

TRANSFORM

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Environment ●
Economy ●
Society ●

Dec/Jan 2021/22
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Waterlogged

The data centre industry has a drinking problem – and without action, it's only going to get worse

PLUS

Malign growth Jørgen Randers on societal overshoot and collapse

Small but mighty Encouraging SMEs to join the climate fight

Victory garden How Kew Gardens is combatting biodiversity decline

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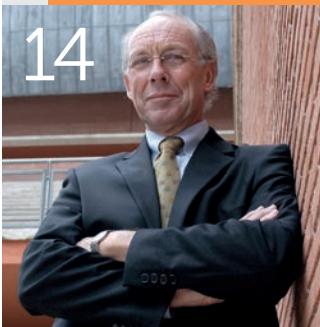
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SARAH MUKHERJEE MBE, CEO, IEMA

Back from the summit

COP26 is now over, and we're all digesting what the deal agreed in Glasgow actually means for us, our businesses and the planet. It was my privilege to represent IEMA members at the event. Despite the perhaps disappointing outcome, I was amazed and inspired by the members I was lucky enough to meet during the conference – people all over the world doing incredible things that are making a real difference to the planet.

We must now think about how we can continue to implement the actions that will bring us to net zero, and we have plenty of food for thought for you in this edition of *Transform*. Jørgen Randers co-authored the seminal 1972 report *The Limits to Growth*, which completely changed the conversation around how we were using the planet's resources; on page 14 we speak to him about his work a generation on, and its continued relevance for sustainability.

There were many conversations at the Glasgow summit about zero-carbon energy and how we are going to achieve it. For many countries, onshore and offshore wind are a vital part of the mix – but how do you go about ensuring that wind turbines are zero waste, too? Huw Morris has been finding out; read his report on page 32.

Huw has also been investigating another little-discussed but vital question concerning sustainability: how much water is used in cooling the computer and IT information systems we rely on for our digital ways of working. The amount of water utilised is immense – can we reduce the impact while ensuring we remain connected? Find out on page 18. Meanwhile, Chris Seekings reports on an important COP26 side event that addressed the connected issues of climate justice, education and gender equality, particularly regarding the role of girls' education in fighting the climate crisis; you can read about this on page 27.

I hope you enjoy this edition of *Transform* as much as I have. As always, we welcome your thoughts and comments, and we are always interested in hearing new ideas for features and articles.

Have a great couple of months, and speak soon.

"I was amazed and inspired by the members I was lucky enough to meet during COP26"

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

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ROUNDUP

ENVIRONMENT &
SUSTAINABILITY
NEWS AND VIEWS



1.5°C target still 'within reach'

World leaders, business groups and NGOs have said the 1.5°C target of the Paris Agreement is still alive, despite disappointment with the COP26 outcome.

The two-week conference concluded with countries agreeing to "revisit and strengthen" their 2030 Nationally Determined Contributions (NDCs) by the end of 2022 and report progress on emissions every two years, as well as committing to 'phasing down' coal use. Negotiators also agreed on carbon market rules for implementing Article 6 of the Paris Agreement, but failed to deliver elsewhere, such as in delivering a financial assistance programme to help poorer countries deal with 'loss and damage' caused by the climate crisis.

Despite this, European Commission president Ursula von der Leyen, UK prime minister Boris Johnson and UN secretary-general António Guterres have all stated that the Paris Agreement is still alive. "COP26 is a step in the right direction," said von der Leyen. "1.5°C remains within reach; but the work is far from done. The least we can do now is implement the promises of Glasgow as rapidly as possible and then aim higher."

These sentiments were echoed by the business community. Eliot Whittington, director of the UK and European Corporate Leaders Groups, said the summit has generated fresh energy around the 1.5°C target. "If the range of commitments from governments, business and investors to deliver real action is reflected in and inspires more ambitious new targets next year, then we still have a chance of doing this – that is insufficient but undeniable and positive progress."

Tanya Steele, chief executive at the World Wide Fund for Nature, said COP26 has reinforced the need for rapid, deep and ongoing emissions cuts alongside support for vulnerable countries facing climate impacts. "This summit has seen the goal of limiting global warming to 1.5°C become the North Star guiding us all, but a clear pathway is far from certain, and we still have a long way to go."

COP26

Indigenous groups slam 'business-as-usual' COP26

Indigenous groups have said COP26 showed that world leaders' interests lie with economic bottom lines, rather than tackling the climate crisis.

The It Takes Roots alliance called the carbon trading, carbon capture and storage, and market-based mechanisms sold at COP26 "false solutions", while working towards net-zero targets, as opposed to zero emissions, was described as a "cover-up for inaction and business-as-usual".

The Indigenous Environmental Network said all leaders were complicit in the watered-down language of the Glasgow Climate Pact, arguing that the change from 'phase-out' to 'phase-down' of unabated coal was not made without buy-in from all parties. It also said "serious alarms" had been raised after the agreement included a lack of consensus on loss and damage finance.



LOCAL GOVERNMENT

UK public distrusting of world leaders' ability to deliver

The UK public has more trust in local councils to take action on climate change than it does in world leaders, according to research carried out by the Local Government Association (LGA) and published at the COP26 summit. After surveying 1,000 people, researchers found that 40% trusted their council most to address the climate emergency, followed by the government on 28% and world leaders on 15%.

Countries agreed at COP26 to revisit their NDCs at next year's conference in Egypt, but the poll suggests the public has little faith that they will make the emission cuts necessary to deliver the Paris Agreement.

The LGA said councils know their villages, towns and cities best and are working with communities to improve lives, but need more powers to be devolved. "Councils know their communities better than anyone else," said its chairman James Jamieson. "This is why they are best-placed to lead the way towards a net zero future."

Beyond the spreadsheet: The future of climate work

Overcoming the stagnation of climate action in cities is a matter of adopting better digital planning systems. **Tomer Shalit** reports

Cities have come a long way since the Paris Agreement in 2015. The number disclosing their emissions has more than doubled, totalling 812 in 2020 – yet 51% of these had no climate action plan in place in 2020, only 18% had set targets aligned with 1.5°C, and just 6% had interim targets, attesting to the meager state of climate planning.

And while “cities are where the climate battle will largely be won or lost,” as UN Secretary General António Guterres said before COP26, there is still no systematic and straightforward way for them to easily build effective climate plans.

Analysis paralysis

Climate work is crippled by complexity. City economies are intricate systems and while we know what they need to reduce emissions – increased numbers of journeys on foot or by bicycle, for instance – multiple such shifts need to operate all at once. There is also the question of how much needs to shift, and the fact that cities are financially and operationally constrained. This makes ‘analysis paralysis’ a predicament for climate teams in cities.

Disjointed solutions

Spreadsheets are the main tool cities use to plan transitions. They are hard to update, scattered, and lack the interoperability necessary to plan in

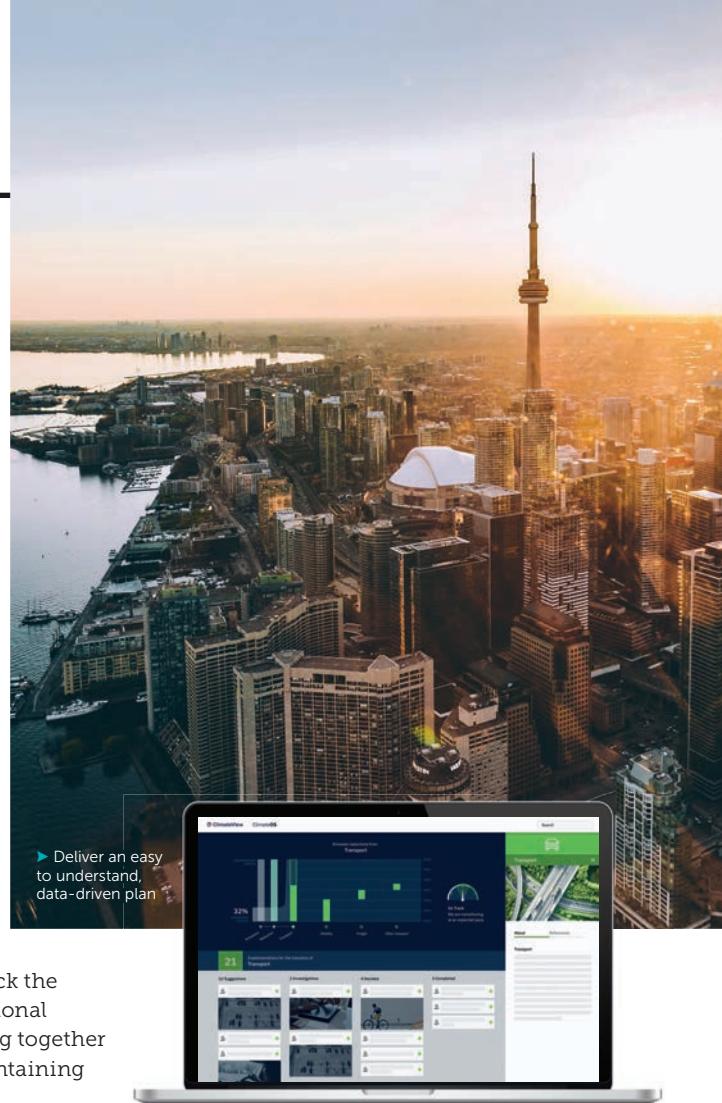
a way that connects emissions to targets, targets to actions and actions to the finance needed to implement the transition. They also lack the essential visual and operational means to manage and bring together multiple stakeholders, maintaining instead a siloed order.

