

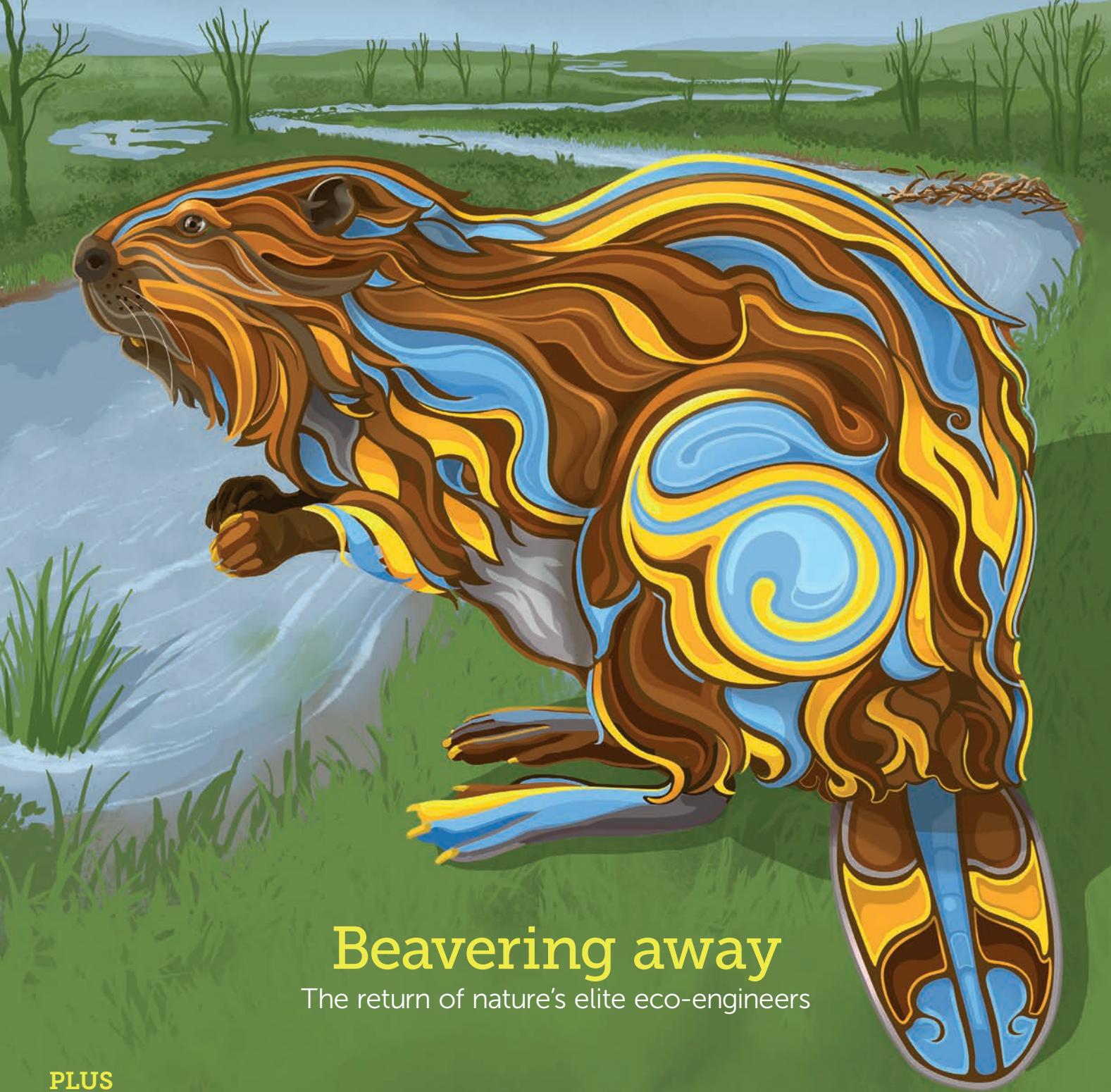
TRANSFORM

FOR ENVIRONMENT AND SUSTAINABILITY PROFESSIONALS

Environment
Economy
Society

Feb/Mar 2022

www.iema-transform.net



Beavering away

The return of nature's elite eco-engineers

PLUS

Stealing from tomorrow Sir Partha Dasgupta on biodiversity loss

Out of credit How can carbon offsetting be made more trustworthy?

A broader view Why GDP isn't the be-all and end-all of success

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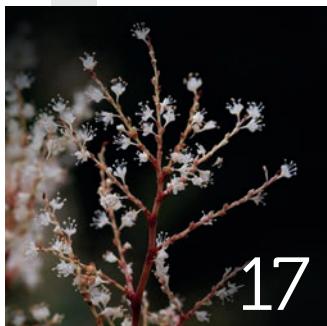
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bit.ly/IEMA_OnTheHunt



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

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ROUNDUP

ENVIRONMENT &
SUSTAINABILITY
NEWS AND VIEWS

RISK

Environment threats top WEF risk ranking

Climate action failure is the risk global leaders fear most over the next 10 years, followed by extreme weather and biodiversity loss. That is according to the World Economic Forum's (WEF) *Global Risks Report 2022*, which draws on the expertise of nearly 1,000 academic, business, government, civil society and thought leaders.

Climate action failure was identified as having the highest potential to severely damage societies, economies and the planet. However, more than three-quarters of global leaders believe that international efforts to mitigate climate change are in "early development" or have "not started" yet.

Human environment damage and natural resource crises also feature in the top 10 risks for the next 10 years, as do social cohesion erosion, involuntary migration, adverse technological advances, debt crises and geopolitical confrontation. The erosion of social cohesion, livelihood crises and mental health deterioration were identified as the risks that had increased most since the start of the COVID-19 pandemic. Only one in 10 leaders believe the global recovery will accelerate in the next three years.

Four areas of emerging risk identified include cybersecurity, competition in space, a disorderly climate transition, and migration pressures, with each requiring global co-ordination for successful management.

"The climate crisis remains the biggest long-term threat facing humanity," said Peter Giger, group chief risk officer at Zurich Insurance Group, one of WEF's strategic partners. "Failure to act on climate change could shrink global GDP by one-sixth and the commitments taken at COP26 are still not enough to achieve the 1.5°C goal."

Read the full *Global Risks Report 2022* at bit.ly/GlobalRisks_2022

ECONOMICS

Cost-of-living crisis 'most immediate threat' to climate targets

The most immediate threat to the UK's net-zero agenda is the cost-of-living crisis, as soaring energy prices and rising inflation mean households face a major squeeze, the Institute for Government has warned.

In a recent policy briefing, the think tank highlights how rising costs are set to come to a head in April this year, when inflation is set to peak, along with tax rises and a new energy price cap. This is likely to add around £600 to the typical household's annual energy bill. The government's response will be critical in preserving political and public support for net-zero policies.

The first test the government faces is showing how it can help households weather the storm without losing track of net zero, according to the paper. It also needs to demonstrate how it can reconcile net zero with the long-term provision of secure, affordable energy.

NET ZERO

UK government taken to court over Net Zero Strategy

ClientEarth is taking the UK government to court over its Net Zero Strategy, claiming that the proposed policies will not deliver the emissions reductions required under legally binding climate targets.

The group of environmental lawyers said that the government has breached its legal duties under the 2008 Climate Change Act. Moreover, they claim that its approach risks having to introduce drastic measures for future generations, with disproportionate impacts on people's rights to life and to family and private life under the European Convention of Human Rights.

"It's not enough for the UK government simply to have a net-zero strategy, it needs to include real-world policies that ensure it succeeds," said Sam Hunter Jones, senior ClientEarth lawyer. "Anything less is a breach of its legal duties and amounts to greenwashing and climate delay."



IEMA Connect 2021

IEMA's inaugural membership conference took place last December, with members treated to a day of thought-provoking discussions and workshops. **Chris Seekings** reports



IEMA Connect 2021, held in December, attracted an impressive line-up of speakers, from government representatives to sustainability professionals working at some of the world's largest organisations.

The inaugural online conference gave IEMA members the opportunity to engage with thought-provoking panel discussions and workshops, exploring hard-hitting discussions on COP26, climate change and much more.

After a warm welcome from CEO Sarah Mukherjee MBE, attentions turned to the role of the built environment in tackling the climate crisis, with a galvanising presentation from Ayo Sokale, project manager at the Environment Agency.

The chartered civil engineer outlined the importance of taking a holistic approach to the challenge, focusing on the three pillars of sustainability – environmental, economic and social – and remaining mindful of the inextricable link between social inequality and environmental degradation.

"Use your voice at work, in your professional institutions, in your communities, and campaign on the things that matter to you," she said. For people of colour trying to break into the environment and sustainability profession, she added: "Don't let anything stop you from using your voice, or make you feel like you are not allowed to do what you



want to do, even in a space that isn't diverse yet – because you are going to be the one that makes it so!"

Three additional keynote presentations were made throughout the day-long conference, including one on breaking down barriers to build green skills across the globe, presented by Andrew Griffiths, head of value chain sustainability at Nestlé UK & Ireland.

Meghna Das, sustainability lead at UNICEF UK, gave a presentation on how to tackle the climate crisis for children, young people and communities, giving examples of private sector partnerships and further opportunities for engagement.

The sustainable business transformation of the 2020s was also explored by Mike Barry, director at Mike Barry Eco

Limited, who posed three questions: Why do you need to become sustainable? What do you need to do to become sustainable? And how do you integrate sustainability into all you do?

IEMA members were also able to navigate through various panel discussions on how to reach net zero, building a skilled workforce to drive positive change, the next steps for tackling the global biodiversity challenge following the first part of COP15, and COP26 outcomes and challenges.

A day of networking, engagement, and fascinating discussion was closed by Mukherjee, who highlighted how a "strong sense of commitment and professionalism" came through strongly from IEMA members during the conference.

She added: "You will all take away particular memories and inspiration from the conference, as well as new contacts and ideas. A huge thank you to our wonderful members for your engagement and passion, and for helping us to make IEMA Connect 2021 such a success."

IEMA members can rewatch all the sessions from the conference at bit.ly/3FXgdPl

IEMA CONNECT 2021 was sponsored by LRQA. The Exhibit sponsor was RRC international.





MEMBER NETWORKS

Steering group members needed for Biodiversity and Natural Capital Network

Biodiversity and natural capital underpin businesses' delivery of products and services, as well as creating sustainability for business, people and planet. Businesses are increasingly looking to understand and develop good practice in these potentially complex areas.

In 2021 the UK government produced the Environment Bill, which included significant measures on biodiversity net gain, and there are increasing initiatives from organisations such as Science-Based Targets for Nature and the UK Business and Biodiversity Forum.

Recognising these activities, the IEMA Board has identified the need for a dedicated Policy and Practice Network and Steering Group for biodiversity and natural capital, to support business and members. We are looking for IEMA members who would like to become part of the steering group for the new network. The steering group will be made up of nine volunteer representatives and a chair, and will oversee the development and delivery of policy and practice in biodiversity and natural capital.

The group will aim to drive best practice, innovation and advocacy, guided by the principle of transforming the world to sustainability. It will

champion issues relevant to biodiversity and natural capital professionals, help set up a strategy for the network, and create an annual work programme that might include responding to consultations, informative webinars and preparation of guidance material.

This is a unique opportunity to drive the agenda in this area. If you are interested in joining the group, please respond by 10 February 2022 to policy@iema.net with answers to the following questions (no more than 500 words):

- What role do you believe the Biodiversity and Natural Capital Steering Group can play in supporting professionals in this area?
- What do you believe are the key issues?
- What other relevant skills and knowledge do you have?
- Would you like to be considered to chair the group, and why?

Terms of reference are available on request. IEMA aims to establish a diverse membership for the steering group, both demographically and in terms of technical and soft skills. Member selection will include particular attention to ensuring that it has a diverse make-up.

MEMBER NETWORKS

Contribute to the Climate Change and Energy Network

During COP26, the Climate Change and Energy (CCE) Network's supported our members to engage through webinars, consultation responses and guidance. Many IEMA staff and members attended as guest observers, and we presented on net-zero issues.

The CCE Network is looking for new contributors and steering group members for 2022. We have a range of activities planned to help develop opportunities for network members. These include:

- Guidance and briefing on climate change adaptation and resilience
- A network task group will develop a concise publication on Scope 3 emissions
- Webinars and blogs: Have you any initiatives or developments that could be of interest within a blog or webinar?
- We have vacancies to fill, through election, to the CCE Network Steering Group. Could you contribute to this IEMA network?
- Other topics include: zero-carbon transport, net-zero transition, influencing climate action, removals and offsets.

We encourage you to join in and support us however you can. Write to us at climate@iema.net, indicating which opportunity you are interested in and how you feel you can support, with the activity in the subject line.

**Dr Jonathan Foot,
FIEMA CEnv, IEMA
Climate Change
and Energy Network
Steering Group chair**

PUBLICATION

New land and soils guidance for EIA

Soil protection and health is rising up the policy agenda with the announcement that a Soil Health Action Plan (SHAPE) for England will be published to help restore the health of our soils. Lord Goldsmith made the announcement in a speech during a debate at the Report Stage of the Environment Bill in the House of Lords in September 2021. He confirmed that SHAPE will be a crucial part of the UK government's plan to halt species decline by 2030, as well as meet long-term, legally binding targets on biodiversity. The government recognised that well-managed soils can increase biodiversity, improve water quality and reduce carbon emissions; it is expected to consult on SHAPE's draft outline in the spring of 2022.

