

# TRANSFORM

FOR ENVIRONMENT AND SUSTAINABILITY PROFESSIONALS

Environment ●  
Economy ●  
Society ●

Jun/Jul 2023  
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DIRTY

# Fashion

Why it's time to clean up the clothing industry

## PLUS

**Climate and couture**  
VIN + OMI's manifesto  
for sustainability

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**XR changes tack**  
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# CONTENTS

Jun/Jul 2023

## UPFRONT

### 04 **Comment**

Sarah Mukherjee MBE reflects on the best ways for activists to get the climate emergency message across

### 05 **News roundup and IEMA news**

Includes a UN report on plastic pollution and guidance on decarbonising local plans

### 10 **IEMA Impact 2022**

Lisa Pool reports on the Institute's work on green skills and jobs

### 11 **IEMA Opinion**

Tech alone can't sort out the world's climate problems, warns Tom Pashby. We need investment and government to make real change

### 12 **Legal brief**

Regulations, consultations and guidance explained. Plus, record fine for Anglian Water and case law on commercial fishing for sandeel

## CONNECT

### 34 **Career profile**

Jon Frederick Treacher, sustainability lead assessor, tunnels and underground infrastructure, COWI

## FEATURES

### 14 **Interview: VIN + OMI**

The eco-designers and 'ideologists' explain their mission to promote sustainability on the catwalk

### 18 **Manufacturing**

Unfair and unsustainable, the clothing industry is a major contributor to global emissions. Huw Morris reports

### 22 **Biodiversity**

Catherine Early examines emerging frameworks and standards that help businesses take stock of their impacts

### 24 **Q&A: Jayati Ghosh**

The professor of economics at the University of Massachusetts Amherst tells Chris Seekings why we need a realignment of economic systems to tackle climate change

### 27 **Climate activism**

As pleas to government fall on deaf ears, XR activists vow to ramp up protests and disruption. But will such tactics backfire?

### 30 **Water and planning**

Sandra Norval traces the history of the water system to see what lessons we can learn for a more integrated plan for clean and plentiful water supplies

### 32 **Air pollution**

Better satellite monitoring is changing how we measure air quality. Rick Gould looks at what Nasa's TEMPO is bringing to the party







**SARAH MUKHERJEE MBE, CEO, IEMA**

**H**ello, and welcome to another edition of *Transform* magazine. It is always a pleasure to spend time with you, our amazing members. The conversations that we have, and your passion for making the world a better place, are among the best parts of the job. However, many of you I speak to express frustration that thought leaders are not being clear enough about what we need to do to make the world a better place. There is no such obfuscation with Jayati Ghosh. An academic and author with a powerful intellect, Dr Ghosh is a past winner of a UN Development programme prize. She is clear in her views – inequality is the root cause of climate change and we must do something about that. Read her thoughts on private jets and the COP process in her interview with Chris Seekings.

One group of activists that have put civil disobedience at the front of their strategy is Extinction Rebellion. But are their tactics more, or less, likely to bring about societal change? Chris considers the arguments for and against. As the seasons change, many in the North will be heading out for a set of clothes for holidays or other events to mark the change in the weather. But, as Huw Morris reports, fast fashion is bad for the environment, bad for the communities that make it and entrenches inequality. Read his report on how rich countries need to kick their fast fashion habit to save the planet.

What things on Earth can you see from space? If you asked a colleague that question, air quality might not be one of the things identified. Rick Gould updates us on how TEMPO equipment on the Intelsat 40e satellite will help us model and mitigate air pollution on terra firma.

As always, do get in touch if you have any content ideas or suggestions on how we can improve. We welcome your thoughts and comments.

**“Fast fashion is bad for the environment, bad for the communities that make it and entrenches inequality”**

## **IEMA** Transforming the world to sustainability

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

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# ROUNDUP

ENVIRONMENT &  
SUSTAINABILITY  
NEWS AND VIEWS

## STUDY

### EU able to replace Russian gas with green energy by 2028

Green technologies can replace Russian natural gas by 2028, according to a study by the University of Oxford.

The researchers estimate that total capital expenditure needed to replace Russian gas with renewables and heat pumps is €811bn (£705bn). This includes planned spending of €299bn (£260bn) on clean energy as part of the European Green Deal, and an additional investment of €512bn (£445bn), of which up to 90% could be recouped over the next 30 years by eliminating the need to buy gas.

However, the transition depends on important policy changes, with the report arguing that public and private funds must be available to achieve large-scale deployment of renewables and heat pumps.

The authors also suggest targeted policy support for investors, including through improved auctions for utility-scale solar and wind, and addressing permitting challenges, deploying rooftop solar panels at speed, and increasing support for insulation and the installation of heat pumps.

Dr Gireesh Shrimali, co-author of the report, said: "By eliminating reliance on importing a fossil fuel with volatile prices and supply, the EU can alleviate energy security concerns, address the cost-of-living crisis through energy costs, and advance its goals to achieve net-zero emissions and tackle the climate crisis."

Scan the QR code for the full report



## LEGISLATION

### UK to scrap 341 environmental laws in Brexit cull

UK ministers have published a list of 600 EU laws that the government plans to scrap by the end of the year following Brexit, including 341 environmental laws. This is far fewer than the 1,700 environment-related laws that were due to expire on 31 December under the 'sunset' clause in the Retained EU Law (Revocation and Reform) Bill.

Rules relating to sustainable fisheries, and governing habitat regulations, are among the laws set to be scrapped, many of which date back to the 1980s.

The reasons given often simply state: "This regulation relates to a requirement/scheme/agreement which is no longer in operation, or is no longer relevant to the UK."

Watering down plans to scrap EU laws has infuriated some Conservative backbenchers, with Sir William Cash arguing, in a letter to prime minister Rishi Sunak, that the move will hamper economic growth.

However, the British Chambers of Commerce welcomed the decision to remove the sunset clause in the Retained EU Law Bill, warning that the sudden removal of vast swathes of legislation overnight risked "unintended, but negative consequences".

Scan the QR code for the full list of EU laws



## REPORT

### World can slash plastic pollution by 80% by 2040, UN claims



Plastic pollution can be slashed by 80% globally by 2040 if countries and companies make deep policy and market shifts using existing technologies, according to a report by the UN Environment Programme (UNEP).

Reusing, recycling, and reorienting and diversifying products are the three main areas of focus needed to create a circular economy, the report says. For example, it states that promoting reuse options, including refillable bottles, bulk dispensers, deposit-return schemes and packaging take-back schemes, can reduce 30% of plastic pollution by 2040.

Cutting plastic pollution by an additional 20% can be achieved if recycling becomes a more stable and profitable venture, while careful replacement of products such as plastic wrappers, sachets and takeaway items with products made from alternative materials can deliver an extra 17% decrease.

However, even with these measures, 100 million metric tonnes of plastics from single-use and short-lived products will still need to be safely dealt with annually by 2040 – together with a significant legacy of existing plastic pollution.

The report states that this can be addressed by setting and implementing design and safety standards for disposing of non-recyclable plastic waste, and by making manufacturers responsible for products shedding microplastics, among other measures.

UNEP executive director Inger Andersen said: "This UNEP report lays out a roadmap to dramatically reduce these risks through adopting a circular approach that keeps plastics out of ecosystems, out of our bodies and in the economy."

The QR code will take you to the full report





CONSULTATION

## IEMA responds to consultation on cost of environmental regulations to development

In February, the House of Lords began a consultation on the impact of environmental regulations on development. The consultation was intended to “assess the governance, the associated costs for developers and promoters, and the impact on the delivery of projects, of nationally defined environmental regulations in England”. It comes on the eve of biodiversity net gain (BNG) requirements being introduced into the planning system later this year and following the publication of the government’s Environmental Improvement Plan.

To develop its response, IEMA held a workshop with members and key stakeholders in this area, many of whom work in the built environment. IEMA’s response recommended the following:

- There are many challenges to developers in implementing environmental regulations but the most significant is uncertainty. Government agencies should be providing more information, guidance and practical examples for business. This would help stakeholders to feel confident to start to implement new requirements and take advantage of opportunities such as biodiversity markets.

- Resourcing is key to success in the implementation of environmental regulations, and responsible agencies must be resourced and upskilled sufficiently, including in order to undertake environmental monitoring.

- Information needs to be easier to find, and this includes licensing, regulations, different requirements across schemes – such as Nature Recovery Network, environmental land management and BNG schemes – and across nations.

- Environmental requirements should not always be seen and referred to as costs; they can be better communicated and treated like an investment in resources for the future of biodiversity and the economy. There are opportunities as well as costs in environmental legislation.

The cost of not meeting environmental needs is a further increase in the decline in species that we have seen in the past 10 years, which is part of an overall downward trend in species abundance since 1970.

GUIDANCE

## Go back to the drawing board when planning for net zero

Around a third of the UK’s greenhouse gas emissions arise from sectors that are directly shaped or influenced by local authorities. Despite there being no statutory duty for local authorities to take account of the UK’s net-zero targets (a recommendation of the Skidmore Review that is not being taken forward by government), most have voluntarily made declarations of climate emergency and have set their own ambitious decarbonisation targets for 2030 or 2035.

Decarbonisation projects mostly involve changes to infrastructure that is already built and to sectors that already exist. Local authorities have an abundance of advice on this, centred around ways of using energy more efficiently, switching to electrification and promoting community renewable energy schemes.

Council sustainability teams are increasingly influential, and work hard

to reduce local emissions against a challenging backdrop of stop-start funding rounds from central government, tight budgets of their own and the same inflationary pressures faced by all sectors of the economy. The biggest challenge of all is that many are trying to ‘beat the clock’ – aiming to get their areas to net zero 15 or 25 years before the rest of the UK.

An often-repeated statistic is that 80% of the buildings we will have by 2050 are already built, which means that 20% of the buildings we will have in 2050 are still on the drawing board. The best opportunity for a local authority to make an impact at scale on local emissions comes with the local development plan process – the drawing board. This is the point at which the authority makes choices on spatial strategy – planning policies, where a development will be sited, what it will be and how it will be built. An ever-

GUIDANCE

## Changes to the fourth round of adaptation reporting

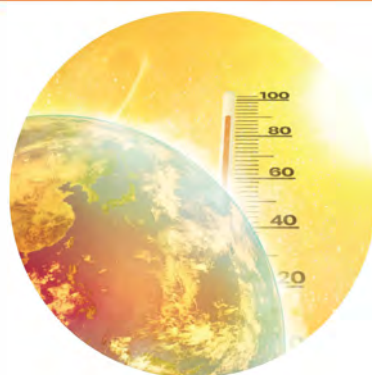
The Climate Change Act 2008 put in place the Adaptation Reporting Power (ARP), which has now been going for three rounds, in five-year cycles. The fourth round is coming up and the government is consulting on whether to make changes to the reporting requirements.

Organisations are asked to report on how they manage climate risk. Reports cover the impacts of climate change on their organisation, how they intend to adapt and their progress on adaptation.

Initially the timings were not in line with the timetable for the UK Climate Change Risk Assessment (CCRA), with the result that the CCRA’s did

not have access to all the latest evidence. Less than 5% of ARP reports in round three were received in time to inform the third CCRA. It seems likely that one of the changes will be an amendment of the timetable so that CCRA’s will reflect the most up-to-date positions of the reporting organisations.

For the first round, it was mandatory to report, while, for the second and third rounds, it was not. The government is consulting on whether to make reporting mandatory rather than voluntary for the fourth and future rounds. It seems likely that it will, the evidence being that not all organisations will



report when reporting is voluntary. This makes it impossible to know whether these organisations and the core infrastructure they run are adequately taking the need for adaptation into account as they plan. Given that these organisations are critical for the functioning of society, and with recent climate events proving that adaptation needs to be at the top of corporate agendas, it



improving amount of advice and data on how to do this with energy efficiency in mind is available to planners.

