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Shaping our future

SARAH MUKHERJEE MBE, CEO, IEMA

ORIANA FENWICK/SYNERGY ART

Hello again. I hope you are having a productive and successful year so far.

It will not be too long before IEMA becomes The Institute of Sustainability and Environmental Professionals (ISEP), as we launch the new name that members voted for last year.

This transformation marks more than just a name change. It's a bold step into the future of our profession – one that recognises the crucial role of environmental and sustainability professionals at the heart of the global economy. Since our founding over 25 years ago, our work has evolved to become a driving force for sustainable change.

For more information, see page 8, and we will keep you updated as we prepare for the rebrand in mid-July. Thank you to all members who have contributed so much to the process – taking part in focus groups and workshops, and offering your thoughts through surveys and emails, helping to shape the way ISEP will look and feel.

One of the current conversations in professional institutions is on artificial intelligence (AI). For example, how can we use it to smooth your professional journey, while ensuring that the rigour of the current system remains intact? At a wider level, how can energy-hungry AI systems be used to find sustainable solutions to resource crises? Chris Seekings has been talking to IEMA Fellow Adam Elman, sustainability director at Google, to find out more.

Transform has also been in conversation with author and environmentalist Guy Shrubsole, who suggests that England's archaic land-ownership structure has led to the country becoming one of the most nature-depleted on Earth.

As always, we value all your thoughts and comments. Many of the articles we cover in *Transform* stem from members' suggestions, so if you want to see a subject covered, do let us know.

"This transformation marks more than just a name change. It's a bold step into the future of our profession"

IEMA Transforming the world to sustainability

Following a vote by the membership, IEMA's application to change its name to The Institute of Sustainability and Environmental Professionals (ISEP) has been approved by the UK government, via Companies House. Changing our name and brand from IEMA to ISEP will be a gradual process as we transition between our old name and the new one.

The Institute of Sustainability and Environmental Professionals (formerly the Institute of Environmental Management and Assessment)
Company Limited by Guarantee.
Registration Number: 03690916
Place of Registration: England and Wales
Registered Office Address: Fenland House, 15 B Hostmoor Avenue, March, Cambridgeshire, PE15 0AX
tel: +44 (0) 1522 540069 | info@iema.net | www.iema.net

Editor
Sharon Maguire, s.maguire@iema.net

Deputy editor
Chris Seekings, c.seekings@iema.net

Sub-editor
Caroline Taylor

Managing editor
Sian Campbell

Group creative director
Matthew Ball

Account executive
Tom Crane, 020 3771 7260
tom.crane@thinkpublishing.co.uk

Group commercial manager
Tony Hopkins, 020 3771 7251
tony.hopkins@thinkpublishing.co.uk

Commercial director
Michael Coulsey

Production director
Justin Masters

Client engagement director
Melissa Michael

Executive director
John Innes

Printer
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ROUNDUP

AI AND TECH IN ACTION

ENERGY

AI to drive electricity demand, but could also slash emissions

Electricity requirements from data centres are set to more than double by 2030 as artificial intelligence (AI) adoption soars worldwide, reaching the equivalent of Japan's entire power consumption today.

That is according to a report from the International Energy Agency (IEA), which forecasts that data centres will account for almost half of the growth in electricity demand in the US this decade. Indeed, the US economy will consume more electricity in 2030 for processing data than for manufacturing all energy-intensive goods combined, including aluminium, steel, cement and chemicals.

In advanced economies more broadly, data centres are projected to drive more than 20% of the growth in electricity demand over the next five years.

Energy use at data centres is soaring

While the increase will push up emissions, the report claims that the rise will be "small in the context of the overall energy sector", and could be offset by emissions reductions enabled by AI adoption in other sectors. Also, as AI becomes increasingly integral to scientific discovery, it could accelerate innovation in energy technologies such as batteries and solar PV.

To benefit from AI, the report states that countries must quickly accelerate new investments in electricity generation and grids, improve the efficiency and flexibility of data centres, and strengthen the dialogue between policymakers, the tech sector and the energy industry.

"With the rise of AI, the energy sector is at the forefront of one of the most important technological revolutions of our time," said IEA executive director Fatih Birol. "AI is a tool, potentially an incredibly powerful one, but it is up to us – our societies, governments and companies – how we use it."

Read the full report at www.iea.org/reports/energy-and-ai

CLIMATE ACTION

AI expertise for climate action 'limited'

Broad awareness and expertise in the use of AI to facilitate climate action is still "severely limited", according to a white paper from Google.

The report highlights how generative AI could add €1.2trn to Europe's economy within 10 years – for example, by increasing efficiency and reducing energy usage in large buildings by 20-40%.

However, of the potential GDP gains, €500bn depends on reskilling and upskilling workers, with the EU currently lacking talent that combines digital and climate expertise.

Without professionals skilled in both areas, economies are likely to struggle to harness the potential of technological solutions like smart grids, predictive maintenance and carbon monitoring tools.

The paper calls for a 'European Academy for Skills for the Clean Economy', where sustainability and digital experts offer training for high-demand skills in sectors such as energy, agriculture and transportation.

It adds: "The path forward is clear: better data access, infrastructure, skills development and responsible AI deployment can help maximise the technology's benefits for Europe."

Read the white paper at www.bit.ly/AI-Climate-Goals

ENERGY

Eco impacts of data-centre cooling

A first-of-its-kind lifecycle assessment by Microsoft has quantified the carbon, water and energy impacts of four data-centre cooling techniques. It found that switching from air cooling to cold plates – which cool data-centre chips directly – could reduce emissions and energy demand by roughly 15% and cut water consumption by 30-50% throughout lifespans.

The study also quantified possible energy, water and emissions savings by switching to 100% renewable energy sources, finding that emissions could be reduced by 85-90%, regardless of the cooling technology used.

This level of detail is rare and difficult to uncover, taking the researchers more than two years to complete. They have made the methodology available to others in the industry through an open research repository.

Husam Alissa, leader of the study, said: "We're advocating in this paper for the use of lifecycle assessment tools to guide engineering decisions early on and also sharing the tool with the industry to make adoption easier."

The open-access white paper, published in *Nature*, is available at www.nature.com/articles/s41586-025-08832-3

SHUTTERSTOCK

EMISSIONS

How to move beyond estimates using product carbon footprints

BY CHLOË FIDDY

As climate impacts become increasingly material to business risk and opportunity, many organisations are looking to understand – and reduce – the carbon emissions tied to their products and supply chains. For most, scope 3 emissions, particularly those from purchased goods and services, make up the lion's share of their carbon footprint. Yet this is often the least understood area, frequently calculated using generic, high-level spend-based estimates.

Emissions are not created equal. Two similar products can have vastly different carbon profiles based on sourcing, production methods, transport, and other factors. Relying solely on industry averages can mislead decision-making, distort performance metrics and discourage low-carbon innovation.

That's why product carbon footprints (PCFs) are becoming the focus for organisations seeking greater granularity, accountability and credibility in their carbon reporting and reduction strategies.

Our newly published paper, *An Introduction to Product Carbon Footprints*, supports practitioners navigating this shift, providing a practical and accessible entry point to the world of PCFs. The paper includes:

- A clear explanation of what PCFs are – and how they relate to lifecycle assessment
- The challenges and limitations of spend – or volume-based scope 3 assessments
- Key standards and guidance shaping PCF development, including ISO and the Greenhouse Gas Protocol
- Details of sector-specific tools and data sources for practitioners
- Real-world examples of how companies have used PCFs to identify emissions hotspots and drive product-level reductions
- Practical advice on data collection, boundary setting, emission factors and verification.

Why now? Demand for product-level emissions data is accelerating. Regulatory developments such as the EU Carbon Border Adjustment Mechanism, the Corporate Sustainability Reporting Directive and the Ecodesign for Sustainable Products Regulation are making PCFs necessary as well as useful.

In parallel, large buyers are increasingly requesting PCFs from suppliers to inform procurement, decarbonisation plans and compliance. And with tools and platforms emerging to support data collection and analysis, barriers to entry are gradually coming down.

This guide is aimed at sustainability professionals, procurement teams, supply chain managers and anyone who has to calculate or understand the emissions associated with purchased products and services. It's a practical, standards-informed introduction to PCFs.

For more, see www.bit.ly/intro-to-PCFs

IMPACT ASSESSMENT

Latest edition of *IA Journal* covers proportionality in impact assessment

BY RUFUS HOWARD

In March, IEMA's Impact Assessment Network released the latest volume of the *Impact Assessment Outlook Journal, Delivering Proportionality in Impact Assessment*.

This edition brings together thought pieces from experts across the sector, exploring why proportionality matters and how we can do better.

Guest editor Nick Giesler has drawn on the expertise of local authority officers, legal specialists, project coordinators and EIA practitioners to highlight practical ways to deliver proportionate assessments and reporting.

At a time when environmental assessment is under public and political scrutiny, this volume offers a timely reframing: environmental assessment is not a blocker to development but a vital enabler. By focusing on proportionate process and outputs, we can improve how we assess, communicate and deliver sustainable outcomes.

The authors share opportunities for refining environmental assessment practice and look at how future approaches, including the introduction of Environmental Outcomes Reports, could help embed proportionality more deeply across the system.

All 24 volumes of the *IA Outlook Journal* are available on the IEMA website for members to explore key issues and insights from IA practice. If you would like to be notified of future calls for articles for upcoming volumes, make sure you have selected 'Impact Assessment' in your member preferences.

For further details, visit www.bit.ly/OutlookJournal24

ISEP to launch in mid-July signalling a new era for our dynamic profession

After more than two years of reflection and consultation with members, we're proud to announce that the new name and brand identity of our professional body will launch publicly in mid-July 2025. From that moment, IEMA will officially become The Institute of Sustainability and Environmental Professionals (ISEP).

This transformation marks more than just a name change. It's a bold step into the future of our profession – one that recognises the crucial role of environmental and sustainability professionals at the heart of the global economy. Since our founding more than 25 years ago, our work has evolved from the periphery of business and policy to a driving force for sustainable change. Our new name and purpose reflect this shift and set the stage for the future.

What members can expect

As part of the rebrand, we're introducing a new set of professional membership suffixes that align with our updated identity. From the public launch in mid-July, members can begin using the following postnominals:

- Graduate – GradISEP
- Associate – AISEP
- Practitioner – PISEP
- Full Member – MISEP
- Fellow – FISEP

Chartered Environmentalist (CEnv) and Registered Environmental Practitioner (REnvP) designations will remain unchanged. A potential suffix for retired members is under discussion and will be reviewed at our next board meeting.

To support your transition, new digital membership credentials will be issued during the launch week. These will feature your updated suffix and can be used in email signatures and on LinkedIn and other professional platforms. Make sure your email address is up to date so you receive your personalised credentials.

Get involved: be a part of the story

The rebrand isn't just a change in name – it's a shared movement driven by thousands of professionals like you. Every member will receive an amplification pack by email in July, filled with tools to help you share the news with your networks, colleagues and employers. From social media assets to email banners, the pack will empower you to help shape awareness of our new identity across the profession and beyond.

- **Stay up to date via our members-only update page: iema.net/future-purpose-of-iema**
- **To share information more widely, please use: iema.net/evolution**

Why the change?

The rebrand is the culmination of the Future Purpose of IEMA project, a wide-reaching, member-led process launched nearly three years ago. More than 6,400 member engagements, including surveys, workshops and interviews, shaped the journey. A resounding 81.19% of members voted in favour of the change at our extraordinary general meeting in December 2024. The outcome was clear: a fresh identity for a dynamic profession.