In this context, IEMA is delighted to announce that IEMA's latest Impact Assessment Guidance, *A New Perspective on Land and Soil in*

Environmental Impact Assessment, will be published in February. The guidance was originally scheduled for publication in October 2021, but final publication has taken longer than anticipated.

The guidance seeks to move practice away from a narrow focus on quantifying and financially compensating impacts on agricultural land, instead advocating a new and wider approach to assessing the soil functions, ecosystem services and natural capital provided by land and soils. It highlights and reinforces the importance of soil functions and ecosystem services to wider systems including, but not limited to, carbon and climate, hydrology, food production, biodiversity and ecology. Part position paper, part educational resource and part methodological guidance, the result is a handbook on the

current state of land and soil in environmental impact assessment (EIA) and will be a valuable resource for practitioners seeking to assess and manage the effects of developments on land and soil.

IEMA sees this as the start, rather than the end, of its guidance in this important area, and looks forward to further innovations in methodological development and future examples of good practice from EIA members and EIA Quality Mark organisations. We are hopeful that this publication will strengthen the consideration and protection of our vital and finite land and soil resources through impact assessment and planning.



Go to bit.ly/Webinar_Lands to book onto the guidance launch webinar for the chance to hear from the guidance's key authors.

PUBLICATION

Second edition of EIA greenhouse gas guide launched

In the development of major projects, it is important to consider greenhouse gas (GHG) emissions through environmental impact assessment (EIA) during the consenting and planning process. IEMA first published its EIA guide *Assessing Greenhouse Gas Emissions and Evaluating their Significance* in 2017 to coincide with the changes to the EIA regulations, with a greater emphasis on climate and GHGs. This guidance followed on from IEMA's 2015 EIA guide *Climate Change Resilience and Adaptation*. In 2020 we updated and published a second edition of the latter,



based on input from our expert members and stakeholders. We are now proud to announce the publication of the second edition of the former, updated based on insights from the past five years to take the current state of good practice into account. The new guidance will be accompanied by a launch webinar and is expected to be available from February.

Check iema.net/events to book onto the guidance launch webinar for the chance to hear from the guidance's key authors.



NICK BLYTH

IEMA policy and engagement lead

IEMA responds to call for evidence on green tariffs

The UK energy sector is undergoing a profound transition, with wind turbines and solar photovoltaics now accounting for more than 40% of its electricity mix. Contributing to or shadowing this transition, energy retailers are increasingly offering 'green electricity' or '100% renewable' tariffs to their customer base. It is seen as an easy climate action for households and businesses to take, but there are concerns over the transparency of tariffs and whether they truly support decarbonisation.

This was the context behind a call for evidence from the Department for Business, Energy and Industrial Strategy late last year, which aimed to help it understand challenges around this topic and consider the case for reforms. Drawing on relevant practice and surveys, IEMA responded and raised several issues. One of these is understanding how organisations are themselves using green tariffs, and what their influence (positive or negative) is on organisations' transition decision-making – especially in the context of net zero.

IEMA's response proposed that improved consumer information is needed, reflecting changes in the market and the net-zero context. IEMA has provided explainer guidance (bit.ly/NetZeroExplained) and updated principles (bit.ly/PathwaysToNetZero) to support professionals, and looks forward to contributing to further developments in 2022 and working with members to build understanding and share good practice. Read our blog and full response at bit.ly/GreenTariffs_Response

GOVERNANCE

Policy and Practice Committee holds first meeting

The inaugural meeting of IEMA's Policy and Practice Committee (PPC) took place in January. The PPC was created following a 2021 review of IEMA's governance structures pertaining to policy and practice activity.

The review (bit.ly/PolicyPracticeRev) concluded that a PPC should be established to provide long-term and strategic oversight across all IEMA policy and practice activity. It will meet four times a year.

The committee will enable IEMA's thematic member steering groups – Climate Change and Energy, Impact Assessment, Global Environmental and Social Assessment, and Circular Economy – to deliver their respective activities in a more effective and joined-up way.

In addition, and as set out in the governance review, the PPC will:

- Identify major projects for relevant member steering groups to deliver
- Advise on expert stakeholders for any task and finish groups required for policy and practice work
- Appraise the impact of policy and practice outputs, and suggest process improvements
- Regularly consult and survey IEMA's membership to gauge views on policy and practice priorities.

The members of the Policy and Practice Committee are as follows:

- **Louise Nicholls**, managing director at Suseco.org (interim chair)
- **Conor Savage**, climate reporting manager at Natwest
- **Andy Whyle**, sustainability consultant at S-AW
- **Adrian Barnes**, senior manager at Green Investment Group
- **Stefan Boss**, director of environmental planning at Stantec



- **Bret Willers**, head of climate change and sustainability at Coventry City Council
- **Andrew Smith**, research environment and sustainability lead at Crown Commercial Service
- **Cathie Mackay**, vice president of environment health and safety services and third-party oversight at GSK
- **Marie Fox**, evidence adviser at the Environment Agency
- **Laura Bartle**, net zero policy and strategy manager at the National Grid
- **Dr Eric Twum**, chief executive officer at Institute of Green Growth Solutions

For more information regarding the PPC and its activities, contact policy@iema.net

Urban oases

The pandemic seems to have focused minds on the importance of green space, says **Aona Stuart**

Urban areas are hubs for people, infrastructure and commerce, requiring extensive resources and putting intense pressure on the environment. As urban landscapes become the everyday environment for most of the human population, with the UN predicting that 68% of the global population will be living in urban areas by 2050, we must address the inextricable link between nature and people.

Intense urbanisation processes have resulted in built environments that lack green spaces. However, more recently, and in response to the COVID-19 pandemic, there has been a change in the perception and functionality of existing green spaces and infrastructure. Incorporating green spaces into the built environment can strengthen relationships between nature and people.

Green spaces can typically be split into the following categories: those for pleasure (public parks, tree-lined streets), those for use (allotments, playing fields), water features (canals, dockyards), natural green spaces (meadows, woodlands), controlled green spaces (greenbelt, nature reserve) and unintended green spaces (disused railway lines and wasteland). These green spaces have a plethora of benefits, including improvements to local air quality, local biodiversity, human health and wellbeing, and urban resilience to

climate change impacts, as well as reductions to the urban heat island effect.

Nature positively affects human health in several ways, with one widely recognised benefit being the provision of opportunities for physical activity. For example, tree-lined streets encourage cycling as a form of travel by increasing

"There has been a change in the perception and functionality of existing green spaces"

the appeal of the route. They have also been shown to reduce temperatures in the hottest months through shading, and by absorbing heat from the air via the process of evapotranspiration.

Urban areas are vulnerable to the increasing frequency and intensity of the environmental extremes caused by climate change. Ecosystems provide a buffer, or a measure of resilience, in urban environments, helping to address environmental challenges. An urban planning strategy that aims to design effective green infrastructure can implement climate change adaptation strategies while also creating green spaces for biodiversity.

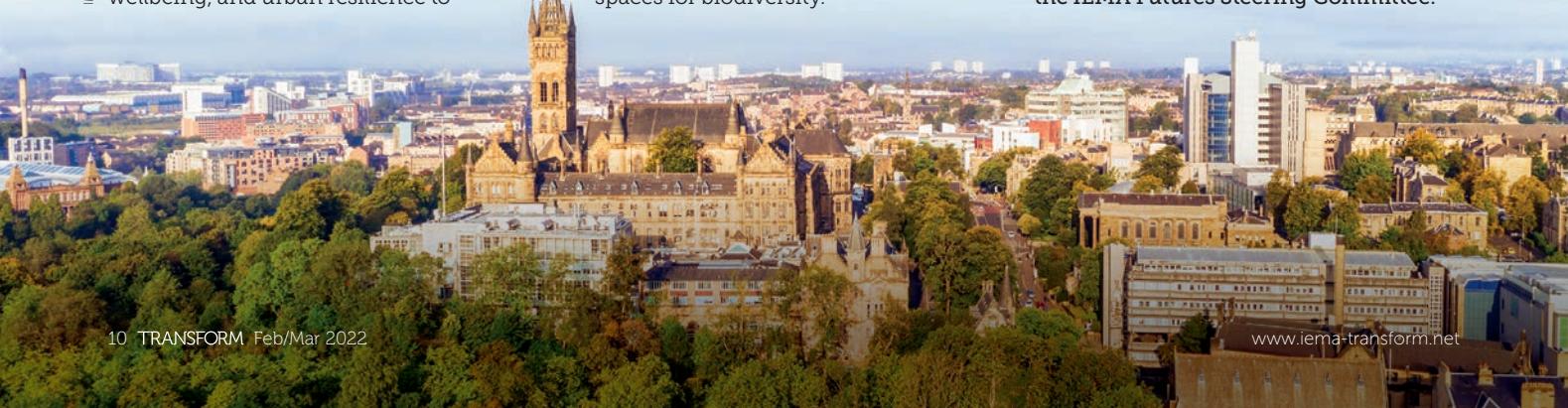
Including green space in projects

Arcadis applies sustainable principles to support the inclusion of green spaces into its projects. By considering spatial use, connectivity and accessibility when master planning places, we can contribute to a range of transformational aims, such as promoting active travel, improving community health and wellbeing, and building flexible places that can adapt to future changes in climate, population and the economy.

Arcadis is working with Glasgow City Council to develop the Liveable Neighbourhoods programme, a post-COVID-19 and climate change response to make Glasgow more resilient by promoting active travel and nature-based solutions. This toolkit highlights the importance of local public space within Glasgow, and the need to re-prioritise the balance of the streets to maximise social, economic and environmental benefits. There will be increased space for green infrastructure, contributing to the city's climate adaptation and mitigation strategy.

Construction in urban areas has previously focused on infrastructure, creating residential and commercial space with limited access to nature. However, the incorporation of green spaces and green infrastructure in design has unearthed numerous benefits that encompass human health and wellbeing, biodiversity and urban resilience. With nature increasingly at the forefront of people's minds, we can expect to see more beneficial change to our urban landscapes in the future. 

AONA STUART is an environmental consultant at Arcadis and a member of the IEMA Futures Steering Committee.

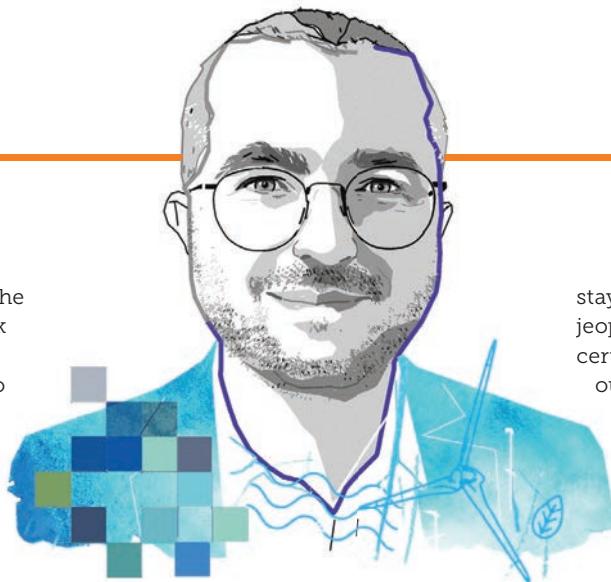


It is now two months since the COP26 climate summit took place in Glasgow – billed as a last chance opportunity to take decisive action on the climate emergency. We also have the second part of COP15 on biodiversity in China later this year, taking place during what many are calling the ‘sixth mass extinction’. The situation can feel daunting, and that sense of urgency and overwhelm was highlighted in Netflix’s recent climate fiction blockbuster *Don’t Look Up*, which sees astronomers trying to work with the US government to prevent a comet destroying Earth (spoilers ahead).

Out of the silo

One of *Don’t Look Up*’s key themes is cross-sectoral collaboration. The film is centred around a senior astronomer (played by Leonardo DiCaprio) and an astronomy PhD candidate (Jennifer Lawrence). The latter, Kate, discovers that a very large comet is heading directly for Earth; her senior colleague, Randall, confirms her findings and contacts the US government and mainstream media, only to have their concerns minimised and ignored.

Their treatment at the hands of institutions they expected to be responsive leads them, in different ways, to cross-sectoral collaboration. Kate has an outburst on a chat show and is ostracised by the US government. She initially tries to have a normal life, but can’t resist the urge to get involved in street activism. Randall spends most of the film being pulled into the administration and



TOM PASHBY: IEMA DIGITAL JOURNALIST

Don't Look Up challenges us to collaborate and diversify, says **Tom Pashby**

media circus as chief scientific adviser to the government – while having an affair with a very high-profile talk show host. He only joins Kate in her activism when it’s too late.

Neither of the two main characters have the skills or experience required to effectively navigate politics or the media. I’m sure plenty of academics and people who are otherwise in non-political professions can relate, and would rather stick to what they know. However, an increasing number of climate scientists and other academics and experts are getting more involved in public life. It is understandable that climate scientists, particularly those at the top of their field – working, for example, as co-authors of IPCC reports – would rather

stay away from politics, worried it may jeopardise their careers. However, there certainly are ways to collaborate beyond our silos in pursuit of climate action.