The future is digital

New digital tools have a role to play in sorting through the complexity and streamlining processes of climate work.

With ClimateOS, the world’s first climate operating system from ClimateView, cities can manage complex systems in one integrated, collaborative platform. All the data, technical and social interdependencies are available at a glance, providing meaningful insights into the transition while easing and accelerating the decision-making process for climate strategists and stakeholders.

By using a simple graphical interface, powered by complex mathematical models, climate strategists now get a bird’s-eye view of all their emissions, the limits and potentials of different policy levers, and how actions to reduce emissions would transition to a zero-carbon economy. Not only does it help with understanding emissions, building strategy and creating science-based targets, it also enables collaboration and



greater transparency, while significantly cutting workload and accelerating transition implementation.

Part of becoming a smart city involves digitising climate work and building interoperability and flexibility at the core of processes – as understood by our partners Microsoft and CDP.

Intelligent systems

The benefit of solutions such as ClimateOS is that as the user base scales, the reasoning, data and assumptions, and policies and implementation improve. More than a means to manage the transition in one city, a digital platform such as ClimateOS provides a solution to accelerate the transition by building collaborative intelligence globally. 

TOMER SHALIT is founder and CPO of ClimateView.

 **ClimateView**



Compliance register due a health check?

Let's be honest, after the last year and a bit, maybe you haven't had your finger on the pulse when it comes to keeping on top of legislation for your management system. Don't worry, Cedrec can help!

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IEMA COP26 Webinars – ON DEMAND

In the build-up to COP26, we hosted weekly webinars on critical COP themes: climate change, climate security and risk, sustainable finance and the role of nature, featuring special guest speakers.

Catch up on any you missed below:

- ◆ 'Climate Science and COP26' – Updates on the latest Climate Science in the build-up to COP26'
- ◆ 'Climate Risk and Security' – Global security leaders and the developing frontline'
- ◆ 'COP26 and Sustainable Finance' – Prospects and progress'
- ◆ 'Bridging the gap: from COP15 to COP26'



BIODIVERSITY

COP15 adopts Kunming Declaration on biodiversity

The 15th meeting of the Conference of the Parties to the Convention on Biological Diversity finally began in Kunming last month after two previous attempts were aborted due to COVID-19. The conference – known as COP15 – will continue in April and May next year.

COP15's purpose is to galvanise international action on the biodiversity crisis. This means countries from around the world working together on policies, funding and establishing international targets to reduce biodiversity loss and enhance the natural environment.

More than 5,000 representatives from governments, universities and NGOs attended the conference in mid-October. Discussions spread across several days covered themes such as financing for biodiversity, natural capital accounting and developments on nature-based solutions from around the world.

Biodiversity mainstreaming also featured in the conference programme, with leaders of



industry showcasing many approaches that are being taken around the world to integrate biodiversity and natural capital considerations into supply chains. In the UK, this is an area that the IEMA-supported UK Business and Biodiversity Forum prioritises through its programme of events and activities.

The highlight of COP15 was the adoption of the Kunming Declaration, which commits countries to collaborate on developing and implementing an ambitious post-2020 global biodiversity framework for reversing biodiversity loss and putting the planet on a pathway to recovery by 2030. At present, the framework is not legally binding. Rectifying this when the conference resumes next year would demonstrate real ambition and ensure efforts really are focused.

Recognising that action on biodiversity – particularly in the context of investment – is more of a challenge in the Global South, the Chinese government committed to establishing a

specific fund to help finance projects in some of the poorest countries around the world. Initially, the Kunming Biodiversity Fund will provide approximately 1.5bn yuan to do this.

The progress made at this initial phase of COP15 has been promising, but further action will be required when it resumes – particularly in relation to legally embedding ambitious targets on biodiversity preservation and restoration. Furthermore, greater recognition of the interdependencies between the global biodiversity and climate change crises is required. It is not possible to solve them separately, given the many ways in which they impact one another, such as the extent to which a warming planet increases the risk of habitat loss.

At the time of writing, the global climate change talks scheduled to take place in Glasgow, known as COP26, have not yet taken place. When they do, there must be a focus on integrating international action on biodiversity and climate change. Failure to do so is simply unsustainable.



ENVIRONMENTAL REVIEW

IEMA responds to Defra consultation

The government has recently consulted on establishing a process for environmental review, which is likely to be similar to the way in which judicial review currently works.

The consultation was undertaken by Defra during the summer, and IEMA put forward a submission setting out how establishing environmental review will require careful amendment of the Civil Procedure

Rules. Specifically, our response recommended that there should be provision for all interested parties to have a role in environmental review, and that there is scope for the same provision on costs that is applied in judicial review, so that winning parties are awarded costs.

IEMA's full submission can be found at bit.ly/IEMA_DefraResponse



**ENERGY**

Options for strengthening ESOS under consideration

The Energy Savings Opportunity Scheme (ESOS) was established in 2014 as a mandatory assessment that most large organisations in the UK must undertake every four years to help them identify ways to manage energy use more efficiently. Following public consultation, the Department for Business, Energy and Industrial Strategy is currently considering different ways to improve and strengthen the scheme.

In its submission to the consultation, IEMA set out support for proposals to bring medium-sized organisations under the scheme to help drive wider efforts for managing energy use more efficiently. Our submission also put forward the case for aligning ESOS with other initiatives to improve their effectiveness, including the government's mandatory carbon reporting requirement.

Read IEMA's full submission at bit.ly/IEMA_BEISResponse

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EMISSIONS

Clarification on net zero

Aiming for net zero has become synonymous with climate leadership – but at the same time it has received criticism as a concept that, if wrongly approached, can actually allow organisations to avoid transition. This was recognised by UN Secretary General António Guterres in his speech on the opening day of COP26, in which he stated: "There is a deficit of credibility and a surplus of confusion over emissions reductions and net-zero targets."

Following a recent survey indicating that around 60% of IEMA respondents



are now working for organisations with net-zero commitments, we have been working to support a greater consensus and credible underpinning for net-zero approaches. This included a recent workshop contributing to the COP26 Climate Champions Race to Zero consultation. In October we also published a net-zero 'explainer guide' (bit.ly/IEMA_NetZero) and a climate action 'toolbox' (bit.ly/IEMA_Toolbox); available to all IEMA members, these resources have been actively supported by IEMA's Climate Change and Energy Network.

BUSINESS

Climate disclosures to be mandatory

The UK government has announced that it will become the first G20 country to enshrine in law mandatory Task Force on Climate-Related Financial Disclosures (TCFD) aligned requirements for the country's largest companies and financial institutions to report on climate-related risks and opportunities. In the summer, IEMA members workshopped and responded to the government's consultation exercise. We disagreed with a proposal not to require scenario analysis, and outlined in our response why this should be included in the mandatory regime.

We are delighted that this requirement has been included in the government's final response, which introduces a requirement for qualitative scenario analysis – a powerful tool to help companies assess climate-related risks and opportunities. The requirements



will also be more closely aligned with the recommendations of the TCFD, to ensure coherence with associated requirements introduced by the Financial Conduct Authority and the Department for Work and Pensions.

Hungry for change

Mohammed Mohamoud examines the impacts of food and drink systems on the environment

The private sector will have a significant part to play if the UK is to achieve net-zero emissions by 2050. Investment and business model

transformations are key and, promisingly, we are beginning to see this across industries such as energy and transport.

Conversations around the food and drinks sector have been comparatively muted, but it isn't hard to see why. It's relatively easy to wrap our heads around the damage that fossil fuels inflict on the climate, or the air pollution emitted by cars. The issues around food and drink are more sophisticated and nuanced.

Food and drink systems are some of the UK's most carbon-intensive activities, often involving extensive global supply chains with multiple moving cogs. Waste charity WRAP's recent report *UK Food System GHG Emissions* estimates that greenhouse gas emissions linked to the UK's food and drink production and consumption are around 158Mt CO₂e – equivalent to 35% of UK territorial emissions. That is a significant proportion, and one that starts to bring home the magnitude of the problems around our current food systems.

The problems in food systems

One of the main areas of concern within food and drinks systems is the negative environmental impact of agriculture. Standard agricultural practices have had devastating impacts, contributing to soil

erosion, deforestation and climate change; mass monoculture productions reduce biodiversity and soil quality, while chemical fertilisers and tilling can lead to serious soil degradation. The depletion of natural resources through intensive agriculture has causes arable soils to lose 40%–60% of their organic matter, and left more than 2m hectares of soil at risk of erosion. This comes with sizeable economic costs: a report by the Sustainable Food Trust estimates that the loss of soil carbon across the UK costs us £3.21bn each year.

