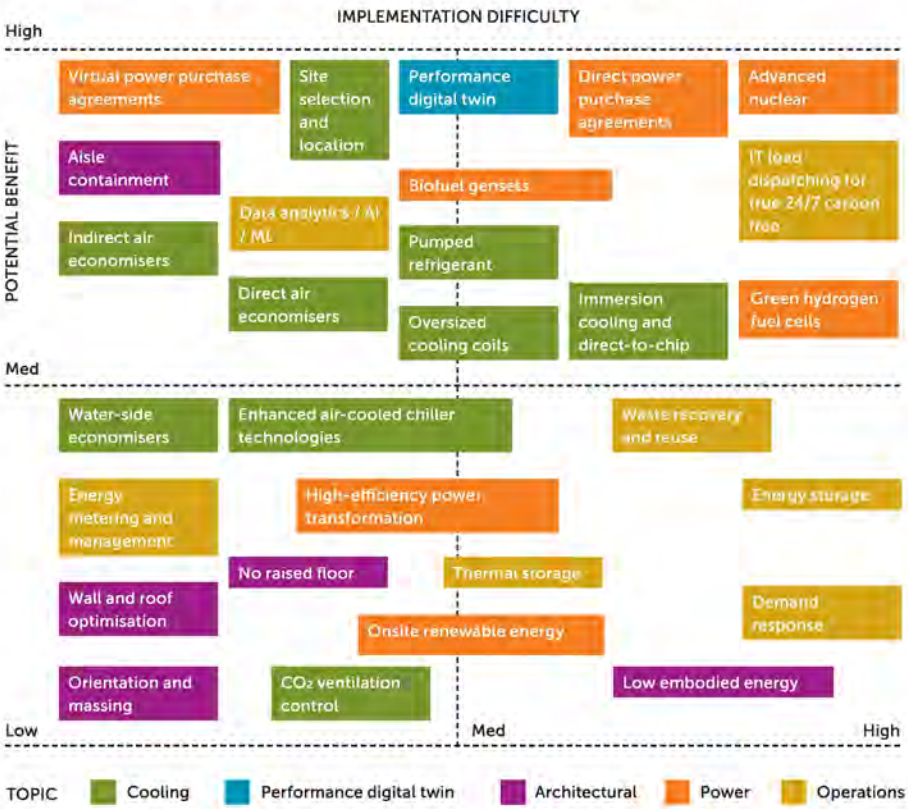
They are currently responsible for up to 1.3% of global electricity demand and, along with data transmission networks, account for 1% of energy-related greenhouse gas emissions worldwide. This is expected to skyrocket over the next decade, with data centre electricity use estimated to rise about fifteen-fold and account for 8% of projected total global electricity demand by 2030.

"With the increasing demand for AI and machine learning, the need for computing power is growing exponentially," Seibold-Egeland explains. "It's encouraging to see that the data centre industry is taking proactive steps to drive sustainability, setting targets to address this surge."

Cooling these vast data centres is also critical to maintain performance, with a typical one-megawatt data centre consuming around 6.75 million gallons of water a year using traditional cooling methods. The metals and land used in the construction and operation of data centres are also key sustainability concerns, along with the electronic waste generated.

Thankfully, there are many innovative solutions being implemented to reduce the environmental impact of these centres. For

Comparison of sustainability measures for data centres



Source: Driving Sustainability in Data Centers, Jacobs

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example, some companies are using advanced air-cooling technologies, such as adiabatic cooling and free air cooling.

"The first target should be not to use water," says Seibold-Egeland. "When that's not possible, instead of using freshwater, you can use recycled water that's been treated, or sea water cooling methods. There are many options, but where you are in the world will be a big factor in determining what works best."

When it comes to energy, firms are turning to onsite renewable energy, complemented with battery energy storage systems, while AI and machine learning are also being harnessed to understand how best to cut emissions. The table on the previous page highlights a range of potential sustainability measures, along with the possible benefits and difficulty of implementation.

For the data centres themselves, companies are constantly evaluating design and looking to improve efficiency. "If you look at a computer 30 years ago, it would fill an entire room, but now they fit in your hand," says Seibold-Egeland. "Similarly, while the digital needs of society increase, hopefully the power usage of data centres decreases due to smarter data centre design."