Come together

A good recent example of this was the Insulate Britain protests in the UK, which saw activists blocking roads, including the M25, and demanding that the government insulate all homes in the UK and address fuel poverty. In November, the group announced that a charity worker, a GP, scientists, an engineer and a vicar were all facing jail for their participation in the protests. Similarly, a jury acquitted Extinction Rebellion activists who had been involved in a different

protest, whose backgrounds were: retired GP, recycling worker, shoemaker and retired probation officer.

I’m not saying that one particular direction of travel from one silo to another is better than another – my point is we should recognise that we’re all part of a movement that requires us to work together and support each other as best as we can. While it’s critical that elected representatives lead on decision making

in parliaments and governments, scientists and academics must be included in the process of politics to ensure the best outcomes. Conversely, without democratic representation in major scientific, technological and engineering projects, social justice concerns risk being left by the wayside.

Without diverse skills, experiences and backgrounds in our respective fields of work, we will be limiting our capacity for effective action on environmental and sustainability related issues. 



"Scientists and academics must be included in the process of politics to ensure the best outcomes"

IN COURT

Thames Water fined £4m after sewerage discharge

Thames Water Utilities Limited has been fined £4m for discharging half a million litres of sewage into Seacourt Stream and Hinksey Stream in Oxford over two days in July 2016.

The discharge flowed for at least 3.5km along the streams, through a pub garden and past community allotments, causing the deaths of up to 3,000 fish.

The court heard that the company had failed to carry out essential maintenance in a sewer it knew was vulnerable to blockages. There was no system in place to identify blockages or pollution; the company instead relied on public observations.

The incident was reported to the Environment Agency by canoeists who found themselves paddling among dead fish in sewage.

Senior officer Robert Davis said: "Sewage pollution was bank to bank and there was a foul stench [...] Among the dead fish, fisheries officers observed hundreds more on the surface, suffering and gasping for oxygen".

The court also heard that, during a major sewer renewal project in 2012, Thames Water had opted for a solution that saved millions of pounds and, critically, relied on six-monthly sewer cleaning to prevent

blockages. However, it had no documented programme for sewer maintenance, despite knowing of the maintenance requirement and the risk of blockage and pollution if this was not carried out.

The investigation found that the company had failed to adequately maintain this section of sewer for at least 16 years. The Agency had issued two formal warnings in February and March 2012 after earlier pollution from the same point due to a blockage.

The judge said: "This fine sends out a clear warning to the boards of all water companies – invest heavily in maintaining your sewers and don't drop the ball when it comes to carrying out that maintenance. Incidents like this are preventable and are completely unacceptable, particularly at a time when the need to protect the water environment for wildlife and people has never been greater and when public consciousness on environmental matters is so high."

This brings the total fines levied against Thames Water since 2017 to £32.4m, for 11 cases of water pollution in Oxfordshire, Buckinghamshire and Berkshire.



CASE LAW

RSPB loses judicial review

In *R. (on the application of RSPB) v Natural England*, the RSPB and a nature conservation scientist appealed a Natural England decision to grant a licence to "take and disturb" hen harriers for scientific, research or educational purposes under the Wildlife and Countryside Act 1981.

Hen harriers are a rare bird species and enjoy the highest level of statutory protection. Under EU Directive 2009/147, EU member states are required to designate special protection areas (SPAs) for their conservation. There are two SPAs in England.

Hen harriers feed grouse chicks to their young, and individuals seeking to maximise grouse numbers for shooting were killing harriers and destroying their nests. Criminal enforcement had limited effect. In 2015, Natural England recommended piloting a brood management scheme in which eggs and chicks would be removed from nests, reared in captivity and released into a suitable habitat away from grouse moors.

On receipt of a licence application in 2017, Natural England produced a Habitats Regulations Assessment in accordance with the Conservation of Habitats and Species Regulations 2017, identifying a potential decrease in breeding and juvenile survival as the trial's principal risk; it suggested potential mitigation. It completed a Technical Assessment, concluding that there was no satisfactory alternative to the trial. The first licence was granted in January 2018.

Previous judicial proceedings claimed that Natural England was wrong to consider the application only in terms of research, and that it failed to consider hen harrier conservation. It was alleged that Natural England should have considered satisfactory alternatives to brood management, not just alternatives to the trial.

A judge held that the 1981 Act required Natural England to consider only whether there were other satisfactory solutions to the scientific

purpose, and that it had granted the licence lawfully. The judge declined to find that Natural England was protecting the grouse moor industry and concluded that Natural England had been entitled to find that the scientific trial would not adversely affect the SPAs' integrity.

The appellants claimed the judge had been wrong to look at the research element while ignoring hen harrier conservation. They believed the judge should have considered Section 16(1) of the Act, which said "no other satisfactory solution" – meaning the broader objective of the EU Directive, not just the specific derogation. They also submitted that the decision was incompatible with Sections 16(1) and 16(A1), criminalising and preventing hen harrier persecution.

On appeal, it was concluded that the judge had been correct to find that Natural England had properly considered the application as being for permission to carry out a research project within the Act, rather than conservation. The judge found the Act's structure and wording to be clear, that the "purpose" for which "other satisfactory solutions" had to be considered was the purpose for which the licence was sought, and that Natural England had been required to consider alternative solutions for the evidence-gathering process, not alternative conservation techniques.

They also confirmed that brood management was not designed to displace hen harriers but reduce their persecution; that brood management was not unlawful or contrary to SPA integrity; and that the trial was temporary and unlikely to involve many interventions in SPAs.

The appeal was dismissed.

NEWREGULATIONS

THE LATEST

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LEGISLATION

Building regulation

Changes supporting energy efficiency and electric vehicle charging are to be made to the Building Regulations 2010 on 15 June 2022 in England. Two amending statutory instruments have been published to bring them in. There are also two new Approved Documents, and others have been updated.

☞ cedr.ec/82f



LEGISLATION

Environment Act

The Environment Act 2021 has received Royal Assent over three years after it was announced by government. It provides the post-Brexit environmental protection framework for things such as nature, water quality, waste and resource efficiency and clean air.

It allows the government to set binding targets, and establishes a new environmental watchdog, the Office for Environmental Protection, which will hold the government and other public bodies to account and ensure laws are complied with.

☞ cedr.ec/82l



LEGISLATION

RoHS

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (Amendment) Regulations 2021 amend

Schedules A1 and A2 to the main Regulations, which list the restricted substances and maximum concentration values, and exemptions to restrictions.

The list in Schedule A1 is amended to further restrict the use of four restricted substances (DEHP, BBP, DBP and DIBP) to medical devices and monitoring and control instruments.

In Schedule A2, the exemption for mercury to be used in electric rotating connectors in ultrasound imaging systems is renewed, and a new exemption is established for certain lead compounds and barium, used in certain civil explosive applications.

☞ cedr.ec/82j



LEGISLATION

Environmental permitting

The Environment Agency has added 10 new biowaste standard rules permits and generic risk assessments: SR2021 numbers 1 to 10. These are fixed rules for activities and developments with a low-level environmental risk, which can be followed to simplify the application process. SR2015 No 12: 75kte non-hazardous mechanical biological (aerobic) treatment facility is withdrawn.

☞ cedr.ec/82k



GUIDANCE

REACH

Defra has issued a policy statement on its inclusion of Substances of Very High Concern on the UK REACH Candidate list. As the policy is made under post-Brexit legal arrangements, it

is not subject to a parliamentary vote or public consultation. With submission of information being voluntary, experts worry the government plans to water down requirements on key chemicals.

☞ cedr.ec/82e



CONSULTATION

Illegal deforestation

Defra is seeking views on implementing the provisions included in the Environment Act 2021, which aim to tackle the use of illegally produced 'forest risk' commodities in UK supply chains. The Act makes it illegal for large businesses in the UK to use forest risk commodities produced on illegally occupied or used land. Secondary legislation is needed to implement these provisions, and this consultation will help inform the design of this legislation and accompanying guidance.

☞ cedr.ec/82g



CONSULTATION

Single-use plastic

Defra is consulting on the next phase of single-use plastic item bans. This includes plates, cutlery, balloon sticks, and expanded and extruded polystyrene cups and food and beverage containers. A separate ongoing consultation will help determine future single-use plastic policy in England. Information is requested on items such as wet wipes, tobacco filters, sachets and single-use cups, as are views on reusable or refillable alternatives.

☞ cedr.ec/82h

☞ cedr.ec/82i

A natural remedy

Sir Partha Dasgupta, author of the landmark Dasgupta Review on the Economics of Biodiversity, tells Chris Seekings why a new approach is needed to halt and reverse humanity's destruction of nature

Last year, the Dasgupta Review, a landmark review into the economics of biodiversity, concluded: "To detach nature from economic reasoning is to imply that we consider ourselves to be external to nature. The fault is not in economics; it lies in the way we have chosen to practise it."

Authored by Sir Partha Dasgupta, the hard-hitting document provides a damning assessment of how traditional economic models have failed to accurately value the goods and services provided by nature, and argues that humanity has collectively "mismanaged its global portfolio of assets" – with dire implications for the environment. It has been compared with the influential 2006 Stern Review on the Economics of Climate Change, but also attracted its fair share of controversy, with critics claiming that it ignores fundamental problems with capitalism and allows for the pursuit of endless growth.

As one of the most eminent economists of the 20th and 21st centuries, Dasgupta is not afraid to confront

these critics, forthright in his assertion that a new approach to economics is required to tackle the biodiversity crisis facing the world today.

A new approach

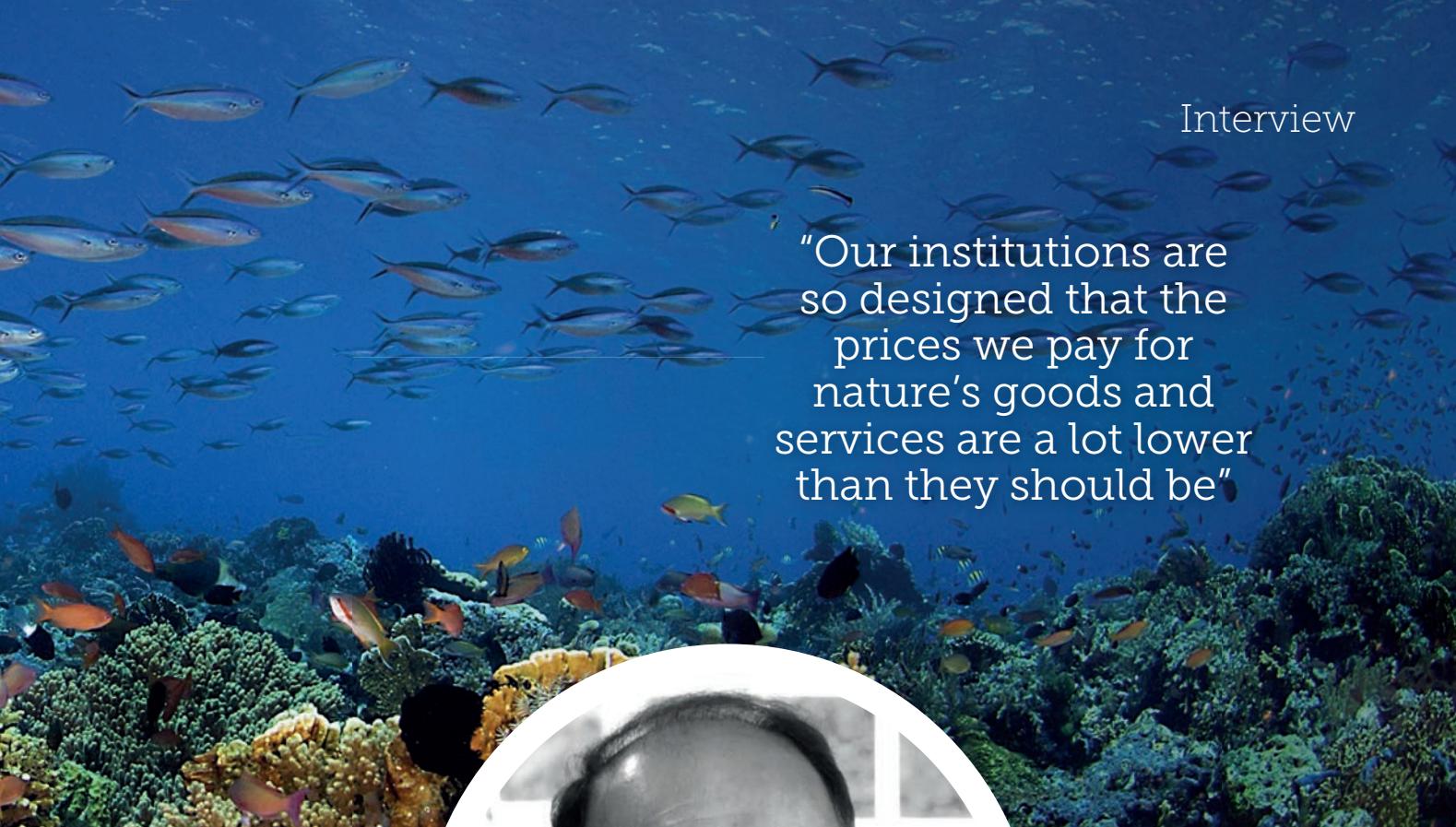
Dasgupta first became interested in nature and ecology while growing up in India, later becoming involved in environmental economics when studying for his PhD at Trinity College, Cambridge in 1968. "My interest in the workings of the biosphere dates back to my schooldays, when my geography teacher at the Rajghat Besant School taught us geography as an analytical subject – he was inspirational," he says. "Formally, in my PhD dissertation, the central chapter was on the concept of optimum population size. To study that, I constructed a model in which there is a fixed factor that limits consumption possibilities, in contravention to normal practice among growth economists."