ISEP's purpose is to empower our members to become global changemakers, transforming the world today for a sustainable future. Whether you're an environmental specialist, a sustainability generalist, or someone simply driving positive change in your area, ISEP is here to inspire you with ideas, enable you with best practice and ensure your excellence with globally recognised standards.

What comes next?

From 17 July 2025, you'll start to see the new ISEP name, logo and identity across our website, training materials, certificates, reports and social media. You'll also receive your updated digital membership certificate and LinkedIn badge to help showcase your professional commitment. Until then, please continue using 'IEMA' in day-to-day professional settings.

We're very grateful for the support, insight and participation of our members throughout this journey. The new brand belongs to all of us – and with your voice and advocacy, we can ensure that ISEP reflects the strength, clarity and future ambition of our global profession. Let's shape the future, together.


Damien Plant (left) and Mat Roberts

REGIONAL NETWORKS

IEMA EUROPE

An Eco Forum in the Balkans

BY DAMIEN PLANT FIEMA

IEMA Europe member Damien Plant contributed to the second Balkan Eco Forum in the seaside town of Herceg Novi on Montenegro's Adriatic coast.

Two hundred delegates gathered, from policymakers to the business and entrepreneur communities. There was significant interest in foundational areas such as reporting and disclosure, waste, energy production and electric vehicles, as well as in sectors such as marine regeneration and software for measuring impacts of, for example, events or tourism.

The Brazilian ambassador to the region also delivered an excellent pre-brief around the host's ambitions for COP30.

IEMA's Plant was there to talk about business risks and to participate in sessions linked to environmental, social and governance (ESG). He was joined by our friend and colleague Mat Roberts, a fellow IEMA Fellow, who collaborated on the topic of ESG and delivered a masterclass on waste management.

The Western Balkans is a fascinating case study for sustainability professionals. Although hobbled by ageing Yugoslav infrastructure, unhelpful demographic trends and several brutal conflicts, it benefits from an educated, technically strong population, as well as natural resources and beauty in abundance. While a transformation to sustainability is beneficial to all countries, it is even more so for nations that are catching up and have a profound opportunity to close the gap.

For readers involved with Balkan developments, Eco Forum will likely take place in 2026. For more, see www.bit.ly/eco-forum-balkans


Herceg Novi

EAST SCOTLAND NETWORK

East Scotland welcomes new members

BY GAYLE BARCLAY, CHAIR

The East Scotland network is delighted to see a flurry of new members to its LinkedIn group (www.linkedin.com/groups/13515348/) – welcome all. Please use the group as a way to reach out and share ideas or interesting initiatives you come across.

The steering group met in April and discussed plans for upcoming events, including a beach clean, a social and a site visit. Details of these will be shared on our LinkedIn page.

We would love to host more site visits; they are a great way to share learnings and meet with like-minded people from a variety of backgrounds. If you are willing to host one, please contact us.

We are also hoping to recruit in the coming months – watch this space!

FELLOWS CORNER

Webinar: Women in the sustainability and environmental profession

The IEMA Fellows Network hosted an inspiring and insightful webinar on 'Women in the sustainability and environmental profession: becoming an IEMA Fellow and how to demonstrate leadership', expertly chaired by Sarah Mukherjee MBE.

Our distinguished panel of Fellows, Hanifa Ymer, Helen Woolston and Lydia Izon-Cooper, brought a wealth of experience from sectors including finance, transport and public health.

The discussion offered practical and personal reflections on career development, the importance of mentorship and how embracing our authentic selves can drive professional success.

Fellows shared candid stories and actionable advice, making this a must-watch session for those aspiring to lead with purpose.

- **Missed the live session?** Watch the webinar at www.bit.ly/women-in-the-profession
- **Curious about becoming a Fellow?** Explore last year's members-only workshop by logging on to the iema.net website. And for a wealth of webinars, go to Connect 2024 at vimeo.com/showcase/11424908 (using the following password: IEMA2024).
- **Want to go deeper?** Join our upcoming IEMA Fellow Member Upgrade Digital Workshop. Visit www.bit.ly/Fellow-Member-workshop

TUESDAY 24 JUNE

Fellows networking evening

A face-to-face meeting in Central London during London's Climate Action Week will provide an opportunity to connect with like-minded Fellows in a relaxed, collaborative environment.

- To register for the event, visit www.bit.ly/Fellows-networking

A WORKFORCE FIT FOR TOMORROW

Luke Denne on how green and growth go hand in hand

A green industrial revolution is under way, one that is not only tackling our environmental crises but delivering economic growth and prosperity across the country. However, to continue to grow and thrive – especially as the wider economy stagnates – the sector needs skilled workers and green skills.

To tell that story, IEMA has again teamed up with Content With Purpose (CWP), a strategic content creator, to underline the critical importance of building a workforce ready to deliver growth and a cleaner, greener future for all.

The result is a digital series, Green Horizons: A Workforce Fit for Tomorrow, which uses a range of short films, case studies and interviews to highlight both the opportunities in the green economy and the urgent need to close the skills gap – particularly in sustainability roles across all sectors.

According to CBI Economics, the UK's net-zero economy has grown by 10% annually for the past two years and now employs around one million people. The number of people completing green skills training courses has increased by more than 50% during that same period. But to sustain that momentum, the sector needs workers in roles that go beyond what's typically seen as "green".

As IEMA CEO Sarah Mukherjee MBE says in the series: "The jobs that are really needed are ... welders, plumbers and engineers. It's those practical skills that are really needed to drive us forward with the infrastructure we need for a greener future."

Harrison Ewen talks sustainability at Center Parcs; and (inset) an example of a green job highlighted in Green Horizons

Green means growth

The series features sit-down interviews with experts from a range of organisations, including Energy UK, heat pump startup Aira, the Royal Botanic Gardens, Kew, and the UK Sustainable Investment and Finance Association (UKSIF).

James Alexander, CEO of UKSIF, and Dhara Vyas, chief executive of Energy UK, both articulate the need to grasp the economic opportunity that the green transition can provide, delivering well-paying jobs at all levels across the country.

"We have this great opportunity to create growth and deliver sustainability at the same time," says Alexander.

The series also addresses the sector's lack of diversity. A featured case study looks at the Diverse Sustainability Initiative, set up by IEMA after research revealed that the profession ranks second-worst nationally – behind only farming – for diversity. The initiative connects professionals from across the UK's communities with mentoring, support and training.

"It's not just about representation," says Mukherjee. "We need to show that the green transition creates real, decent jobs for everyone – no matter where they come from or what they do."

Series partners

Organisations contributing to the series include the Canal & River Trust, Egis, Arup, Center Parcs, BSI, RSPB, CWM Environmental and SRK Consulting. Their stories cover green roles in ecology, mining, communications, infrastructure and urban design – demonstrating the wide scope of opportunity in the green economy.

The importance of storytelling

Max Smith, founder and managing director of CWP, says: "It's brilliant to once again partner with IEMA on this important series. At a time of both environmental urgency and economic challenge, we need to show that these goals are aligned. I hope this series inspires people – young and old – to seize the green opportunities ahead."

● Green Horizons is available now on the Green Careers Hub website

LUKE DENNE is head of editorial at CWP

Legislation expert **Neil Howe** highlights the major developments on some key Labour manifesto pledges

As we head into the summer parliamentary recess, two key bills are already in motion. This issue highlights the significant changes ahead for the planning system and holding water companies to account.

Extension to sustainability reporting deadlines

The European Parliament has voted overwhelmingly in favour of postponing the implementation of the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD).

The CSRD delay means that large companies, previously scheduled to begin reporting in 2026, will now need to start reporting on the 2027 financial year, with publications due in 2028. Small and medium-sized listed enterprises will now begin reporting on their 2028 financial year, with reports due in 2029. The CSDDD's deadline has also been extended to 26 July 2027. These changes are expected to provide companies with additional time to prepare and align their operations with sustainability reporting and due diligence obligations.

tinyurl.com/mvvrm3wz

Boost to water powers

The Water (Special Measures) Act 2025 has received Royal Assent, and will boost the powers of regulators to tackle pollution. Seen as the most significant increase to enforcement in a decade, the Act gives regulators new powers to take tougher and faster action to crack down on water companies damaging the environment and failing their customers. It increases the ability of the Environment Agency to bring criminal charges against water executives who break the law and creates tougher penalties for obstructing investigations. It also enables Ofwat to ban bonuses to water bosses if they fail to meet high standards.

tinyurl.com/3bdjm4um

New Act enforces higher standards on water companies

Planning system reform

The Planning and Infrastructure Bill has been introduced. It aims to reform the planning system to speed up and streamline the delivery of new homes and critical infrastructure, such as clean energy projects. The government sees planning and construction as key to economic growth.

tinyurl.com/4uk788ma

NEIL HOWE PIEMA is head of writing at Barbour EHS

IN COURT

The Environment Agency has secured a proceeds-of-crime judgment for £313,382 against two men who ran an illegal waste tyre site. Operating without an environmental permit, tyres were stored in an unsafe manner, creating a significant fire and high-pollution risk.
tinyurl.com/4y5uzhvr

Lastly, in case law, marine conservation organisation Oceana UK is challenging the government's decision to issue more than 24 oil and gas exploration licences. Campaigners say the impact on climate change and accident risk had not been considered.
tinyurl.com/9w5w579k

SHUTTERSTOCK

ON THE WATCHLIST

New policy and legislation continues at pace across the UK, with significant changes to the permitting regime planned

Water industry enforcement levy

To pay for enforcement of the Water (Special Measures) Act 2025, there are proposals for a new direct levy on certain water discharge activities carried out by water companies.

tinyurl.com/yrf7nhfu

Impacts on water environment

The Northern Ireland Environment Agency is consulting on impacts on the water environment, gathering evidence for the Significant Water Management Issues Report, which will be issued in 2025-2026.

tinyurl.com/28ae92v7

Environmental permit reforms

Defra is seeking views on reforms to the Environmental Permitting Regulations, with the aim of creating a more flexible and proportionate regulatory hierarchy. Under the plans, a tiered system of control would be established, allowing activities to be regulated under exemptions, standard rules permits or bespoke permits, depending on their environmental impact. The changes will result in the reclassification of certain activities.

tinyurl.com/4erjhd4j

Household recycling

Scotland has published a consultation on changes to recycling and waste management. The government is designing a new code of practice to support the transition to a more circular economy and to set out priority actions for waste. It includes the rural food waste exemption and possible kerbside collection of textiles.

tinyurl.com/ehhecb4v

'IT'S ABOUT LAND BEING USED FOR THE COMMON GOOD'

Archaic land ownership rules have seen England become one of the most nature-depleted countries on Earth. **Guy Shrubsole** tells Chris Seekings how we can take the countryside back

It's a simple question, but one with profound ramifications: who owns England? The answer is shrouded in secrecy and reveals a legacy of corruption and sexism stretching back to the Norman Conquest almost 1,000 years ago.

It also explains many of the environmental challenges we face today, with a tiny group of wealthy landowners having allowed the country to become one of the most nature-depleted on Earth.

Indeed, conservation groups have found that only 3% of land is effectively protected for nature. Wildlife has declined by 32% on average since 1970, with half of plant species reduced in distribution. And no stretch of river in England is in good overall health.

Fortune for the few

In his latest book, *The Lie of the Land*, environmental campaigner Guy Shrubsole explains how a collection of powerful aristocratic landowners have wreaked havoc on the countryside – and how the public can restore it.