Innovative locations

Northern Virginia is home to the world's greatest number of data centres, which are typically located on the outskirts of cities where real estate is not so expensive.

When choosing where to build a data centre, the co-location with wastewater treatment plants and hydrogen electrolysers could also be an important sustainability consideration. After using renewable energy sources to split water into hydrogen and oxygen, the hydrogen from the electrolyser can be used to power the data centre, while the pure oxygen can be utilised by the wastewater treatment plant for aerobic treatment.

"You can then also use that treated water for cooling towers in the data centres, so having those three things near each other provides a lot of synergy," says Seibold-Egeland. And the huge excess heat generated from data centres can be used for district heating in local communities, reducing overall energy consumption and increasing efficiency.

> "How we manage data is becoming one of the greatest considerations for businesses"

There are also some very innovative ideas being explored when it comes to the location of data centres. "There's some really creative stuff going on, like they're looking at whether they can put data centres at the bottom of the ocean," adds Seibold-Egeland. "People are asking why we have to have them on land. Can we put them in outer space? There are all kinds of creative ideas happening."

Ambitious plans

How we manage data is becoming one of the greatest considerations for businesses worldwide, and tech giants like Microsoft and Google know that they have to keep the environmental footprint of their data centres under control amid the unrelenting march of AI.

In January 2021, more than 100 data centre operators and trade associations pledged to become climate neutral by 2030 by signing the European Climate Neutral Data Centre Pact. "I know there are sceptics out there, who think CEOs are just setting targets when they won't be there five years from now when the target rolls around," says Seibold-Egeland. "It's very ambitious, and it's going to take a lot of energy and money to achieve that, but as a consultant, I do see those companies putting in a lot of effort, so I'm optimistic, as long as their attention and funding is still there."

Sharing ideas and best practice on sustainability will be increasingly important for an industry that is notorious for its secrecy. However, collaboration is growing, and the iMasons Climate Accord is also helping companies come together to share ideas on carbon reduction in digital infrastructure. "It's a world which is very confidential, and if we work with one client, a firewall comes up and we cannot work with a competitor," says Seibold-Egeland. "But sustainability is the one place I see companies really talking, and accepting that, yes, we want a competitive advantage, but we have to cut emissions, improve air quality, water usage, and everything else, together."

Read the full report on sustainable data centres at www.bit.ly/JacobsReport

FULL CIRCLE

Zero Waste Scotland is focused on closing the energy sector's circularity gap. **Kenny Taylor** reports on progress so far

We live in a world of restricted natural resources, where population growth and consumption often rely on lengthy and volatile supply chains of raw materials, based on damaging extraction and production practices that lead to environmental impact.

A circular economy is part of the solution to the climate emergency, ensuring that nothing goes to waste and that everything has value. It is an all-encompassing approach to life and business, which can be explained as 'make, use, remake' rather than 'make, use, dispose'.

We are still a long way from circular practices in Scotland, as shown in our *Circularity Gap Report Scotland*. High consumption, extensive extraction and a large emissions profile characterise the Scottish economy. The report revealed that Scotland's state of circularity is only 1.3%, leaving a gap of 98.7%; the global average is 8.6%. This means that Scotland almost exclusively uses virgin resources to satisfy its residents' needs and wants. The report scenario plans some routes for us to improve our status, including tapping into the potential of Scotland's large-scale energy infrastructure, from power plants to offshore oil and gas platforms.

Circular decommissioning

However, to date, decommissioning of energy infrastructure has primarily followed a linear economy model, with little regard for social and environmental factors. Circular decommissioning will require substantial knowledge transfer, expertise and financial resources – in addition to new supply chains and collaboration between various actors, from regulators to operators. To realise Scotland's energy transition ambitions, vast quantities of materials will be required to build and deploy infrastructure. As the Scottish government's principal adviser on moving towards a circular economy, we have been leading efforts to systematically quantify material impacts and identify circular opportunities across Scotland's energy transition and are building a suite of evidence illustrating that change is needed.