Indeed, there was very limited understanding of environmental economics when he started out at Cambridge, with most traditional economists ignoring impacts on nature and resource limitations when analysing growth trends. "It was little understood in 1968, nor were mainstream economists interested in the environment. Even today, received growth and development economics, and the economics of poverty, steer clear of ecological matters. You won't find ecological economics in economics departments in the UK, but you will in geography departments."

Population, poverty and nutrition, the environment, social science and how these interact with the economy are all areas covered by Dasgupta's research over the



"Our institutions are so designed that the prices we pay for nature's goods and services are a lot lower than they should be"



decades. His impact on the field of environmental economics is impossible to overstate, culminating in his review on the economics of biodiversity, published in February last year.

Valuing nature

Commissioned by the UK Treasury, the Dasgupta Review highlights how demands on nature far exceed supply, and states that the introduction of natural capital into national accounting systems would be a "critical step" in transforming how wealth is measured globally. This would involve governments valuing goods such as soils, air, water and all living organisms in the same way they value buildings, machines and roads. The services that nature provides are overlooked by accounting systems, too, ignoring how the natural environment breaks down our waste, for example, or how forests and other carbon sinks mitigate the effects of climate change.

"Our institutions are so designed that the prices we pay for nature's goods and services are a lot lower than they should be," Dasgupta explains. "Estimating the relative productivities from various forms of natural capital, such as wetlands, lakes, coastal fisheries, forests, mangroves, coral reefs and so forth, is hard work, but there is now an impressive literature that does just that. The problem isn't that there aren't such studies to help introduce ecological concerns into economic decision-making, but rather that economic



decision-makers remain ignorant of them, and continue to ignore them even when informed of them."

However, the concept of putting a monetary price on the goods and services of nature sits uneasily with some. Environmental writer and activist George Monbiot last year accused the Dasgupta Review of promoting "totalitarian capitalism", where

"everything must now be commodified and brought within the system" by extending "the capitalist revolution" into our relations with the living world. Dasgupta is unmoved by the accusation. "I find the criticism the armchair sophistry that intellectuals are fond of uttering," he says. "They should ask rural households in South Asia, Africa and Latin America what they make of natural capital, whether they are cognisant of the relative worth to them of the various forms of natural capital they live on directly."

Thinking of the future

Valuing nature in such a way would force us to think about how our economic activities now will impact future generations. The Dasgupta Review also calls on governments to adopt new metrics for economic success that account for the benefits of investing in "our most precious asset" – nature – and to end our obsession with gross domestic product. "GDP is the market value of the output of final goods and services,



but the measure does not deduct the depreciation of capital assets," Dasgupta explains. "So, if nature is depleted, such as a wetland destroyed for raising output of produced goods like roads and buildings, GDP will record an increase."

The review instead calls on politicians to consider 'inclusive wealth' when determining economic success. "The right measure to use for assessing the sustainability of economic programmes is an inclusive measure of 'wealth', which is the social worth of an economy's stock of produced capital, such as roads, and human capital, such as health and education, and natural capital, such as ecosystems and minerals," says Dasgupta. "Nature does not appear in received growth and development economics, but economic development is sustainable only if the economy's inclusive wealth per capita does not decline over time."

His review also explains how we have degraded nature to the point where the demands we make of its goods and services far exceed its ability to meet them on a sustainable basis, which it describes as 'impact inequality'. Demand is influenced by population, GDP per capita, and the efficiency with which we convert nature's goods and services into GDP, while 'supply' is the rate at which nature can regenerate itself. "To address

"The disconnection from nature has meant that we have no inner compunction to protect it"

the imbalance, we can either lower the demand or help to raise the supply. We could reduce future population size from what it would otherwise be through increased aid for family planning and reproductive health in sub-Saharan Africa, for example; reduce per capita GDP of the rich world; or increase the efficiency with which nature's goods and services are converted into final output, such as lowering food waste and moving to clean energy."

Taking responsibility

Nature is a "blind spot" in economics, according to Dasgupta; he calls this "an institutional failure, not only a market failure". However, he believes that growing urbanisation, the profusion of technology, and reduced access to green

spaces have led to the situation we are in today, with society having become more detached from the natural world. "The disconnection has meant that we have no inner compunction to protect nature," he says. "We need that compunction because the market does not offer the incentive to economise on nature – quite the contrary."

Establishing the natural world within educational policy could help counter this societal shift, leading to the development and design of new environmental education programmes. "Our education should, in part, be directed in nature studies, from primary school onward," he says. "That may allow us to develop a love for nature, which would then create an inner urge not to tarnish it willy-nilly. Self-restraint would serve to substitute for the market's inability to impose restraint on our part by charging us more for nature's goods and services." Our disregard for biodiversity and nature has been brought into sharp focus in recent years, with the UN warning that one million species may be pushed to extinction within the next few years due to human activity.

However, with a raft of educational, financial, and biodiversity-related announcements made at COP26 last year, Dasgupta is optimistic that the protection of nature is now taking a more prominent role in efforts to tackle climate change. "It is gratifying that the UK government now places nature at the heart of climate change, for climate regulation by nature is only one of the multitude of services she provides." This has not always been the case, with governments having prioritised policies and initiatives to halt global warming above ending the destruction of nature, failing to recognise that the two crises go hand in hand. "Separating climate change from deterioration of the many other services nature provides has been an unhappy interlude in the economics of climate change governments have been encouraged to adopt over the years. Happily, that is likely to change. Whether biodiversity loss will be placed on a par with climate change remains to be seen." T

A KNOTTY ISSUE

Nic Seal explains how the UK's Japanese knotweed problem could present an opportunity for carbon capture

Every year, the Japanese knotweed removal industry generates thousands of tonnes of plant waste, which is consigned to landfill. Here, it regrows or decays, giving off gases such as methane. We need a new way of dealing with it – ideally one that is not just zero-carbon but carbon-negative, reducing atmospheric carbon dioxide (CO₂).

Japanese knotweed is rife in the UK and costs an estimated £166m to treat each year. It's not a notifiable plant, and it isn't illegal to have it growing on your land, but it is illegal to let it spread through inaction – encroachment-related legal cases are on the rise. The Environment Agency calls knotweed the UK's "most aggressive, invasive and destructive plant" due to its regenerative capabilities, arising from an extensive underground rhizome system that can regrow from a piece as small as a fingernail.

At Environet, a Japanese knotweed specialist, we recognise that our business activities create waste and emissions to land, air and water, which we seek to mitigate as best we can. We don't like adding excessive amounts of dangerous herbicides to the environment, as they can find their way to watercourses. As far back as 2008 we thought it was crazy to dig up knotweed-infested soils from one site only to dump it in a landfill site many miles away. We wanted a zero-waste solution, so our research and development team developed an

eco-friendly screening method, whereby the rhizome is sifted and separated from the soil, allowing the cleaned soil to be reused. This avoids the environmental and financial costs of consigning vast quantities of otherwise good soil to landfill and importing clean fill.

However, with the knotweed removal industry still generating thousands of tonnes of plant waste every year, our industry needs to go further. Developing a solution for dealing with the waste we generate is the next step – and all the better if we can also deploy the plant's powerful CO₂-scavenging powers in the fight against climate change.

Waste not

A couple of years ago, we started developing a method of converting excavated knotweed rhizome into

"We started developing a method of converting knotweed rhizome into biochar"



biochar. This involves heating the organic matter in the absence of oxygen – pyrolysis – thus removing naturally-occurring tars to leave carbon in the form of charcoal. The charcoal, which benefits from a honeycomb-like structure, can be charged with additives such as liquid organic fertilisers to create a soil amendment, improving soil structure and locking carbon away for hundreds, if not thousands, of years.

We recently secured a patent for the apparatus and method used in this solution, which could eliminate the need for landfill disposal and eventually be used to deal with all of the UK's Japanese knotweed waste, as well as that produced by other invasive plants such as bamboo and giant hogweed. This would not only save clients considerable sums of money, but also create a useful byproduct that could be supplied to the agricultural and horticultural sectors and ensure that the carbon captured by invasive plants is never released back into the atmosphere.

The next stage of our research will concern delivering economies of scale, including how to process large quantities of knotweed waste quickly and efficiently while managing emissions produced by the pyrolysis process, as well as sourcing markets for the biochar.

We hope to be converting all excavated plant waste we produce into biochar by the end of 2022 as part of our pledge to become a carbon-neutral business – and, in doing so, reduce our industry's reliance on landfill and the associated costs incurred by those dealing with this highly invasive plant. In harnessing its CO₂-scavenging abilities, Japanese knotweed could finally do some good! ☺

NIC SEAL,
FIEMA is the
managing director
of Environet.

Hydrogen is being touted as a clean fuel that could support the transition to a low-carbon or net-zero emissions future. Burning hydrogen releases no carbon dioxide (CO_2), making it promising for addressing global warming. But is hydrogen genuinely a clean fuel? In many cases, it is primarily manufactured from fossil fuels. Fund managers' fossil divestment policies need to address this 'fossil hydrogen' – but how?

Including hydrogen in a fossil divestment policy may seem surprising. When hydrocarbons burn, they release greenhouse gases. Burning natural gas (primarily methane) releases CO_2 , which accumulates in the atmosphere and causes global warming. Hydrogen, on the other hand, burns 'cleanly'; its only combustion product is water vapour, which seems promising in terms of emissions.

Unfortunately, this is not the whole story. We need to look at the total lifecycle emissions, as much hydrogen manufacture generates CO_2 emissions. Emerging interest in hydrogen as a 'clean fuel' represents a significant challenge in climate terms.

Fossil divestment policies should bar many forms of hydrogen manufacture. Some fund managers appreciate this, although it may be more challenging for tracker funds. Others may query how hydrogen fits with fossil divestment, or have difficulties obtaining necessary company data. Ethical and sustainable fund managers can show climate-friendly leadership by adopting clear, robust investment policies.

Hydrogen as a fossil fuel

Hydrogen burns cleanly but is primarily manufactured from fossil fuels. Different colours denote different production methods:

- Green hydrogen, manufactured via water electrolysis using renewable energy.
- Black or brown hydrogen is manufactured from coal – brown from lignite and black from bituminous coal.
- Grey hydrogen is sourced from natural gas and manufactured via 'steam reformation'. Each tonne of grey hydrogen results in the emission of around nine tonnes of CO_2 .
- Blue hydrogen is typically grey hydrogen where much (but not all) of the CO_2 has been captured; total lifecycle emissions are at least as high as natural gas.
- Turquoise hydrogen is manufactured from natural gas via methane pyrolysis, with the carbon extracted into solid form. However, industrial use of the resulting solid carbon leaves it as a potential source of future emissions.

A load of hot air?

Hydrogen is presented as the clean fuel of the future, but it's not always that straightforward.

Quintin Rayer discusses why fund managers may want to divest from it

The Hydrogen Council, established by the oil and gas industry, has been promoting hydrogen; it should be noted that switching from natural gas to blue hydrogen may be beneficial to the sector, since more natural gas is needed to generate the same amount of heat.

Blue hydrogen requires the expansion of carbon capture and storage capabilities. To manage climate risk, storage must be robust on timescales exceeding 10,000 years. Blue hydrogen thus increases physical climate risk and poses moral hazard.



Fossil divestment

For portfolios, fossil divestment helps manage climate risk. It focuses on keeping carbon in the ground or targets emissions from burning fossil fuels. An emissions focus may seem appropriate given the current emphasis on net-zero targets. However, with water vapour as the only combustion product, divestment policies formulated around carbon emissions may find addressing hydrogen challenging.

A crucial message is the need to keep carbon reserves beneath ground. Fossil divestment encapsulates a simple logical argument. In 2012, estimates suggested that, to keep global warming below 2°C , only around 565 gigatons more CO_2 can be released by mid-century, at most. At that time, proven underground coal, oil and gas reserves amounted to 2,795 gigatons. More recent updates indicate that at least two-thirds of known fossil fuel reserves must remain unburned.

Furthermore, in 2018, the Intergovernmental Panel on Climate Change recommended

"The manufacture of black, brown, grey, blue and turquoise hydrogen relies on extraction of carbon reserves"

limiting warming to 1.5°C – the lower end of the 2015 Paris Agreement target. Its 2021 report advised that for a 67% chance of keeping warming below 1.5°C, only 400 gigatons more CO₂ can be emitted.

An investment policy defined around non-extraction offers valuable clarity on the position that fossil divestors should take regarding hydrogen as a fuel. The manufacture of black, brown, grey, blue and turquoise hydrogen relies on the extraction of natural carbon reserves. As a result, they are all highly refined fossil fuel gases, breaching a fossil divestment policy of non-extraction of natural carbon reserves.

Climate risks

Plans to continue fossil fuel use and deal with its emissions present significant risks to climate stability in terms of physical climate risk and moral hazard. The physical climate risk is that, once committed to ongoing fossil fuel use, the technologies intended to address emissions might not prove capable of deployment at the necessary scale. It is safer to reduce dependence on these technologies through emissions reduction.