He tells me how his passion for the natural world was sparked in the 1990s by protests against the Newbury bypass near where he grew up, with the road's route through woodlands resulting in the felling of thousands of mature trees.

"It left a searing memory after seeing environmental destruction up close in terms of ancient woodlands being despoiled," he says.

"I studied history at university and went on to do a master's in sustainable development, getting involved in student activism around climate change and the Make Poverty History campaign."

However, it was only about a decade ago when Shrubsole was investigating the causes of the 2013-14 UK winter floods with Friends of the Earth that he became fascinated by the subject of land ownership. "Poor land management had been denuding our hillsides, draining and desiccating our blanket bogs and peat bogs, and destroying all the ways in which the landscape would naturally absorb more water.

"It got me thinking: who actually owns those hills? Who owns those peat bogs? Who owns all this land that we could be using in a much more ecologically sustainable way? I started looking into it and realised it was so hard to unpick who owns England owing to secrecy surrounding the Land Registry, so I needed to investigate."

His research revealed that just 1% of the population owns around half of the land, with ownership concentrated in the hands of a few wealthy families, institutions and the Crown.

Root of the problem

The findings helped spawn Shrubsole's *Sunday Times* bestseller, *Who Owns England?*, and sparked a long-overdue discussion around landownership and property rights.

"The reasons why a lot of large estates have remained large over the centuries has been this very sexist idea of male primogeniture, whereby the eldest male in the aristocratic family inherits all the land and keeps the estate together," Shrubsole explains.

"Fundamentally, this all goes back to the Norman Conquest and William the

NICK WHITE

> The demands of private gain and profit shouldn't take priority over preserving a natural carbon sink

Conqueror, who when he became king said, 'all the land belongs to me and it's for me to hand out as patronage'. Having brought over around 200 Norman barons to conquer England, he then proceeded to give land to those aristocratic families, who continue to be major landowners to this day, such as the Grosvenors, who became the dukes of Westminster."

While countries such as France experienced revolution and land reforms hundreds of years ago, the same antiquated rules still prevail in England today. Systems of inheritance in other European countries have also evolved very differently.

"We have a hang-up about land and who owns it in this country, with the right-wing press saying we can't possibly pry into this stuff because it's class warfare. But, for me, it's about land being used for the common good," Shrubsole says.

"When we talk about land, it's always seen through the lens of someone's home or garden, so if you want to reform land ownership in this country, the attack line is 'you're coming after my garden; you're coming after the idea of an Englishman's home being his castle'.

"But just 5% of land in England comprises homes and domestic gardens, and I care a lot more about the other 95% – I'm much more interested in the people whose homes are actually castles."

Another rather unique way in which the English talk about land is describing owners as being the 'trusted custodians of the countryside'; a message that is often reinforced by the National Farmers' Union.

While there are many enlightened landowners who are passionate about protecting the countryside, and who recognise the essential ecosystem services they provide, Shrubsole says that they tend to be "few and far between".

"They are often a kind of counter-cultural force, rather than the prevailing norm, because so often nature is just seen as private property, rather than as something which the public have a legitimate interest in protecting," he adds. "Sometimes the demands of private gain and profit shouldn't take priority over preserving a natural carbon sink, for example, or protecting an ecosystem."

Dismantling custodianship

Indeed, *The Lie of the Land* describes how property rights in England not only allow owners to enjoy the fruits of their land and exclude others from it but also provide the protection of *jus abutendi* – or the right to destroy.

When this right was challenged by the introduction of sites of special scientific interest (SSSIs) in 1949, Shrubsole explains how a backlash from

The 10,000-acre Langholm Moor in Scotland is now community owned

landowners quickly ensued. "You had countless horror stories of SSSIs being destroyed, ploughed up, set on fire and sprayed with pesticides."

Today, fewer than half of SSSIs are in a favourable condition – and a significant portion are not being monitored regularly – while many more are declining, thanks to overgrazing, burning, ploughing and other forms of neglect.

"Our approach to land management is also why we've seen moorland-burning degrade our peat bogs, which are one of the country's biggest carbon stores, for the past 150 years or so," Shrubsole says.

"The government now sees this as an ecologically devastating thing to do, but attempts to rein it in have been opposed at every stage by the owners of thousands of acres of moorland who use it to shoot grouse; burning the land and the heather, changing the ecosystem, killing basically anything that can predate grouse, and presiding over all manner of wildlife crime.

"If you are to tackle some of the worst abuses of land use in this country, you have to contend with the small number of people who own that land and their political power, which is why dismantling some of these myths about custodianship is really important."

A common treasury for all

Shrubsole believes that the UK government should take inspiration from policies pioneered in Scotland over the past 20 years and introduce a Community Right to Buy in England.

Land ownership is even more highly concentrated north of the border but, since 2003, communities have the first right of refusal to buy land should the owner decide to put it up for sale. Now, half a million acres of Scotland belongs to communities.

"They're not just buying pubs and village halls – important assets though they are – but also enormous estates; huge 10,000-acre former grouse moors in the case of Langholm Moor," Shrubsole says. "They've had a vibrant public conversation about land, and a lot of the legislation that underpins community buyouts also has sustainable development baked into the heart of it.

"That's something Westminster needs to learn from and take into English legislation, because there's a risk it sees community ownership as continuing to be small in scale, rather than allowing communities to dream bigger and think about owning a stretch of river, for example, or a natural flood defence like a peat bog that the town depends upon to protect it from flooding."

> Reforms have been opposed by the owners of thousands of acres of moorland, who use it to shoot grouse

I speak to Shrubsole as the Planning and Infrastructure Bill passes through the House of Commons and the House of Lords. The bill aims to remove "unnecessary blockers" to new developments as the UK government tries to deliver 1.5 million new homes by 2030. He, like many others, is concerned that environmental protection is seen by ministers as one of the blockers. "I'm frustrated by some of the rhetoric from the government, but I would simply say that the biggest blocker to building more affordable housing is not the planning system, but has always been issues around land values.

"If you look at what underpins the value of a house, it's not that bricks and mortar have suddenly become expensive, it's the fact that the location value of land has gone up and up.

"Councils and development authorities ought to be able to buy land at closer to existing use value, which would allow them to buy land a lot more cheaply, and homes to be sold at more affordable prices. So I hope Labour pays much more attention to the fundamental issues driving the housing crisis."

Introducing a carbon land tax, requiring large landowners to report their stewardship via an 'ecological Domesday survey' and encouraging rewilding efforts through environmental land management schemes are just a few more of the reforms that he would like to see and believes the public would approve.

"*The Lie of the Land* asks for some sensible and moderate reforms that should have been done decades, if not centuries, ago but are particularly relevant in an era of ecological breakdown and the climate crisis.

"If you were to give the public greater access to land through an extended right to roam and greater ability to own land as a community, I think we would see a transformation in the way it is managed and looked after in this country.

"It would give all of us the chance to be stewards of the land in a way which, up until now, only a very small number of people have been able to."

Shrubsole's latest book is on restoring our countryside

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Gold fever

Edward Debrah on the effects of illegal mining activities in Ghana

Galamsey, a popular term for illegal mining in Ghana, is a significant environmental and socio-economic concern. While historically gold mining has been a cornerstone of Ghana's economy, this surge in illegal mining, especially in water bodies, is largely attributed to increasing unemployment, elevated gold prices and various other economic pressures.

These illicit mining operations often use hazardous chemicals, including mercury and cyanide, for gold extraction. Mercury, in particular, is used to amalgamate gold particles but management of its use is inadequate and substantial quantities of it are discharged into adjacent waterways. In water, mercury transforms into methylmercury, a highly toxic substance that accumulates in fish and other aquatic life forms, endangering the aquatic ecosystem and the communities that depend on fish for nutrition.

Research indicates that mercury levels in certain water bodies in Ghana significantly exceed safe thresholds.

Sedimentation and water clarity

The process of mining also involves removing topsoil and rock, which is often discarded into waterways, resulting in excessive sediment build-up. This can prevent sunlight penetration, which hinders photosynthesis in aquatic plants and, in so doing, disrupts the whole aquatic ecosystem. Heightened turbidity also reduces oxygen levels, adversely affecting fish and other organisms.

Water that is laden with sediment presents significant challenges and increased costs for treatment, and this has an impact on communities and industries that depend on clean water for drinking and other purposes. The Ghana Water Company has already had to suspend or restrict water treatment operations in some areas, resulting in water shortages.

Galamsey activities frequently redirect rivers and streams to extract resources from riverbeds, thereby disrupting

Mining for gold

SENDERISTAS/SHUTTERSTOCK.COM

the natural water flow and harming organisms that depend on specific habitats. Fish populations are particularly at risk, as alterations to their habitats interfere with breeding cycles and diminish food sources. This decreases biodiversity and undermines the resilience of ecosystems, which in turn affects local communities reliant on the river for fishing and agriculture.

Health hazards

The health consequences of water pollution from illegal mining are extensive. Exposure to mercury is associated with neurological and developmental disorders. Consuming water or food tainted with cyanide can lead to severe respiratory issues, cardiac arrest and, in extreme cases, death.

The health risks linked to illegal mining extend beyond individual communities, presenting a public health challenge for Ghana as a whole. Over time, the cumulative effects of chronic mercury exposure can lead to significant health crises, especially in remote communities with limited access to well-equipped healthcare facilities.

> Mercury levels in certain water bodies in Ghana significantly exceed safe thresholds

Economic impacts

The Ghana Water Company says that treating contaminated water has pushed up its operational costs, which they often have to pass on to consumers or they restrict water supply in impacted areas.

Polluted water also damages crops and diminishes yields. Farmers dependent on river water for irrigation experience decreased productivity, and even the complete loss of cultivable land. The fishing industry also suffers because of illegal mining, as contaminated rivers and lakes reduce fish populations.

Over time, these economic challenges exacerbate poverty, particularly in rural communities that depend on agriculture and fishing for their livelihoods.

Regulatory and policy challenges

The difficulties associated with illegal mining are intensified by inadequate regulatory enforcement and policy deficiencies. While Ghana has regulations for small-scale mining, enforcement is hindered by limited resources, corruption and political interference. Despite initiatives by the government, such as Operation Vanguard – a taskforce aimed at addressing illegal mining – these operations continue because of the high demand for gold and the absence of alternative employment for many people.

The environmental, health and economic impacts of illegal mining on water bodies in Ghana are profound and extensive. Tackling the practice requires a cooperative approach among policymakers, communities and stakeholders to ensure the preservation of the environment for future generations.

EDWARD DEBRAH MIEMA CENV is an HSEQ executive

AI IN THE SKY

While climate activists say they want to 'smash the system', green NGOs are turning to subtle, slick tech to catch polluters out. **David Burrows** reports

For too long it has been easy to ignore what takes place far out at sea and impossible to know who's responsible for 'mystery' oil spills that wash ashore with distressing frequency. But those days "are coming to an end" thanks to technology, according to SkyTruth, the non-profit conservation technology organisation: "Cerulean will shine a bright light on this hidden problem and give our partners powerful new tools to bring an end to chronic oil pollution in the ocean."

The Cerulean platform uses satellite imagery and artificial intelligence (AI) to detect oil slicks and identify nearby vessels and offshore infrastructure that may be responsible. It is free and publicly available information, enabling journalists, campaign groups and regulators to "democratise access to critical environmental data and empower global efforts to protect our planet".

The detection technology is already revealing the true scale of 'chronic oiling' – including in marine protected areas around the UK. On 1 January 2024, Naomi Tilley, oil and gas campaign lead at Oceana UK, started checking the platform: within 10 days a spill showed up in UK waters. "This is happening a lot but we are not hearing about it," she says, having used data from the platform as part of a September 2024 report that details oil pollution in UK seas. If this was happening on land, companies "wouldn't be getting away with it", she adds.