Done by the book, no new development would create an additional decarbonisation to-do list for sustainability teams. However, if built with business-as-usual planning policies, the moment a development is

completed and occupied it joins the queue of things to be fixed by the climate action plan. This is not the fault of planners, who face the perennial challenge of balancing all the requirements of development plans, of which climate is only one of many considerations. All policies need rigorous evidence bases, even ones relating to climate change.

The new toolkit recently published by IEMA – *Practical Steps for Decarbonising Local Plans* – is a starting point for a local authority to consider the GHG emissions implications of alternative policy options. Packed with resources and signposts, it sets out step-by-step guidance for local authority planning and sustainability teams to integrate their workstreams, understand baseline emissions and carbon budgets, develop policy backed by a solid evidence base, and monitor and feed back policy outcomes. It also – and this is a critical point – shines a light on the art of the possible, enabling local authorities to engage with multiple stakeholders in a way that puts emissions data forward in a transparent and objective manner.

The toolkit is available to IEMA members on the Institute's website.

would be a shame to miss the opportunity to ensure comprehensive reporting. This would close any gaps, ensuring that no aspects of a sector are ill-prepared for the effects of climate change.

IEMA's response to the consultation recommended some stakeholder mapping to identify interdependencies and to close gaps.

The consultation addressed the scope of reporting, and the IEMA recommendation was for regulators to report and therefore ensure that the smaller parts or operators within their sector and regulatory remit are within scope of oversight. Regulators have various duties and powers to enable adaptation across their sectors and could be reporting on how they're using these and on the effect that they are having.

Overall, the primary objective for adaptation reporting should be to integrate climate change risk management into the work of reporting organisations. This will raise the overall standard of adaptation planning. *IEMA Climate Change Adaptation Practitioner Guidance* sets out a maturity matrix for adaptation planning and delivery.

It would be helpful to standardise the reporting format so that the reports are easy to read, understand and audit. If reports are mandatory and standardised, organisations will be better able to assess their interdependencies with other organisations and risk assess the potential for cascading failures. Such assessments can only be as robust as the weakest report in the system. Auditing is essential so that

the quality of reports, as well as the delivery of actions identified in the reports, can be appraised in a transparent way.

IEMA is also hoping to see reporting designed in such a way as to complement other climate reporting requirements (such as those in line with the Task Force on Climate-related Financial Disclosures) to avoid duplication of work. Ideally, organisations will be able to draw upon a database of mitigation and adaptation information to fulfil their reporting requirements. This will minimise compliance burdens and make mandatory reporting more acceptable.

IEMA's Climate Change and Energy steering group members held a workshop to discuss IEMA's response to the consultation. See the website for full details.

## ADVICE NOTE

# Updated advice on non-technical summaries

IEMA's Impact Assessment Network is updating its advice note on non-technical summaries (NTS). An NTS must convey the key findings of an environmental impact assessment (EIA) in a clear and concise format to allow the public to understand a development proposal and its likely significant effects. The updated advice note is designed to improve the quality of NTSs in EIA practice and follows on from IEMA's eBrief *Effective Non-Technical Summaries for Environmental Impact Assessment* issued in January 2012.

The purpose of an NTS is to make the key issues and findings of the EIA report or environmental statement accessible and easy to understand for the general public. The public can be defined as any individual or group of individuals, organisation or political entity with an interest in the outcome of a decision. However, NTSs are also used as a quick guide to an EIA's findings by other stakeholders, including decision-makers. One should keep this in mind when thinking about the length, content and style of your NTS.

The updated advice note will provide guidance on the following: **Content** – what should be included in an NTS; **Key Skills & Competencies** – the key skills required in the team preparing the NTS; **Accessibility** – how to ensure suitably non-technical language; **Presentation** – how an NTS should be structured and presented; and **Digital Approach** – how to make best use of online and digital approaches.

The updated advice note will be available in early summer.

PUBLICATION

## Case studies show best practice in biodiversity net gain operations

From January to March, IEMA ran a series of webinars giving practical examples of implementing biodiversity net gain (BNG) ahead of mandatory requirements coming into force in November that will affect built environment developers and land managers.

The webinars were grouped into three areas: baselines and the Defra biodiversity metric; implementation and stakeholder engagement; and measuring and monitoring. They are still available to watch on the IEMA website.

We have captured all the case studies in a paper due out this summer. The paper will be exclusive to members and will include lessons learned and outcomes, alongside tools that the organisations involved used in their practice, frequently asked questions and suggested responses.

The paper explains how Barratt is integrating BNG into its development lifecycle processes and to help the site selection process, including the production of internal guidance on BNG. It also highlights how IEMA Corporate member Laing O'Rourke worked in partnership with Atkins, VolkerRail and Network Rail on the East-West Rail project, taking a strategic approach to delivery that included applying the mitigation hierarchy, minimising land-take wherever possible and retaining maximum vegetation at the design stage.

Network Rail and Mersey Rivers Trust talk of implementing BNG at the new Headbolt Lane railway station, and how biodiversity can deliver wider benefits. Terence O'Rourke in partnership with The Wildlife Trust for Bedfordshire, Cambridge, and Northamptonshire explain what they have done in their housing project near Cambridge to achieve a positive outcome for wildlife and to give the new community at Trumpington Meadows access to nature.

Each section comes with answers to frequently asked questions to try to demystify some of the processes around BNG operations. Questions include:

- 'Is it a Phase 1 habitat survey that I need to inform my baseline?'
- 'My site is near a watercourse. What does that mean for BNG?'
- 'Which scaling factor is applied if the off site is located in the neighbouring local planning authority but the same national character area?'

## IEMA steering group shapes advice on plugging the circularity gap

The *Circularity Gap Report 2023* for the UK shows that from all the materials that flow through the UK's economy, just 7.5% are used again, leaving a circularity gap of 92.5%. This means we are throwing away most of our valuable resources while continuing to extract and use more virgin materials; demonstrating how unsustainable our production and consumption patterns are.

The linear economy, also known as the 'take-make-use-dispose model', has contributed to the climate and biodiversity crises. It has also created significant resource shortages, risks and negative impacts to businesses, people and the planet.

Circular economy business models keep products and materials in use in a high value state, by design, for as long as possible to get the maximum value from them. Circular business models have the potential to be a key driving force towards a more resource-efficient economy, reducing the environmental pressures we face.

Transitioning to circularity can seem overwhelming and there is a common misconception that traditional business models need to be torn up. However, businesses and organisations can start on the path to circularity anywhere in their operations.

The IEMA Circular Economy Network Steering Group has been developing new guidance on circular business models to help IEMA members begin and further their journey into circularity, and build a case for change.

By demonstrating the negative losses of common linear economic strategies, we can show the value gained by positive impacts of applying a circular strategy. For example, extending the life of products by designing for durability, repairability and upgradability counteracts obsolescence.

CONSULTATION

## Response on giving protected sites added protection

In February, the Office for Environmental Protection (OEP) launched a call for evidence on protected sites for nature in England and Northern Ireland.

IEMA hosted a small workshop of experts, including from the IEMA Biodiversity and Natural Capital Network, to respond to the consultation.

The consultation considered specifically Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

The OEP's own document published earlier this year, *Progress in Improving the Natural Environment in England, 2021/22*, reported

that there is "a continued decline in the condition of SSSIs".

The British Ecological Society's paper *Protected Areas and Nature Recovery* identifies that statutory agencies struggle to meet the level of monitoring set out in the Common Standards Monitoring framework used on protected sites and that 78% of SSSIs had not been monitored for more than six years (their mandated period for reporting monitoring).

Protected sites are essential to halt the loss of rare and declining habitats and species. Protected sites can be part of meeting environmental



targets, including increasing species abundance by 2042 compared with 2022 and ensuring they are 10% higher in 2042 than in 2030.

In its response to the consultation, IEMA set out several recommendations.





However, making changes to 'business as usual' can be met with objections. The latter part of the guidance will explore some common objections and how to counter them with information, case studies and data to help build an evidence base highlighting the positive impacts to

organisations, people and the planet of adopting circular approaches.

The Circular Economy Network Steering Group held a workshop with IEMA members in April to capture thoughts and ideas on the shape of this new guidance, which is due to be published this summer.



The laws on protected sites could be updated and adapted (not removed) to have a greater focus on maintaining and improving irreplaceable habitats and priority habitats, enhancing populations and priority

species, and providing space for nature to adapt within them. This might include the creation of buffer zones and stronger influence on the areas directly adjacent to sites to reduce impacts. It might also include a consideration of improving the connectivity of the currently 'freestanding' protected sites to other habitats. New protected sites might be created.

Monitoring reports are currently published every six years, which is an effective timeframe, but these reports should include forward plans for improvement and monitoring should include biodiversity trends. These plans should be created with local stakeholders, especially those who have a role in managing the protected areas. The data collected

should be stored and freely available for the future.

Perhaps most importantly, the government agencies in charge of protected sites must have sufficient resources to organise the good management of sites effectively. This includes providing information to stakeholders requiring permissions in a timely fashion, and monitoring and planning to protect and enhance habitats and species.

Updating laws and implementation strategies, and strengthening government agencies to provide good service to protected sites, will support the development of the full range of priority habitats and species within the sites.

The full consultation response can be found on IEMA's website.

## OBITUARY

### Remembering Dave Stanley

By Martin Baxter, IEMA policy and external affairs director, deputy CEO

If you've ever met Dave Stanley, IEMA Fellow, you'll know of his passion and drive for sustainability. A former fighter-pilot trainer, coincidentally based in the small Lincolnshire village I live in, he was a huge enthusiast for energy efficiency, and for rapid cuts in the use of fossil fuels as the solution for addressing climate change. Our conversations were always lively and sometimes long, particularly when we travelled together to Cumbria to assess an IEMA graduate programme. We agreed on most things and I was always left energised to do more – Dave's enthusiasm was infectious.

I first got to know Dave in the late 1990s, as he moved from being the first environment manager of the Environment Agency to focus more on his other passion – pasture-fed livestock. He was a fantastic advocate and volunteer for IEMA, as a non-executive director on our Board (2013-16), a member of our Strategic Advisory Council, a training course assessor, and more.

Another member of the IEMA team, Tammy, remembers how Dave once 'arrived at a panel meeting a few minutes late, telling us all he was sorry but he had been delayed by some difficult lambing during the night. On another occasion, Dave explained how a prize cow had managed to get out and end up in a water-filled ditch. Dave had waded in chest deep to rescue it, with no thought for his own safety.'

Sadly, Dave passed away suddenly in March. He will be missed by family, friends and colleagues, but his motto 'tread lightly' is one that we can all carry forward.





# OUR IMPACT

**IEMA and Deloitte partnered in 2022 to deliver an important piece of work that has become the foundation of our activities on green skills. Lisa Pool reports**

**B**lueprint for a Green Workforce Transformation, launched on 28 April 2022, provides practical steps, case studies and a toolkit for leaders, to inform their workforce transformation so they can thrive and survive in a future green economy. We look at its impact one year on.

Supporting green skills and jobs has always been a key theme within IEMA – we have provided evidence to parliamentary inquiries on this topic and our deputy CEO, Martin Baxter, was appointed onto the government's Green Jobs Delivery Group. We also know from feedback that, as members, you often spend your time trying to influence decision-makers to act on embedding the right people and skills to do the job. This report provides a launch pad for many members and partners to begin (or reignite) these conversations, while the toolkit enables the assessment of green skills gaps with practical, actionable solutions.