Moral hazard arises when schemes offer the lure of not needing to change behaviours, resulting in delays to the rapid and decisive emissions reductions necessary. For example, blue hydrogen could lock the economy into using fossil fuels instead of emissions reduction.

Adoption by sustainable fund managers

Some fossil-divested fund managers appreciate these arguments and have concluded that black, brown, grey, blue and turquoise hydrogen are fossil fuel-related and should be divested from. However, fund manager discussions have also identified concerns. Where can managers find data on the hydrogen-manufacturing activities of potential investments? Some environmental, social and governance data providers' content may be insufficient for identifying different forms of hydrogen production. As clients of these data providers, fund managers should make it clear that they require this information in order to implement their fossil divestment policies. Alternatively, fund managers may have to conduct research themselves to fill the gap.

How do hydrogen-based applications fit into divestment policy? What about technologies using green hydrogen? Fossil divestment policies based on non-extraction of natural carbon focus on hydrogen

manufacture, not use.

Sustainable investors can still

hold firms that are developing hydrogen technology or better electrolyzers; the electricity source can be addressed separately.

What about firms with a partial involvement in, say, grey hydrogen, that are developing green hydrogen? Wouldn't grey hydrogen manufacture be banned? Yes, but a *de minimis* policy can address it. Fund managers often use *de minimis* levels in existing fossil divestment policies, making this consistent with current practice.

Suppose a firm's sales or turnover from fossil hydrogen manufacture is less than the stated *de minimis* – say, 10%. Then investment would not be prohibited since the involvement is considered minimal. Fund managers could also actively engage with the firm to reduce its fossil hydrogen involvement.

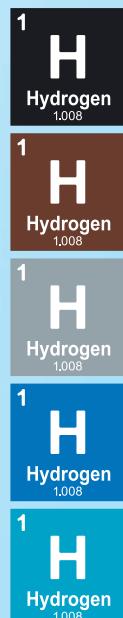
Fossil-divested trackers

Actuarial pension consultants often recommend using index trackers to reduce scheme fees. Sustainable tracker funds may be fossil divested, but the index methodology may not address fossil hydrogen. If so, tracker funds based on it are unlikely to be fossil hydrogen-free. If index providers have no interest in updating policies to address fossil hydrogen, this would be a concern.

Really clean hydrogen

Sustainable fund managers' fossil divestment policies should emphasise non-extraction of carbon reserves. Vested interests promote hydrogen as a clean fuel, even though this is often not the case. Prohibiting investment in black, brown, grey, blue and turquoise fossil hydrogen production will help protect the climate. Fund managers need to robustly define their fossil divestment policies to make it clear they prohibit fossil hydrogen. Clients will appreciate the clarity and demonstrable leadership on climate-friendly investment. 

QUINTIN RAYER is a chartered wealth manager, Fellow of the Institute of Physics and head of research and ethical investing at P1 Investment Management.



A PLAN NOT DERAILED

Billed as a once-in-a-generation chance to transform railways, the Integrated Rail Plan has prompted outrage. **Huw Morris** reports

It started as speculation, then turned into rumours. The press briefings steadily followed, and when the blow finally fell it was worse than expected. Now there is anger – and a sense of betrayal.

The eventual unveiling of the government's Integrated Rail Plan (IRP), more than a year behind schedule, outraged transport, business and political leaders across the north of England. The axing of most of the eastern leg of HS2, which will stop at East Midlands Parkway instead of Leeds, was a huge – if anticipated – reversal, given those press briefings. Leaders were not expecting the government's demotion of Northern Powerhouse Rail (NPR).

Prime minister Boris Johnson had repeatedly promised HS2 would extend to Leeds as part of his 'levelling up' agenda. Huge swathes of transport, business and regeneration planning during the past decade depended on it. While the IRP amounts to a £96bn investment – trumpeted by ministers as the 'biggest ever' – only £40bn is debatably new money, with the rest having already been allocated to HS2.

Sugaring the pill, the government promised electrification across the main lines and £200m to 'start work' on a mass transit system for Leeds, and suggested potential future upgrades to support 'left behind' cities.

Liverpool City Region mayor Steve Rotheram was unimpressed. "The IRP

was a once-in-a-generation opportunity to revolutionise our country's rail network," he said. "Properly delivered, it had the potential to be as transformative for rail travel as Stephenson's Rocket. Instead, they have proposed a service that could have been promoted by Gladstone in the Victorian era.

"It won't deliver the £16bn of economic benefit we were promised; it won't free up freight capacity or take heavily-polluting HGVs off the road, and it won't help connect our region with opportunities across the country."

In a final and less publicised twist of the knife, the Department for Transport also stripped the sub-regional agency Transport for the North (TfN) of power by assuming 'immediate and full responsibility' for the NPR. TfN will be demoted from 'co-client' to a 'co-sponsor', and will sit on a new joint board made up of government and TfN officials.

Local reaction

"Our statutory advice asked for a £40bn network, but the government has decided to provide even less than half of that," says TfN interim chair Louise Gittins. "The leaders of the north, jointly with government, have worked hard to come up with an evidence-led plan to help reverse the chasm of under-investment over the last four decades to give passengers in the north a railway network fit for today and for generations to come. That doesn't mean

The Integrated Rail Plan – at a glance

- An additional £625m to progress the Transpennine Route Upgrade
- Full electrification and upgrade of the Transpennine Main Line between Manchester, Leeds and York as the first phase of a reduced NPR
- Electrification of Leeds–York line
- Leeds–Bradford section of the Calder Valley Line to be upgraded and electrified
- Warrington Bank Quay low-level station reinstated, with lines between Warrington and Liverpool upgraded and electrified, and Liverpool Lime Street station enhanced
- A £360m fund for contactless ticketing to focus on the north.

"Properly delivered, the IRP had the potential to be as transformative as Stephenson's Rocket"





THE READING ROOM

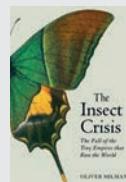
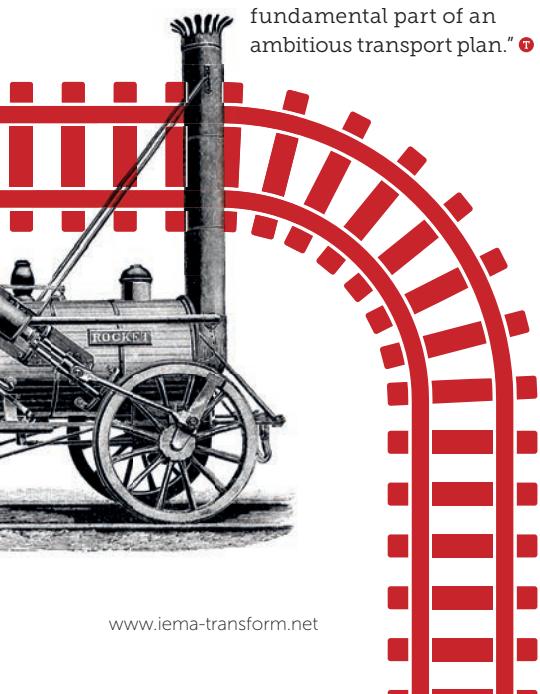
a bit here and a bit there, or minor upgrades to the existing network."

HS2 and NGR aimed to increase rail network capacity to accommodate more passengers and shift freight from road to rail; TfN argued this was crucial if the UK was to reduce carbon emissions.

According to Tom Arnold, a research associate at Liverpool University's Heseltine Institute for Public Policy, Practice and Place, the IRP focuses on 'quick wins' through electrification and upgrades. "The plans do little to significantly increase capacity, meaning freight and local services will continue to use the same lines as inter-city services, with speeds restricted. Some of the most undersold benefits of HS2 lie in its ability to release capacity on other lines.

"Upgrades to the network will be hugely disruptive for passengers, leading some commuters to switch to driving – perhaps permanently. The plan does not address congestion in and around Manchester, which slows down services travelling through the city, with IRP proposals continuing to rely on an already over-burdened Piccadilly station.

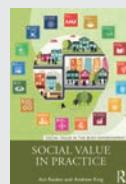
"A key aim of high-speed rail is to reduce domestic air travel, an objective that is barely mentioned in the IRP and will not be achieved with piecemeal improvements. Finally, electrifying rail lines should be considered a basic upgrade to ancient infrastructure, not a fundamental part of an ambitious transport plan."^T



The Insect Crisis: The fall of the tiny empires that run the world

Oliver Milman

A groundswell of research suggests insect numbers are in decline all over the world – in some places by more than 90%. *The Insect Crisis* explores this emergency, arguing that its consequences could rival even those of climate change. In a compelling, globe-spanning investigation, Milman speaks to scientists and entomologists to find out why these extraordinary creatures are disappearing.



Social Value in Practice

Ani Raiden and Andrew King

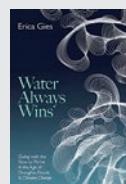
The book connects social value to the UN's global Sustainable Development Goals (SDGs) and presents an insight into the many and different practical ways in which individuals and organisations can make a positive impact towards resolving the 'people, planet and prosperity' agenda. Using the book's practical examples, readers learn how to create social value, improve and build upon current practice, and co-create social value in partnership with clients and the supply chain.



Gold Standard Sustainability Reporting: A step by step guide to producing sustainability reports

Kye Gbangbola and Nicole Lawler

This practical book, by IEMA Fellow Kye Gbangbola, shows how to undertake a reporting process and produce a sustainability report in line with the new standards and frameworks presented by the International Integrated Reporting Council and the Global Reporting Initiative. Anyone involved in delivering or developing a process to embed sustainability reporting for an organisation will find this book invaluable.



Water Always Wins: Thriving in an age of drought and deluge

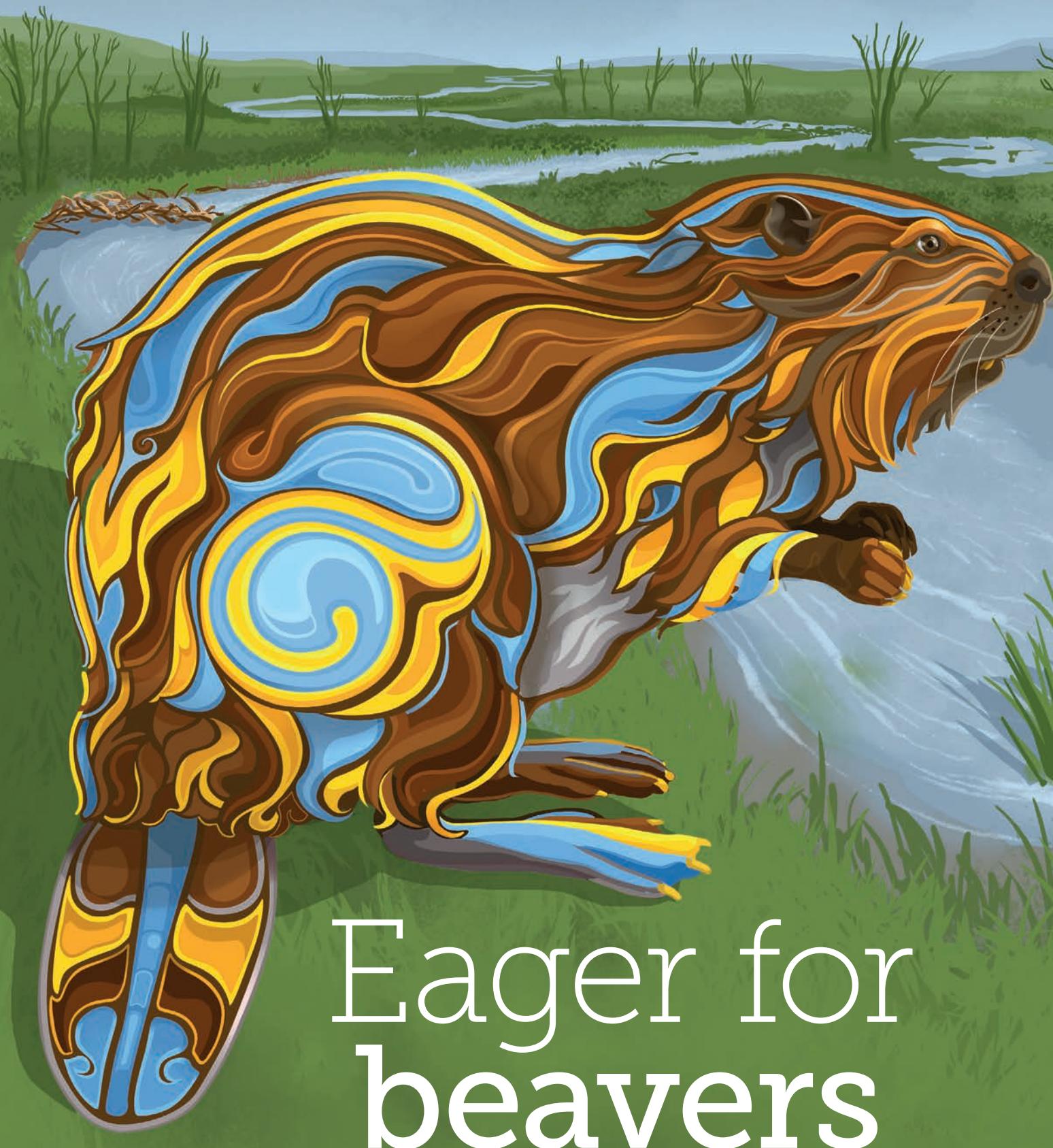
Erica Gies

Water troubles, such as increasingly frequent or extreme floods and droughts, are some of the first obvious signs of climate change. Urban sprawl, industrial agriculture and engineered water infrastructure are making things worse. Erica Gies follows water 'detectives' as they search for clues to water's past and present, using cutting-edge science and research into historical ecology, animal life and earlier human practices.