Tilley isn't the only campaigner that has turned to technology to pinpoint polluters where regulators and governments appear to be turning a blind eye – on land, at sea and in the air.

"AI, in combination with satellite imagery and open data, is revolutionising the way we monitor environmental degradation and support nature recovery," says Lisa Burton, founder and CEO of Authentic Legal Ai, a company "on a mission" to help organisations navigate AI, data governance and compliance with integrity, intelligence and empathy. "These technologies provide a global, near real-time view of ecological change, revealing what was previously hidden," she adds.

Others also feel that the game really has changed. Max Boucher, head of nature programmes at FAIRR, the $75trn collaborative investor network that raises awareness of environmental, social and governance (ESG) risks and opportunities, says technology is fundamentally transforming environmental accountability and shining a light on poor practices.

Fishing for problems

In our seas, there are those oil spills, as well as aquaculture expansion and an unmonitored and massive growth in shipping that are all piling pressure on an ocean already stressed by climate change. It's estimated that one-fifth of seafood is also caught illegally or simply unreported (a crime worth up to $23.5bn). As Tony Long, CEO of Global Fishing Watch, noted in a TED talk: "You can't monitor the whole ocean from the decks of ships but you can from space."

Platforms such as Global Fishing Watch and Ocean Risk and Resilience Action Alliance are using tech tools to scan vast amounts of fishing data for red flags. Their work helps uncover illegal fishing activity so that buyers, insurers and other stakeholders can make informed decisions with better ecological outcomes.

One of the tools harnesses data to enable insurers to quickly discover whether fishing vessels they are considering insuring are at risk of engaging in illegal, unreported and unregulated (IUU) fishing. Cutting off access to insurance makes it more costly for IUU vessels to operate, so carrying "significant potential in reducing illegal fishing globally", according to Long. "By making data transparent, the vessel viewer tool will allow insurers to cross-check reported information on a vessel's identity and activity, pinpoint information gaps and ultimately help them make risk-based decisions about whether or not to insure a vessel," he explains.

On land, NGO Mighty Earth has been chasing commodity corporates for years,

JOE WALDRON

"Technology is transforming environmental accountability and shining a light on poor practices"

highlighting their links to deforestation of precious forests. One of its latest reports linked Cargill-driven deforestation in Brazil to factory-farmed chicken in the UK. They used satellite imagery, land registry documentation, fire alerts, environmental permits and licences – alongside trade and publicly available commercial information – to assess the size, scale and nature of the deforestation, and to identify links to the companies involved.

In 2023, the NGO worked with AidEnvironment and they identified 68 cases of deforestation linked to the protein giant JBS's beef supply chain, covering an area of more than 125,000 hectares. All the cases were analysed, confirmed through high-resolution satellite imagery, and validated before being published. This kind of information is "immensely valuable" to investors who want to understand exposure to ESG risks and make values-aligned decisions.

This is where ethical AI "shines", says Burton, enabling "more transparent, data-backed investment decisions that reward genuine sustainability efforts rather than slick marketing".

This new tech is proving valuable to companies that want to present robust reports, back up environmental claims and stay on the right side of both campaigners and regulators.

Real-time data and traceability are opening up new ways for large companies to cut costs while tracking progress deep in their often-opaque supply chains, says Boucher at FAIRR. Thinking about agricultural sectors, for instance, satellite images interpreted by AI, combined with simple on-farm measurements, can show a direct correlation between regenerative agriculture projects and improvements in carbon, soil health and biodiversity, he adds.

REDD alert

In October, a new data platform from CTrees – REDD+AI – was the first to measure forest degradation from logging, fire and road construction across all tropical forests. Enabled by AI and advanced satellite data, the system detects change in every five-metre area of tropical forests worldwide. The data show that in 2017 to 2023, human activities like logging, fire and road construction degraded an average of more than 6.9 million hectares of tropical forest per year.

The results are not pretty but they will be pretty important in the fight against climate change. "This is the first data set of its kind to precisely reveal where and to what extent forest degradation (the second 'D' in REDD+) is occurring, enabling a more comprehensive strategy for emission reduction," says Sassan Saatchi, CTrees' CEO and senior research scientist at NASA Jet Propulsion Lab/Caltech.

The data could also be especially useful for ensuring that forest carbon credits – which many companies are relying on to achieve sustainability targets and which have been at the centre of various scandals in recent years – are measurable and verifiable. AI-powered algorithms can, for example, analyse large data sets to track deforestation rates, calculate carbon sequestration in forests, monitor industrial emission levels and give real-time updates, and ensure that carbon credits are accurately quantified and verified.

The stark effects of deforestation

AI is also "excellent at predicting outcomes based on historical data", explained Suraj Mane from EcoTechtonic – a start-up focused on environmental stewardship – in a recent blog. "When applied to carbon credit markets, AI can analyse past emission trends, weather patterns and industrial activity to forecast future carbon reduction opportunities," he wrote, and "these predictive insights allow companies to plan their carbon reduction strategies more effectively and maximise their carbon credit returns."

Green claims

Accurate measurement and verification of changes in ecosystems, supporting restoration and ensuring that environmental claims (such as carbon offset credits) are genuinely backed by verifiable data represents "a powerful shift from reactive environmentalism to proactive accountability", says Burton at Authentic Legal Ai. "It's inspiring to see technology being deployed in the service of transparency and planetary health, rather than profit or surveillance," she adds. "This is AI being used for good: not to manipulate, but to reveal truth."

Corporates will also be leaning on it as the bar for due diligence rises through regulations such as the EU Regulation on Deforestation-free Products, the Corporate Sustainability Reporting Directive and the Corporate Sustainability Due Diligence Directive.

Debate over the pros and cons of AI, technology and data – including in the realms of ESG – will rage on. Any conversation about the power of data and AI comes with caveats – a warning not to get too carried away; to stay grounded. "Technology should support decision-making, not overwhelm it," says Priscillia Moulin, co-founder and director of strategy at MosaiX, a "scalable nature intelligence platform that combines cutting-edge AI with community engagement". Moulin feels the real value lies not just in the technology itself, but "in how it's applied, validated and translated into credible action".

Legal professionals are also increasingly likely to use AI and satellite-based platforms to bring hard evidence into public discourse and legal cases. It won't be easy: linking the data to a specific company that is alleged to have caused harm and proving that actual harm is caused will be a challenge, explains Dominic Watkins, partner at law firm DWF.

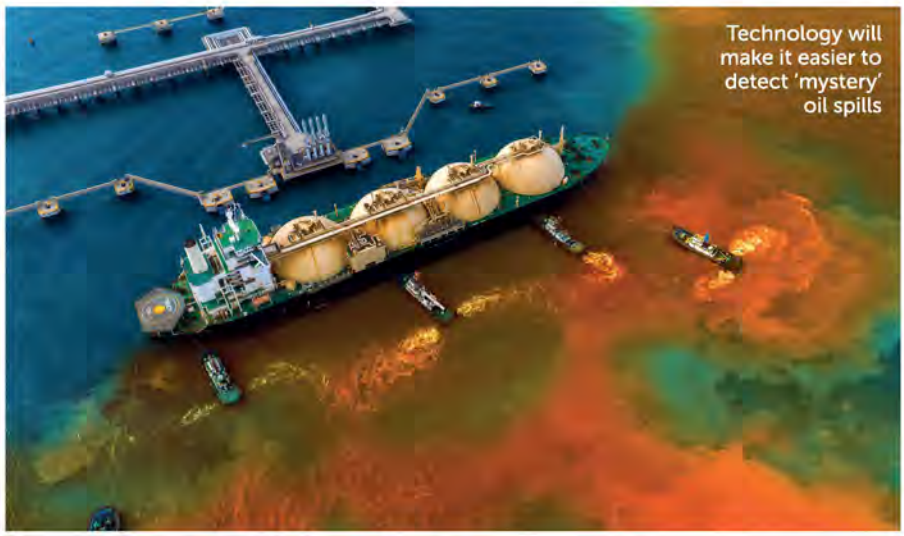
Burton "absolutely expects" this use to expand – particularly as AI tools become more accessible and regulatory bodies start to accept this kind of data as evidence. Monitoring will also become easier – and harder for regulators to ignore. Sectors like agriculture, energy, mining and shipping – those with physical environmental impacts – will be among the most exposed.

However, any company making sustainability claims could be held accountable through data – from carbon credit purchasers to fashion retailers. The Advertising Standards Authority is also proactively monitoring green claims. Last year, it boasted how its AI-based active ad-monitoring system checked for greenwashing across 140,000 adverts made by air travel companies alone.

As Long said in his TED talk, these are "interesting times", as "seemingly intractable problems are starting to yield to the power of technology, AI and global interconnectedness".

DAVID BURROWS is a freelance writer and researcher

"It's inspiring to see technology being deployed in the service of planetary health, rather than profit"



Technology will make it easier to detect 'mystery' oil spills

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A force for nature

Katie Smith explores how organisations are turning to data and new technologies to tackle biodiversity loss in South-East Asia

Biodiversity loss and ecosystem collapse has been ranked as the second most severe risk to economies and societies over the next decade, according to the World Economic Forum's *Global Risks Report 2025*.

It's not surprising given that the World Wide Fund for Nature's latest *Living Planet Report* found that wildlife populations have declined by an average of 73% over the past 50 years, with the biggest decrease in freshwater (85%), terrestrial (69%) and marine (56%) populations.

The report, which tracked almost 35,000 vertebrate populations of 5,495 species from 1970 to 2020, warns that parts of the planet are approaching dangerous tipping points – driven by nature loss and climate change. This includes South-East Asia. Home to more coral reefs than anywhere else in the world, almost half of the planet's mangroves, and a third of the world's coastal and marine habitats, the region is a hotspot for biodiversity.

However, deforestation, rising temperatures and extreme weather events pose a real threat. Indeed, up to 42% of the region's species could be lost by the end of the century if organisations, countries and governments don't intervene.

Seeking answers

Nature-based Solutions (NbS) are the answer, according to some experts.

The Southeast Asia Climate and Nature-based Solutions (SCeNe) Coalition is a network of nine non-profit organisations working to advance conservation and climate action in South-East Asia. Its goal is to bridge the gap in investment, technical expertise and resources in NbS and accelerate the delivery of such conservation projects.

"Data and technology are essential tools in scaling and monitoring NbS," says Edwin Seah, NbS partnerships lead at SCeNe Coalition. These include geospatial mapping, remote sensing and drones that provide real-time insights into ecosystem health, carbon sequestration and biodiversity changes.

"In regions such as South-East Asia, where ecosystems are vast and diverse, these tools are crucial in addressing the scale and complexity of conservation efforts," he adds.

SCeNe Coalition is developing tools and resources to support organisations to deliver high-quality NbS through three key workstreams:

- NbS Tool analyses current environmental and social conditions for users and helps investors and local frontline organisations (FOs) evaluate baseline data.
- NbS Portfolio gives implementation guidance criteria and information about other projects in the region.
- NbS Incubator provides legal, technical, financial and business development support for FOs developing NbS projects.

"Through these workstreams, we aim to direct carbon and climate finance towards just and equitable climate mitigation and adaptation work, and to the conservation of biodiversity and critical habitat," Seah says.

VIRGINIA BRIA

MAKING WAVES IN THE CORAL GARDEN

Corals from the Sentosa coral nursery are planted on adjacent seawalls – the coral garden.