We have published a range of reports, evidencing circularity for energy infrastructure, including: *Circular Steel in Scotland* (2023), *Energy Infrastructure Materials Mapping* (2023), *Scotland's Ports: A Future Vision* (2022), *The Future of Onshore Wind Decommissioning in Scotland* (2021), and – in partnership with offshore renewable energy research centre ORE Catapult – *End of Life Materials Mapping for Offshore Wind in Scotland* (2022).

Energy Infrastructure Materials Mapping quantifies 12 'selected' materials (see Figure 1) that can be generated from energy infrastructure decommissioning, and those required to deploy multiple technology ambitions.

The report forecasts an increase from an established baseline of 65 million tonnes (Mt) of consumed material across the energy sector in 2018 to over 240Mt by 2050. This is a 12% rise[1] year on year to 2050, with a potentially far greater

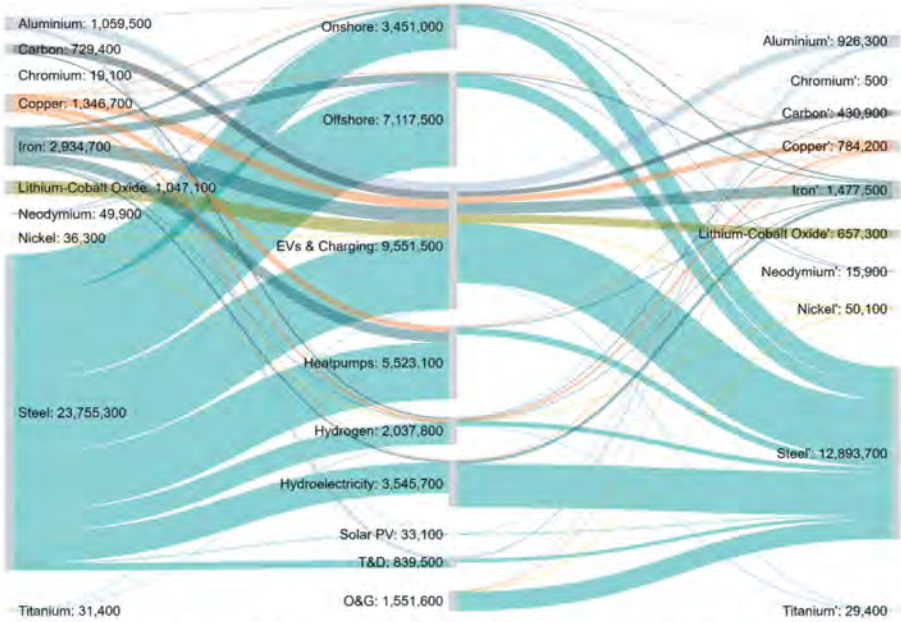

Figure 1: Sankey diagram of the materials required (left) and generated (right) up to 2050
Source: *Energy Infrastructure Materials Mapping* (2023)

Scaling up reuse of materials can help in the production of wind turbines

MARITXU / SHUTTERSTOCK. ALANMORRIS / SHUTTERSTOCK

Materials from decommissioned oil and gas rigs can be used for new energy infrastructure

short-term increase in the coming decade as we ramp up onshore wind deployment, develop ScotWind offshore wind farms and build up the hydrogen and electric vehicle sectors.

Reading from the right of Figure 1, caveated quantities of decommissioned infrastructure material flow into the technologies and associated materials we are likely to need to deploy to meet our net-zero ambitions (illustrated on the left). In some instances, we are close to fulfilling our requirements. However, the competition among technologies and the shortfall in key materials illustrates the shaky ground on which development ambition finds itself. Apart from concrete, the materials for the energy infrastructure under investigation in this report are mostly extracted outside Europe and processed outside the UK, exposing the sector to potentially volatile and lengthy supply chains.

The report highlights evidence of the reuse of materials and components. However, refurbished components are often exported. Reuse is preferred to end-of-life treatment, but when reuse is outside Scotland, it does not support a circular economy, as material is leaked from the Scottish economy. This is particularly pertinent for materials such as neodymium, where limited open exchange trade means there are significant supply chain risks.