How business can help

It isn't all doom and gloom. Andrew Griffiths, head of value chain sustainability for Nestlé UK and Ireland, recognises the complexity of value chains and where emissions can be reduced. Nestlé is the world's largest food and drinks company and Andrew has more than 20 years at the company in both operational and engineering roles.

"We have seen a significant upturn in terms of action and understanding," he says. "I think there's a recognition not only that the agri-food sector has a significant impact on the environment, both from a climate and from a nature perspective, but also that food systems are critically dependent on nature and climate. So, if we don't take action, it creates real challenges in terms of the resiliency of our food systems."

Nestlé's Generation Regeneration initiative came in the lead-up to the UN Food Systems Summit, held in New York

in September 2021. The initiative aims to protect and restore the environment, improve farmer livelihoods and enhance farming communities' wellbeing.

Nestlé has recognised that agricultural supply is a major area of concern. "You look at the vast majority of food companies and somewhere between 70%–95% of their carbon footprint will sit in their agricultural supply, typically," says Griffiths. In response, the company has proposed a solution to advance farming practices via regenerative agriculture. This is a holistic approach that conserves and restores farmland and ecosystems to deliver sustainable agriculture. Its techniques range from irrigation technology that preserves precious freshwater, to minimum tillage to promote soil's quality and capacity to store carbon.

What about the future?

Griffiths highlights four key actions that will help address sustainability in the food system:

- 1 Incentivising and supporting the transition towards regenerative agricultural practices
- 2 Addressing food loss and waste
- 3 Rebalancing our diets so they include less meat and dairy
- 4 Genuine collaborative action.

He says we need to "start looking at farmers as genuine stewards of our landscapes – enabling a real transformation of nature and producing not only food but also enhanced water quality, increased water availability, increased habitat and biodiversity, a whole raft of different outcomes. That's the transition I want to see". 

MOHAMMED MOHAMOUD, *GradIEMA* is an IEMA Futures member and a sustainability consultant at CGI.

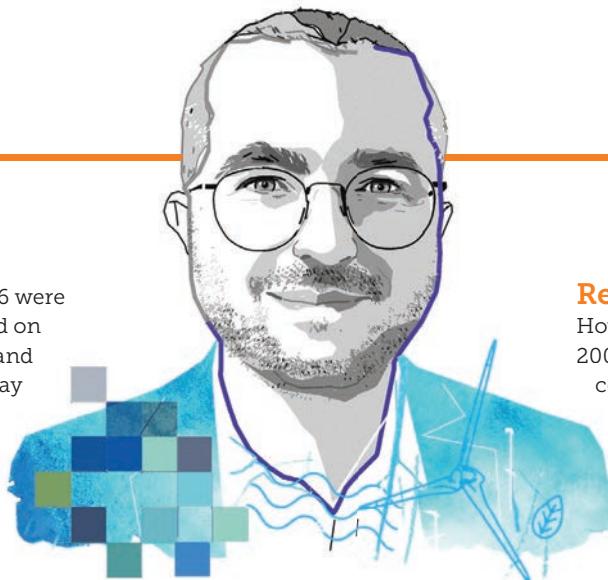
Expectations for COP26 were varied – would it build on the Paris Agreement and lead to a global pathway to limit global heating to 1.5°C, or would it be a repeat of COP15 in Copenhagen, which was so disastrous that it set back climate action by years? I'm writing in the middle of the second and final week of the conference and it's still unclear which road the international community will take.

COP26 should have taken place in 2020, but was delayed by the COVID-19 pandemic. In 2018, the world's leading climate scientists said in the Intergovernmental Panel on Climate Change's *Special Report on Global Warming of 1.5°C* that we have 12 years to take "rapid, unprecedented and far-reaching changes in all aspects of society" to hit 1.5°C rather than 2°C of global heating. The report painted a dystopian picture of a 2°C-heated world that would include the forced migration of hundreds of millions of people whose homes are becoming uninhabitable – mainly from the Global South.

The report helped kick off a wave of international activism that included the emergence of Greta Thunberg and Extinction Rebellion, as well as countless institutional climate and ecological emergency declarations. Popular protests found themselves blocked by coronavirus – which, ironically, brought down emissions due to global lockdowns and economic slowdowns. However, this dip in emissions appears to have been a blip, and emissions have since continued to rise at roughly the same rate as before.

A lack of ambition?

It's impossible to know whether we would be in a better position if we were coming out of COP27 rather than COP26, and if Extinction Rebellion's roadblocks had been continuous during the past 24 months, but these could have helped maintain ambition. And there is



TOM PASHBY: IEMA DIGITAL JOURNALIST

Is COP26 living up to expectations? **Tom Pashby** reports from Glasgow

plenty of ambition at COP26 – it's just not necessarily translating into the international agreements and policy decisions that are needed to transform the global economy towards net zero.

If you listen to any of the dozens of podcasts covering COP26, or read some of the thousands of media articles on the summit, you will receive mixed messages, to say the least. By the time this has been published, the final text of COP26 may have committed the international community to climate action commensurate with a 1.5°C-heated world, but even my short experience of climate politics suggests that the final product will be more nuanced (read: not good enough).

COP26 has been derided as one of the least inclusive and transparent climate summits since the UN began holding them nearly three decades ago. Civil society has consistently raised concerns that the most polluting countries and the fossil fuel industry are over-represented, while the communities most affected by the climate emergency are largely blocked from the talks through administrative or financial barriers.

"There is plenty of ambition at COP26 – it's just not necessarily translating into the decisions needed"

Reasons for hope

However, 25,000 delegates from 200 countries still came to the conference – 25,000 people who had to navigate the UN Framework Convention on Climate Change registration system, book travel and accommodation, and find their way to the conference centre. These people are some of the most committed in the world – although plenty more are similarly, if not more, committed to averting climate catastrophe.

Based on the number of delegates alone, one would hope that the volume of grassroots activists, sustainability professionals and private and public sector representatives are enough to steer the planet towards net zero in time for 1.5°C of warming, rather than 2°C.

I went to the march through Glasgow on Saturday 6 November, which reportedly drew 100,000 people to the streets; across the globe, hundreds of thousands more marched in their own cities, towns and villages, calling on decision makers to set us on a path to a safe planet. The outpouring of emotion from speakers and attendees contrasted greatly with the suited delegates going through the heavily guarded ring of steel that surrounds the COP negotiations space. We must hope that they are more aligned than they seem.

As I write, the headlines concern how the main agreement involves 'urging' countries to commit to limiting global heating to 1.5°C and ending the use of coal. Plenty in the climate action space would say we should have phased out coal decades ago, and be well on our way to a 100% renewables-powered world. Instead, we're already at 1.2°C of global heating, and activists are saying that the conference is 'just rhetoric and vibes'. ☺

IN COURT

Northumbrian Water fined for County Durham pollution

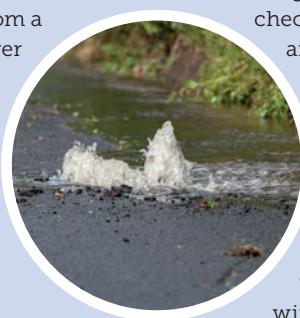
Northumbrian Water has been fined over £500k for polluting a watercourse, in a prosecution brought by the Environment Agency.

The water company received the fine at Durham Crown Court, having changed its plea and admitted causing or knowingly permitting a water discharge activity on 22 May 2017. The incident followed the discovery of raw untreated sewage flowing from a burst manhole cover in Heads Hope Dene into a nearby stream, between Hutton Henry and Castle Eden in east Durham.

Northumbrian Water's engineers made the discovery themselves, as they had been aware of problems caused by blockages of a combined sewer in the rural location due to tree root damage and were at the scene preparing for amelioration work.

The company self-reported the incident to the Agency, and it is believed the pollution took place over two to three days – but it was impossible to quantify how much sewage had entered the watercourse.

Water samples indicated raw sewage had entered the stream, and later surveys found the ecology and habitat of the



watercourse was damaged for 2km, with river sample results indicating a detrimental impact on water quality for 4km.

The water company began work to clear the blockage that day, as well as remedial work to make improvements. A longer-term solution to reroute the sewer out of the Dene is currently underway.

Judge James Adkin said the company was aware of serious tree root ingress following checks in April 2017, and although there was little time for immediate significant work, it made only "a makeshift response to an active pollution threat". Chicken wire and bales had

been used near the manhole to hold back sewage debris, which he described as being "totally inadequate" when the pollution incident took place.

Agency regional environment manager Rachael Caldwell said water companies had a legal duty to avoid pollution and "must act quickly to reduce any damage that happens as a result of their activities".

Northumbrian Water was fined £540,000 and ordered to pay costs of more than £142,000, as well as a £170 victim surcharge.

CASE LAW

Boy's judicial review against Environment Agency granted

In *R. (on the application of Richards) v Environment Agency*, the claimant applied for judicial review of the Agency's approach to regulating hydrogen sulphide (H_2S) emissions from a landfill site operated by the interested party, pursuant to an environmental permit issued by the Agency.