Malika Meghjani has created 3D maps of the garden to track progress. She says: "They're interactive maps, so you can see close-up images. You can see the species name, segmented area for it and how the map looks overall. It's essentially Google Maps for underwater environments."

Meghjani and Sam Shu Qin are also looking at how to optimise maintenance of the reefs. "We're trying to identify those hotspots where this is required," Meghjani says. "If everything looks okay then they don't need to dive."

Shu Qin adds: "Different species have different resilience to thermal strength, so that's where technology can help us identify which corals are better adapted to future conditions. In Singapore, we're finding corals that can tolerate higher sedimentation and temperature stress."

Meghjani is also exploring whether certain properties on the water surface indicate what's happening below. "We have small autonomous buoys that can sense the water quality – the temperature, pH level and salinity – and tell us about the underwater domain as well," she says.

Malika Meghjani has developed software to help Our Blue Spaces analyse, measure and identify coral. It can also clean up images when visibility is poor.

To date, more than 4,500 users from 279 organisations have used the NbS Tool, where almost 100 organisations have identified over 280 NbS projects. "We want to ensure that high-quality NbS projects don't just take root but thrive – delivering triple benefits for nature, people and climate across the region," he adds.

Technology can also help to scale up coral restoration efforts. Working with non-profit coral restoration organisation Our Blue Spaces, Malika Meghjani, assistant professor in computer science and design at Singapore University of Technology and Design, developed software to help them analyse coral types and their growth.

The technology can clean up images in low-visibility waters, measure coral areas and identify corals using machine learning, saving time and resources. "Marine biologists take pictures, put a scale against them, measure how much the coral has grown and that's their record," Meghjani explains. "We wanted to enhance these images so they can see them better, label them and figure out the size of them in one tool."

Murky waters

Talking about the challenges she faces, Sam Shu Qin, marine biologist and co-founder of Our Blue Spaces, says: "Low visibility in Singapore's waters is our biggest pain point, so sometimes it's hard to get good pictures or videos to document coral growth and survey marine life. The process is also manpower-heavy – divers go out for the whole day to measure the data before we can actually get something we can analyse."

She adds: "We're at a trial stage where we have a coral nursery at ONE°15 Marina in Sentosa that we use as a test area to optimise the software before going out to open water. We've done a few runs to test the manoeuvrability, and whether we need to adjust the parameters or the drone structure to optimise documentation."

The long-term goal is to have a system that can memorise where transplanted corals are so that growth can be monitored over six months or a year. "There are still things that need to be looked at, like how you train the machine to understand the difference between corals and rocks."

KATIE SMITH is a freelance writer and editor

ENHANCING MARINE EXPLORATION

Meghjani has worked on a project that uses artificial intelligence to streamline underwater data collection and real-time decision-making for marine biologists.

Project MERLION (Marine ExploRation with Language-guIded Online iNformative Visual Sampling and Enhancement) addresses challenges such as limited data storage and communication bandwidth by identifying and reporting key events in real time. "If objectives change from time to time and marine biologists are interested in looking at puffer fish and cloud fish, but then want to see turtles, they can communicate this in natural language in real time," she says.

AI is used to help collect data on puffer fish, for example

"MERLION can align itself with the user's requirement and give only those unique events that are meaningful."

Visual data is enhanced in real time and monitored long term. Previously, the robot would be left underwater for three or four hours if it was powered autonomously by batteries, Meghjani says, and the marine biologist would then spend another four hours looking at the entire video sequence.

"We found a scoring metric where we could score the automated summaries based on what humans think," she adds.

"We showed users the entire video sequence or visual experience and they would select the summaries from it. We benchmarked against that, and our MERLION approach came close enough to the human score."

- **SCeNe Coalition: www.scenecoalition.org**
- **Project MERLION: www.youtube.com/watch?v=o1hDcecdX5g**

THE GREEN PARTY

A recent conference heard how the festivals and outdoor events sector is working towards sustainability. **Catherine Early** reports

The festivals and outdoor events sector faces a significant sustainability challenge. Though they vary in size and location, such events effectively create human settlements with all the associated transport, waste, water and sanitation infrastructure needed to accommodate thousands of people for a day or a weekend.

However, the public-facing nature of the sector means it has a unique role in shifting attitudes and behaviour, and can provide a testbed for innovative sustainability solutions.

As climate minister Kerry McCarthy told the A Greener Future (AGF) annual conference in February: "It's not just about what you can do to reduce your own emissions, it's the platform that you have to influence others. You have a much louder voice than many sectors that aren't quite as exciting or as much a part of people's lives."

Progress is being made. AGF has been assessing festival impacts worldwide for 19 years. It publishes an annual report outlining progress, innovation and areas for improvement within the sector. In 2024, it found that of 40 festivals assessed across 16 countries, more were offering fully vegetarian or vegan meals (20% compared with 8% in 2023), and had boosted recycling rates to 49%, compared with 46% in 2023 and 38% in 2022, with single-use plastics now banned at 70% of events assessed.

AGF CEO Claire O'Neill acknowledged that the festivals it assessed were generally more environmentally aware and active than the average, as they are either working with AGF or have achieved its certification. "Nevertheless," she said, "these results are promising, showing a trend towards decarbonisation and waste reduction. In particular, we are happy to see more festivals going plant-based, as this is one of the single most important changes events can make to protect nature and tackle climate change, and costs nothing."

Audience transport is the biggest source of emissions, representing 35-94% of an event's total, depending on location and length of event – even a small number of people flying will result in large emission shares.

Decarbonising trucking

Transporting event infrastructure to and from events, as well as equipment needed by individual acts, is a major source of emissions, at an average of 13% of an event's total, according to AGF's data.

Richard Burnett, managing director of trucking company KB Event, has been using hydrotreated vegetable oil (HVO) as a fuel for a while. He believes events in the corporate sector are making the change more quickly than those in the music business, which are put off by costs. While

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> Audience transport is the biggest source of emissions

he wants to move towards using electric trucks, he thinks the main barriers to this are costs, infrastructure, skills, availability and performance of the vehicles. Electric trucks cost around £400,000, compared with £150,000 for a standard HGV designed to pull trailers.

The sector also faces the challenge of travelling long distances in a very short space of time. He recalls a client asking if he could use an electric truck to transport equipment from the UK to Barcelona.

"We did all the mapping, looked at the charging infrastructure and the range of the truck. The technology will get there, but at the moment, it has not moved on sufficiently fast enough."

Burnett believes that the government needs to do more to support the trucking sector to make changes more quickly.

Portaloo problems

The issue of water and sanitation is becoming urgent for festivals. Most toilets at festivals are chemical portaloos, with waste removed daily by tankers. Some festivals use compost toilets to reduce waste transportation, but this stood at just 15% of festivals assessed by AGF in 2024. Some 30% are connected to the mains for some or all of their wastewater.

According to Jacob Tompkins, chief technology officer of The Water Retail Company, water companies do not have sufficient sewerage capacity locally to handle very large events. "When you take the waste away in tankers, it goes to a sewage treatment works which is already over capacity, and then the tankers have to drive further and further," he told the AGF's conference.

Jane Healy manages water and sanitation at the Glastonbury Festival, and oversees 6,500 toilets, the contents of which are removed by Wessex Water using around 350 water tankers over five days. "The situation is getting worse for Glastonbury – the local treatment works are at capacity, so we have to go further afield. That's more miles on the road by big tankers, which is undermining what I'm trying to achieve," she says.

Similarly, although water consumption at festivals is significantly lower than household use – at an average of 20 litres per person per day for festivals involving camping, compared with an EU household average of around 140 litres – large events can cause problems, such as low pressure in the tap for residents nearby.

The issue of water capacity is not well understood, Tompkins says. For example, in its plan for 2025-2030, Anglian Water has said that it cannot provide any new water supply. "If you've got an event there, there will not be any water."

To reduce the amount of transported waste, Healy uses compost loos, with 800 on site at Glastonbury. She is also looking at options for dealing with urine – for example, by turning it into fertiliser.

Healy believes that festivals can be great testing-grounds for new technologies. This year at Boomtown, which she also manages, water technology company MTD will provide units that transform wastewater into purified water on site. Theoretically, the treated water could be repurposed, for example for showers – although not this year. "It can only deal with 200 cubic metres a day, which isn't going to solve my issue, but it's an exciting start," she says.

Tompkins points to a raft of companies developing technologies that can remove nitrates and phosphates from wastewater and then sell them. He firmly believes that festivals could be an interesting

testbed for new technologies, and in return be seen as champions of water and wastewater innovation, rather than a burden on the local area.

Biodiversity impacts

Few festivals have given much thought to biodiversity impacts. However, organisers of the We Love Green festival in the Bois de Vincennes near Paris have begun a three-year analysis of their impact on nature, including that of noise and light pollution, and the presence of large numbers of people.

In 2024, the team installed ultrasonic sensors on bird and bat nesting boxes to monitor nest-building and brooding periods, and the number of eggs and fledglings per nest. It will also assess impacts on soil. This arrangement is being repeated in a similar area with no festival to compare findings.

With many trees planted just 20 years ago, the species that live in this urban wood are already partly adapted to human presence and disturbance, says Hortense Serret, an ecologist and founder of the consultancy Nabi Ecology, which is working with the festival on the initiative.

Data from the first year of analysis showed little impact on the birds, with a chick mortality rate of 5%, similar to that in other parks. Bat activity was found to take place later at night during the festival, indicating that they were avoiding the lights and noise. However, the festival had less impact than horse racing at the park, she says. Human activity and bad weather at the festival meant the soil was very disturbed, leading to lower plant diversity immediately after the event. However, this returned very quickly.

This kind of study can lead to 'fights and fears' with stakeholders. "You need people to come to the table and have a real conversation ... to discuss the good and bad impacts of the festival and find solutions together," Serret adds.

THE CARBON COST OF MUSIC FESTIVALS

Average share of emissions	Weekend camping festivals	Weekend non-camping festivals	Multi-weekend/ week-long events
Audience transport (ground)	39.5%	36.3%	22.1%
Audience transport (flights)	11.6 %	9.0%	68.7%
Food	8.8%	8.6%	2.8%
Beverage	12.6%	9.0%	1.6%
Artist transport and accommodation	7.8%	15.2%	2.2%
Production, freight, crew transport	13.6%	13.3%	1.5%
Purchased materials and serverware	2.1%	4.0%	0.4%
Energy and fuel	3.1%	2.8%	0.5%
Water, waste	0.8%	1.8%	0.1%

Source: A Greener Future

> Festivals could ... be seen as champions of innovation, rather than a burden on the local area

Pioneer events

Sustainability leaders in the live music sector have worked to create a concept show to prove that all aspects of an event can be greened. In August 2024, trip-hop band Massive Attack headlined at Act 1.5, designed to demonstrate the potential for large shows to become low-carbon.

The band had already collaborated with climate scientists from the Tyndall Centre for Climate Change Research and commissioned a roadmap for decarbonisation of the live music sector.

Held in Bristol with an audience of 32,000, Act 1.5 put many of the roadmap's recommendations into practice. The main stage was powered by renewable energy, with Grid Faeries and Ecotricity providing a 1 megawatt battery, to avoid the use of diesel generator backup; catering was meat-free site-wide; and all touring and production vehicles were electric or fuelled by verified 100% waste product HVO fuel.

Audience travel was reduced via a localised pre-sale period to encourage attendance by people nearby and the provision of free post-show electric shuttles to the main rail hubs. The artists travelled by public transport, and reduced the amount of equipment needed to be taken by road.