## Paving the way

The IEMA Corporate Partnerships Team has witnessed this report kickstarting green skills journeys in several organisations and has

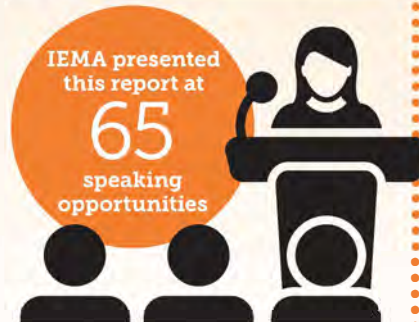
supported large employers with thousands of employees in the public and private sector to run green skills assessment workshops. These workshops are forming the basis of green skills transformation strategies, which are crucial to the success of the future workforce.

Following this report, another large IEMA partner saw an opportunity to develop its senior executives by running the IEMA certified course, Leading with Environmental Sustainability. The new shared understanding and enthusiasm among the leadership team has led to a 100% increase in people employed specifically in green jobs.

With over 16,000 views of the All Jobs Greener landing page and more than 600 downloads of the report, we are sure that the examples above are not isolated. All these small ripples throughout individual organisations will start to make waves across industry. We're excited to see how this agenda develops and we would love to hear about how you have used our report – just email [marketing@iema.net](mailto:marketing@iema.net) to get in touch.

**LISA POOL** is IEMA's head of marketing

## REPORT STATISTICS







While technology exists to enable economic growth without destroying the planet, we can't rely on it as the sole solution to climate catastrophe, says **Tom Pashby**

**T**echnology has delivered massive improvements to people's lives and has enabled the UK to dramatically decarbonise its electricity grid. The pace of innovation and economies of scale mean that power generation from renewable energy sources has expanded and dropped in cost, and government and corporations invest billions in tech because they see it as a solution to the problem of the climate and biodiversity emergencies.

One of the most exciting areas of technological development in the climate action sector is negative emissions technologies (NETs), including carbon capture and storage (CCS).

NETs are held up by some as the silver bullet needed to enable the global capitalist system, which hinges on infinite economic growth, to keep going, while saving the planet from climate breakdown. Some NETs have been proven to work insofar as they do literally suck up carbon dioxide from the atmosphere – but none has been able to do so at scale.

The operational and business models of NETs often present contradictions to their stated aims.

Operationally, they often require huge amounts of electricity. In most places where electricity is available on a grid, the grid electricity is more than likely to be at least in part generated by the combustion of fossil fuels. Circumventing this means siting direct air capture facilities near high-volume zero-carbon generators such as geothermal heat in Iceland, which is very limiting.

Business models are still being developed to create a market in which NETs can work for climate action. As things stand, one of the easier models is to sell the captured carbon dioxide to industries such as carbonated drinks manufacturing – but this releases the gas back into the atmosphere, cancelling out the benefit of removal.

Direct air capture entrepreneurs are faced with massive obstacles in terms of access to capital funding and those limited spaces where they can find proximity to zero-

carbon electricity. Philanthropists are interested, but philanthropy is not an appropriate long-term revenue stream for tackling the global societal challenge of climate change. Philanthropists are free from democratic oversight and can withdraw their support whenever they wish.

While these technologies are being worked on, the climate emergency is getting worse, and the fossil fuel industry continues to expand extraction for combustion. There are significant gaps between the scale of action needed to mitigate and adapt to climate breakdown and commitments to action, and between commitments and delivery.

In the main, the technology for decarbonisation exists – such as building insulation, smart grids, wind turbines and solar panels. The main obstacle continues to be political will. Markets are moving regardless of political leadership, but the speed of capital flows is not fast enough to achieve net-zero global emissions in time to avoid more than 2°C of global heating.

**"In the main, the technology for decarbonisation exists – such as building insulation, smart grids, wind turbines and solar panels. The main obstacle continues to be political will"**

Reliance on the future potential of NETs, CCS and bioenergy carbon capture and storage creates a serious risk of complacency and, given the extremely tight window in which we must act, they should be disregarded from climate action plans.

That might sound like an extreme position and disappointing for fans of NETs. Just to be clear, I am not against NETs, provided they are rolled out in a socially and environmentally just way, but we don't have the time to add in variables to the problem of climate action.

We already have the tools to avert climate disaster – what's needed is political will and financial capital, both of which can be deployed today.

**TOM PASHBY, AIEMA, is a digital journalist at IEMA**



## IN COURT

## Record fine for Anglian Water over sewage spill

Anglian Water has been fined £2.65m after pleading guilty at Chelmsford Magistrates' Court to allowing millions of litres of untreated sewage to overflow into the North Sea.

It is the largest-ever fine imposed for environmental offences in the region.

The prosecution followed an Environment Agency investigation in 2018 into discharges at Jaywick Water Recycling Centre near Clacton-on-Sea. Anglian Water had decommissioned a piece of equipment at the site which led to the conditions for untreated sewage to be released into the North Sea.

Anglian Water failed to act on available data that would have alerted it to the issues, and there was also a lack of an alarm system to inform the water company of how often the discharges were occurring.

Since 2010, water companies have been responsible for self-monitoring water recycling sites. Environment Agency officers carry out audits and inspections of waste water treatment works. Data experts analyse hundreds of thousands of discharges to identify illegal activity, which is used as evidence to hold water companies to account.



An investigation in 2018 found that the discharges into the North Sea, recorded over a month between June and July, were the equivalent of more than three Olympic-sized swimming pools, or 7,500,000 litres.

The Jaywick Water Recycling Centre does have an Environment Agency permit, which only allows discharges into the sea during storm conditions. However, sentencing Anglian Water, district judge Andrew

King said "more could and should have been done" to prevent this pollution.

He added that it should not have taken Environment Agency officers to spot what was happening during a routine inspection, and they simply "heard, looked and saw" what Anglian Water operatives, who were present on site every day, should have seen. The fact that "Anglian Water finds itself in court so frequently" was reflected in the level of the fine, as was "a

## CASE LAW

## Court refuses petition for judicial review on catching sandeel for commercial purposes in 2022

In *Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs*, the owner and operator of a sandeel fishing vessel argued that the secretary of state's decision was unlawful in both substance and timing, and sought to ensure the same illegalities would not affect the UK fleet's ability to catch sandeel in 2023.

The petitioner had fished for sandeel using a vessel for many years in shallow water at the edge of the Dogger Bank area and similar locations in the North Sea. The species was fished mainly for use in animal feed and fertiliser, and according to the petitioner represented about 2.7% of the total catch in the North Sea up to the effective closure in 2021.

They maintained that sandeel stocks were stable and capable of

exploitation within guidelines issued by the intergovernmental marine science organisation dealing with the sustainable use of seas and oceans, the International Council for the Exploration of the Sea (ICES). Fishing for sandeel would be profitable for it and represent a diversification from its main operations in fishing for mackerel and herring.

It was determined there was a likely need for action to ensure the sufficient protection of sandeel, based on scientific evidence that the species benefited the food web and the wider ecosystem if allowed to proliferate in the sea. The UK approach was to follow ICES advice that there should be zero catches of sandeel in various areas of the North Sea. The



petitioner argued it was futile to introduce a conservation measure that would only prohibit about 2% of sandeel fishing in UK waters while leaving the remaining fishery unaffected. The quotas held by the petitioner could be seen as "possession" within the meaning of Article 1 Protocol 1 ECHR, to which it was entitled to free enjoyment.

Lord Sandison, in his decision,

said of the test for interference: "The petitioner accepts, consistently with the importance of environmental protection to society as a whole and the wide margin of discretionary judgment afforded to ministers in that context, that in principle it was open to the secretary of state to take the view on the basis of the scientific and other material before him that prohibiting



clear pattern of the company not responding adequately" to previous penalties.

Defra water minister Rebecca Pow said: "I am clear that water companies must not profit from environmental damage. This latest result follows on the heels of a £2.1m fine handed to South West Water. In both cases, the fines will rightly be paid solely from the company's operating profits and not passed on to customer bills.

"Going forward, all fines will be paid into our Water Restoration Fund to support projects that will help improve our natural environment and our water quality."

sandeel fishing by UK vessels would produce environmental benefit. Rather, the difficulty lies in assessing the proportionality of the contemplated benefit with the corresponding detriment to the petitioner's possessory interests."

He concluded: "The secretary of state's 2022 determination which is complained of may properly be regarded as a modest but meaningful contribution to valuable maritime conservation and ecological goals. Even having full regard to its modest nature, its effect on the petitioner is not disproportionate or excessive for the reasons already stated. Lack of compensation for, or equivalent mitigations of, the closure of the fishery is in those circumstances an outcome which is within the wide margin of appreciation afforded in this area to national authorities."

The petition was refused.

# NEW REGULATIONS

THE LATEST ■ LEGISLATION ■ GUIDANCE ■ CONSULTATION



## LEGISLATION

### REACH

The Draft REACH (Amendment) Regulations will extend the amount of time that the Health and Safety Executive (HSE) has to check compliance of registration dossiers. This essentially extends the deadlines of registrants to submit information to the HSE by three years.

➔ [cedr.ec/8yjd](https://cedr.ec/8yjd)



## LEGISLATION

### Environmental permitting

The Draft Environmental Permitting (England and Wales) (Amendment) (England) Regulations will amend the environmental permitting regime to optimise the regulatory tools available for managing and protecting groundwater quality. The amendments will come into force on 2 October 2023.

➔ [cedr.ec/8yyp](https://cedr.ec/8yyp)



## GUIDANCE

### Net zero

A new policy paper sets out the government's plans to enhance the UK's energy security, seize the economic opportunities of the transition and deliver on net-zero commitments. *Powering Up Britain* aims to secure the UK's energy independence by investing in 'home'-produced gas, oil, nuclear and renewable energy, which will shield the UK from the impacts of external geopolitical pressures. The plan aims to create almost half a million green jobs by 2030, create a strategic advantage in new clean industries and generate opportunities for UK businesses to "export their expertise".

➔ [cedr.ec/8yjd](https://cedr.ec/8yjd)



## LEGISLATION

### Hunting

The Hunting with Dogs (Scotland) Act 2023 has been published. It closes loopholes in existing laws that have allowed the practice of illegal hunting for sport to continue. A new two-dog limit for all use of dogs in the course of hunting will be introduced, as will a ban on trail hunting.

➔ [cedr.ec/8ygd](https://cedr.ec/8ygd)



## CONSULTATION

### Fines

The government has published a consultation that aims to strengthen the Environment Agency's ability to issue monetary penalties for environmental offences in England, and to raise the cap for such penalties. The options include raising the cap from £250k to £25m, £250m or an unlimited amount. The plans also aim to extend such fines into the environmental permitting regime.

➔ [cedr.ec/8ykg](https://cedr.ec/8ykg)



## CONSULTATION

### Carbon leakage

The government is consulting on policy measures to mitigate carbon leakage risk. Carbon leakage means any movement of production and associated emissions from one country to another owing to different levels of decarbonisation effort through carbon pricing and climate regulation. Carbon leakage undermines decarbonisation efforts. Potential policies include a carbon border adjustment mechanism applied on imports that would reflect the carbon emitted in their production together with any gap between the carbon price

already applied in the country of origin and the carbon price that would have been incurred had they been produced in the UK.

➔ [cedr.ec/8ym](https://cedr.ec/8ym)



## CONSULTATION

### Air quality

Defra is seeking views on the draft revised national air quality strategy, which sets out actions the government expects local authorities to take to achieve long-term air-quality goals, including ambitious new PM2.5 targets. The strategy establishes a framework to enable local authorities to make the best use of their powers and deliver for their communities.