The claimant, a five-year-old boy, lived near the site. Born prematurely, he suffered from broncho-pulmonary dysplasia (BPD). His respiratory health was poor, and a consultant respiratory paediatrician instructed by the claimant concluded that his BPD and premature birth did not explain the severity of this condition. The consultant's opinion was that exposure to H_2S from the site was impairing the boy's health and quality of life, and that continued exposure was likely to lead to chronic obstructive pulmonary disease (COPD), reducing his life expectancy.

A toxicologist and pathologist instructed by the interested party stated that any development of COPD would be the result of the claimant's premature birth. Nevertheless, there were concerns in the local community about the smell from the site and the possibility it might impact local air quality and residents' health.

On 5 August 2021, Public Health England (PHE) published a 'Health Risk Assessment of Air Quality Monitoring results from March to June 2021' regarding the site. This made clear that the 2021 emissions were above the WHO's half-hour average guideline level of five parts per billion, and above the US Environmental Protection Agency (EPA) reference value of one part per billion. PHE recommended that all measures be taken to reduce off-site odours from the site as early as possible to meet the WHO guideline, and that all measures be taken to reduce H_2S concentrations in the local area for 2022 below the EPA value.

The claimant submitted that the Agency had failed to discharge its duty under the Human Rights Act 1998 –



specifically its duties under the European Convention of Human Rights article 2, to protect his right to life, and article 8, the right to respect for private and family life. He also argued that the Agency failed to discharge its public law duties at common law to act reasonably and take reasonable steps to acquaint itself with relevant information.

The judge concluded that the operational duties of the Agency were triggered. For article 2 it was necessary to establish either that the claimant's condition constituted an inevitable precursor to the diagnosis of a relevant disease, or that his current condition was life-threatening. His BPD was an inevitable precursor to a serious life expectancy-reducing illness, attributable to ongoing exposure. For article 8, there was a direct effect on the claimant's home, family life and private life from adverse effects of severe environmental pollution.

The Agency had taken reasonable and appropriate action of monitoring emissions levels and advice from PHE. However, there was no document before the court indicating how PHE's risk assessment recommendation had been addressed, and the Agency had not adopted the discipline. Agency officials had not done what was required to comply with the applicable legal duties.

The judge stated: "I have made clear that I am not satisfied, on the evidence, that the Agency has yet addressed its legal duties in the way that it must. But there is an obvious and pressing public interest imperative that it must do so, as a matter of urgency. It is well able to do so".

The application for judicial review was granted.

NEWREGULATIONS

THE LATEST

■ LEGISLATION ■ GUIDANCE ■ CONSULTATION



LEGISLATION

Climate disclosures

The biggest firms and financial institutions will have to disclose their climate-related risks and opportunities in accordance with new legislation that is set to come into force from April 2022.

It is expected that more than 1,300 of the largest UK-registered companies and financial institutions will fall under the new requirement, which will include private companies that have more than 500 employees and a turnover of £500m-plus.

The aim is to make sure that the biggest businesses are considering the risks and opportunities they face due to climate change, and are thinking about emission reduction plans and how they can adapt to climate change.

[cedr.ec/7ya](#)



LEGISLATION

Air quality guidelines

The WHO has cut its recommended limits for air pollution, and urged nations to tackle the problem to help save millions of lives.

This is the first such update for 16 years, and the new guidelines recommend air quality levels for six pollutants for which evidence has advanced the most on health effects from exposure.

In particular, the limit for the most damaging pollution (particles from burning fossil fuels) has been halved, and the

new limit for nitrogen dioxide – mainly produced by diesel engines – is now 75% lower than previously.

[cedr.ec/7y7](#)



LEGISLATION

E-waste

The EU has taken an important step against the e-waste and consumer inconvenience caused by the number of different, incompatible chargers for electronic devices. Proposals for an amendment to the Radio Equipment Directive 2014 will result in charging port and fast-charging technology being harmonised. Under the amendment, USB-C will become the standard port for all smartphones, tablets, cameras, headphones, portable speakers and handheld videogame consoles.

In addition, the EU proposes to unbundle the sale of chargers from the sale of electronic devices. This will improve consumer convenience and reduce the environmental footprint associated with the production and disposal of chargers, thereby supporting the green and digital transitions.

[cedr.ec/7y5](#)

sections on 'When a material is waste', 'When a material has not become waste' and 'When a material meets the end of waste test'.

[cedr.ec/7y6](#)



GUIDANCE

River basin management

A series of reports on river basin planning have been published by the Environment Agency. They collectively describe how waters in England are managed and provide background, evidence and analysis on the challenges affecting the water environment.

These reports support the Draft river basin management plans: 2021.

[cedr.ec/7y9](#)

[cedr.ec/7y8](#)



CONSULTATION

Heating systems

The Department for Business, Energy and Industrial Strategy is consulting on phasing out the installation of fossil fuel heating systems in homes, businesses and public buildings that are off the gas grid.

No specific end date is set for businesses and public buildings, but the aim for homes is to end new fossil fuel heating installations from 2026 and replace them with a 'heat pump first' approach. Where heat pumps cannot be practically installed, high performing replacement heating systems will be required instead.

[cedr.ec/7yb](#)

[cedr.ec/7yc](#)

Pushed to the limit

Almost 50 years since the publication of *The Limits to Growth*, co-author **Jørgen Randers** tells Chris Seekings what we can expect for the environment and society over the next half century

When Professor Jørgen Randers is not too busy modelling the likelihood of imminent societal or environmental collapse, he spends much of his time planning a follow-up to his famous report *The Limits To Growth*, commissioned by the Club of Rome.

It is almost 50 years since he co-wrote the groundbreaking 1972 paper, which is based on the computer-simulated consequences of exponential economic and population growth in a world of finite resources. The report concludes that, without substantial changes in resource consumption, humanity is

likely to face a "sudden and uncontrollable decline in both population and industrial capacity". Today, the forecasts are more relevant than ever, with the Earth's resources pushed to the limit as climate change and biodiversity loss continue unabated.

After taking time away from building his latest computer model, Randers tells me about the world's current trajectory, and what we can expect for society and the environment over the next 50 years.

Enduring debate

More than 30m copies of *The Limits to Growth* have been sold, in 30 languages. The report caused a storm of controversy on its publication – while some



Randers's co-authored report *The Limit to Growth* (right) has sold more than 30m copies since its publication in 1972

"It's possible to run a society as long as there is income growth, but once that starts to decline, people get very upset"



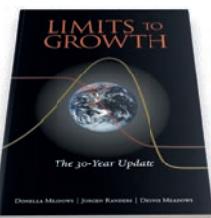
IMAGE: OTANIA/CONTRASTO

economists praised it for tackling uncomfortable questions, others accused it of being motivated by a hidden agenda: to halt growth in its tracks. "The reason it got so popular is that it was attacked so fiercely within a couple of weeks after publication," Randers says. "It was on the front page of the *New York Times Book Review*, with three macroeconomists attacking it so savagely that people asked, 'what the hell are these guys saying that makes these

economists so angry?' That's when it spread and took off."

The report proposed 12 possible scenarios for 2100, with the most pessimistic suggesting "overshoot and collapse" in economic growth, characterised by devastating pollution and breakdown in production and living standards. Subsequent work continues to confirm that insufficient changes have been made to consumption, although the consequences are still debated. "We

were the only people we knew at the time who were working on the biggest questions of population growth and environmental science as they were emerging," Randers explains. "We took it for granted that growth in the extraction of resources, population and pollution would have to stop, but were asking whether this would



happen through smooth adjustments within the limits of the planet, or through overshoot and collapse."

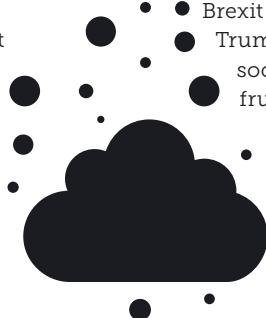
With a career spanning politics, finance and academia, the environmental scientist is not afraid to speak bluntly about where the world is heading, and the widespread changes needed. "I've been a chairman of three banks and started a number of companies, so I have all the credentials, but now I'm starting to get hectic about things. Someone needs to speak very clearly about why we are moving so slowly, and luckily I'm totally independent now."

Pollution collapse

Randers was working on his PhD at the Massachusetts Institute of Technology when he wrote *The Limits to Growth*. At the time, many thought the world would run out of coal, oil and gas. "Instead, we are following Scenario Two from the original report, which we called the 'pollution collapse,'" Randers explains. "This is where there are no resource constraints, and consequently, human population keeps expanding, with more economic activity and emissions."

He believes we are unlikely to control emissions fast enough, and that global temperatures are set to rise around 2.5°C above pre-industrial levels by 2075, before starting to decline. "Humanity is emitting much more into the atmosphere than is absorbed by the oceans and the forests. The big task at hand is to decline the unsustainable emissions we have today down to zero, and then negative emissions for a couple of hundred years to suck the carbon dioxide out of the atmosphere. The question is, can this be done in a smooth manner?"