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Eager for
beavers

Beavers are on the comeback, with Scotland making them a protected species and the Westminster government looking at their wider reintroduction. **Huw Morris** reports on these elite eco-engineers



For Harry Barton, the moment of truth came on Valentine's Day in 2020. A trailblazing trial on a river in east Devon came to an end after five years, with revelatory conclusions.

Following the reintroduction of two beaver families to the River Otter, the trial discovered that this mammal could not just survive there, but thrive. The population grew to at least eight and as many as 13 family groups, with only three casualties known to observers.

Their effect on the landscape was noteworthy, particularly in terms of flood prevention (see '*The River Otter beaver trial*', overleaf). They built dams using tree branches, vegetation, mud and rocks, while the ponds and wetlands they created hampered the river flows that risked causing flooding further downstream.

"It's extraordinary how beavers have captured our imagination," says Barton, chief executive of the Devon Wildlife Trust, which spearheaded the trial. "Apart from their obvious visual appeal, there is something special about bringing back a creature that has been lost for centuries – one that seems more linked to our primeval past than to our modern high-tech present. But then, beavers are no ordinary beasts."

Indeed, these tree-felling, dam-building, wetland-creating, semi-aquatic rodents, which are capable of changing river courses, are rapidly becoming heroes in the UK's conservation and biodiversity fightback – and they are making a comeback.

From zero to hero

Hunted to extinction in Britain 400 years ago for their fur and castoreum (a natural secretion used in perfumes and medicine), beavers were reintroduced in 2009, when the Scottish government authorised the release of beavers from Norway in Argyll's Knapdale Forest – the UK's first official reintroduction of a mammal species to the wild. After assessing the Knapdale trial in 2016, the Scottish government announced that the beavers could stay, and it made

BUSY BEAVERS

- **Beavers weigh** between 16-30kg, and can grow to 1.2 metres long.
- **Beavers can hold their breath underwater** for 15 minutes, and their average speed in water can be up to five miles an hour.
- **Beavers are nocturnal** and spend up to 12 hours a day building and maintaining their territory, which can range up to 7km.
- **According to the Beaver Trust, Britain's current beaver population** is estimated at 550 individuals; 450 are thought to live in the Tay catchment in Scotland, with 30 at the site of the official Scottish Beaver Trial on the nation's west coast.

them a protected species in 2019. The success of the River Otter trial has encouraged the UK government to go further.

Plans to release beavers into the wild in England took a "cautious" step forward in 2020, with a government consultation on further reintroductions and the establishing of native beaver populations. Under the proposals, applications for licences to release beavers into the wild must demonstrate positive stakeholder engagement and local buy-in, as well as proof that there has been a comprehensive assessment of their impacts on surrounding land, the water environment, infrastructure, habitats and protected species. Projects must also ensure that support is in place for landowners and river users.

The plan aims to contribute to the government's 25-Year Environment Plan pledge on providing opportunities for reintroducing formerly native species where there are clear environmental, social and economic benefits. Ministers are considering options.

Joshua Larsen, senior lecturer in water science at the University of Birmingham, says beavers are "probably the best option available" for recovering river corridor biodiversity that thrives in or requires habitat where there is some frequency of disturbance. They are also great in wetland, meadow or freshwater habitats that

"Disturbance can play a critical role in creating a new mix of habitats that benefits biodiversity"



Biodiversity



THE RIVER OTTER BEAVER TRIAL

The Devon Wildlife Trust worked closely with landowners, social scientists, flood experts, biologists, geneticists, government bodies and fishing interests on a trial licensed by Natural England between 2015 and 2020.

The trial area covers the entire area of the River Otter's 250km² catchment, containing 594km of watercourse. The Otter rises in the Blackdown Hills before flowing through highly productive agricultural land in its middle and lower reaches, then entering the sea at Budleigh Salterton.

In March 2015, two families of wild-living beavers of unknown origin were captured from the River Otter. Detailed health examinations by experts from the Royal Zoological Society of Scotland confirmed that they were healthy Eurasian beavers, fit for re-release.

Since their introduction into the enclosed site, the beavers have built 13 dams, holding up to a million litres of additional water within ponds on the site. The results of the trial were:

- The area influenced is 1.8ha, equating to 56 litres of surface water storage per m² of land. During storm events, on average, peak flows were 30% lower leaving the site than entering.
- The average lag time between peak flow into the site and peak flow out was one hour over 183 metres.
- Even in saturated conditions and during the largest monitored flood events since the winter of 2013, the flood peaks were still reduced due to the hydraulic roughness of the dams and felled trees.
- The water storage and gentle release effect resulted in significant and constant base-flow from the site, even in periods of drought.

have a mix of flowing and still water. "Conservation, or environmental management, and disturbance often don't go together very well, yet disturbance can play such a critical role in creating a new mix of habitats that really benefits biodiversity – and nothing does this better in river environments than beavers."

The benefits of beavers

Beaver dams slow river-flows, in turn slowing the spread of nitrates and phosphates from fertilisers, which damage fish and water quality. The dams also create watery habitats that allow macro-invertebrates such as worms and snails to thrive – and, with them, creatures higher up the food chain. "In drier areas, they may create the only area of significant water availability and potentially act as fire buffers, while the ponds as a habitat refuge during drought," Larsen adds.



"Beavers are definitely the most active ecosystem engineer, compared to other rewilding candidates"

Beavers are also good at trapping carbon by storing plant detritus in ponds, although these ponds can also be sources of carbon and methane. Larsen points out that long-term outcomes are less clear, as the amount of carbon that beavers trap depends on how long they stay in a river valley – and how willing humans are to let them remain. We need a clearer understanding of where beavers fit within river systems' carbon cycle, he says.

"Beavers need the space to do their work, so obviously this can be a big constraint in areas with more human activity. However, where space is available, the tide is definitely turning. They are a bit unique in the rewilding space because they really stick to river corridors in terms of habitat range, and they are definitely the most active ecosystem engineer, compared to all other rewilding candidates."

"Rewilding definitely doesn't mean 'no management', though – there needs to be very active oversight and potentially intervention to keep things on track, and I think we're learning this to some extent from beavers through the active management and relocation programmes that exist."

Forest and farmland factors

So what are the downsides? Beavers are natural disrupters and chomp their way through forest cover. They can also be responsible for flooding fields or some urban areas and their infrastructure.

Mike Jeffries, associate professor of ecology at the University of Northumbria, says the greatest potential drawback is flooding of productive farmland. He also acknowledges that the River Otter trial did not shy away from the thorny issue of returning a large mammal to a landscape that has been altered by humans – problems included blocked culverts, paths blocked by trees that had been felled by beavers, and orchard trees gnawed.

Much has been written about the wonders and horrors of reintroducing the beaver, notes Barton; he says people could forgive for thinking beavers are either the answer to every river's problems or will destroy the landscape. "As humans we like to think that we make decisions on hard evidence, but this is seldom the case. We are far more comfortable with our beliefs, and will accept 'facts' that support them and reject those that don't."

"What we have lacked is real evidence of how these animals behave in a lowland English river, how extensive and intense their real impacts are, and how we can work with them to accentuate the good and minimise the problematic."

Preparing for the **worst**

Aled Jones, director of the Global Sustainability Institute, talks to Chris Seekings about how the impacts of climate change could unravel civilisation as we know it, and how we can build resilience

With a background in theoretical physics and mathematics, and a PhD in astrophysics, professor Aled Jones could have taken numerous different career paths. He decided to apply his skills to tackling perhaps humanity's greatest challenge: climate change.

As director of the Global Sustainability Institute at Anglia Ruskin University in Cambridge, he and his team of scientists and engineers are involved in a number of research projects, modelling how the impacts of climate change are likely to deliver seismic shocks to the global economy.

Food shortages, water scarcity and fluctuations in energy prices are all set to become more frequent amid rising temperatures and increasingly extreme weather patterns, potentially triggering civil and political unrest and unprecedented migration.

Jones is among the few people informing governments, financial institutions and businesses about the likelihood of these shocks, advising them on the steps needed to build resilience in an increasingly interconnected world.

How did you become interested in modelling the impacts of climate change on the financial sector and global economy?

After talking to businesses and governments about climate change and what needs to happen to get to net zero, the barrier that everyone talked about was finance. They needed access to the right amount of



Climate change

money to invest, but their current shareholders didn't have long-term views, so they weren't able to implement long-term strategies to make the necessary changes. That pushed me into the area of climate finance and investment and insurance, supporting the financial sector to try and understand the changes coming.

How do you model the potential impacts of climate change?

We have moved away from the physical climate modelling, and focus on the market, business and government response. This is systems modelling, where you can model the behaviours of market actors and understand the feedback loops within systems. We stress test the impact of a climate change event on conflict, for example, to discover which countries are more susceptible and what supply chains might be impacted. Or it might be a shock in energy prices, and how that might translate into a shock in food prices.

Most of our work is built up in partnership with business leaders, finance leaders and with governments, carrying out a lot of interviews. We ask stakeholders how they would respond in a global food security crisis and use scenario development to inform case studies for businesses, insurance companies or government to test their resilience to particular events.

How accurate are your projections?

If you ask a business how they would respond to a crisis, you would probably get a different answer depending on the day of the week, but the aggregated responses are quite similar. We're reluctant to put a percentage on our confidence limits because there's such a wide range of possible futures. What we can say is that the sorts of things we are modelling have happened.

So for food shocks, we use data from 2007 and 2011 to calibrate the models, and include things that weren't captured in previous models. We then try to calibrate it so you can get a rough idea of whether a crisis is a one-in-10-year event or a one-in-20-year event. It's not guaranteed to happen in the next 10 years, but if an insurance company is looking at a one-in-200-year event, because that comes within their insurance remit, it's really easy to come up with scenarios that are quite apocalyptic.

You have built a model to explore political fragility and conflict from potential resource crisis, the Global Chaos Map Project. What have you learned from that?

The Chaos Map looks at every country in the world and where there is most likely to be civil unrest when global food prices go above certain thresholds.

"It's the kind of thing that ex-prime ministers and ex-presidents talk a lot about"



"We need more co-operation between business and governments so we can think about where the vulnerabilities are"



There are some really long-term political challenges in Pakistan and India, Latin America and Nigeria. If you had the right set of circumstances and political tension, overlaid with a global food crisis caused by environmental shocks where food prices went up exponentially in a really short period of time, it's quite easy to come up with extreme events. Ukraine is one of the biggest exporters of wheat, and the political tensions with Russia, laid on top of a food crisis, could lead to extreme events.

It's not that we're all going to die because we're running out of food, but we may all die if we start chucking nuclear weapons at each other because of the political response to losing 10% of global food.

You have written about the potential for environmental shocks to trigger a global 'de-complexification' event, in which societal and economic complexity could undergo widespread reversal. Could you tell me about that?

The most recent work we have done is on the entire collapse of civilisation; not necessarily nuclear bombs being chucked around, but probably where the finance sector collapses and you find it really difficult to move money around the world and don't have supply chains any more. You could see huge inflation, the food export and import market collapse, massive civil unrest and huge migration – within countries, in particular, but also between countries, causing them to collapse.

We looked at which countries could potentially feed themselves if they had to, which ones had enough internal energy or the capacity for renewable energy, and which ones didn't have borders with countries that may collapse. People can argue whether you need borders, but the top five countries that are easiest to defend are all island states such as New Zealand, Australia and the UK.

However, the UK is the most vulnerable country when it comes to finance, and we could lose a significant percentage of our GDP and tax intake and economic stability if something happened in climate finance. There's a lot of stranded assets the UK is exposed to, but also, if suddenly the world decided to do something radically different around solving climate change, we have a huge exposure to renewables and climate finance – so if there was an economic shock that took down finance then London would have a huge explosion.

What can the world do to build more resilience and prepare for these shocks?

We've seen increasing efficiency in food and energy systems, driven by just-in-time production. That's the best way to maximise profit, but the problem is that if anything goes wrong, the whole thing collapses. Shocks to the system will become bigger and more frequent because of climate change, so we do need to have flexibility to absorb those shocks. That means, potentially, not overproducing but just having enough capacity so we can respond, and understanding the systems and processes around those responses, such as how to produce more food in the short term and how we distribute that.

If Europe and North Africa came up with some form of treaty to manage food systems, then we could hugely increase the security of both Europe and North Africa for the next 20–30 years. But if we were to get a shock and put up export bans up to protect ourselves, that will make the global system worse because we are so globally interconnected. We can't do it ourselves – we need to have a global response.



Are these steps currently being made at the international level?

It's been done nationally in some countries with food or energy strategies, but most are not thinking about it in this way. We need more co-operation between business and governments so we can think about where the vulnerabilities in supply chains are, where the vulnerabilities in countries are, and how to map that and develop a global process or even a regional process. That could be within the UN process or as part of COP. It may come out of the pandemic.