The Tyndall Centre's analysis of the show's impacts against the roadmap, compared with a hypothetical show where environmental measures are not prioritised, found a 72% reduction in emissions from artist and crew travel, and a 90% fall in greenhouse gas emissions associated with food. Emissions connected to on-site electricity were at least 81% lower than the counterfactual show, which was assumed to run on diesel generators.

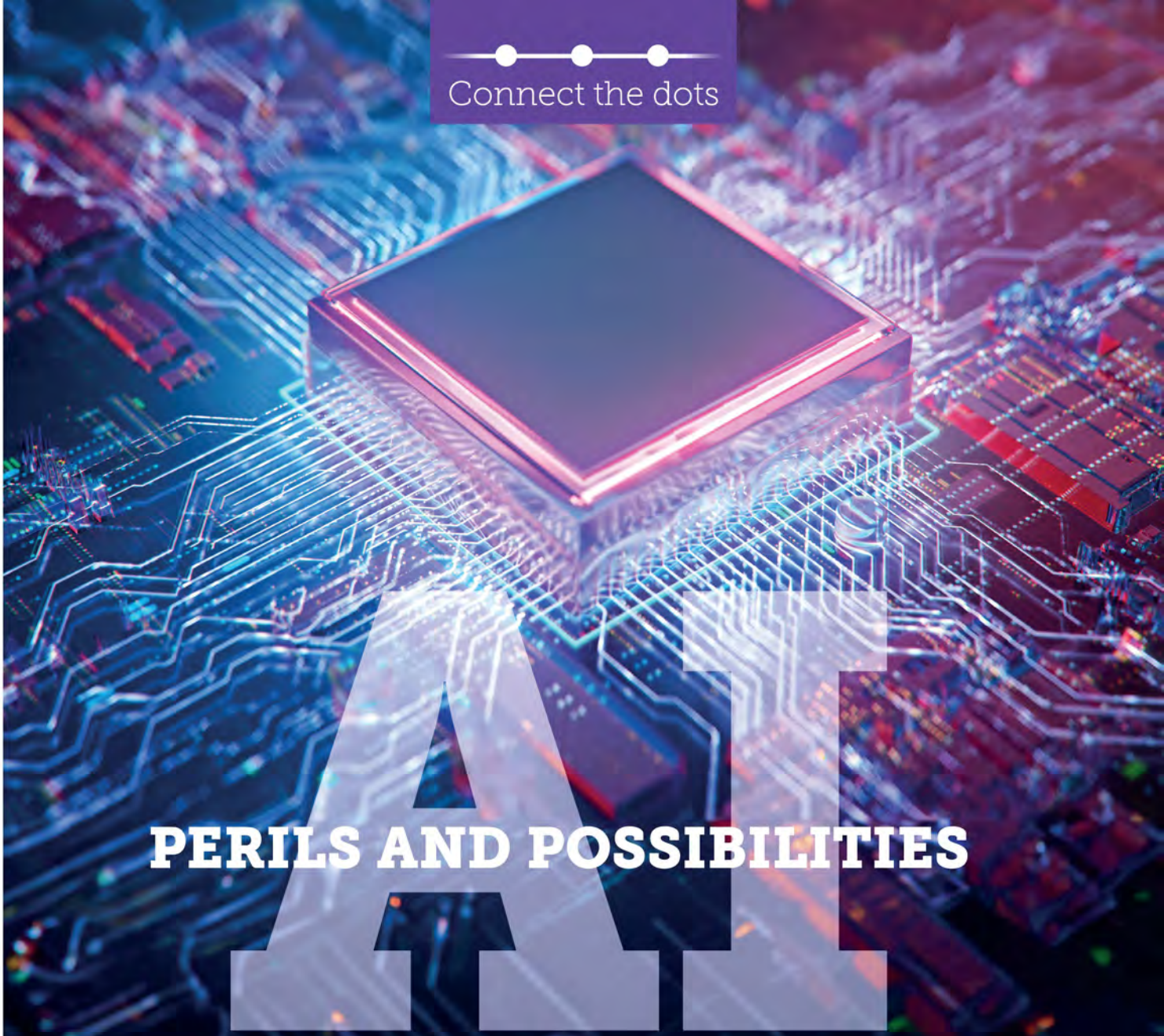
The Tyndall Centre believes collaboration was central to the show's success – especially the work with the train industry on audience travel, and the power and battery technology firms for festival power.

Music producer Jamal Chalabi thinks that the main barrier to making sustainability mainstream is a mindset that it is still optional. "It has to be part of every single conversation. People question the cost, but if we don't act, how much more will it cost?"

CATHERINE EARLY is a freelance journalist

Green skills and careers at Glastonbury

IEMA CEO Sarah Mukherjee MBE will be at Glastonbury's original solar-powered venue, Croissant Neuf, speaking at the Outrage + Optimism LIVE event. She will discuss green skills and careers alongside Greg Jackson, CEO of Octopus Energy, with Matthew Phillips from Global Optimism hosting. For more information, visit www.bit.ly/4jtJnZw



AI PERILS AND POSSIBILITIES

Generative artificial intelligence is having a profound impact on the environment and society, with the road ahead fraught with risks and rewards, writes **Chris Seekings**

One of the most pressing, and least-understood, issues facing sustainability professionals today is the emergence of generative AI (GenAI), which will come at a huge cost to the environment and society if not developed responsibly.

GenAI differs from traditional AI in its ability to generate original content – rather than just analysing existing data – and is set to transform almost every sector, including energy, healthcare, finance, entertainment, customer service, art and product design.

"This is probably the first technology that completely changes cognitive tasks, and it's evolving very quickly," says Antonio Vezzani, economic affairs officer at the UN Trade and Development (UNCTAD) agency.

Indeed, we are in the midst of an 'AI boom' following the release of tools such as ChatGPT, with a report co-authored by Vezzani warning that 40% of jobs could be affected within the next decade. "It will replace many jobs and tasks, but also create new ones, so the problem is how we manage the transition," he says. "There is strong transformative potential for societies and economies, but also a risk of widening inequality."

Concentration of power

UNCTAD's *Technology and Innovation Report 2025* forecasts AI to reach $4.8trn (£3.6trn) in market value by 2033 – which is roughly the size of Germany's economy – but the benefits could be highly concentrated.

Just 100 firms, mainly in the US and China, account for 40% of global corporate R&D spending, while leading tech giants, such as Apple and Microsoft, are each worth more than the whole GDP of Africa.

Furthermore, 118 countries, mostly in the Global South, are currently absent from major AI governance discussions.

There are already divides between developed and developing nations in relation to digital infrastructure, such as internet connectivity, and there's a risk that AI will further amplify those divides.

"There are three key leverage points: infrastructure, data and skills, which favour developed countries with the most patents, supercomputers, and so on," Vezzani explains. "AI could also see the competitive advantage of low-cost labour in developing countries become less relevant as a result of automation; transforming global value chains."

Carbon costs

Turning to environmental impacts, research by Goldman Sachs – which is rolling out a GenAI assistant for its bankers, traders and asset managers – suggests that the AI boom will see data-centre power demand grow 160% by 2030 as their carbon emissions double.

Mark Zuckerberg, CEO of tech giant Meta

A ChatGPT query typically requires nearly 10 times as much electricity to process as a Google search, with the research forecasting data centres to consume 3-4% of the world's power by the end of the decade, up from 1-2%.

"For years, power demand from data centres has been flat despite a near tripling in workload," according to the researchers. However, a deceleration in power efficiencies and increased AI demand could result in "electricity growth in the US and Europe not seen in a generation".

Meanwhile, emissions from AI chip manufacturing – much of which come from mining rare earth elements – skyrocketed more than 4.5 times last year, new research from Greenpeace East Asia indicates.

The region sits at the heart of the chip supply chain, and its heavy reliance on fossil fuels presents another challenge to the sustainability of AI. "Chipmaking is being leveraged to justify new fossil fuel capacity in Taiwan and South Korea – demand that could, and should, be met by renewable energy sources," explains Katrin Wu, Greenpeace East Asia's supply chain project lead.

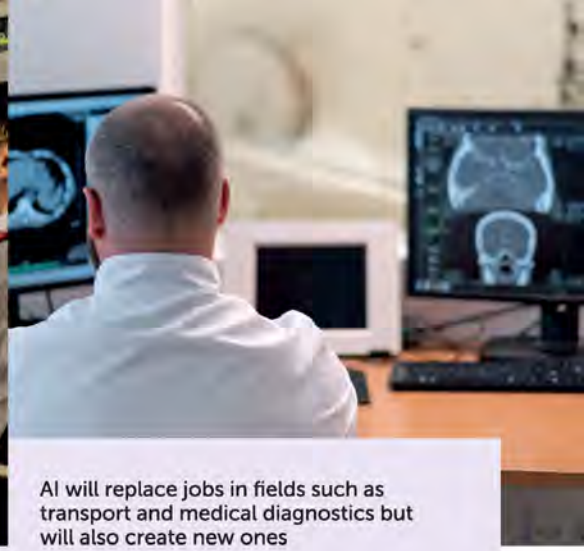
Seizing opportunities

While the increase in electricity demand for data centres is set to drive up emissions, a recent report from the International Energy Agency suggests that the rise could be offset by emission reductions if AI adoption is widespread.

This is backed up by a new white paper from Google, which claims AI could help mitigate 5-10% of global greenhouse gas emissions by 2030 – equivalent to the EU's total annual emissions.

"That number is much bigger than emissions from data centres, so there's a huge opportunity here," says Adam Elman, Google's director of sustainability for EMEA and IEMA Fellow. "Billions of people use products like Google Maps every day, and we work with partners in governments, cities, companies, startups and NGOs that can use AI for climate action."

For example, the company's Solar API platform uses geospatial data and AI to map 472 million buildings around the world. Providing data on roof size and radiation, this enables solar designers, installers and developers to scale up more cheaply and quickly.



AI will replace jobs in fields such as transport and medical diagnostics but will also create new ones

AI's predictive capabilities can also forecast wind output up to 36 hours in advance – helping to dispatch wind energy to grids promptly – and can accurately predict river flooding a week ahead of schedule.

Elman adds: "Google Maps has helped people get around more sustainably for many years, but we now use AI to very quickly calculate the most fuel-efficient driving routes, which has helped avoid 2.9 million metric tonnes worth of emissions in the past two-and-a-half years; equivalent to taking 650,000 fuel-based cars off the road annually.

"We've also been working with the aviation sector on contrails, which account for a third of the emissions from flying. Using geospatial data and AI, we've been able to cut real-world contrails by 54%."

Green machines

Despite the numerous applications for climate action, the technology must decarbonise and become more efficient if it is to have a net-positive impact.

Google owns and operates more than 29 data centres worldwide, and the explosion in AI drove its emissions up 48% between 2019 and 2023 – highlighting the challenge for the company to achieve its 2030 net-zero goal.

"It's a hugely ambitious goal – 20 years ahead of the Paris Agreement – and it's something we remain committed to, but access to clean energy is very different around the world, which is why we've been so focused working with policymakers and partners in Asia to bring clean energy to the region," Elman explains.