Randers published his first book as a solo author on this issue – *2052: A Global Forecast for the Next Forty Years*, highlighting global environmental trends – in 2012. He says that when it comes to the climate and pollution,



Randers speaks at the launch of *2052: A Global Forecast for the Next Forty Years*

"You don't get anywhere by being a doomsday prophet. One must talk about the great opportunities that exist"

"we are clearly in overshoot", but have yet to see large-scale global ecological collapse. "We have seen regional, national and small cities collapse, but not the big one. My feeling is that social collapse will occur before we get the total ecological collapse."

Political unrest

- Brexit and the election of Donald Trump were both symptomatic of societies growing increasingly frustrated with unprecedented income inequality, Randers says. "When you get beyond a certain point, people start to rebel. The best example I know is the decision in the UK to leave the EU, which

was an act of frustration. It had nothing to do with the EU, in my mind. The same with Trump – people don't know what they are for, but they're absolutely certain they don't like the present."

Despite being home to the most billionaires of any country, the US has seen inflation-adjusted wages grow by only 0.2% per year since the early 1970s. With extreme weather becoming increasingly frequent, this creates the perfect storm for unrest. "It's possible to run a society as long as there is income growth, but once that starts to decline, people get very upset," Randers explains. "It is a drain on the spirits of the people who face increasing inequity and low labour participation rates. With ever-rising extreme weather, I think some people will get very frustrated, and then you don't really know what will happen."

These trends paint a bleak picture for the social structures we depend on. Is it possible to avoid societal and ecological collapse? "Yes, it is fully possible, but it requires decisions that are hard to get democracies to agree on, because they involve costs in the short term that only give a benefit 30 to 60 years into the future. The real challenge is to get short-term markets and short-term people to agree on action."





The path ahead

A decade ago, after being tasked by the Norwegian government with studying how best to cut emissions by 2050, a commission chaired by Randers recommended a 15-point plan to the Norwegian parliament, which would have cost each citizen around €250 each year in taxes and slashed emissions by two-thirds. "I spent four years travelling Norway, trying to convince people this was a great deal, that the solutions existed with only a small tax increase," he explains. "I thought it was an easy sell, but it proved to be absolutely impossible – even in stinking rich Norway, it is still impossible to get people to pay for a solution."

Although it might be difficult to get people to agree on what is needed to tackle the climate crisis, the solutions are very simple for Randers. "Replace coal, oil and gas with renewable energy, replace agriculture with regenerative agriculture, and change the development model that we have been trying in vain to force onto the poor world," he says. "It involves taxing the rich and making them pay for transitional costs to build wind and forest in the Global South

"My feeling is that social collapse will occur before we get the total ecological collapse"



where it's most desperately needed, and just give it to them, so they then have the energy for economic development."

But when talking about economic development, Randers says it is "totally ridiculous" to look at GDP in isolation as a measure of success. He argues that economists who have embraced a "neoclassical macro" approach to growth have too much influence over political discourse, and that new indicators are needed. "GDP is simply a measure of the activity level, which is why it increases when there are floods or hurricanes and a boom in construction," he explains. "We need to use the quality-of-life indicator, which depends on how much food there is – not the value of food – how much pollution there is in the air, and the purchasing power people have."

Positive scenarios

One scenario that no longer looks likely to play out is the continuous sharp population growth witnessed during the past 200 years. Randers believes this is likely to peak in the 2050s at around 9.5 billion people, and then decline rapidly down to around six billion in 2100 – the same as it was in 2001. "The reason is simply that the number of children per woman has been falling like a stone in both the rich and particularly the poor world over the last 50 years," he says.



"The position of women has improved dramatically through education, health and contraception, and this is not going to change in the next 50 years. The population goes down not because people starve or heat and that type of thing, but because of the major shift in the self determination of women."

This is perhaps one of the few positive trends that could give us optimism. Although Randers has spent decades watching as the environment has been trashed in the name of growth, he knows how important it is to convey an optimistic message. "The climate crisis is the most urgent crisis facing the world – even the poverty crisis is not as important, because if we solve that without solving the climate, then we will lose the poverty victory afterwards," he says. "But you don't get anywhere by being a doomsday prophet. One must talk about the great job opportunities that exist, or the huge floating wind parks we could build easily."

Next year is also the 50th anniversary of the UN's Conference on the Human Environment, known as the Stockholm Conference, and the celebrations in June 2022 will be used to launch the follow-up book to *The Limits to Growth*. "It remains to be seen what will be in the final version," Randers says. "This was a big group effort, and we haven't finished yet. There has been a move in the right direction since 1972, institutions such as the

Intergovernmental Panel on Climate Change have been built, we have ministries for the environment – but our models show that we can't continue progress at this pace. The only thing we can do is tell the world to stay away from the sad scenarios and try to implement the positive ones." ↑

American writer Maggie Stiefvater summed up the irony perfectly: "You could write a book about things you can't find online." The information communication sector is doing everything to prove her wrong. Forecasts suggest the industry will see explosive growth in the next few years. According to consumer data specialist Statista, there were 4.66 billion active internet users worldwide – 59.5% of the global population – as of January 2021. Of this total, 92.6% (4.32 billion) accessed the internet via mobile devices. Technology conglomerate Cisco predicts that 5.3 billion people will have access to the internet by 2023, with 29.3bn devices online by 2030, while the International Energy Agency estimates internet traffic will double by next year.

This massive thirst for information means a massive thirst for water. Data centres, vital to meeting this demand, are huge quaffers of water due to the electricity generation or cooling they require. In the US they consumed 660bn litres of water in 2020, according to the country's Department of Energy. Technology giants, in particular, are major guzzlers: Google gulped down 15.79bn litres of water in 2018, while Microsoft swallowed 3.5bn litres – mostly through their data centres.

The scale of the problem

"Considering how much data is stored in data centres, it is ironic how little data is available about how they operate," says David Mytton, a researcher in sustainable computing at the Uptime Institute, Imperial College London. Most people start with energy when focusing on data centres' environmental impact, he says – an area that has seen major shifts to renewables during the past decade. Large data centre operators such as Amazon, Google and Microsoft are regularly in the top 10 renewable energy buyers each year.

Mytton points to figures published last year in *Science* revealing that, between 2010 and 2018, the number of servers worldwide increased by 600%, network



Data centres are expected to see explosive growth in the next few years, but the industry is under fire for its water usage. **Huw Morris** reports

Thirsty business



Water

traffic by 1,000% and storage capacity by 2,500%. Yet energy consumption only grew 6%, largely due to the migration of data to cloud computing, which manages 40% of servers. "The same cannot be said for water consumption, which is a decade behind energy in understanding, transparency and progress," he argues.

"We have to be careful when comparing resources like energy and water, because the sustainability goals are not the same. With energy the goal is zero carbon, but zero water is not the right approach. Data centre water consumption is dependent on the region, because that dictates which cooling technologies can be used. In cooler regions, zero water can be achieved and should be the goal, because free airflow cooling is possible for some, if not all, of the year. But in many hot regions, this is simply not viable. That's important to understand,

"Considering how much data is stored in data centres, it is ironic how little data is available about how they operate"

because not only is a large part of future demand growth going to come from hot regions like Africa, South America, India and Asia, but global temperatures are also going to increase due to global warming in general."

Myton states that less than a third of data centre operators use metrics for measuring water usage, with the issue a low priority for most. Facebook is one of the few global companies to report water usage effectiveness (WUE), a metric for tracking annual site consumption; Google and Microsoft simply publish total water consumption. "Unfortunately, you can't actually use Facebook's infrastructure in the same way you can with Google and Microsoft – it's all for their own applications.

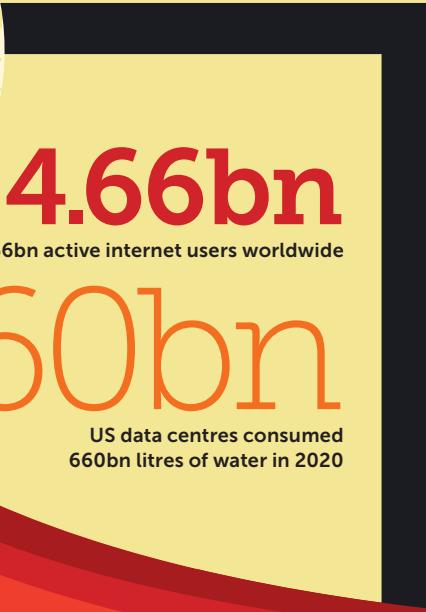
"Understanding the source of water is also necessary to analyse water metrics. Some would argue that, where water is used, the goal should not be zero water but zero freshwater. If water is recycled or reclaimed, its impact is not the same as if all the water is drawn from municipal or freshwater sources. However, this is not revealed by consumption metrics or WUE. The relative water stress of a region is also not represented in these figures."

This is about to change, according to Kerry Stares, a partner and director of responsible business at Charles Russell Speechlys. "The direction of travel is very clear – businesses will be increasingly required by regulators, investors and customers to disclose data and information about their environmental sustainability, including use of water and other resources," she says.