The pandemic has been a global challenge, and some leaders are saying we could have dealt with it better with a more global response. We can vaccinate everyone in the UK three or four times, but unless the whole world is vaccinated, new variants are still going to pop up. When New Zealand says it's going to close down until it goes away, that doesn't work unless everybody closes down.

Let's come up with a process for global collaboration, because we can't protect ourselves from events happening elsewhere. There is more and more evidence that we need to get better at managing global responses, but there is less action in terms of delivering it. It's the kind of thing that ex-prime ministers and ex-presidents talk a lot about and put their effort behind. It would be better if current prime ministers and presidents did the same.

Credit control

David Burrows delves into the controversy around carbon offsetting, and examines the moves to make the voluntary carbon market more effective and reliable

At its heart, carbon offsetting is incredibly simple. The idea is to compensate for greenhouse gas emissions that cannot currently be reduced by paying for a certified unit of emission reduction or removal – anything from planting trees (nature-based solutions) to providing efficient cook stoves (technology-based offsetting). Individuals, businesses and even countries can offset their emissions.

Supporters see it as a critical tool in tackling climate change both now and into the future, provided it is done with integrity and that the project wouldn't have happened without the additional funding. Reaching net-zero could be impossible without it, they say. Critics see it as a deceptively simple, corner-cutting alternative to carbon reduction, with Greenpeace calling it "the most popular and sophisticated form of greenwash around".

Is there a role for offsetting in achieving net-zero? And if so, what does this look like?

A lack of nuance

The answer to the first question is 'yes, but' – and there are a lot of buts. These include the extent of offsetting (whether emissions have been reduced as much as possible), the type of offset, the credibility of the scheme or project, and the credibility of the claims being made.

Indeed, the nuance in this debate is being lost (or ignored) in the media narrative around it. There is talk of a 'wild west' market that allows polluters to keep on polluting. Fossil fuels companies, in particular, have come under fire for their shady use of offsetting, but fingers are already pointing at others who claim carbon neutrality, as well as schemes that allow them to do so.

"Offsets can make a difference, and they do make a difference," explained Anne-Marie Warris, director of

control



"There is certainly pretty hyperactive demand for businesses wanting to get forward on carbon credits"



consultancy Ecoreflect and vice chair at Verra, a non-profit that runs the Verified Carbon Standard (VCS) programme, during an IEMA webinar on the topic last year. However, she added, there are bad stories as well as good.

Offsetting has been a hot potato since the 1990s, when carbon management plans came to the fore. Roberta Barbieri, PepsiCo's vice president of global water and environmental stewardship, summed up the issues in a podcast for Future Food when she said: "The concerns in the past are that offsets are a 'get out of jail free' card for companies – I'll go plant some trees somewhere in the world and I'll continue to emit greenhouse gas emissions guilt-free."

Growing demand

Demand for offsets surged in 2020 and 2021; Gold Standard, one of the leading project accreditation bodies for offsets, says demand for its services increased 28% between 2019 and 2020, and 43% from 2020 to 2021. Its senior director of communications Sarah Leugers says the climate marches played a part in driving this – which is ironic, given that Greta Thunberg, the campaigner synonymous with strikes and climate activism, is no fan of offsetting.

Tom Popple is senior manager of climate change and stability at Natural Capital Partners, which works with the likes of Sky and PwC on carbon reductions and offsetting; he says there has been a "doubling or tripling" of demand for carbon credits. "There is certainly pretty hyperactive demand for businesses wanting to get forward on this both for carbon neutrality and net-zero," he explains. The other push is coming from financial institutions, he adds.

One of the big stories to emerge from COP26 last year was the agreement on rules for a new global carbon market. Known as Article 6 of the Paris Agreement, the framework offers a centralised system that is open to the public and private sectors and a separate one that will allow countries to trade credits. The agreement wasn't without controversy – principally, the fact that

"You need to innovate, you need to create a safe space for these new technologies to come through"

millions of old credits can flood the new system – but will certainly grease the wheels of the carbon offsetting market.

Future forecasts

Data pulled together by the Climate Policy Initiative shows how the voluntary carbon market (VCM) was fairly flat until 2016, but then started to expand rapidly. The number of issuances – representing the supply side, when carbon credits are created or issued to a project, based on their independently verified emission reductions or removals – jumped from 34m tonnes of carbon dioxide equivalent (tCO₂e) in 2016 to 181m tCO₂e in 2020. Retirements – the demand side, when companies (or individuals) purchase carbon credits and use them for offsetting or other climate action claims – almost tripled in the same period, from 34m tCO₂e to 95m tCO₂e.

Future growth forecasts are even more striking. Using data on demand for carbon credits, projections by experts and the volume of negative emissions needed to reduce emissions in line with 1.5°C of global warming, McKinsey experts estimated that annual global demand for carbon credits could reach two gigatonnes of CO₂ equivalent (GtCO₂e) by 2030, and as much as 13GtCO₂e by 2050. Forecasting the value is trickier: the VCM could be worth anything between US\$5bn and US\$50bn by 2030.

That's a lot of carbon and a lot of cash, so it will pay to get this right. Fossil fuel companies' use of offsetting has cast a shadow over the market – "that keeps me awake at night," says Leugers – but there is hope that more accountability will serve the sector well. The 'burden of

Mitigation

'proof' is higher now, the University of Oxford's Thomas Hale suggested during the IEMA webinar. (Hale was involved in the creation of the 'Oxford offsetting principles' – a set of guidelines to help ensure offsetting actually contributes to achieving a net-zero society.)

Responding to criticism

Those involved in offsetting say companies are asking more questions. Before 2021, according to Popple, only one in five organisations probed for the detailed documentation that responsible, accredited providers should be able to produce; that figure is now much higher. The chain of custody is overseen by Icroa, the body that represents carbon reduction and offset providers; it has been fighting fires in recent months as criticism of the VCM surges.

Icroa isn't alone: Verra has also recently had to react to criticism of schemes registered in its VCS programme, including one involving the fast-food chain Leon. More corporates making claims will mean more headlines, so businesses should tread carefully. A credible science-based target is now a prerequisite for being able to offset – and it should be remembered that the fossil fuel giants don't have that in place.

Reduction also trumps offsetting every time, but are providers hammering this home? Offsetting should be for unavoidable or residual emissions, which will be higher in some sectors, such as aviation, than others. Equally, offsetting is an attractive option for the here and now, allowing companies to show they are taking action. This leaves offsets vacillating between being a quick fix and a last resort, suggested the University of

Manchester's Robert Watt in his 2021 paper for *Environmental Politics*, 'The fantasy of carbon offsetting'.

Addressing the issues

The reality is that the VCM is confusing and littered with traps. The Climate Policy Initiative has likened it to ice cream, with myriad flavours made using a variety of choice



ingredients. Onto these you can sprinkle extras to enhance the offsets' quality and appeal (one area to watch is the additional social benefits in some carbon offsetting schemes). "To make offsets as widely available as ice cream we need a liquid market with variety, multiple purveyors, industry standards, buyer choice, and consequences for bad quality and excess use," wrote Climate Policy Initiative senior adviser Vikram Widge.

Supply could match demand, with credits coming from avoided nature loss (including deforestation), nature-based sequestration (such as reforestation), avoidance or reduction of emissions, and technology-based removal of CO₂ from the atmosphere. McKinsey noted, however, that there are issues that could see supply shrink from a potential 8–12GtCO₂e per year to 1–5GtCO₂e.

One of these issues is the time lag between the initial investment and the eventual sale of the credits. This was picked up in an analysis completed by

the Environment Agency earlier this year (*Achieving net-zero – a review of the evidence behind carbon offsetting*), which noted that two critical factors are how quickly the approaches produce greenhouse gas emission reductions or removals, and the length of time the climate benefits will be maintained for. For many of the 17 assessed approaches to reaching an impactful scale by 2030, implementation must begin "very soon".

A credible system

This is a climate crisis, and emissions must be halved by the end of this decade. Can the standards that underpin the VCM keep up with this urgency without jeopardising offsetting's reputation?

Much is expected of the Taskforce on Scaling Voluntary Carbon Markets, an initiative spearheaded by ex-Bank of England governor Mark Carney that is working to scale an effective and efficient voluntary carbon credit market to help meet the goals of the Paris Agreement. A governance body has been announced, and now the work starts on creating a global benchmark to reassure buyers and critics that carbon credits are what they say they are. The Voluntary Carbon Markets Initiative, meanwhile, also promises to ease credibility concerns, focusing initially on how businesses can make climate claims around terms such as 'net zero' and 'carbon neutral'.

Everyone was waiting to see how Article 6 panned out, says Popple, but established standards bodies such as Gold Standard and VCS are now considering how to incorporate more effective, credible solutions. "For supply to meet demand, you need new solutions," he says. "You need to innovate, you need to create space for new technologies to come through, but not at the risk or detriment of the quality of offsetting."

VCMs might not have worked perfectly to date, but the urgency of the climate crisis and heightened scrutiny of solutions could be just what's needed to build a credible global system.

DAVID BURROWS is a freelance writer and researcher.

Redefining success

The world's obsession with GDP as a measurement of economic success could present one of the biggest barriers to achieving climate and environmental goals. ***Chris Seekings*** reports

Gross domestic product, or GDP, has been seen as the ultimate measure of a country's economic success, prosperity and overall welfare for almost 80 years. The yardstick was adopted in 1944 by Allied nations at the UN Monetary and Financial Conference at Bretton Woods in the US, and has been used by wealthy countries to boast about their apparent success ever since.

For decades, though, economists have warned about the flawed characteristics of GDP, and its failure to consider the fundamental characteristics of human wellbeing. Furthermore, the focus on GDP may be one of the biggest barriers to achieving net-zero emissions by 2050, while actively counting the destruction of nature as economic gain.

Robert Kennedy pointed this out during an election rally in 1968. "It counts the destruction of the redwood and the loss of our natural wonder in chaotic sprawl," he said. "Yet the gross national product does not allow for the health of our children, the quality of their education or the joy of their play. It measures neither

our wit nor our courage,
neither our wisdom nor our learning.

It measures everything, in short, except that which makes life worthwhile."

Useful, but flawed

Although it is a profound message, Kennedy's assessment of GDP is not entirely fair. The measurement is defined as 'the monetary value of all finished goods and services made within a country during a specific period'. This is a useful indicator of a country's economic activity, which can reflect the rising welfare of its citizens. Since China began to open and reform its economy in 1978, its GDP growth has averaged almost 10% a year and more than 800 million people have been lifted out of poverty, according to the World Bank.

However, we should note that the 'G' in GDP stands for 'gross', not 'net', and therefore doesn't tell us about the depreciation of assets and the extent to which a country is using tomorrow's resources to consume today, or how well-off it will be in the future. A nation that grows by borrowing will see GDP rise, but much of the increase in income may go back out of the country to pay the interest.

"For the inventors of GDP, it was never ever thought of as a measure of success or performance," explains Jørgen Randers, co-author of *The Limits To Growth*. "It was simply a measure of the activity level, and the value of the goods and services that are being produced. That's the reason why GDP increases when there is a mass murder or when there are floods, because then, of course, there is a lot of economic activity."

GDP fails to capture values such as people's health and wellbeing, social cohesion, and the distribution of wealth – but perhaps its biggest failing is its inability to consider the environmental impact of endless economic growth.

Uneconomic growth

When Anglo-Australian mineral company BHP Billiton opened the Ok Tedi gold and copper mine in Papua New Guinea in 1984, the country saw its GDP rise. However, the mine inflicted huge environmental damage, discharging at least 90m tons of tailings into the local river system every year and thus polluting the main source of livelihood for 40,000 people, causing huge financial losses.

It remains one of the worst environmental disasters ever caused by humans, and is a prime example of how the pursuit of higher GDP can be devastating for both the environment and the economy. "We're going to see a lot more damage in the future, not less," warned Royal Melbourne Institute of Technology Professor Doug Holdway in 1999. "If you put 400m tonnes of tailings down a river system, there should be no surprises that you're going to have significant biological impacts that will last for decades, possibly even centuries".

Looking at the global picture, it is easy to see how our short-term obsession with GDP is likely to have catastrophic long-term impacts for the environment and economy. The average global temperature has increased by more than 1°C since the Industrial Revolution and our unprecedented carbon emissions, and the UN has warned that this is on course to surpass 3°C. Last year, a study led by scientists from University College London found that, by 2100, global GDP could be 37% lower than it would have been without the impacts of warming. "Burning CO₂ has a cost to society, even if it is not directly to our wallets," says study co-author Dr Chris Brierley. "Each person's emissions



"Burning CO₂ has a cost to society, even if it is not directly to our wallets"

could quite well result in a cost to humanity of over US\$1,300 per year, rising to over US\$15,000 once the impacts of climate change on economic growth are included."