➔ [cedr.ec/8yl](https://cedr.ec/8yl)



## GUIDANCE

### Water quality

A Defra policy paper sets out the government's plans to transform the water management system; clean up the water environment; and create a sustainable supply of water for people, businesses and nature. The plan aims to integrate the water system, address the sources of pollution and boost the water supply through extra investment, tighter regulation and more effective enforcement.

➔ [cedr.ec/8yn](https://cedr.ec/8yn)



## CONSULTATION

### Climate change reporting

DAERA is consulting on developing regulations that will place climate change reporting duties on specified public bodies. These regulations are required to be made under the Climate Change Act (Northern Ireland) 2022.

➔ [cedr.ec/8yo](https://cedr.ec/8yo)

# THE SHOCK FACTOR



Trailblazing eco-designers and 'ideologists'  
VIN + OMI speak to Adam Batchelor and Chris  
Seekings about their work promoting sustainability  
across the fashion industry and beyond

**"We are not just a fashion label, we are an ideology,"**

say VIN + OMI, whose showstopping work has attracted a legion of fans, including household names such as Beyoncé, Lady Gaga, Michelle Obama and even King Charles.

The double act first met at a party more than 20 years ago and have since gone on to build a reputation for their daring fashion designs and shows, driven by one shared purpose: to promote sustainability and environmental protection.

"It all started for me when I was doing a lot of photography for big fashion houses, and saw these racks and racks of clothes at the back end of the industry. So much waste! It is the second most-polluting industry in the world," Omi explains. "When we met in 2001, we started this blue-sky thinking about what sustainability should look like, and began to develop our brand."

With a background directing large

**"Their manifesto has 15 key principles, including a commitment to 'always look first for a unique solution to a problem'"**

companies, Vin was already familiar with ethics, safety and sustainability. However, he remained frustrated by the lack of creativity involved in his work. "Omi suggested fashion, and I said I could get my head around that," he says. "But we agreed immediately it would have to be done in the right way, and not to follow what everybody else is doing in fashion – we would do it our way."

## Problem solving

The two began researching new business models with tech start-ups in Silicon Valley, and learned important lessons about circular economies and the power of social media. They wrote a manifesto with 15 key principles, including a commitment to 'always look first for a unique solution to a problem'.

After considering latex for their designs, the duo travelled to Malaysia to investigate how it was sourced from rubber trees. This was a shocking experience, finding "terrible" working conditions on the plantations and lack of education among workers in the

villages. "The middlemen were just ripping them off, and it was completely unethical," Vin says. "So, we thought, right, we've got a bit of money, we'll purchase a part of a plantation and run it the right way. We started looking at the biology of the trees, the ecology of the area, the ethics of the workers, and how the latex sap is transported. We were able to develop our own latex sheet, which we still use today, and ploughed money we made from that back into the community and education programmes."

This is just one example of how VIN + OMI are guided by their manifesto, which also states that they 'will always try to develop a social impact or environmental impact project around any of our work'.

"When we were deciding everything from the name of the business to how it would run, we quickly realised that design couldn't be the primary goal; it would have to be secondary, and our primary goal would be our educational, environmental and social impact," Omi says. "We derived a very simple simultaneous equation, which works around commerciality viability and sustainability, concurrently. We are still working on that formula because you





"You cannot do sustainability based on just one factor... It's like playing Mozart's Symphony No. 40 with just the brass section – it doesn't work"





cannot do sustainability based on just one factor, such as the environment or poverty. It's like playing Mozart's Symphony No. 40 with just the brass section – it doesn't work."

## An ideology

Indeed, to label VIN + OMI as 'fashion designers' is to hugely understate what they do, with the pair instead preferring to describe themselves as 'ideologists'. They will only undertake retail ventures if there is a direct benefit to a charity or the environment, and will not do so for profit. Their business models are circular, and they will only work with celebrities and high-profile individuals or organisations that support their core values.

Vin says: "We've partnered with over 50 businesses on a variety of projects. For example, we do large fashion shows twice a year to showcase our eco textiles that we have developed. We are currently working with our host hotel – One Hundred Shoreditch – in East London and developing social impact projects with them. Our previous host partners were the Savoy and the Dorchester. We only take on those venues for our shows if they develop a reciprocal arrangement where we advise on how they can run their business more sustainably and develop projects. We hope we leave a sustainable legacy in return."

Daler-Rowney, Jägermeister, and KMS are three companies they are currently working with to help introduce new sustainable projects via "radical thinking". "We love the challenge of dissecting an industry we know nothing about," Vin continues. "With Daler-Rowney, for example, we turn a lot of their plastic paint tubes into textile, which we put on our catwalk dressers. With Jägermeister we are working on a range of sustainable projects, and with KMS we are looking at how the hair-



Sap being extracted for latex; using the catwalk to influence the psyche of the consumer

product brand interfaces with salons and develops sustainably."

VIN + OMI fashion shows are shocking and provocative, with the intention of changing perceptions about consumption and fast fashion. In 2016, Debbie Harry and Blondie band member Matt Katz-Bohen joined them on the catwalk to promote their Stop F\*\*\*\*\*g the Planet collection, with the hard-hitting slogan designed to make people stop and think. "There are people who need a fix by purchasing something every day or every hour online – it's a psychological problem," Vin says. "We try to solve that by highlighting in our shows how consumers should buy less and from sellers that care about their products, which might mean spending more – you've got to get that into the psyche of the consumer."

"Ocean plastic waste, no-kill alpaca and sheep fleece clippings, and nettles and chestnuts are just a few of the alternative materials used to develop their fabrics"



## Royal approval

Despite their rebellious nature, VIN + OMI have not gone unnoticed at the highest echelons of society.

In 2019, King Charles invited them to his Highgrove Estate to see if they could use any materials from the gardens in their fabrics, which led to their STING collection made from salvaged nettles. "We share a passion for the environment and a sense of humour – he's very funny," Omi says. "He sent us a letter saying we must come down and take whatever we wanted. We saw these nettles that would rot if nothing was done with them, so decided to make a textile from them."

Ocean plastic waste (VIN + OMI was the first global company to reuse salvaged ocean plastic waste to make new textiles), no-kill alpaca and sheep fleece clippings, and nettles and chestnuts are just a few of the alternative materials used to develop their fabrics, with all their designs taking inspiration from protection of the natural world. VIN + OMI moved operations to





Vin (L) and Omi (R) take inspiration from the natural world for their designs

the UK countryside 12 years ago, where they grow their materials for projects.

Vin explains: "We're very passionate about the countryside, so it's all understanding the science of cropping and how we can do things that are better for the environment that underpin our creative work."

### A new hope

The irony of working within an industry that is so polluting is not lost on the duo, who have managed to infiltrate a sector driven by unsustainable consumption

and resource extraction. "Fashion, like most industries, is run on greed, and larger fashion houses will not slow down because they're only interested in profits," Vin says. "They'll throw out tokenistic sustainable projects to hoodwink a client base that are actually trying to do the right thing."

He believes that governments must do more to put an end to unsustainable fast fashion. "If you outlaw the ridiculously cheap clothes that are manufactured at 30p and marked up to a couple of quid, regulate working conditions, and limit imports from countries that aren't subscribing to the planet's future, you will start to limit the amount people buy. If Primark still exists, people will still shop there, so we must be more

"People say that VIN + OMI really needs to expand, but the problem with that is you lose that flexibility as a sustainable brand"

stringent. All those people that are passionate about sustainability should run for government."

He also believes that the government should be doing more to support innovation. "We need innovation to solve a lot of the problems, but there's not an easy way to get there. I know the government is getting pumped up about innovation and funding programmes, but it's hard and tedious to navigate. We have waste programmes for what we throw away, but how about extra money if you find a new way of using that waste?"

Fashion houses must also take more responsibility, with Vin suggesting that most "just want to hit their targets" on waste, without going "above and beyond".

However, there is still hope for the industry, with a new generation of designers taking inspiration from VIN + OMI and manufacturing on a smaller scale while harnessing the power of social media. "To be honest, I think that the old guards have to go – that's the reality," Omi says. "There are a lot of great ideas and fresh blood coming through, and you no longer need magazines and newspapers to amplify your work. There are all these innovative people selling on TikTok, Instagram and Facebook, and creating a micro circular economy."

Another commitment in VIN + OMI's manifesto is to ensure 'empathy is at the core of our business model and our practice'. Omi explains: "People say that VIN + OMI really needs to expand, but the problem with that is you lose that flexibility as a sustainable brand. We run the business predominantly on empathy, and when you do that, you take away the greed and realise, we've got three meals a day, a roof over our heads, and don't have a bad lifestyle, and we are fine with that."



# OUT of Fashion

The global clothing industry is not only unfair but increasingly unsustainable.

**Huw Morris**  
reports

**K**aya Dorey sums up how the fashion industry comes with an escalating price tag. "No-one thinks about their \$5 T-shirt and how that became \$5. People are getting paid lower than liveable wages and working in terrible conditions," says the founder of Novel Supply Co, a Vancouver fashion company.

"We have this fast-fashion problem. It's made people think they're going out of style every week, so they need something new. We're making products from synthetics derived from petroleum and when we're fed up, we throw it in the garbage, and it never biodegrades.

"Synthetics and micro-plastics are polluting our waters and now getting into our food. We need to think about what's going into the product."

Dorey's fashion label produces garments free from toxic dyes and synthetics. Instead, it uses hemp and organic cotton and environmentally friendly inks. Her company employs a "closed-loop" philosophy of production,







## Manufacturing

taking back the garments it creates when they are worn out. Novel Supply Co has an automated manufacturing hub to make its products locally. Those products are also biodegradable. "We're making more products, pay people more, it's more ethical, more just and more efficient."

Dorey, who was named a Young Champion of the Earth by the United Nations (UN) in 2017, is in a minority. The fast-fashion business model is responsible for numerous damaging environmental, social, and economic consequences. These are found all along the supply chain, from overproduction to harmful manufacturing processes through to problems with waste disposal, says Willis Towers Watson director David Bennett.

"It's arguably economically impossible to manufacture, ship and retail a \$5 T-shirt or £12 dress in a way that does no harm to the environment, the workers who make it, or the countries left to process the waste."

### Stark figures

Water is one example. Around 7,500 litres is needed to make a single pair of jeans, equivalent to the amount the average person drinks in seven years. According to the UN Conference on Trade and Development, around 93 billion cubic metres of water, enough to serve five million people, is gulped down by the fashion industry annually.

But starker consequences loom. The Ellen MacArthur Foundation predicts that without urgent action the whole industry is on track to chew up a quarter of the global carbon budget by 2050.

Estimates of the global emissions from fashion vary, with reliable data, industry transparency and peer-reviewed scientific research all lacking. McKinsey & Company and Global Fashion Agenda (GFA) put the figure at 4.8%, the UN says it is at least 8% and the World Bank 10%.

Elisa Tonda, head of the UN Environment Programme's consumption and production unit, says with global clothing and footwear manufacturing concentrated in Asia, the industry relies on hard coal and natural gas to generate electricity and heat. "If we continue with a business-as-usual approach, the greenhouse gas emissions from the industry are expected to rise by almost 50% by 2030."

That means the global fashion industry will be emitting the same amount as released by India in 2021, a nation of around 1.4 billion people and the third largest emitter of greenhouse gases after China and the US.