4.66bn

There are 4.66bn active internet users worldwide



660bn

US data centres consumed
660bn litres of water in 2020



2,500%

Data storage capacity increased 2,500% between 2010 and 2018

"It is essential that water usage is not considered in isolation"

to, and increasingly transparent about, how water risks may impact their operations and supply chains.

"Those taking conscious and proactive steps to manage water consumption responsibly, and who can demonstrate that through disclosure, will be at the front of the line for capital and custom."

The industry's response

Some in the data centre industry are taking water very seriously. Google, for example, announced a target to "replenish 120% of the water we consume" on average across its offices and data centres. "At data centres, we'll identify opportunities to use freshwater alternatives where possible – whether that's seawater or reclaimed wastewater," the company's chief sustainability officer Kate Brandt has said. "When it comes to our office campuses, we're looking to use more on-site water sources, such as collected stormwater and treated wastewater, to meet our non-potable water needs like landscape irrigation, cooling and toilet flushing."

US data centre owner CyrusOne is restoring 120% of the water used at its two biggest facilities in Arizona and Texas – both regions of high water stress. It says the sector must take responsibility for water consumption not only because it is the right thing to do, but also because failure to do so could result in "significant damage to the industry's reputation" and future growth.

"Water scarcity is a local issue," says Kyle Myers, CyrusOne's senior director of environmental health, safety and

The UK government, for example, has committed to make it mandatory for businesses to report on their climate risk in line with the recommendations of the Taskforce on Climate-Related Finance Disclosure.

Climate change will create significant water-related risks and data centres will need to be astute

sustainability. "If you operate in an area where water is plentiful, it's probably not a big issue. But if you operate in an area where water is not as plentiful, that's where we have to look at best practices within the industry."

Myers admits that customers, shareholders, staff, board members and communities are all pushing on resources. "For us, the story started with moving into a market where there was water scarcity; the local planning commission said, 'use all the power you want, but you can't use water'. That made us start thinking about what design might work.

"There's been an increased focus, especially in the last two years, from the customer base. It used to be climate change and that's all you'd hear. Now we hear about water scarcity – we just got a four-page questionnaire with maybe 40 questions just on water from a potential customer and a large company. So we know it's top-of-mind for a lot of organisations.

"Moving toward less water consumption per kilowatt hour of power delivered to servers – the WUE metric – has got to be the focus. But it's not just the water on-site, it's also the water used to make the electricity. One great thing is renewable power sources, like solar panels and wind power. The water consumption on those is zero, at least according to the accounting methods. If you're able to pair renewable power with zero or low-water cooling, you can get to zero water consumption across cooling, as well as carbon-free power."

Myers says the issue is a moving target, particularly as the industry grows 10%–15% annually. "If you assume we'll continue that line of growth in the next 20 years, by 2040, 80% of the data centres won't even have been built. There's huge opportunity to leverage technology and innovations and see what others are investing in. That's going to be the future of how we make water scarcity a non-issue from an environmental perspective."

Technology lawyer Mark Bailey, a partner at Charles Russell Speechlys, predicts that the focus on water as a precious commodity will increase, and contractual metrics could emerge to measure its consumption. "As part of an overall energy and resource efficiency programme, it is essential that water usage is not considered in isolation, as the overall efficiency of the data centre in terms of power and energy consumption can be beneficially affected by water use," he says. "The overall water lifecycle in a data centre, including steam emissions, may generate measurable benefits for a local community around the data centre for water recycling, provided the right tax incentives are created and there is a local demand to fulfil." 

HUW MORRIS is a freelance journalist.

Little by little

How can we encourage small businesses to play their part in the drive to net zero? **David Burrows** reports

Small and medium-sized enterprises (SMEs) make up about 90% of businesses and account for 50% of worldwide employment, according to the World Bank. In the UK, they constitute 99% of the business population – 5.6m businesses – and are essential to achieving net zero by 2050.

"We will not get to net-zero as a country without SMEs taking action now," says Louise Kjellerup Roper, CEO at business and sustainability think tank Volans. "No SME should be forgotten or left behind."

Many are feeling left out, though. A recent report by Volans and others involved in the Bankers for NetZero initiative identified a "chasm" between early adopters and innovators who are willing to take a risk, and the "early majority" of companies that are already aware of net zero, and are willing to act, but haven't yet done so. This group constitutes "millions" of businesses, the authors estimated.

Aquobex is one of them. The flood resilience specialist, headquartered in Oxford, is finding the barriers to net-zero progress hard to overcome. "There are

hundreds of questions, even if you want to be proactive, and very little advice or real data to enable us to start on this journey," explains managing director John Alexander. "For those who don't care, it is very easy to not bother – and that is the danger."

Targeted support

So, are small businesses stuck on net zero? And what is being done to help them?

An August survey by the British Chambers of Commerce (BCC) and O2 showed that just 9% of small businesses were measuring their carbon footprint – and the number of companies setting emissions reduction targets had actually

"One of the challenges here is talking about SMEs as a group, but they're all very different"



decreased since February 2020. Around one in three had yet to seek advice or information to help them develop a net-zero roadmap or improve their environmental sustainability.

"In my experience, businesses are, by and large, reactive beasts," explains Anna Graham, business sector manager at Zero Waste Scotland (ZWS). "They are generally not proactive." While she admits that this is a fairly broad-brush statement, it should be borne in mind that, due to the COVID-19 pandemic, millions of small companies are currently worrying whether they will be here in six months – let alone in 30 years. Asking them to start measuring their energy use, calculating carbon footprints and coming up with a net-zero plan can be a hard sell.

Frameworks such as the Task Force on Climate-Related Financial Disclosures, the Partnership for Carbon Accounting Financials and the Science-Based Targets initiative (SBTi) are geared towards large corporates. SBTi explains that, among the 847 companies that have aligned their climate mitigation targets with 1.5°C and net-zero emissions by 2050, just 66 are SMEs. However, SMEs do now have their

own route for setting science-based targets, which "balances the need for them to take account of emissions across their value chains, without imposing too great a burden".

The government has also been striving to keep things simple: its focus has been on the small steps that, collectively, make a big difference. It has launched an SME climate hub that includes tools, guidance and case studies on everything from LEDs to a simplified emissions reporting process. The information is undoubtedly valuable (and has all been independently evaluated), but it is easy to become overwhelmed: of the businesses quizzed by BCC, 22% didn't fully understand the term 'net zero', and yet on the climate hub you are into greenhouse gas emissions protocols and scope 1, 2 and 3 emissions within a couple of clicks.

Bankers for NetZero said that while the new hub is a start, seeking out advice on decarbonisation remains a "frustrating experience" for SMEs.

Framing the issue

In the rush to get businesses to sign up to net-zero pledges, the government is also arguably losing sight of what exactly it wants businesses to do *now*. Framing is important, says Debbie Ward, director at Cirklo Consult and knowledge transfer manager at the University of Wolverhampton's Environmental Technologies and Resource Efficiency Support Services (EnTRESS).

"Businesses just want the practicalities of it all," she explains. "They just want to know that what they're doing is making them more efficient, more

Just 9% of SMEs are measuring their carbon footprint



competitive, and ideally saving them money. They don't necessarily care whether it's circular economy, or if what they're doing would put them in the race to net zero programme."

Has the publicity around net-zero and the UK's hosting of the COP26 climate talks resulted in a bump in calls to advisory services? "It's an easier sell," says EnTRESS project manager Andrew Stott – but most are still focused on the day-to-day of their business, juggling the impacts of COVID-19 and Brexit. "Free support isn't the catch-all for helping businesses to make change," adds ZWS's Graham. "They

need to be convinced that they need to make the change themselves".

This was a theme picked up in a 2018 paper for the journal *Local Economy*. A huge amount of public funding has been invested in helping SMEs reduce energy consumption and carbon emissions, but there has been little research into the experiences of those who run the schemes – so Sam Hampton from Oxford University's Environmental Change Institute interviewed 19 low-carbon advisers. The current approach when engaging with SMEs is to focus on buildings, technologies, payback periods and assistance with the purchase of new equipment. This hooked people in.

However, more in-depth conversations about organisational culture, corporate responsibility, values, risk and energy use had been sidelined. The softer stuff was proving a harder sell – but will be crucial in achieving net-zero.

In a recent paper co-written with Professor Richard Blundell from the Open University Business School, 'How can

"For those who don't care, it is very easy to not bother – and that is the danger"



SMEs contribute to net-zero?", Hampton wrote. "programmes designed to deliver emissions reductions via financial incentives tend to result in short-term and purely transactional forms of engagement [...] This is particularly problematic, given that net-zero commitments require businesses to embark on a longer-term journey, and to make changes that may offer few, if any, immediate financial returns."

Hampton has called for a "shift in the culture of advice-giving" – but there will need to be sticks, as well as carrots. The money-saving message could in fact be tertiary among the key triggers that will get businesses moving; regulation and customer pressure could push SMEs further and faster.

Joined-up thinking

The government has talked up the green recovery, but is reticent to roll out more red tape. Still, there are opportunities for more joined-up thinking. The tension between landlords and tenants is an

obvious sticking point for energy efficiency programmes. "The government needs to work with the small business sector to identify where there is a mismatch between the person with the power to invest in low-carbon changes (such as the landlord in a commercial property), and the person who would benefit from those changes (that is, the tenant)," says Friederike Anders, policy adviser at the Federation of Small Businesses. She wants to see "smart policy decisions".