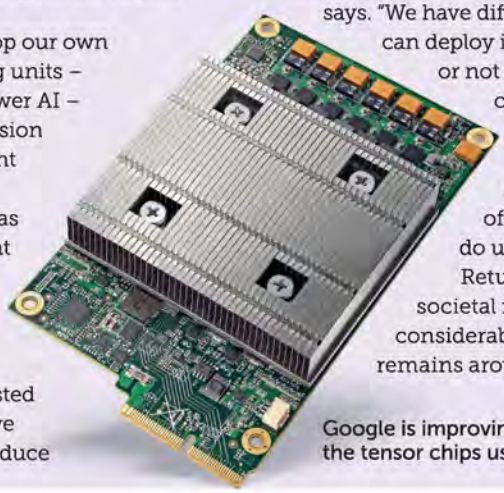
"We also develop our own tensor processing units – the chips that power AI – and our latest version is twice as efficient as the previous version, which was 67% more efficient than the one before. On the AI models themselves, we have tried and tested practices that have been shown to reduce energy use by 100 times and emissions by 1,000 times."

> "Developing nations must have a seat at the table to ensure AI serves global progress"

However, concerns around the vast quantities of water needed to cool data centres, and their impacts on biodiversity, remain. A study of 8,000 centres by NatureFinance found that 45% are in areas where there is a high risk to the availability of water, while more than 50% are in areas where there is a risk of drought.

"We're very thoughtful about where we locate our data centres, working with local communities and experts," Elman says. "We have different solutions we can deploy in terms of whether or not we use water to cool data centres, and we have an overarching goal to replenish 120% of the fresh water we do use."

Returning to the societal impacts of AI, considerable uncertainty remains around how it will transform lives, and how we can narrow the gap between the inevitable winners and losers that arise from its development under the current technological monopoly.



Google is improving the efficiency of the tensor chips used to power AI

As regulations and ethical frameworks take shape, developing nations must have a seat at the table to ensure AI serves global progress and to tackle existing biases in models that are trained in the West.

UNCTAD is also calling for an AI equivalent to the global ESG framework, which would act as a public disclosure mechanism to improve accountability.

"We need to find a way to involve big tech companies at the UN or international level, because the rate of technological progress is too fast for governments and policymakers to understand what's going on," says Vezzani. "We use the example of ESG because it works and has been taken up by stock markets, and will bring some transparency and accountability to the industry."

A balancing act

On the one hand, GenAI could be transformative for sustainable development, preventing climate disasters, helping develop new drugs such as malaria vaccines, and vastly improving quality of life and job satisfaction, while adding trillions to global GDP.

On the other, it could further widen inequality where millions, if not billions, of people are left jobless and struggling to find meaning while climate and nature targets slip out of reach.

Vezzani says: "Humans are behind the technology, so it's up to us to decide where this goes." As for a pause or slowdown in GenAI development, he simply adds: "Impossible."

JONAH ELKOWITZ/SHUTTERSTOCK.COM

The ups and downs of BNG

A flagship policy on nature recovery has passed its first anniversary. **Huw Morris** looks at how biodiversity net gain has fared so far

On first impression, the 14 hectares of farmland near the village of Hart, County Durham, looks nothing special. A stone's throw away from the coast, the site was previously classed as "low productivity". Now it offers a model for planning authorities and private firms tackling the simultaneous challenges of housing development and nature restoration.

Hartlepool Borough Council needs to build 400 homes a year to match demand. Since the introduction of biodiversity net gain (BNG) in England, developers must create or enhance habitats to compensate for harm caused by new schemes. They must deliver at least 10% better-quality BNG, measured by the extent, significance, quality and type of habitat.

The council has joined up with off-site BNG provider Environment Bank to create a habitat bank at Hart. This will offer biodiversity units for developers to purchase and meet the mandatory requirements. With housing schemes well under way in the area, developers such as Bellway, Miller Homes and Keepmoat now have immediate access to local biodiversity units.

Under the partnership, the provider will fund, establish and monitor Hartlepool's bank of habitat-enriching projects. In the next 30 years, the site will feature wildflower meadows, native hedgerows, mixed scrubland and new ponds. These aim to support a variety of species, such as lapwings, skylarks, great crested newts, brown hares and pollinating butterflies.

"Ensuring a ready supply of local off-site biodiversity units is crucial for unlocking development in Hartlepool," says the council's principal estates surveyor, Philip Timmins. "Partnering with Environment Bank allows us to meet our housing growth targets while delivering significant environmental benefits – without adding administrative burdens to the council."

But how has BNG fared elsewhere? What are the main challenges in delivering the policy? And what should happen next?

The challenges

BNG came into force for large developments in February 2024 and for small sites a couple of months later. Under the Environment Act 2021, planning authorities must publish their first biodiversity reports by 26 March 2026.

These reports will feature a wide range of qualitative and quantitative data on the BNG impacts of development.

Three studies suggest that the policy is struggling to bed in, however. Home Builders Federation research reveals that 98% of small and medium-sized (SME) developers find BNG a challenge. Some 94% report delays in processing planning applications since the policy became a legal requirement.

Nine out of 10 SMEs blame the delays on "insufficient BNG expertise or resources within local authorities". The study also reveals that 85% of developers with small sites believe the costs of BNG are not proportionate to the size of their projects.

SMEs with smaller sites are often unable to accommodate the requirement within their schemes and rely on purchasing off-site biodiversity units like those at Hartlepool. However, the federation warns, there are still not enough suitable credits available. This is hitting costs and "posing a substantial threat to the viability of smaller housebuilding sites".

Planning authorities are also resorting to external consultants to meet the BNG requirement, with each council spending an average of £23,000 a year on fees, the federation found. This chomps up most of government BNG funding for local authorities before factoring in the costs of hiring staff or providing training.

Freedom of Information requests as part of the study reveal that nearly 40% of authorities lack access to in-house ecological experts. A quarter of councils have seen ecologists leave their roles in the past year, while one in three have not expanded their ecology teams since BNG was introduced.

"The home-building industry has embraced BNG and is committed to increasing housing supply and protecting and enhancing our natural environment," says the federation's CEO, Neil Jefferson. "However, if we are to increase supply alongside these new requirements it is vital to address emerging barriers to implementation, such as the insufficient resourcing of local authorities, shortage of ecologists and inadequate guidance."

IKON IMAGES/JOHN

Can BNG calm NIMBYism?

A survey of 14,000 people by Joe's Blooms revealed that:

75%

think all new housing developments should improve the natural environment by creating green spaces or habitat banks

84%

of NIMBYs think all new developments should boost nature

36%

say nature improvements should happen locally over other parts of the country, with support peaking at 43% among affluent rural residents

49%

of NIMBYs cite loss of green space or environmental damage as key factors in resisting housing schemes

Behind schedule

A second study suggests that Defra overstated BNG's potential. It had estimated that 5,428 hectares of habitat would be generated through the policy each year. But FOI requests to local authorities by Wildlife and Countryside Link discovered that just 680 hectares of off-site land have been set aside for nature recovery, a shortfall of 86%. This rises to 1,220 hectares when including ecology companies – but still a shortfall of 78%.

Only 93 hectares of on-site BNG were recorded. Wildlife and Countryside Link says the combined 773 hectares have "dramatically missed" the government's BNG delivery expectations, achieving just half the minimum amount of annual habitat creation expected.

An additional 786 hectares have been proposed by local authorities as potential off-site habitat banks, but have yet to be approved. Only four authorities in England have so far implemented more ambitious 20% BNG requirements, while 30 have upcoming policies that, if adopted, will require more than the mandatory 10%.

"BNG is full of potential, but it's also full of holes," says Wildlife and Countryside Link chief executive Richard Benwell. "Holes in ambition, which remains limited to offsetting harm to habitats; holes in implementation, with huge numbers of planning applications falling through the gaps; and holes in enforcement, with no way to check that many of the promised gains for nature ever happen."

Revisiting exemptions

A third study points to a less obvious problem. Data from technology specialist TerraQuest shows that more than 75% of non-householder planning applications in England have claimed an exemption from BNG since the policy's introduction. The three most common reasons cited for exemption are *de minimis* or does not impact a priority habitat, self-build and custom development, and retrospective planning permission. *De minimis* claims made up 76% of total non-householder exemptions in August-December 2024.

> "The abuse of the exemptions policy ... is holding back progress in meeting nature restoration targets"

"BNG is a world-leading policy and the government has the ability to go a step further in safeguarding England's biodiversity for future generations by revisiting the exemptions regime," says Oliver Lewis, chief executive of biodiversity tech start-up Joe's Blooms. "The abuse of the exemptions policy, especially *de minimis*, is holding back progress in meeting nature restoration targets."

BNG has had a rocky start but it is too early to bury it, says IEMA policy and engagement lead on biodiversity and natural capital Lesley Wilson. She calls on Defra or Natural England to carry out research into the policy to see "what works and what doesn't work".

Developers, landowners, planners and council ecology teams all need time to learn the ropes. "A year is not long enough to judge whether something that is very new is going to work," she adds.

HUW MORRIS is a freelance journalist

DOVAL / IKON IMAGES

Challenge and change

Can disagreement improve resilience? **Sara Hickman** explains how to create a strong foundation for braver conversations

Resilience. What does that word mean to you? Perhaps building it is an important part of how you approach your work and life or it's integral to how you lead your team. Perhaps it's part of the values you have built into the culture of your organisation. Maybe it's simply a buzzword.

Resilience, as a term, covers many aspects of our work and personal lives: how we deal with setbacks, how we respond to challenges, how we deal with and manage workloads, and, crucially, how we respond to the people we work alongside (some of whom we may like and some we may not).

We will have an instinctive approach to those situations and, with varying degrees of success, we will have created our own innate levels of resilience. Whether we would consciously name it resilience or not, what you will have created is a 'method' or a way of working that helps you deal with, and then recover from, challenging situations.

This is good news. We would encourage everyone to be conscious of their own methods because doing something on purpose and with clarity makes it repeatable: if I can break it down step by step, I can repeat the process.

Here's the potential problem: often the methods we've created may relate to objective and tangible activities. For example, if you once struggled to manage your time and workload but have learned a few techniques to help, it's likely you can handle the challenge of a busy schedule. You now know what to do to recover from a stressful period of activity. In turn, this improves your resilience.

The problem may occur when our resilience is connected to a challenging relationship and the difficult conversations that may occur repeatedly as a result.

Building resilience levels when it comes to handling difficult conversations is hard. When we are in conflict with people it can cause hardship and adversity, primarily because it can be emotionally draining and because the solution can be more complicated, less linear. It's not a 'do this' and 'get that' equation.

Focusing on disagreement is not an obvious route to increasing resilience in these situations. We would disagree. When we work with individuals or

decision-making groups, we know that disagreement, managed well, leads to more trust and connection in relationships.

So, how can disagreement improve resilience? The answer to that question begins with two important steps:

- **Step one:** Dispel the myths around disagreement
- **Step two:** Replace those myths with tangible (resilience-building) actions

In our previous article (*Transform*, Mar/Apr 2025), you will have read that language matters when it comes to shaping culture, informing our mindset and shifting perceptions. Before we get into the myths around disagreement, let's start with a small change. We recommend that you expand your description of disagreement to 'well-formed' disagreement.

This is a simple change and it is incredibly effective when it comes to how we feel about disagreeing with others: it's not chaotic or adversarial but structured and well-formed.

Dispelling our top three myths on 'disagreement'

1. **It's better to have difficult conversations 'in the moment'**

With this myth, we convince ourselves that having a conversation 'in the moment' is better and less stressful because it's over and done with quickly – well, technically it is, but only for you. The problem is, it's often not a repeatable or helpful conversation and so the stress level continues from conversation to conversation.
Replace this myth with **structure**.

2. **I can just wing it – I don't need to prepare, I know what I need to say**

With this myth, we can congratulate ourselves a little on our approach because it can give us a short-term, but potentially false, sense of confidence. We feel brave, we know what we want to say and so away we go...
Replace this myth with **discipline**.