Fashion consumption is highly unequal between G20 countries, according to research by the Hot or Cool Institute, published jointly with the Rapid Transition Alliance. Australia has the highest footprint, heading for 503kg of carbon dioxide equivalent (CO<sub>2</sub>e) per year by 2030, resulting from average per capita consumption of around 2kg of new clothing per year and clothing discards of around 23kg. India, at the other end of the scale among G20 countries, has the lowest per capita fashion consumption footprint at 22kg of CO<sub>2</sub>e per year, despite rapidly rising consumption levels and an

**"Around 93 billion cubic metres of water, enough to serve five million people, is gulped down by the fashion industry annually"**

expanding middle class. That is less than 5% of Australia's footprint.

Even working to a very conservative estimate that fashion contributes 4% to global emissions, the industry would have to slash its emissions to 1.1 billion tonnes of CO<sub>2</sub>e to be on the 1.5°C pathway under the Paris Agreement by 2030, according to the research.

The study also reveals the per capita footprint target for 2030 is exceeded in 14 of the 19 G20 countries – the EU is not included – indicating that rapid and radical reductions in fashion consumption are needed. Estimates of current average per capita footprints by country were calculated as of 2020 and projected to 2030 by considering expected changes in population and gross domestic product (see overleaf).

Indeed, without decarbonising its operations, the fashion sector will be belching out an estimated 2.7 billion tonnes of CO<sub>2</sub>e in 2030, say McKinsey

# Manufacturing

and GFA. They estimate that around 70% of fashion's annual emissions occur in the production and processing stages, 10% in transport and retail, whereas 20% are generated in the use phase.

Other commentators say figures for the use phase can vary, depending on the type of fibre. The highest emissions from cotton clothing, for example, occur during washing and drying.

## The cost of haute couture

Yet cheaper clothing is only a part of the problem. The Hot or Cool Institute research found that carbon emissions from fashion consumption by the richest citizens across G20 nations are 10 times higher than those from the bottom income groups in the same countries.

Such findings counter the dominant narrative that it is poorer citizens, buying cheap clothes, who make the fashion industry unsustainable. In fact, it is the scale of purchasing by the richest citizens in countries such as the UK, US, Japan and Germany that is responsible for much of fashion's climate impact, says the study. The cost of haute couture and designer outfits is borne by more than the credit cards of the wealthiest.

The carbon footprint of fashion consumption among wealthy G20 nations – such as the UK, US, Germany, Japan, and Saudi Arabia – must fall by 60% on average by 2030, the study says. For upper-middle-income nations, like Brazil and South Africa, it needs to fall by 40%. In nations like India and Indonesia, the average carbon footprint of fashion consumption is below the 1.5°C limit.

To bring fashion in line with the global climate commitment of 1.5°C, the richest 20% in the UK, with an average disposable income of £69,126, must cut their consumption footprint by 83%, while the richest 20% in Germany and Italy must cut theirs by 75%. In France, that target should be 50%.

Buying fewer new clothes is four times more effective at cutting emissions than increasing how long they last, the next best solution. To keep the 1.5°C target alive, the study says per capita fashion consumption needs to return to 2010 levels in most high-income countries, alongside reformed business models and slashed emissions in the production, retail and disposal of garments.

## G20 COUNTRIES' PROJECTED FASHION FOOTPRINTS

Countries need to aim for a per capita fashion consumption footprint of 128.7kg of CO<sub>2</sub>e by 2030 to comply with the 1.5°C aspirational target of the Paris Agreement. The 2030 average carbon footprints of fashion consumption for the G20 countries, measured in CO<sub>2</sub>e and ranked from highest to lowest, is on track to be:

Australia

503kg

Japan

390kg

US

387kg

UK

374kg

South Korea

373kg

Canada

335kg

South Africa

329kg

Mexico

311kg

Saudi Arabia

276kg

Germany

266kg

Italy

254kg

Argentina

211kg

Russian Federation

197kg

France

146kg

Indonesia

117kg

Turkey

87kg

China

62kg

Brazil

53kg

India

22kg



"The fashion industry needs to change its ways as quickly as a catwalk model changes their clothes"

In short, system and behaviour change, "especially by wealthy consumers with bulging wardrobes, need to come together so that people dress themselves within planetary and climate boundaries", says Rapid Transition Alliance coordinator Andrew Simms. "The fashion industry needs to change its ways as quickly as a catwalk model changes their clothes."

## Fashion and net zero

Fashion companies may be increasingly turning heads with their net-zero pledges, but many of these "are not worth the paper they're written on", according to Stand.earth. The North America-based environmental campaigners assessed 10 large fashion firms' plans for reaching

net-zero emissions. The companies – American Eagle, Fast Retailing, Gap Inc, H&M, Inditex, Kering, Levi's, Lululemon, Nike and VF Corp – have targets to at least halve their direct or scope 1 and power-related or scope 2 emissions by 2030. However, Stand.earth points out that the Science Based Targets initiative has not verified half of the brands' emissions goals. Half have not published interim goals before 2030.

Supply chains are another problem. Only H&M and Kering, have pledged to at least halve their indirect or scope 3 emissions this decade. They are the only two committed to 100% renewable energy across their supply chains by 2030. Only half of the brands have set independent targets to phase out thermal coal in supply chains. None shares baseline data on coal use.

Stand.earth also warns none of the 10 has public targets to reduce fossil-fuel-derived material use this decade, despite these representing around 15% to 20% of the fashion sector's emissions footprint.

HUW MORRIS is a freelance journalist



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11:30, 7 June, Finance Stream

6-8 June, Brighton  
Stand: C19

# UPPING THE ANTE



The onus on business to report on nature is accelerating, with multiple frameworks and standards taking shape. **Catherine Early** explains

**B**usinesses' awareness of their impacts and dependencies on nature is rising fast. UN negotiations for a new global deal for nature at COP15 in December were attended by an estimated 2,000 business representatives, compared with previous nature summits, which had seen barely any.

This has followed increasing evidence of the dependency of business on nature. More than half of global GDP is moderately or highly dependent on nature, according to new analysis by PwC. All 163 economic sectors analysed by the consultancy have a portion of their supply chain that is highly dependent on nature. For agriculture, fisheries and aquaculture, forestry, food and drink, and construction, all the economic value of direct operations is highly dependent on nature.

PwC argues that businesses should place nature loss on the same level as climate change in strategy and risk assessments. It is anticipating a rise in work in this area and is upskilling its entire global workforce on the issue, doubling the number of nature specialists it employs to 1,000, and launching a global Centre for Nature Positive Business.

## Mandatory disclosures

In fact, one of three key business asks at COP15 was for disclosures on nature to be made mandatory by 2030, with more than 330 business and finance institutions writing to governments urging them to enshrine this in a target.

A survey by consultants at KPMG last October found that only around 40% of 5,200 top global corporations report on biodiversity. And those that do report are

not necessarily doing so at a mature level, according to analysis by the World Business Council for Sustainable Development (WBCSD) of 55 of its members already active on the issue.

This found a lack of standardisation and timebound, measurable targets. Businesses tended to focus on actions to reduce nature loss, with fewer first considering how to avoid it.

But businesses are going to have to get up to speed on the issue, and fast. The final deal agreed at COP15 – named the Kunming-Montreal Global Biodiversity Framework (GBF) – includes a

**“Businesses tended to focus on actions to reduce nature loss, with fewer first considering how to avoid it”**

commitment by governments to require large companies and financial institutions to regularly monitor, assess and disclose risks, dependencies and impacts on nature, covering their operations, supply chains and portfolios.

Governments will bring forward proposals to meet this and other targets in the GBF in national biodiversity strategies and action plans in time for COP16 in 2024. France made the disclosure of biodiversity risks mandatory in 2021. The UK is actively discussing mandatory nature reporting, whose supporters include international environment minister Lord Goldsmith.

The EU has taken the GBF as a baseline against which to check the requirements in its Corporate Sustainability Reporting Directive, says Martin Lok, executive director of the Capitals Coalition. “If they are not sufficient to meet the GBF targets, the EU will push for further clarification in relation to nature-related elements and make all the guidance in line with the GBF,” he says.

In Brazil, financial institutions sized up to 10% of the country's GDP must report to the Central Bank of Brazil on social, environmental and climate risks relevant to the country. There are other examples in Indonesia and India that are not specifically about nature, but are clearly related to the issue, he adds.

However, businesses should not wait until governments force them to report, Lok believes. “What we hear from many of the businesses that are leading on this is that they want to stay ahead of the curve, and they can help shape the guidance that is now under way.”

## Frameworks to help

Several pieces of work to help businesses assess, monitor, report and act on nature risks and dependencies are now coming to a head. The Taskforce on Nature-related Financial Disclosures (TNFD) – a market-led initiative to standardise companies' nature-related financial disclosures, based on the principles of that for climate-related disclosures – has developed a risk management and disclosure framework to help companies report and act on nature-related risks. TNFD published V0.3 of its beta framework in November 2022, and its final guidance will be ready in September.





**"Most businesses have much more nature-related data within their own organisation than they are aware of"**

McCormick adds that membership organisations such as the WBCSD and Capitals Coalition have a role to keep track of changes and distil them to members.

WBCSD is supporting businesses to speed up the process of identifying the risks, opportunities and priority actions that are relevant to their business by providing sector-specific roadmaps. "It's a one-stop shop, so you don't have to go to the SBTN there, and the TNFD and the GBF there," she says.

Despite the complexities of nature reporting, businesses should be reassured that much of the work they need to do can build on related environmental reporting – for example, on climate or freshwater, says McCormick.

### **Making the most of data**

According to Lok, businesses already collect a lot of the data required for nature reporting, but ownership can be fragmented within a company. "Most businesses have much more nature-related data within their own organisation than they are aware of; they're not always sharing it across different systems." Other data relevant to the environment in which a company operates can be found in global datasets or via non-government organisations, he says.

"It's about seeing what they're doing already to avoid and reduce negative impacts, and about how they're looking to reverse those and just starting from there," says McCormick.

**CATHERINE EARLY is a freelance journalist**

Meanwhile, the Science Based Targets Network (SBTN) is planning to release a beta version of guidance in May. This will enable companies to set science-based targets for nature and will focus on impacts on freshwater quantity, quality (specifically nitrogen and phosphorus), as well as protecting and restoring terrestrial ecosystems. The guidance will be piloted by a group of pre-selected companies ahead of a wider roll-out in early 2024.

In addition, the Global Reporting Initiative has developed and consulted on a Draft Biodiversity Standard to support companies in meeting reporting obligations. The International Sustainability Standards Board – a body created at COP26 to develop a comprehensive global baseline of sustainability disclosures for the capital markets – is considering nature-related standards and disclosures.

### **Acronym overload**

Though the number of new standards and frameworks can seem like an "acronym tsunami", the organisations behind them and corporate member bodies are working to ensure they align as much as possible, according to Nadine McCormick, senior manager of nature action at WBCSD.

"This is a really fast-moving space, much faster than climate reporting, because we're following on the path of climate, so the SBTN is following the path of Science Based Targets initiative (SBTi) in developing science-based targets for nature, and the TNFD is following the Task Force on Climate-Related Financial Disclosures," she says.

"There's a lot of feedback loops and it's a very evolving, iterative approach which can feel uncomfortable, so the challenge for a business is how to keep up."

# TURNING THE TIDE ON INEQUALITY

**Jayati Ghosh**, professor of economics at the University of Massachusetts Amherst, talks to Chris Seekings about how inequality is destroying the planet, and what we can do about it

**I**nequality is the root cause of climate change, biodiversity loss and many of the social challenges facing countries across the world today. However, vested interests have long sought to distract us from this fact, enabling the unsustainable lifestyles that have brought us to the point of no return for the planet as we reach environmental tipping points.

These are the views of professor Jayati Ghosh, who, for decades, has argued that a redistribution of wealth and realignment of economic systems is necessary to tackle the greatest challenges facing humanity.