It should come as no surprise that global upward trends in GDP have correlated with an increase in air pollution,

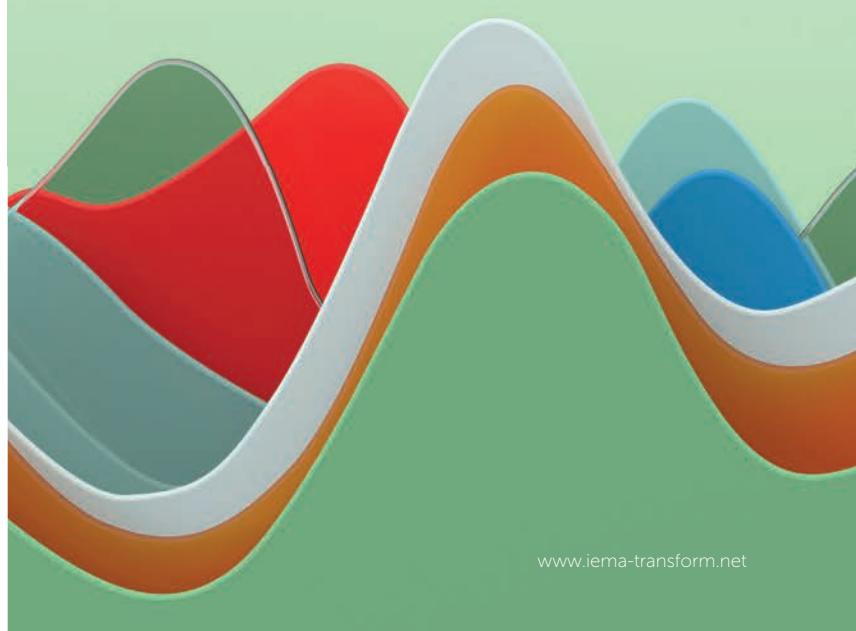
resource depletion and biodiversity loss, too. "Gradually, everyone has gotten into this totally idiotic thinking that if GDP grows, then everything is better," Randers explains. "What can we do? It is very simple: develop another indicator."

Pricing nature

According to the UN, around one million animal and plant species are now threatened with extinction – many within decades. This is more than ever before in human history. The main causes? Loss and degradation of habitat (mainly deforestation), over-exploitation (hunting and overfishing), invasive species, climate change and nitrogen pollution – all of which are driven by human economic activity.

The Dasgupta Review, commissioned by the UK government and published last year, argues that nature is a "blind spot" in economics, and that humanity has "mismanaged its global portfolio of assets". It calls for a new measure of economic success, highlighting how demands on nature far exceed supply and significant declines in biodiversity are undermining productivity, resilience and adaptability – in turn threatening economies, livelihoods and wellbeing.

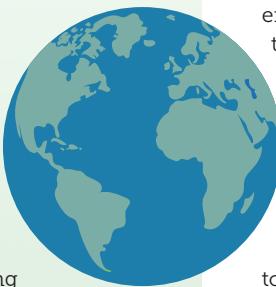
"Nature needs to enter economic and finance decision-making in the same way buildings,



machines, roads and skills do," the review's authors explain. "To do so ultimately requires changing our measures of economic success. GDP is needed for short-run macroeconomic analysis and management. However, GDP does not account for the depreciation of assets, including the natural environment. By measuring our wealth in terms of all assets, including natural assets, 'inclusive wealth' provides a clear and coherent measure that corresponds directly with the wellbeing of current and future generations. Introducing natural capital into national accounting systems would be a critical step towards making inclusive wealth our measure of progress."

Frameworks for natural capital accounting and assessment already exist, and are at different stages of development. These include:

- **Genuine progress indicator:** Developed in the US in 1994, the genuine progress indicator takes GDP and corrects it for various social and environmental factors such as inequality, under-employment and costs of pollution. It separates the concept of societal progress from economic growth.
- **Inclusive Wealth Index:** The UN's biennial report measures the 'social value' of a country's natural, human and produced capital assets, and aims to represent the trade-offs between different conservation and development policies.
- **System of Environmental-Economic Accounting:** Aims to draw attention to the impact of economic activity on the environment and has been adopted by the UN Statistical Commission. It is built on five 'core accounts', measuring the area, condition, contribution, value and stocks of ecosystems.
- **Green GDP:** Developed by China in 2006, green GDP is a measure of national economic output that takes environmental factors into consideration. It found that environmental damage would have knocked 3% off China's GDP in 2004.



environmental factors into consideration. It found that environmental damage would have knocked 3% off China's GDP in 2004.

● **The Changing Wealth of Nations:**

Developed by the World Bank, the index measures 141 countries' produced, natural and human capital, as well as their net foreign assets. It was designed to help governments "plan for a more sustainable future", although it was intended to be used alongside GDP.

- **Doughnut economics:** Economist Kate Raworth developed the doughnut economics concept in 2021. It is based on two concentric circles: 'social foundation' – containing human needs, such as water, housing, equality, peace and education – and the 'ecological ceiling' – representing the boundaries of the planet's ability to support life. It aims to replace GDP, focusing on 'thriving' rather than 'growth'.
- **Gross National Happiness Index:** The index was developed in Bhutan and implies that sustainable development should take a holistic approach towards notions of progress. It is a single number index developed from 33 indicators categorised under nine domains, including psychological wellbeing, health and ecological diversity and resilience.

Shifting focus

Technological advancements have been successful in improving air quality and bringing down emissions in some parts of the world, suggesting that it may be possible for human society to decouple growth in GDP from growth in environmental degradation. However, as demonstrated by a study by Ward et al. in 2016, it is unlikely that GDP can ultimately be detached from growth in material and energy use. "It is therefore misleading to develop growth-oriented policy around the expectation that decoupling is possible," the authors wrote. "Society can sustainably improve wellbeing, including the wellbeing of its natural assets, but only by discarding GDP growth as the goal in favour of more comprehensive measures of societal wellbeing."

While GDP functions as an effective calculation to measure the total productive output of a country, it actively discourages governments from pursuing the more ambitious policy measures needed to deliver the UN's Sustainable Development Goals (SDGs) and the aims of the Paris Agreement. To achieve truly sustainable growth, it appears that GDP will need to be supplemented with other measures of social progress. Ward et al conclude: "Now is the time to recognise the biophysical limits, and to begin the overdue task of reorienting society around a more achievable and satisfying set of goals, rather than simply growing forever." ①

"For the inventors of GDP, it was never ever thought of as a measure of success or performance"



Why did you become an environment/sustainability professional?

Studying civil engineering, I was frustrated that the curriculum seemed unchanged for decades. I added elements of environmental engineering and investigated the aerodynamics of wind turbine blades.

What was your first job in this field?

Towards the end of my masters degree in sustainability of the built environment, I was offered a position as graduate sustainability adviser for a housebuilding company. I divided my time between construction sites and boardrooms, working towards my PIEMA qualification.

What does your current role involve?

In my first 12 months at Thakeham, a zero-carbon community creator, it published its first sustainability strategy, with **targets for reaching net zero** by 2025 across the production and operation of every home, as well as the whole business. I am also interim head of zero carbon placemaking and nature in the Future Homes Hub, where I am developing a roadmap for industry collaboration and translating goals into performance metrics. My responsibility is for how places can be well designed, maximise biodiversity net gain, achieve water resilience and respect environmental thresholds.

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

I started as a sustainability manager, working to develop our sustainability strategy. I now spend more time on panels at events, and sharing our approach with government and industry organisations.

What's the best part of your work?

It's exciting being part of a company at the top of its game. We were the first UK housebuilder to sign the SME Climate Commitment. Personally, I'm a Sustainability Leader of the Year finalist for the Edie Sustainability Leaders Awards. Being in a position to shout about our efforts is the best part.



CAREER PROFILE

Josie Cadwallader-Thornewill, PIEMA

Sustainability director
at Thakeham Group



What's the hardest part of your job?

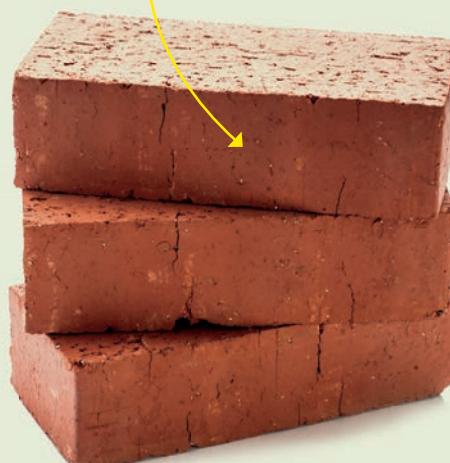
We have made three commitments to net zero by 2025. Scope 1 and 2 business emissions, and making home operations zero-carbon, are significant challenges, but carbon-neutral production is huge! We are developing a process for Scope 3 emissions.

What was the last development event you attended?

The Kelp Summit. It may seem random for a **housebuilding company**, but we learnt a lot, and will look at kelp forest restoration along the Sussex coast as a project.

What are the most important skills for your job?

Enthusiasm and persistence.

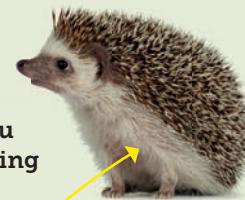


Where do you see the profession going?

We are relevant to every company, particularly SMEs, for translating research and policies into action.

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

I'd like to no longer need to explain biodiversity net gain, and hope zero-carbon homes are mainstream. We are looking at sustainable finance to help the industry identify sustainable projects to finance. For myself, I'd like to buckle down and get my CEnv.



What advice would you give to someone entering the profession?

Find the interconnections between topics – it's a complex world and you won't do it justice by over-simplifying it.

How do you use the IEMA Skills Map?

When I was a sustainability adviser I used it to understand what I needed access to to be able to move forwards. As a director, it helps me structure my team's progress.

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

A driven, positive force.

What motivates you?

Our knowledge, experience and passion are needed. In the construction industry, that means changing how and what we build. It motivates me to work for a company that is rising to that challenge.

What would be your personal motto?

'Find their passion'. If someone cares about **hedgehogs**, I can get them to care about invertebrates and biodiversity.

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

I would meet Guy Stewart Callendar and impress on him the importance of the emotional angle of climate change. Scientific opinion disputed his findings during his time and I would see if I could help shorten the time it took for us to realise our impact on the planet. 



DATES FOR YOUR DIARY

iema.net/events

FRIDAY 4 FEBRUARY

WEBINAR

Threshold breach: an introduction to planetary boundaries

Join us for a webinar hosted by the Yorkshire and Humber region on planetary boundaries with Adrian Gonzalez, lecturer in sustainability at the University of York's Department of Environment and Geography. We will review the concept and its usefulness in providing solutions to rectify breaches, and consider the broader questions this framework poses.

bit.ly/Yorkshire_ThresholdBreach

THURSDAY 10 FEBRUARY

WEBINAR

Net-Zero transitions – professional challenges and key developments

This webinar will outline and explore professional challenges for those working to address net zero. Presenters will provide an overview, drawing on key developments, IEMA survey outcomes, guidance, international standards, case studies and professional experience.

bit.ly/NetZero_Challenges

THURSDAY 17 FEBRUARY

WEBINAR

Launch of Land and Soils in EIA Guide

This webinar will launch IEMA's latest impact assessment guidance on the consideration of land and soils in EIA – something often absent or limited to impacts on agricultural land. Good practice and soil science suggests we should be instead looking at the wider functions of land and soils, particularly given the biodiversity and climate crises.

bit.ly/Webinar_Lands

IEMA SOUTH WEST

Great British Beach Clean



Stephanie Rooke reports on IEMA South West members' participation in a beach cleaning event

September was Great British Beach Clean Week, which raises awareness of the importance of protecting the coastal and marine environment, encouraging the public to take responsibility for rubbish.

The IEMA South West Regional Network joined Keep Britain Tidy to deliver five beach clean events across Somerset, Devon and Cornwall – our first face to face event for 2021. IEMA South West Steering Group members attended to promote IEMA and network with South West members.

Members of the public and local community were interested, and some even joined in! It was also an opportunity to meet my IEMA South West co-chair Kate Turner in person at the Weston-super-Mare event.

The cleans could not have occurred without collaboration. I had worked with Neil Hembrow, Ocean Recovery Project manager for the South West, before, and we were able to organise the events thanks to him and his contacts. Ocean Recovery Project is a Keep Britain Tidy project that aims to recycle the litter collected on beach cleans. Nearly 1,700 cleans have been undertaken since 2010 through the BeachCare South West programme, sponsored by South West Water.

"A huge thanks to the IEMA members who came out"



Keep Britain Tidy's latest campaign is '#waveofwaste'. Over the summer, over 1,500 broken plastic bodyboards were collected from just a few south-west beaches. Each year over 14,000 boards are thrown away, with many more floating off to sea. #waveofwaste promotes buying better boards, or hiring them. Keep Britain Tidy is working with holiday and caravan parks to encourage board lease for the day. IEMA is proud to support this and has made a contribution so Keep Britain Tidy can purchase high quality boards.

"A huge thanks to the IEMA members who came out in all weathers to tackle plastic pollution on our beaches," said Neil. "We look forward to working with the IEMA in 2022 on our campaigns, and getting our boots on the beach again."

The IEMA South West Steering Group is busy planning our spring/summer events. Keep an eye on our social media channels and the website events page for more. You can see more pictures of the Beach Clean at bit.ly/SWBeachClean ↗

STEPHANIE ROOKE, PIEMA, IEMA South West Co-Chair

If undelivered please return to:

IEMA
City Office Park
Tritton Road
Lincoln
LN6 7AS



Environment & Sustainability Professionals' Conference

Don't forget you can
rewatch all sessions
from IEMA Connect
2021 on [iema.net](https://www.iema.net)

Save the Date
Wednesday 19th October 2022