3. **We'll fall out and it will damage our relationship so I just won't address it**

With this myth, we can avoid the possible discomfort or upset by replacing the conversation with avoidance. We do acknowledge that this is a good short-term strategy to help you find the right time for a conversation, but as a long-term strategy, it will only increase stress levels.
Replace this myth with **skill**.

Why dispel the myths?

You don't have to; there is always a choice. It could be that your current relationships and the level of discomfort you feel about disagreement means you can maintain a reasonable level of resilience in your work or personal life.

But holding on to these myths can be strategically risky and personally unsustainable. From experience, we see the following when individuals and teams hold on to these three myths:

- Critical conversations take longer to resolve or end in stalemate or, worse, in unresolved conflict that increases the level of challenge
- You waste time by avoiding conversations or create a pointless cycle that may involve a 'workaround' – increasing workloads and potentially placing indirect stress on others
- Not learning strategies to hold skilful, well-formed disagreement can stifle progress at a personal and strategic level because we never get to a better solution.

How to replace the myths

Apply our three pillars to your meetings, conversations or anywhere that true discussion and collaboration is needed, as outlined in 'The three pillars in practice', left.

These pillars are an introduction to our methodology. We use these simple tools to break through the myths around disagreement and increase your individual resilience within those conversations. It can feel empowering to know you can approach harder conversations and with simple changes maybe even enjoy them.

In summary

Can disagreement improve resilience? If we rush into conversations with little preparation and curiosity, then the answer to that question is 'no'.

In the short term, it's more exciting to build small, repeatable steps into your routine so you have a strong foundation for braver conversations on topics you may have avoided.

In the long term, shifting your perspective and embracing well-formed disagreement as a critical part of your own, your team's and your organisation's overall resilience will increase your ability to innovate into the future. Now that's truly exciting.

SARA HICKMAN is principal consultant and owner at We Are BRAVE
wearebrave.co.uk/brave-principles

THE THREE PILLARS IN PRACTICE

PILLAR 1: STRUCTURE

Your responsibility here is to think clearly about what you want to discuss.

Be clear, be specific. Once clear, explain it to the other person, then set up the date/time/location for the conversation. The risk here is that you might get drawn into having the chat 'in the moment'.

Potential outcome? More structure and thoughtful timing for the conversation increase the likelihood of a calmer dialogue.

PILLAR 2: DISCIPLINE

Your responsibility here is to take time to write down the key points you want to say and to reflect on how the conversation might progress. You cannot control the entire conversation, but you do have personal discipline to stick to what is important.

Potential outcome? Taking control of our own input gives us more confidence in the moment and reduces our stress during the conversation.

PILLAR 3: SKILL

Your responsibility here is to help your brain work for you, not against you. Research suggests that our brains cannot exist in fear and curiosity at the same time. How do we employ curiosity? Ask a question and listen to the response. Then ask another question.

Potential outcome? Curiosity is an amazing tool to gather more information and solve a problem. We can use it to reduce our anxiety levels.

JOINED-UP THINKING

A green bridge over the A3 reconnects two SSSI heathlands

Stephen Elderkin and **Ben Hewlett** investigate what more can be done to link habitats and boost the UK's nature recovery efforts

For all the wonderful complexity of nature, the prescription for nature recovery is simple. The Lawton review memorably summed up what is needed as "more, bigger, better, and joined" habitat. This would reverse the trends of habitat loss, degradation and fragmentation that have driven the UK's decline in biodiversity.

Each of the four Lawton principles matters. Enough large and well-managed areas of habitat provide reservoirs of abundant nature, supporting diverse and viable populations. Bigger 'core' areas support more complex ecosystems, providing greater resilience and the possibility of restarting natural processes. But large islands of habitat are not enough on their own – they need to be connected.

Target 3 of the UN Kunming-Montreal biodiversity protocol also highlights connectivity. It aims for the protection of 30% of land and sea, stating that the protected areas should be not only equitably governed but also "well-connected". Small areas can only support small populations, with limited genetic variability. The result is populations vulnerable to collapse, leading to local extinction from disease or adverse events.

Without connectivity between habitats, there is no possibility of repopulation from other areas. Without an extensive network, there is no ability for species to move in response to changing climatic conditions. The better connected the UK's protected habitat, the more muscular and resilient it will be.

Highway to habitat

National Highways, along with the wider infrastructure sector, has a vital role to play in the UK's nature recovery efforts. We are a major landowner, and our network extends the length and breadth of England. There are 30,000 hectares of vegetated land at the side of the roads, the same area as the Isle of Wight, and this is important habitat in itself. We have been investing in improving data on habitat condition and now manage the land for nature as well as safety. However, it is our role in improving nature connectivity that is most significant.

National Highways' linear infrastructure offers both a positive and a negative for nature connectivity. Road verges are relatively wide and offer corridors for nature that pass through the landscape, connecting up with a variety of adjacent habitats. However, the roads themselves are a source of habitat fragmentation. Any road that carries more than 10,000 vehicles a day is equivalent to erecting a security fence for nature, dividing the habitat either side. In the 70 years that these roads have been constructed, almost no consideration has been given to mitigating this impact or providing nature crossings. That is now changing.

In January 2025, the beam-lift took place for a green bridge over the A3 near Wisley in Surrey. At 30 metres wide and 70 metres long, this structure will reconnect two heathlands, both sites of special

NATIONAL HIGHWAYS

scientific interest with international designation, that were severed by the construction of the A3 50 years ago.

The green bridge in Wisley is being constructed as part of a major project to upgrade a junction on the M25. Another two bridges are being built in Gloucestershire and Cornwall, also part of major construction projects.

While this is to be celebrated, it does not match the investment that is being made in nature connectivity across the world. For example, in 2005 the Dutch decided that they could not achieve their nature objectives without a multi-year defragmentation programme. During the following 15 years they invested more than €200m to address the most significant points of nature severance across the country, including the construction of nearly 200 'ecoducts', or nature crossings, of which 80 were green bridges. The locations for these ecoducts were determined by a top-down analysis of where crossings would deliver the greatest benefit for viability of populations.

In contrast, the handful of green bridges built to date in the UK are part of major enhancement projects – there is no strategic vision for reconnecting nature at a national scale. Making the case for individual crossings will always be challenging, because on their own they will not significantly contribute to nature recovery, and the benefit of a nationally connected network of protected habitats is not considered in the value-for-money analysis.

Construction of the green bridge in Wisley

> "There is no strategic vision for reconnecting nature at a national scale"

A common vision

There is an opportunity to articulate a common vision for nature recovery in the UK and thereby align policy and nature recovery investments to realise it. For the UK to meet its commitments under the Global Biodiversity Framework, and to deliver on the nature recovery priority, we know what needs to be done. We need to create a Strategic Nature Network consisting of core habitat areas with connecting corridors between them. The nationally significant core areas could be defined as priority Nature Investment Zones, which provide the opportunity for nature recovery investments to be targeted and delivered at scale. They also provide for collaboration between the many organisations that are funding biodiversity units or otherwise financing nature-positive activity.

Given that our economy is embedded in nature, this is vital national infrastructure – a national network that merits a decadal infrastructure delivery programme with a natural infrastructure delivery body carrying the mandate to use all the policy and funding levers available to create it.

National Highways would benefit from a commitment to a Strategic Nature Network. We have funded more biodiversity units than any other organisation over the past five years, and will fund more in the next five. A national spatial strategy, guided by nature restoration principles, would allow this investment to be more targeted and maximise the benefit of these programmes.

More importantly, a commitment to the Strategic Nature Network would provide the context within which to make the business case for a national defragmentation programme, including the retrofitting of nature crossings to our network where required.

Justifying the spend on each individual crossing will always be challenging. Only with a bold vision can we hope to make the case for a comprehensive national programme.

STEPHEN ELDERKIN is director of environmental sustainability, National Highways; chair of Rebuilding Nature
BEN HEWLETT is senior environmental adviser, National Highways

● **Rebuilding Nature is a coalition of organisations calling for a Strategic Nature Network; www.rebuildingnature.com**

The Wisley bridge will provide a safe crossing for pedestrians, cyclists, horse riders and wildlife

“I support the development of coastal infrastructure and renewable energy”

Ifeanyi Chukwujekwu MIEMA CEnv, principal environmental consultant, WSP in the UK

Why did you become an environment/sustainability professional?
I started with urban planning. I've always been interested in how cities emerge and the order of development. Growing up in Africa, I had often travelled on holiday with my family to Europe and America and marvelled at the contrast in environmental features.

There are a few examples of well-planned towns in Nigeria, but most master plans are out of date and development is often haphazard. I decided to become a planner to get involved in reversing this trend. I developed a keen interest in sustainable development and geography was one of my favourite subjects, so I chose to study urban and regional planning.

Ifeanyi Chukwujekwu specialises in environmental impact assessment

What is your current role and what does it involve?
I support the development of coastal infrastructure, such as sea defence and other coastal development, and renewable energy infrastructure, particularly offshore windfarms.

I could be involved from the early stages of project development in feasibility assessments and advising on best options to avoid likely significant effects on the environment, to applying for consent from statutory regulatory authorities. The key speciality of my role is environmental impact assessment, mainly within the marine environment.

What's the most challenging part of your work?
Adhering to project timescales and managing client expectations. Also ensuring that environmental impact assessments are proportionate to the project and its environment.

What are the most important skills for your role?
A knowledge of, and an ability to interpret, key policies and regulations. An understanding of the environment and the pressures that could affect baseline conditions. And, equally, an understanding of the source of those pressures, pathways and the receptors that would be affected.

Where would you like to be in five years' time?
Continuing to contribute to sustainable development of infrastructure. I'd also like to be more involved with IEMA.

What advice would you give to someone entering the profession?
It is a rewarding career in terms of considering the big picture and seeing that your contribution has helped to create sustainable environments. It requires patience, as the benefits of some projects take time to materialise. Environmental management is also multifaceted, and professionals can come from varied backgrounds. Discover what you are good at and how that can be applied in creating and managing sustainable environments.

Describe yourself in three words
Resilient, creative, inquisitive.

What motivates you?
Seeing projects come to life with tangible benefits for the environment.

Greatest risk you have ever taken?
Moving to the UK as an international postgraduate student. Literally starting my career again from scratch.

If you could go back in history, who would you like to meet?
Ebenezer Howard, the founder of the garden city movement that sought to create towns with a balance of industry, agriculture and residences.

GET IN TOUCH
If you would like to contribute a member profile, contact: s.maguire@iema.net

Green Careers Hub content spotlight: biodiversity

The natural world is declining at an unprecedented rate – one million species are threatened with extinction, and entire ecosystems are disappearing. All businesses must have a biodiversity policy to integrate into a wider sustainability strategy. Hays offers five steps to put biodiversity back in business: **www.bit.ly/biodiversity-in-business**

Paige Wilson, former policy and public affairs officer at Groundwork UK, showcases how the charity supports individuals and communities and helps nature thrive: **www.bit.ly/Paige-Wilson**

What roles support biodiversity?

- The remit of an **environmental conservation officer** is to protect, manage and enhance the environment across a variety of habitats and species. **www.bit.ly/EnvironmentalConservationOfficer**
- Working with farmers, government bodies and environmental groups, **farm environmental advisers** are critical in driving the transition to sustainable agriculture and as global investment in biodiversity and climate goals grows. **www.bit.ly/FarmEnvironmentAdviser**

For access to information and opportunities around green skills, jobs and careers, visit: www greencareershub.com

Green Careers HUB

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