Steel has drawn significant press interest of late – rightly so, as iron to steel, fuelled by coal, has been the driving force behind our industrial revolution. You could argue that this metal has contributed significantly to our current climate change challenge. Shouldn't its future be about contributing solutions?

Scotland produces between 620 and 930 kilotonnes per annum (ktpa) of domestic scrap steel, which is currently exported. Theoretically, we could have access to as much as 1,216kt of additional steel over the next 10 years from decommissioned North Sea oil and gas platforms.

We have demonstrated in our findings that there are sufficient steel mass arisings and enough scrap steel in Scotland to fulfil new electric arc furnace steel production for offshore wind, using a combination of domestic and decommissioned scrap, assuming that decommissioning in Scotland is scaled up sufficiently and that the infrastructure for collecting/sorting the scrap steel already exists.

Sustainable steel

Our findings are largely supported by Green Alliance in its 2023 report, *A Brighter Future for UK Steel*. However, I was struck by two key points that are fundamental to sustainable steel – demand reduction linked to more efficient use, and reuse options. Green Alliance argues that "better use of steel in the UK and elsewhere could reduce embedded carbon by 14% and cut emissions from the domestic steel industry by an estimated 6% in 2030", and that recycled steel beam is around 10 times more carbon-intensive than a reused beam. More and more companies are keen to track materials throughout their life, boosting their own ESG targets.

Turning from materials to services, the energy transition will not happen without our ports. Ports provide a range of services, handling both customers and products, as well as offering space and logistics. This includes delivering on net zero – for example, off-shore energy facilities. Ports are demonstrating principles embedded in *Scotland's Ports* as value-creation hubs and exemplifying 'place' settings.

We ask port authorities to go further and apply circular economy business models by demonstrating capability in disassembly and resupply, exemplifying strategically located circular logistic business hubs, and providing rental and leasing asset models. The harnessing of circular opportunities must be led by Scottish ports, which have the ingenuity, ambition and skills to deliver circular approaches.

We will have to overcome complex challenges as we manage the materials needed for the energy transition. We want to see a step change in the approaches taken by energy infrastructure stakeholders, moving from linear to circular materials flows. This must include:

- Designing for reuse and remanufacture
- Identifying opportunities for keeping materials and assets in perpetual use
- Realising value in circularity
- Reducing emissions
- Changing behaviour in favour of sustainable practices.

We want to help facilitate that step change. Our role now is to inform and work with partners such as Decom Mission, Scottish Renewables and the Scottish government to see change at a supply chain and national policy level.

KENNY TAYLOR is energy infrastructure lead at Zero Waste Scotland

1 The 241 Mt of virgin materials needed for energy infrastructure by 2050 is the total amount of materials needed from 2020-2050, not the amount consumed yearly, which varies over time in the model; it both ramps up with energy demand over time and is suppressed by increasing decommissioning and material cycling activities.

LET'S NOT BE 'MORE SUSTAINABLE'

Michael Hardisty explains why avoiding ambiguous language is key to making real environmental progress

I think Charles Dickens put it very well when Mr Micawber gave the following advice to David Copperfield: "Annual income twenty pounds, annual expenditure nineteen nineteen six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds nought and six, result misery." This quote beautifully encapsulates the concept of financial sustainability.

But what about environmental sustainability? Perhaps Mr Micawber might have said: "Annual freshwater replenishment twenty million litres, annual freshwater withdrawals 19.95 million litres, result happiness [or sustainable water use]." Or maybe "Annual fish stock recovery twenty million fish per year, annual fish stock depletion twenty and a half million fish per year, result misery [or unsustainable fishing]." We could add similar examples based on rates of reforestation and deforestation or greenhouse gas absorption and emission.

Financial and environmental sustainability are both binary concepts: either we're spending/consuming/emitting more than we should (to be sustainable) or we're not. Of course, we may be spending/consuming/emitting a lot more than we should or just a little more. There's a breakeven point where we're just on the cusp between acting sustainably and unsustainably (annual expenditure of £20 for Mr Micawber). It

might look something like the diagram pictured below.