An author of various books on our unsustainable way of life, and the recipient of numerous awards for her work, Ghosh explains how inequality is driving us to destruction, and what we can do about it.

**How much accountability should people in the West take for their ancestors giving rise to free-market capitalism, the Industrial Revolution and historical CO<sub>2</sub> emissions?**

There's a historical carbon debt, as around 80% of emissions came from today's advanced economies between 1850 and 2011. But I don't think of it in terms of 'the West', because there is a lot of inequality within populations. There's a broader issue of lifestyle and aspirational tendencies that exist all over the world, where everyone is aspiring to a material existence that is simply not sustainable. However, in terms of the remaining carbon budget, there must be more dramatic reductions in rich

countries; not proportionate, but much larger. It must happen alongside increasing carbon emissions in some countries to provide basic human rights, such as access to electricity and transport. The Indian government is demanding more finance because we need to electrify, which is true, but they are allowing massive excess carbon consumption of the top richest 10% and 1%, which we need to curb.

**How much more carbon is being emitted by the world's richest people?**

The World Inequality Lab has found that the top 10% of the world's population, the richest, account for about half of carbon emissions. The bottom 50% only account for 20-30%, and that has been coming down in every region. So, the idea that you must make everybody change their lifestyles is completely misplaced. It's a lie that is propagated by those who want to distract attention from this inequality.

**What can we do to bring down the emissions of the top 10%?**

I would go for a combination of severe taxing of types of consumption and outright banning. I don't see the need for private trips to the moon. Private jets must be taxed, let's say at 3,000% for every ride, and the revenue put into carbon funds. In the US, a sizeable proportion of carbon emissions come

from second homes, so tax that, and there's no need for SUVs in cities.

I would tax types of consumption that are excessively carbon-emitting instead of going after everybody. The only reason it's not taken seriously is because of the political pressure of the elite, because economic power gives you political power, and they use it to change legislation, regulation and policy. There is so much scope for wealth taxes on the extremely wealthy, but you also need an asset register to know where the wealth is, and country-by-country reporting for all nations to share with other tax authorities.

An economist did an assessment of the 965 richest billionaire families in India and, since the pandemic, their wealth has increased threefold. But in 2019, if we had taxed their wealth by 4%, it would have increased GDP by 1%. To put that in perspective, that would double the health budget of central and state governments put together in India.

**Do you think that we need a different perception of wealth and success, and that this could be taught in schools at an early age?**

Absolutely, and this brings us to the broader question about the obsession with GDP as the indicator of progress. People have been talking about other indicators for a while now, but GDP remains crucial in everybody's minds.

**"The top 10% of the world's population, the richest, account for about half of carbon emissions"**



"I would tax types  
of consumption  
that are excessively  
carbon-emitting  
instead of going  
after everybody"

We must get rid of that. We need a dashboard of at least three or four indicators, which all countries would be forced to collect data on. Flourishing can be better public services, more open spaces, more parks for children, less pollution – all the things that a lot of GDP destroys. The UN is working on this, but the process is very long and painful.

**Are developing countries such as India learning from the mistakes made by advanced economies?**

I wish that were true, but in India, the broad economic strategy is taking all the worst mistakes of the US and deciding to go down that route: extreme pollution, extreme environmental destruction, extreme appropriation of people's land and livelihoods, and extreme inequality and privatisation of essential public services. It doesn't mean that there are not great ideas out there, but I don't see our current economic strategy as an example of those.

**The book you co-authored, *Earth for All: A Survival Guide for Humanity*, outlines five major initiatives to put us on a sustainable footing: empower women, eliminate poverty, reduce inequality, transform food systems and overhaul energy systems. Why is empowering women so critical?**

Women are responsible for provision within homes and, given the gender structure of our societies, they are still the ones who are responsible for these patterns of consumption. So, they can be agents of positive change if they are empowered. When we are thinking of transforming food systems, you cannot do that without a much bigger role played by women. Everywhere, there is displacement or loss of land and livelihood, and soil erosion, so women have a critical role in adapting to these changes because they have been the guardians of a particular way of life that is less ecologically destructive in many traditional communities.

It doesn't happen overnight, but you must look at the labour market and recognise the contribution of unpaid work by women – that is huge. So much policy



**"In India, the broad economic strategy is taking all the worst mistakes of the US and going down that route"**

is based on the male breadwinner model, which doesn't allow women to get the legal requirements for some autonomy and independence, and they are so inadequately represented in the political field. I'm a big believer in women's reservation at the local bodies level all the way up to the top, and on company boards, because if there are enough women, it changes the culture in many ways.

**Achieving the five initiatives outlined in the book is described as the 'giant leap scenario'. What is the public's role in ensuring that happens?**

It can only be done if the public is actively involved in demanding these things. It's not going to happen because a state suddenly sees the light and becomes good. Even if you elect well-meaning politicians, there are so many vested interests, so you need major popular mobilisation that will force governments to respond. Pre-pandemic, especially, we had young people and Fridays for Future, but it

wasn't focused. There wasn't a specific strategy to demand of governments. But we do need public protest, civil disobedience, whatever it takes, because it's all so urgent. Most of the mass media is presenting everything in a way that distorts or hides the reality. These Intergovernmental Panel on Climate Change reports should be front-page news. They are so deadly, so terrifying, and yet, they're not; nobody is bothered.

**Do you think COP summits are having a positive effect on tackling the climate crisis and inequality?**

I suppose the last one that did was Paris. It got people to commit to something, and there was some progress. Since then, no. It has been very depressing, and it's so ironic that these are also very climate-expensive summits, with all the private jets flying in with the big heads of corporations thinking how they can make yet another quick buck out of this latest opportunity of 'greening'. Does it mean we can do without them? No, we can't, but you have the Emirates as the host for the next one, and these people have lost all sense of irony or conflict of interest. The summits must be restructured, because right now they are just enormous and expensive talking shops.



**You can listen to the full discussion with professor Jayati Ghosh here**



LOREDANA SANCIULIANO/SHUTTERSTOCK



Extinction Rebellion has promised to step up protests and civil disobedience after a list of its demands for the UK government fell on deaf ears in April. Will this help or hinder the cause, asks **Chris Seekings**

**M**ore than 200 organisations, including trade unions, community groups and charities, took part in a weekend of climate demonstrations around Westminster in April, in what was billed as 'The Big One'.





Led by Extinction Rebellion (XR), the protestors had a list of demands for the government, including ending all new fossil fuel licences, and doing more to take account of citizens' concerns on climate, ecological and social emergencies.

Ministers had until 5pm on Monday 24 April to respond, or "face the consequences". As expected, the clock ticked past the deadline with total silence from Westminster. In response, XR has promised to step up its efforts to force the government to "immediately tackle" the climate crisis and social injustice.

### The next step

XR is now considering an "ecosystem of tactics" that includes everyone from first-time protesters, to "those willing to go to prison". This is quite the turnaround, considering XR announced it had "quit", and would "shift away from public disruption as a primary tactic" just five months ago. Protestors could also face a 12-month prison sentence for blocking roads, under new laws, and six months or unlimited fines for locking on to others, objects or buildings.

So is the U-turn a sign that all is not well among the activists, and that there is disagreement over the best way to build their movement? "We are a decentralised network of groups and individuals, and are empowered to act with a great deal of autonomy, provided we are working



towards our key demands," explains Etienne Stott MBE, a spokesperson for XR and London 2012 Olympic gold medallist. "We have local, regional and national structures that coordinate and link up, but there are bound to be disagreements."

This level of freedom makes it difficult to predict what we can expect, but suggests a return to many of the tactics seen before the start of 2023 – but on a larger scale. Protestors blocking bridges, super-gluing themselves to roads, sit-ins and property damage are just a few examples of the "non-violent civil disobedience and direct action" that we can again look forward to over the coming months.

Stott adds: "I believe massive adoption of these tactics is probably the best hope we have of creating enough pressure on the powers whose inaction is condemning us all to a future of misery and suffering."

### Do these tactics work?

It is not immediately apparent how super-gluing oneself to a prized Pablo

The Big One demonstration in London in April went ahead peacefully and without disrupting the Marathon. An estimated 60,000 people took part, many of whom were from groups with separate interests, including public health, fuel poverty and nature destruction.

Picasso painting – as two XR activists did in Melbourne last year – furthers XR's stated aims to "avoid tipping points in the climate system, biodiversity loss, and the risk of social and ecological collapse".

YouGov polling in the first quarter of this year found that 43% of UK citizens dislike the movement, with 16% liking XR, and 14% remaining neutral (73% had heard of them). Conversely, public opinion polls show that concerns around the climate crisis continue to rise.

Towards the end of last year, the market research firm found that 67% were worried about climate change and its effects, with 62% thinking it's only possible to avert the worst impacts with a "drastic change" to the steps already being taken.

### Time will tell

It's hard to say whether XR and other activist groups can take credit for the huge public concern around the climate and environment. A study by Ben Kenward, senior lecturer in psychology at Oxford Brookes University, and Cameron Brick, then research associate at the University of Cambridge, found that perceptions around XR depended on the news source.

They said: "The rebellion apparently succeeded in strengthening general environmental attitudes but did not lead to major growth in collective mobilisation or improved environmental policy. If activism increases passive support, and leads only to limited further mobilisation, what is it that activism is achieving?"

It is certainly conceivable that XR has helped raised awareness of the climate

"Massive adoption of these tactics is probably the best hope we have of creating enough pressure on the powers whose inaction is condemning us all to a future of suffering"





Although one poll found 43% of UK citizens dislike XR, public concerns about the climate crisis continue to rise

crisis – particularly among younger people – and there are further achievements it can plausibly take some credit for. In 2019, shortly after XR's first high-profile demonstrations, the UK government declared an environment and climate emergency, and then began running trials for a Citizens' Assembly – one of XR's key demands – although this has had limited success.

Activists also point to previous movements throughout history, which were unpopular at the time, but ultimately delivered positive change. "Disruption and civil disobedience have long been used as a tool for change when there are policies which are clearly wrong," says Ben Tolhurst, co-founder of Business Declares, which is a coalition of more than 300 business leaders that have committed to climate action. "The Suffragettes and civil rights movements were hugely unpopular at the time, but now people look back and say they were right, and I think the same thing will happen here."

When looking at examples of successful activism throughout history, a study in 2010 led by Erik Johnson from Washington State University found that the most effective movements use both mainstream tactics – such as voting, lobbying and drafting legislation – and non-violent mobilisation tactics – such as protests, boycotts, civil disobedience, strikes, sit-ins and rallies.

The rebellious nature of XR makes it unlikely that we will ever see them involved in policymaking, for example. However, some would argue that they are a necessary cog in the greater climate action wheel. "We do need public protest, popular mobilisation, civil disobedience – basically, whatever it takes, because it's all so urgent," explains Jayati Ghosh, professor of economics at the University of Massachusetts Amherst. "Most of the mass media is presenting everything in a way that distorts or hides the reality and doesn't allow people even to see the full extent of it."

## The big picture

Although there will be many who disagree with the tactics deployed by activists – the targeting of a London tube train in 2018 was a particularly low point, which XR has since admitted was a mistake – it is understandable that people feel compelled to take action that some might find extreme.

Stott says: "We are talking about the end of our planet's ability to support civilisation – an existential threat – and it's not just me saying this, it is the UN and government scientists. I think, in hindsight, people will look back and think that the tactics were actually very polite

and fairly mellow, when considering we are tackling an existential threat."

Others argue that XR needs to be more strategic with its demonstrations, and not target places and organisations that are unrelated to the climate crisis. Tolhurst counters: "Targeting the perpetrators, such as the oil companies or banks, doesn't seem to get much traction, but the ones that don't appear logical get masses of airtime and millions of views, with every mainstream TV channel asking for interviews to talk about it."