Unfortunately, these decisions are sorely lacking. In the run-up to COP26, ministers sidelined any real strategies and focused on the number of firms making net-zero pledges. Most ministers were still trotting out the old adage that 'saving carbon saves money'. If businesses "just turn the thermostat down or invest in LED light bulbs, they are clearly going to save energy costs, which are a hot topic at the moment", said Paul Scully, minister for small business,

22%

of businesses don't fully understand the term 'net zero'



during autumn's 2021 Net Zero Festival. At times, you have to check it's not 2010.

The heterogeneity of the SME population has been forgotten in attempts to engage far and wide (Ward describes the number of businesses that need to be reached as "frightening"). Comprehensive data on SMEs' greenhouse gas emissions is sorely lacking, but the aggregate impact of such a large component of the economy is impossible to ignore, say Hampton and Blundel. The best estimate so far is 12%; better data would help target hotspots.

"One of the challenges here is talking about SMEs as a group, but they're all very different," said Net-Zero Now executive director Simon Hepner at the Net Zero

Festival. He is focused on sector-based solutions. "We feel it's absolutely essential that we provide guidance, resources and tools to businesses that are in their language, that speak to them about the things that they do every day."

With help of the Sustainable Restaurant Association, Hepner has launched a net-zero accreditation scheme for pubs and bars. "We couldn't have chosen a more difficult sector," he said at the launch. Hospitality has been battered more than any other by COVID-19; it also has a high climate impact and very low margins, and is very time-poor. However, Hepner is more optimistic than he has ever been. "Net zero has given a clear destination and a common sense of purpose," he said. "Now we have to capitalise on that."

Once the hype from COP26 has dissolved, attention will turn to 2022 and action. This includes mobilising the 99% of British businesses that have fewer than 250 employees, which currently face a climate chasm. Saving a couple of hundred pounds on their electricity bills is unlikely to cut it.

DAVID BURROWS is a freelance writer and researcher.

UNTAPPED POTENTIAL.

The Royal Botanic Gardens, Kew – home to the world's largest collection of living plants and fungi – unveiled a new science strategy in September, outlining how it will intensify its world-leading research over the next five years and beyond.

The properties of plants and fungi remain largely unknown and could potentially uncover solutions to some of humanity's most pressing challenges, such as food insecurity and climate change. However, the situation is desperate, with scientists in a race against time to study and categorise species as deforestation, heatwaves and droughts contribute to escalating biodiversity loss worldwide.

Building on more than 260 years of scientific experience, Kew will look to harness its strengths, along with cutting-edge technologies, to push the frontiers of taxonomic research and the study of plants and fungi. The organisation's director of science, Professor Alexandre Antonelli, explains how the next few years are a "closing window of opportunity" to protect and restore our remaining biodiversity – and help deliver numerous benefits for people, the environment and the climate.

How did you first become interested in the study and protection of plants?

I was born in Brazil, so spent a lot of my childhood visiting rainforests with my family and saw first-hand how those forests were disappearing rapidly. I've always been interested in nature, and wanted to take this a step further and do something to protect it, rather than just watch it being destroyed. Much of my own research has been about documenting biodiversity in the tropics, especially in Latin

Alexandre Antonelli, director of science at the Royal Botanic Gardens, Kew, talks to Chris Seekings about how the untapped properties of plants and fungi could hold the key to tackling some of humanity's greatest challenges



"We need to move away from our dependence on so few plants"

America, and finding sustainable ways to conserve it.

You joined Kew in 2019. Why did you think now was the best time to publish its new science strategy?

The world is changing fast, and we are living in a moment of crisis with climate change and biodiversity loss. We wanted a scientific basis for delivering on our manifesto, to intensify efforts to understand and protect plants and fungi for people's wellbeing and the future of life.



At the strategy's launch, you said that "the useful properties of plants and fungi are largely untapped and hold the potential to bring equitable benefits to people and nature". Can you tell me about those benefits?

Plants have been crucial for humanity throughout our evolution and will be in future as well, but the crops we grow today will probably not be the same in the future. Wheat and bananas are being affected by pathogens and pests, and some foods are not going to be suitable in a few decades due to heatwaves, drought and salt intolerance – the latter being an issue because of rising sea levels. We need to find solutions. For example, Kew is working on finding coffee species and varieties that tolerate a warmer climate, and it's the same with beans.

We need to move away from our dependence on so few plants. There are more than 30,000 different plant species with a known human use, but more than half of all calories we consume today come from only three: wheat, rice and maize. If a disease affected those, there could be negative consequences for billions of people. It is, to some extent, about replacing some of those crops, but also about increasing the options.

How can the study of plants help to tackle climate change?

Plants play an important role in capturing and storing carbon from the atmosphere. Most people know that trees perform this role, but the value of grasslands, mangroves and other ecosystems in this process is understated. Our research can improve biodiversity, but also keep carbon out of the atmosphere by developing our understanding about planting the right trees in the



"Rates of deforestation are so high that some species may be lost before they are documented"

right places for the right outcomes. It's the same with grasslands and mangroves. There is also a risk that governments planting billions of trees might do so in a way that is not holistic, which could cause a lot of damage. We should not try to solve one crisis by making another worse, which is why we have just published the *Kew Declaration on Reforestation*, and '10 golden rules for restoring forests'.

How do you go about discovering new species and their properties?

We need to avoid the term 'discovered', because many of the plants found have been known by local communities for a long time. But we are scientifically describing around 2,000 new plants per year through Kew and our collaborators – it's a big global effort. A lot of that is done through fieldwork by our own scientists. Every year around 20,000 specimens from different parts of the world are sent to Kew, and we study their morphology – what they look like – and increasingly use molecular techniques, sequencing species' DNA and comparing them to find out whether they are new. We estimate that there are around 360,000 plant species, and that number is increasing.

Where are the most promising regions for new research?

Brazil is the country where most species are being described as new to science, and we know there is a huge amount of biodiversity there still to be documented, but it is across all ecosystems and regions. Here in temperate Europe, you might imagine that all species have already been



described, but that's not the case – especially when it comes to fungi. Kew is known for its plant collection and research, but we also have the largest collection of fungi, and estimate that at least 95% of fungi are not known to science. There are probably several million species that haven't yet been found, including species in the UK.

Kew's science strategy talks about enhancing partnerships worldwide, and a new digital revolution – tell me more about that.

Kew holds the largest collection of living and preserved plants and fungi, but there are also significant collections in Paris, New York and Missouri, among others, which we are working with closely, and we need new partnerships across the world. But if someone from Brazil or Madagascar wants to know whether something they have found is a new species, they need to compare that with previous collections. Unfortunately, a lot of our collections are not available digitally, so for many species there are no high-resolution images of the specimens and their associated information. We are now working with the government to digitise all our collections and make them freely available, which will speed up species description, conservation and the finding of new traits. A large proportion of the collections we hold are from other countries, so we are doing everything we can to share the information widely so it is a benefit for all on a free basis. There is a broad understanding that this is absolutely critical – it's about democratising the information we hold.

What is the most important thing the government can do to support your research?

The most important thing is to come up with concrete plans to deliver on goals that benefit nature, people and climate in a holistic way. We are in a race to secure enough resources and find innovative ways of speeding up species description and identification, and to understand their conservation status – the threats they face and their risk of extinction. Many new species are now immediately estimated to be threatened because there are so few. In many areas, the rates of deforestation are so high that species may be lost before they are even documented. The challenge is to find and conserve them before they disappear forever. [T](#)

Further information

➤ Read Kew's Science Strategy 2021-25 at

bit.ly/Kew_ScienceStrat

➤ Find the *Kew declaration on reforestation for biodiversity, carbon capture and livelihoods* at

bit.ly/3pMp9BR and its '10 golden rules for restoring forests' at bit.ly/3EqSISZ





Young women speak up

Chris Seekings reports on a side event from the COP26 conference that explored the role of girls' education in fighting the climate crisis

Mid the numerous speeches, negotiations and announcements made during the COP26 climate summit, one side event slipped slightly under the radar: 'Climate justice, education and gender equality – targeting the connections'. Organised by the Malala Fund, it brought together youth activists, world leaders and education experts to discuss these critical and connected issues.

Research suggests that four million girls in low and middle-income countries will not be able to complete their education due to the climate crisis,



and this is set to increase to 12.5 million by 2050. To take one example, almost 80,000 children had their education interrupted when Cyclone Idai hit in 2019. Discriminatory social and gender norms mean that, when climate-related disasters strike, young girls are

often forced into early marriage and expected to take on childcare and other responsibilities.

"They also face poverty and displacement, and are unable to continue their education," said Fatou Jeng, founder of Clean Earth Gambia, who kicked off proceedings with a moving speech. "This is the harsh reality we are facing. If we want to fight the climate crisis and talk about climate justice, then we need to ensure that girls' education is put at the heart of the discussions. We have been talking for a long time, but what we need now is real action."