Mark W McElroy et al (2007)[1] developed the "binary orientation" model of sustainability (which they illustrated using a similar diagram to the one here) and applied it to both ecological and societal sustainability. The concept of planetary boundaries (first developed by the Stockholm Resilience Centre[2] in 2009) also supports the binary view; it defines a "safe operating space" for levels of ozone depletion, freshwater use etc within which we can continue to live happily and beyond which we're in trouble.

What, then, should we make of the claim "...it's more sustainable"? I often hear this phrase used to describe a situation that is in the unsustainable zone but which has moved slightly closer to the breakeven point (which is no bad thing). You can imagine someone describing the use of 5% biofuel in aviation fuel as making flying "more sustainable". Or we might hear that using gas instead of coal is a "more sustainable" way of generating electricity. An uninformed listener might conclude that if gas is "more sustainable" then it must be in the sustainable zone. In reality, both coal and gas sit firmly in the unsustainable zone; gas is just a less environmentally damaging option than coal – it's less unsustainable rather than more sustainable.

Why should we care? Because using the term "more sustainable" in this way gives a level of reassurance that things are OK, that they're already on the sustainable side of the breakeven point, when they're not. It's misleading – it's greenwashing.

If we want to see the changes that are so urgently needed to transform our way of life to a sustainable one, then we need to be honest about those current practices that are unsustainable. Clear language is vitally important in doing that.

So let's try to be clearer in our language so that we don't mislead: in many cases "less damaging to the environment" might be a more appropriate description than "more sustainable".

MICHAEL HARDISTY CENV MIEMA is a sustainability leader with more than 20 years' experience working with blue-chip companies. He now delivers the environmental sustainability strategy for EngineeringUK

References
1 *Sustainability Quotients and the Social Footprint*, accessible at: www.bit.ly/3LF085L
2 www.stockholmresilience.org/research/planetary-boundaries.html

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The reading room

A look at the latest edition of Stephen Asbury's IEMA-endorsed book, *Health and Safety, Environment and Quality Audits,* and the CPD opportunities it presents

Sixteen years ago, the then IEMA CEO, Russell Foster, endorsed the world's first book on risk-based management system auditing. The second and third editions were endorsed by former CEO Tim Balcon in 2013 and 2018. Now, Sarah Mukherjee MBE has endorsed the fourth edition, published by CRC Press in November 2023.

On the latest edition, Sarah says: "Competent auditing is a vital function of well-run organisations. It provides assurance to boards and senior management that appropriate controls and governance arrangements are in place, to both manage environmental impacts effectively and support performance improvement. Now more than ever, it is crucial for organisations and broader society to manage their relationship with the environment – not only to reduce the impacts they have but also to create new opportunities for development and growth."

Professions and professionals from many disciplines use continuing professional development (CPD) as an approach for demonstrating and building competence. Worth 30 hours of CPD, *Health and Safety, Environment and Quality Audits – A Risk-Based Approach* provides learning and professional development through its 10 chapters, in a series of Microlearning™ online tutorials, and a host of supporting materials via its eBook and companion website. As readers progress through each chapter, the book directs them to online assessments which, upon successful completion, each grant three hours of verified CPD to IEMA members – 30 hours for all 10 chapters.

Dr Stephen Asbury, author of *Health and Safety, Environment and Quality Audits*

Author Dr Stephen Asbury says that approaches to auditing have changed over the years, and the 'tick-box' mentality of old should now be consigned to history. "Now is the time for organisations to deliver the continual improvements inspired by Dr Deming, embraced as Annex SL by the International Organization for Standardization (ISO), and compelled in the environmental sustainability discipline by ISO 14001:2015. They must focus their audit programmes and audits on significant risks – the 'big rocks' and 'black swans' within their context – to their objectives."

Big rocks are foreseeable and significant impacts. Black swans – until they happen – seem unlikely to occur, even though they can have catastrophic consequences. They are named for the unexpected black swans found in Australia by the earliest European travellers (probably just as unexpected as the arrival of tall, white Europeans to the Aboriginal Australians).