## A movement of movements

However, the peaceful nature of The Big One demonstration in April – and lack of disruption to the London Marathon taking place at the same time – may partially explain why it was successful in attracting so many people. An estimated 60,000 took part, many of whom were from groups with separate interests, including public health, fuel poverty and nature destruction. No arrests were made.

Stott describes XR as a "movement of movements" – it has also given rise to many other groups, such as Doctors for XR, Scientists for XR and Lawyers for XR – and sees such demonstrations as part of a huge recruitment drive. On his own reasons for joining, he says: "In my career as an elite athlete I have learned more and more about the wonderful potential of human beings. But there is this huge wall blocking that human potential, and unleashing disastrous effects, and so I had to try to help stop that."

The fact is, many activists feel like they have no choice but to take the steps they do. It's also hard to deny that XR has brought attention to the climate crisis, and whether or not you agree with all its tactics, the public's concerns on the issue are growing.



# THE WAY OF WATER

We need to embrace the spirit of the pioneers of the water sector and planning to enable new models that challenge the status quo, says **Sandra Norval**

**W**ater is the essence of life. There's a resounding cry from the public for the water industry to clean up its act. It is a broad topic, with issues ranging from storm overflows, through spills and incidents, to the impact on the development industry of water and nutrient neutrality position statements issued by Natural England. The UK government's new Environmental Improvement Plan includes goals for clean and plentiful water and Defra's Plan for Water sets out its commitments and actions to provide an "integrated plan for delivering clean and plentiful water".

There is a lot to do, but we have a strong band of professionals who are passionate about driving the change that is needed,

and the key stakeholders are united in a shared goal of transforming our interactions with water.

I joined the industry in 2021 to work on the growth of sewer and water networks relating to local plans, neighbourhood plans and planning applications. With a mandate to bring my sustainability experience into the role, I set about understanding how water and planning connect in the UK.

It has been a fascinating progression, with a history rooted in disease control and a future that will be key to addressing water scarcity as well as the more obvious impacts on the environment.

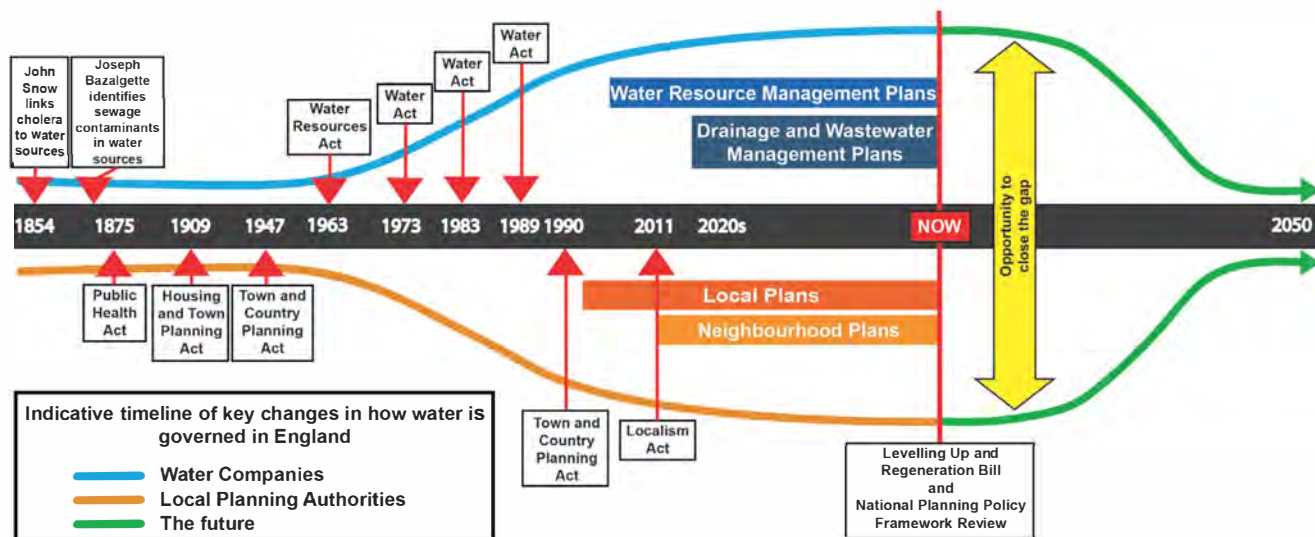
My focus has been on the role of development, and my work with local planning authorities (LPAs), land

promoters and developers has revealed the complexities of addressing water issues within the planning space. The Plan for Water recognises a need to adapt the planning system, but it's useful to first consider how we got where we are.

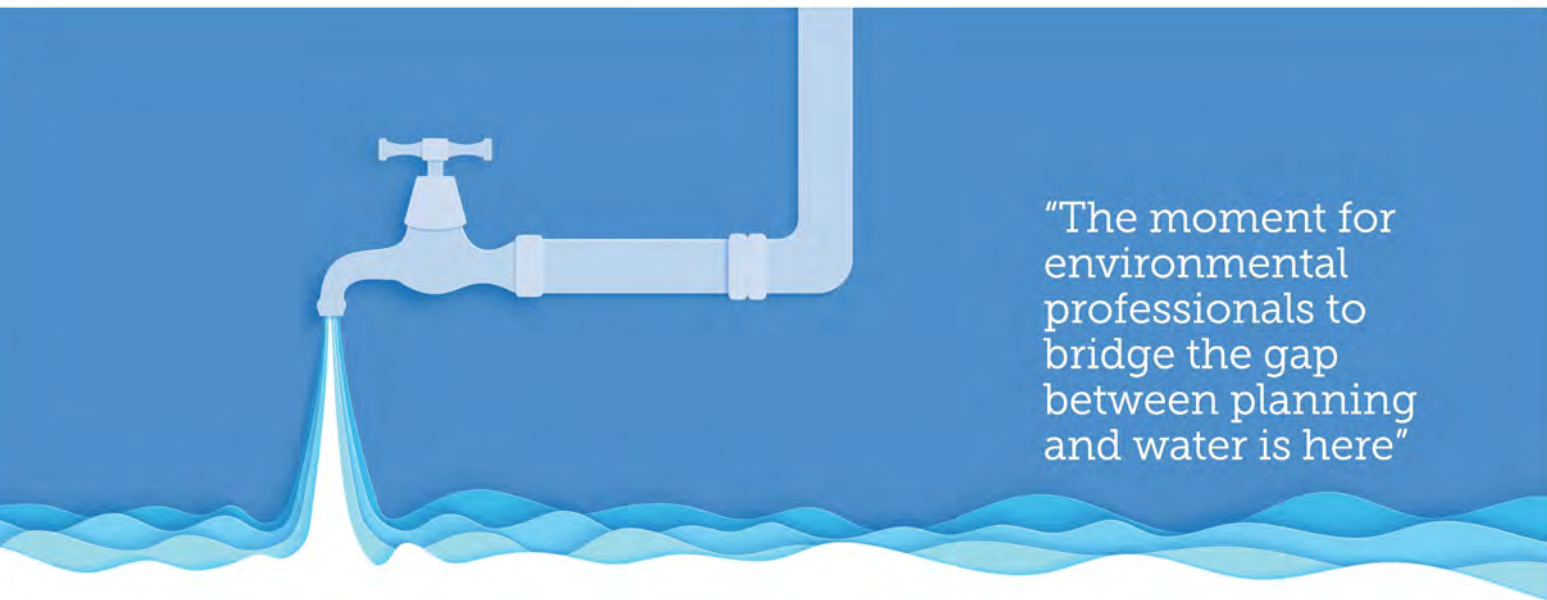
## Step back in time

In 1854, John Snow identified a connection between water pumps and the cholera outbreaks at the time. A simple fix – removing the handle of the pump – resolved the problem, and led to a long-term relationship between the treatment and delivery of clean, nourishing water to the masses and the design of towns and cities. A few years later, Sir Joseph Bazalgette saw the link between contamination of water from

## TIMELINE OF CHANGES TO GOVERNANCE OF THE WATER SYSTEM







“The moment for environmental professionals to bridge the gap between planning and water is here”

sewage and cholera, and developed London's first sewer network, which is still in service today. The design, along with release systems to prevent flooding in times of heavy rain, was replicated across the UK, and the Victorians were happy that they had tackled the issues of the day. Cities grew and the networks grew with them, with responsibilities embedded in the Public Health Act 1875 and minimum standards set in the Housing and Town Planning Act 1909.

Public health, planning and the water sector remained intrinsically connected, with the emergence of the first Town and Country Planning Act 1947, which set out the basics of the planning system, part of a suite of social legislation, which included the creation of the National Health Service (NHS). These Acts were designed to ensure that the key systems on which society depended worked together effectively, and they were groundbreaking in their spirit and scale.

### A parting of the ways

Then things started to diverge. The Water Resources Act 1963 saw water split from direct public authority control with the establishment of river authorities and water resources boards, although public authorities still held seats on the boards to retain some connection and influence.

The Water Act 1973 established water authorities independent of councils, although the water companies remained key consultees. Planning was evolving, and towns and cities were growing more rapidly, increasing the need to develop the networks for fresh and foul water.

In 1983, the foundations for privatisation were laid, reducing the local authority role further. The water authorities became

private companies in 1989, taking them out of the public sector and into a space where new private investment was enabled. The divergence was complete.

As it stands, water companies are a statutory consultee for LPAs when preparing their local plans, but not for planning applications. Some LPAs retain close relationships with water companies, others don't, and this often means there is a gap in understanding between these key sectors, leading to the public frustrations we see today.

Governance processes for LPAs and water companies have evolved. Key processes such as local plans (for LPAs) and the asset management planning process (for water companies) – which

“The future will require creative approaches, blending nature-based solutions with grey infrastructure”

includes management plans for water resources, drainage and wastewater and surface water, along with other supporting plans – were intended to link together, but they don't always knit closely if the relationships between LPAs and water companies aren't strong.

The decisions of the land promoters and developers who are shaping the landscapes in which future homes are set have significant consequences for the future of water, yet the water companies often barely connect with the broader plans in their regions.

### Looking ahead

In the current planning phase for the water sector, regional water resources planning has enabled a more strategic approach at landscape scale, seeking to identify how water can be transported from areas with sufficient supplies to those where they are scarce – no mean feat. This requires collaborative approaches to infrastructure development and local processes that align development with the resources available. For this to work, we need open and honest dialogue, enabled by realistic proposals and supporting relationships that unlock progress.

The range of emerging themes that the sector is being called on to tackle will need similar thinking. There is a great deal of work to be done.

But with strategic challenges of this nature come the biggest opportunities. We must ensure that we are developing a bank of water professionals with planning skills to develop multi-stakeholder proposals and challenge the status quo. The future will require creative approaches, blending nature-based solutions with grey infrastructure, understanding how we can reconnect the water cycle and adopting methods and thinking that break the boundaries we have set ourselves.

In short, we need to embrace the spirit of the pioneers of the water sector, public health and planning to come up with new models that enable genuine strategic collaboration. The moment for environmental professionals to bridge the gap between planning and water is here.

**SANDRA NORVAL, FIEMA, CEnv, is future growth lead, Southern Water. All opinions are the author's own.**

# Stratospheric strides in measuring emissions

Improvements in satellite monitoring are changing how we measure air quality, widening its potential to include regulation. **Rick Gould** investigates

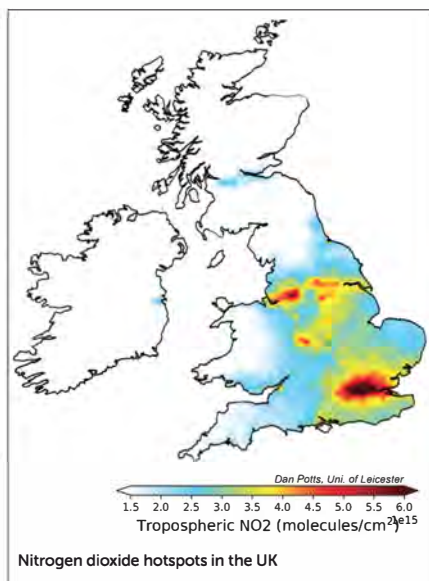
**I**n April, Nasa launched TEMPO, short for Tropospheric Emissions: Monitoring of Pollution, on board the satellite Intelsat 40e. TEMPO will be used to monitor air quality and emissions sources from a geostationary orbit above North America.

Equipped with an ultraviolet (UV) spectrometer, TEMPO will measure columns of key air pollutants, such as tropospheric ozone, nitrogen dioxide, formaldehyde, sulphur dioxide and halogen oxides. Additionally, the sensors on the satellite will measure water vapour, aerosols, foliage properties, clouds and UV-B radiation.

The data from TEMPO will help scientists tackle key questions, such as: What are the sources of these pollutants? How do their concentrations vary hourly and seasonally? How is air quality affecting public health? In what ways does monitoring pollution with satellites improve air-quality forecasts, and how do major incidents such as wildfires affect regional and national air quality?

TEMPO will go further than previous satellite monitors by providing a finer resolution and hourly measurements. A UK research group has also shown the potential of satellite monitoring in regulation, rather than purely for research. A team at the University of Leicester, working with the Environment Agency, the University of Birmingham and the National Physical Laboratory (NPL), have demonstrated how measuring pollution with satellites can meld synergistically with conventional, ground-based measurements of air quality and emissions for regulation in the UK.

Satellites are changing how we measure air quality. "Traditionally, if you wanted to understand the air quality in a given region, you'd put down as many air-quality sensors as you could afford



and you'd get a detailed time series of air quality, but at a limited number of very specific points," explains Daniel Potts, who is in the third year of a PhD within the Earth Observation Science group at the University of Leicester.

## Greater coverage

Air-quality models can fill the gaps between these point measurements, but have their limitations and often miss hotspots of pollution or short-term peaks. "Satellites provide coverage over the entire area, so we can see a snapshot of pollutants as they're transported across the whole region," says Potts.

NPL's Dr Andrew Brown adds: "Satellite air-pollution data is already used in modelling activities. It also complements existing ground-based monitoring techniques by providing a wide-field view, rather than measuring at fixed points."

For example, air-pollution data from satellites is important for the models used

to forecast air quality globally, such as the Copernicus Atmosphere Monitoring Service. "The fact that data from publicly funded satellite missions is freely available to download in near real time makes its use an attractive option to researchers and other end-users," explains Brown.

Satellites can also tell us about changes to air quality following incidents, or alert us to major emissions sources, and both Brown and Potts are quick to highlight how satellite monitoring informed us about possible air-quality improvements during the Covid-19 lockdowns, giving us an insight into the effects of decarbonising the transport sector.

Potts' research initially focused on nitrogen dioxide, which is a major pollutant and relatively easy to detect. "It is linked with a variety of health issues and has a myriad of sources – from wildfires to power stations, to the vehicles we drive. In terms of satellite observations of nitrogen dioxide, it is a very mature field of research, and it is relatively short-lived in the atmosphere, which makes it easier for us to find emissions sources," he explains.

Potts is expanding his research to look at methane and ammonia too. Ammonia emissions are a current concern for environmental researchers and regulators, while a better understanding of methane sources is crucial if we are to successfully reduce greenhouse gas emissions.

The team at Leicester is using data from the European Space Agency's TROPOMI, or Tropospheric Monitoring Instrument, located on the Sentinel-5 precursor satellite that ESA launched in 2017.

Monitoring air quality with satellites began in the 1970s, using satellites with sensors designed for meteorology, yet scientists found that they could also detect particulate matter and sulphate from volcanic reactions.





Nasa's TEMPO was launched on 7 April as a payload on Intelsat 40e aboard a SpaceX Falcon 9 rocket from Cape Canaveral Space Force Station in Florida

Monitoring ozone started at this time, and organisations such as Nasa and ESA have since added monitoring capabilities. Over time, satellite-based spectrometers have enabled researchers to measure more pollutants, with an increasingly finer resolution and faster frequency. For example, the earliest satellites had grid-resolutions in tens or even hundreds of kilometres and temporal resolutions from days to weeks. The global coverage was also patchy. All these parameters have been improved.

"Satellite sensors like TROPOMI cover 95% of the globe once every single day, and map the distribution of nitrogen dioxide, sulphur dioxide, methane, carbon monoxide, aerosol and other pollutants at a resolution of up to 3.5km by 5.5km, clouds permitting," says Potts.

So far, satellite monitoring has been limited to research, especially in the UK. However, the Leicester team and their partners discovered they could use data from TROPOMI to resolve NO<sub>2</sub> emissions from three industrial sources in north-east England, including an oil refinery.

Satellite monitoring can also reveal major incidents and emissions sources – for example, data from TROPOMI and GHGSat showed huge methane leaks from oil and gas producers in Turkmenistan. "These satellite observations led to outside pressure for these companies to rapidly plug these leaks. Now we have the technology to detect, quantify and rectify [leaks] in a matter of days," says Potts.

There are limitations, however. "Satellite monitoring does need further

development before it can be used operationally. Uncertainties are high, resolutions are still quite coarse for some applications, and we lose data every time we have cloud cover," says Potts.

"They also lack standardisation, full metrological traceability and robust estimates of measurement uncertainty. NPL is currently working on projects to address the latter two issues in order to provide more confidence in air-pollutant data from satellites for facility-level contributions," adds Brown.

That said, the future looks promising. With TEMPO over North America, and its cousins the Geostationary Environment Monitoring Spectrometer (GEMS) over East Asia and Sentinel-4 over Europe, they will form a virtual constellation of geostationary satellites that allows scientists to monitor air quality over large parts of the northern hemisphere, with a high spatial and temporal resolution.

"There are also methane-specific satellites, launched by commercial entities and organisations such as GHGSat and MethaneSAT, providing high-resolution observations of methane from the oil and gas industry, waste management and now even agriculture, helping us reduce emissions of a strong greenhouse gas," says Potts.

"We also have Sentinel-7 launching soon, giving us 2km-by-2km global observations of CO<sub>2</sub> and NO<sub>2</sub>, allowing us to directly measure the progress towards net zero of some of the most polluting industries," Potts concludes.

**RICK GOULD is an air-quality adviser with the Environment Agency. He is writing in a personal capacity.**

## KEY SATELLITES FOR MONITORING AIR POLLUTION, SINCE 1995

Instrument	Satellite platform/year	Spatial resolution (field of view)	Temporal resolution	Key pollutants
<b>GOME-1</b>	ERS-2, 1995	320x40km	3 days	NO <sub>2</sub> , SO <sub>2</sub> , aerosol and O <sub>3</sub>
<b>MODIS</b>	Terra, 1999	0.25-1km	1-2 days	Aerosol
<b>MISR</b>	Terra, 1999	0.275km	9 days	Aerosol
<b>MOPITT</b>	Terra, 1999	22x22km	3 days	CO and NH <sub>3</sub>
<b>SCHIMACHY</b>	Envisat, 2002	30x60km	6 days	SO <sub>2</sub> and NO <sub>2</sub>
<b>OMI</b>	Aura, 2004	13x24km	1 day	O <sub>3</sub> , SO <sub>2</sub> , formaldehyde and NO <sub>2</sub>
<b>TRS</b>	Aura, 2004	5x8km	2 days	O <sub>3</sub> , CO, CO <sub>2</sub> and NH <sub>3</sub>
<b>GOME-2</b>	MetOP, 2006	40x80km	1.5 days	SO <sub>2</sub> , NO <sub>2</sub> , AOT and O <sub>3</sub>
<b>IASI</b>	MetOP, 2006	50x50km	0.5 day	SO <sub>2</sub> , NO <sub>2</sub> , NH <sub>3</sub> , and CO <sub>2</sub>
<b>TROPOMI</b>	Sentinel-5P, 2017	3.5x7km	<1 hour	O <sub>3</sub> , NO <sub>2</sub> , SO <sub>2</sub> , CO, NH <sub>3</sub> , CH <sub>4</sub> and formaldehyde
<b>GEMS</b>	GEO-KOMPSAT-2B, 2018	5x5km	<1 hour	CH <sub>3</sub> Br, ClO, formaldehyde, NO <sub>2</sub> , O <sub>3</sub> , SO <sub>2</sub>
<b>TEMPO</b>	Intelsat 40e, 2023	2x4.5km	<1 hour	NO <sub>2</sub> , O <sub>3</sub> , aerosol, formaldehyde and SO <sub>2</sub>

# Jon Frederick Treacher, PIEMA / MCIWM

Sustainability lead assessor, tunnels and underground infrastructure, COWI

### Why did you become an environment/sustainability professional?

As a child I was always really interested in nature and the natural world. I spent hours riding around on my bike in the fields and woodlands.

### What was your first job in this field?

I was a bathing water sampling officer/microbiologist with the Scottish Environment Protection Agency (SEPA). My role was to collect and analyse water samples from designated bathing water sites along the east coast of Scotland.

### How did you get your first role?

I applied after doing an MSc in biology of water resource management at Edinburgh Napier University. The hiring manager at SEPA was aware of the course and invited me for interview.

### What does your current role involve?

I work in an international team on large and complex infrastructure projects. I lead on sustainability management and the certification process on a range of projects, such as bridges, tunnels and public transportation, around the world.

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

Since leaving the UK for Denmark in 2013, I have been on international teams working on infrastructure projects, often leading or being part of the environmental team. I've had some wonderful opportunities and experiences.

### What's the best part of your work?

Encouraging and inspiring others to integrate sustainability initiatives into daily practice so that improvements to the environment and society are seen and felt.



### What's the hardest part of your job?

Nudging the mindset of those who are comfortable with their business-as-usual approach.

### What was the last development event you attended?

Biodiversity Net Gain (BNG) Baseline and Design, in January 2023.

### What did you bring back to your job?

A practical application and demonstration of BNG on a large-scale public transport infrastructure project.

### What is/are the most important skill(s) for your job?

Listening and being able to understand the client's problem is one thing. But being able to suggest workable solutions is the biggest skill of all.

### Where do you see the profession going?

Growing. I can see the profession occupying a place of increasing influence within businesses and organisations.

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

Working on a large-scale public transport infrastructure project that has a positive impact on the environment and provides benefits and opportunities for the communities it is a part of.

### What advice would you give to someone entering the profession?

Get a good science or engineering degree and back this up with work placements to apply the theory learned and see how it works in the real world. Join a professional network such as IEMA and work your way up through the grades.

### How do you use the IEMA Skills Map?

To ensure my professional development is on track.

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

Determined, hard-working and ambitious.

### What motivates you?

I have seen some of the world's natural wonders. I would like my daughter to see them too, as well as those we have managed to restore and regenerate.

### What would be your personal motto?

There are no passengers on this ship.

### Greatest risk you have ever taken?

Moving to Denmark in 2013 with no professional network, job or understanding of the language or culture. I am very glad I took the risk, though.

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

Rachel Carson. She wrote one of the most influential books in the modern environmental movement.

If you would like to contribute a member profile, contact: [s.maguire@iema.net](mailto:s.maguire@iema.net)



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