Asbury says that organisations must apply reliable and repeatable auditing methodology to provide independent assurance of strengths and alerts to areas of weakness. The book presents such methodology as The Audit Adventure™, along with more than 60 case studies, 90 A-Factors (auditing factors, which consolidate the essential nuggets of learning), and a generous helping of tips for auditors. The method is aligned to ISO 19011:2018 *Guidelines for Auditing Management Systems* throughout.

Sue Buxey, IEMA's director of operations and professional standards, says that IEMA is pleased to endorse the CPD learning content in this book and sees it as a valuable contribution to members' ongoing demonstration of their personal development.

IEMA CEO Sarah Mukherjee MBE adds: "I very much welcome this book. It will be a great help to auditors in delivering assurance and value to business."

DR STEPHEN ASBURY FIEMA originally joined the Institute of Environmental Management in 1995. He was the 44th Fellow of our Institution and, as a keen advocate of CPD, is the author of seven books for Taylor & Francis. He was awarded his doctorate by Middlesex University London in 2021

MEMBER DISCOUNT

***Health and Safety, Environment and Quality Audits* is available to IEMA members at 20% discount. Quote AFL03 at the checkout (valid until 31 March 2024). To order your copy, visit www.bit.ly/HS-environment-and-quality-audits**

Rebecca Shadlock CEnv, MCIWM, MCIHT, PIEMA

Technical director, environment and sustainability, Mott MacDonald

Why did you become an environment/ sustainability professional?
Geography was a subject that I enjoyed and I did well in it. I've always loved being outside and used to live near a lock managed by the Environment Agency. I knew of their role from an early age and it seemed the right place to start my career.

What was your first job in this field?
I was a seasonal river inspector but ended up helping the navigation team leader set up and manage a database to track capital projects on assets in the Anglian region.

How did you get your first role?
I kept applying to the Environment Agency until I was successful. I accepted a seasonal role and then secured a permanent job in the flood and coastal risk management team.

What does your current role involve?
Leadership and building relationships. Most of my time is spent growing our presence in the North East and developing a team of environment and sustainability professionals. I am now also an account leader for our work with contractors, so it's a lot of relationship building and work winning.

How has your role changed/progressed over the past few years?
I have built up a varied career history. From being a regulator to being on the other side ensuring that operations are run in a way that is compliant but profitable. I moved into construction and worked on nationally significant infrastructure projects, which I loved, and embedded environmental excellence into schemes. Now, after 18 years, I am putting all this experience into a leadership role, building a team of environment and sustainability professionals in the North East and growing the Mott MacDonald business.

Maya Angelou, author, poet and civil rights activist

What's the best part of your work?
I love meeting and engaging with so many different people and collaborating. Working with technical experts, it is fascinating to see how much difference we can make to the biodiversity and climate crisis with the skills, knowledge and tools we have at our fingertips.

What's the hardest part of your job?
Probably getting everyone on the same page by effective collaboration and getting everyone to see the bigger picture.

What was the last development event you attended?
North East digital sector: 2023 outlook.

What did you bring back to your job?
Awareness and acknowledgement that Newcastle is fast becoming a hub for tech investment and that digital enables us in so many ways and is fundamental to delivering social outcomes.

What are the most important skills for your job?
Being collaborative, open-minded and pragmatic. In my role, intuition is important – and staying up to date with the industry that you're working in. I always prepare and believe that you need to put the effort in to get the right results.

Where do you see the profession going longer term?
We are seeing a transformation from sustainability being an add-on to now being front and centre in fighting climate change. People can see the value of sustainability to both people and planet and this trend will continue to be a critical part of any conversation about development.

Where would you like to be in five years' time?
Part of an executive leadership team and continuing to make a difference. Being part of a business that is profitable but also contributes to delivering social outcomes.

How do you use the IEMA Skills Map?
It helps me to identify gaps in my capabilities and what action I need to take so that I am at the top of my game.

Describe yourself in three words
Hard-working, conscientious and kind.

What motivates you?
My family. Particularly my parents, who didn't have the opportunities that I did, and being a role model to my daughter.

What would be your personal motto?
Work hard and don't give up.

Greatest risk you have ever taken?
I am not a huge risk-taker, but I've always pushed myself in my career and have never been afraid to leave an employer if the opportunities for growth were not there.

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

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