A transformative approach

Research shows that every additional year of schooling for girls leads to significant improvement in a country's resilience to climate-related disasters.

"It should possibly be the biggest priority in the world to make sure that every girl has equal access to education," said Scotland's first minister Nicola Sturgeon at the event. "We won't solve the problems the world has until we properly and fully empower girls and women, and we won't do that without access to education. It is not possible to exaggerate the importance of this."

Young women from around the world shared stories about the challenges they face, and called for a "gender transformative education system" to

Quotes from attendees



Archana Soreng, indigenous youth from India and member of the UN secretary-general's Youth Advisory Group on Climate Change

"It's because of the struggles of my ancestors that I was able to access education, and got the insights into how critical it is for young women to be in policymaking spaces. Studying political science and regulatory governance made me realise that all the literature on climate action and biodiversity conservation is what my tradition is all about. Sadly, it is not written by my community, but by someone else. The current education system makes you feel inferior, and makes you question your traditional knowledge and practices. It's crucial to integrate education systems with indigenous traditional knowledge and practices when we are talking about climate justice."



Alice Pataxo, indigenous youth from Brazil and climate advocate from the Malala Fund

"The children of today's world will be the adults of tomorrow's world. We are the ones who are going to be faced with the direct impacts of climate change. It's very important that we learn how to deal with those situations, and do whatever is necessary today to change the history of global warming. It is important to understand that this directly

affects our lives. So many of us are suffering. That's why history has to be made in a different way now, and it all starts with education. I started a climate education too late in life, so I want the other children to have the opportunity that I didn't have. With education we construct the world today, and change for a better world tomorrow. That's how we make good leaders – our way."



Marinel Ubaldo, advocacy officer for ecological justice campaign and youth engagement at Living Laudato Si' Philippines

"You cannot teach a community of fishermen and farmers how climate change is affecting the wider world. We always have to contextualise it. One of the key factors why we had thousands of people die because of Typhoon Haiyan was because people didn't really understand what a 'storm surge' was. That is a foreign language to us, and if climate change were taught in schools in a way that is contextualised for the community, then people would relate to it and know what the implications are for their livelihoods. Imagine living in a country where every year there is a possibility you will lose your loved ones, and a possibility your house will be washed away. We are living that threat every day. Education is really important for the community to know what to do when there is a disaster, and we should contextualise it so they will understand what it really means for them."



environment until I have the money, and that is the same for most African countries. We need resources so that, by 2063, we achieve our goal of providing 12 years of education for every girl and boy in Malawi. Climate justice in Malawi is synonymous with protecting the education system itself."

David Sengeh, Sierra Leone's minister of basic and senior secondary education, spoke about the effects of lockdowns on girls. "I feel like the COP26 organisers should have had young people moderating all sessions, as everyone should know that they need to be at the head of the table. This climate crisis is an everyday challenge. Every time there is a storm in Sierra Leone or wind blows off a roof, it's kids who are going to stay out of school. And we have learned from other crises, like Ebola, that when you have extended lockdowns it is girls that suffer. The data shows that around 14,000 girls fell pregnant during the Ebola lockdown.

"But we also learned what to do, such as continuous learning, providing hybrid solutions, bringing paper to the communities that need it most. It is about being proactive. We need to

advance climate justice. This would see climate curriculums incorporate a social lens and empower girls to engage in climate policies and negotiations.

Overcoming barriers

The audience next heard from a panel of education ministers about the challenges they face in improving education access for girls around the world, and what they are doing to improve the situation.

Agnes Nyalonje, Malawi's minister of education, explained that a snowstorm destroyed several villages and schools in her country on the day she arrived at

COP26. "At this point in time, I am short of 30,000 classrooms for the only 16% eligible enrolled in secondary schools. We don't have the capacity, and when a storm hits like it did on Monday, it sets us back every time.

"I don't have the means to stop that, but the global community, particularly the Global North, has something to do with that. I need world leaders to say what they mean and mean what they say, and keep to their commitments – particularly the Global North's commitments to deliver on emissions and financing. I cannot assure all girls in Malawi have a safe schooling



engage the students because they are the ones in the community who are going to have to build the trees that are going to strengthen our water catchment areas. There cannot be anything more powerful than having young people at the table to design the solutions."

Baroness Barran MBE, parliamentary under-secretary of state at the UK's Department of Education, explained how the global approach to education must change. "We have heard today, so powerfully, the impact of not educating girls. There is also an opportunity to really fast-forward the rights of women and girls. There is a huge economic and

Malala Yousafzai gave a speech emphasising why educating girls is an important element in building climate resilience

Agnes Nyalonje, Baroness Barran and David Sengeh during a panel on improving girls' access to education around the world

"Education prepares women to develop climate solutions, secure green jobs and address issues"

societal opportunity. In this country, in engineering, only about 23% of jobs are taken by girls. We have announced our draft sustainability and climate education strategy to address that.

"I was so touched by the comments about indigenous communities, knowledge that is sensitive to different communities around the world, and the need to give them the power to make changes in their school and to be recognised by the work we do – which is why we have also announced new climate leaders awards for young people that we hope will really celebrate the commitment that so many of you show."

Call to action

Thousands of young leaders around the world have made five recommendations:

- 1)** Recognise and prioritise the role of quality education in climate action
- 2)** Implement a gender transformative approach to education
- 3)** Deliver the commitments of the Gender Action Plan of COP25
- 4)** Include children and youth in COP official negotiations
- 5)** Put young people and gender transformative educational approaches at the heart of developing Nationally Determined Contributions (NDCs).

In a final message, Malala Yousafzai, co-founder of the Malala Fund, said: "For some of our world leaders, this may just be background noise, but for girls and young women, they see the hardest effects of climate change, and the decisions our leaders make today will determine their future. We cannot hope to build resilience for the decades ahead unless we educate our children – especially girls.

"Education prepares women to develop climate solutions, secure green jobs and address issues at the heart of this crisis. Girls and young women are demanding action and calling for climate education in their schools, and asking for the tools they need to help their communities adapt, to develop innovative solutions, and imagine a future where they can thrive."



With Brexit 'done', the UK legislative landscape is now concerned with achieving net zero. In 2021 we saw the incorporation of international aviation and shipping emissions into the UK Climate Change Committee's sixth Carbon Budget.

The government has set in law the world's most ambitious climate change target – cutting emissions by 78% by 2035 compared to 1990 levels – and we are more than three quarters of the way to our aim of reaching net zero by 2050. It's no surprise, then, that 2022 will continue along a similar theme – although not everything is as progressive.

Landmark or landlocked?

The Environment Bill continues to move slowly through Parliament. Described by the government as 'landmark', 'flagship' and 'world leading', it has been delayed time and again since it was proposed in 2018. Some of this is down to the pandemic, but it has been repeatedly held back while other legislation has progressed.

It is currently ping-ponging its way between the Commons and the Lords, with the latter describing it as "a terrible Bill" – and that was before peers saw the bulk of their 14 amendments rejected. These amendments included demands to declare a biodiversity and climate change emergency, improve protection for ancient woodland and eliminate sewage discharges into rivers.

The latest delays mean the government did not meet its self-imposed deadline for the Bill to receive Royal Assent before COP26 – something it said would "weaken our hand in these extraordinarily important climate and environment negotiations". Surely the Bill will finish its torturous passage in 2022?

Best laid plans

A similar fate has met the planning system reforms, put on hold by housing secretary Michael Gove. The proposals would see the establishment of three planning zones, designed to speed up the decision-making process. Areas would be classified as protected, renewal or growth zones, with development restricted in protected areas. In growth zones, development that conforms to pre-agreed plans will be automatically approved. The reforms have attracted heavy criticism for their emphasis on speed, and some MPs were reportedly worried about backlash in their constituencies.

The Planning Bill was due to go before Parliament late in 2021, but it appears Gove has had a rethink, which could see it heavily watered down, with major reforms removed. It's likely that, in 2022, the Bill will be missing the plans for zonal planning, as well as mandatory housebuilding targets for local authorities.

Future Buildings Standard

Buildings will be key in the drive towards our net-zero target. A consultation is ongoing on phasing out fossil fuel heating systems in homes, businesses and public buildings. Also, feedback on the Future Buildings Standard will see changes to the Building Regulations 2010 – particularly Part L, on conservation and fuel power, and Part F, on ventilation. This will impact non-domestic buildings and dwellings, as well as addressing overheating in new residential buildings.

Heating and powering buildings accounts for 40% of the total UK energy use, so energy efficiency and ventilation improvements are essential, along with the decarbonisation of new and existing homes.

The year ahead

Neil Howe looks at the environment-related legislation we can expect in 2022 – from the slow progress of the Environment Bill to ambitious new waste management schemes



Industry feedback has been largely positive, but there is concern that the consultation did not go far enough; tighter energy efficiency standards have been suggested, and there are questions around the scale of the uptake of low-carbon technologies and how to ensure local planning strategies integrate the right infrastructure decarbonisation. It will be interesting to see whether the legal changes go beyond the scope of the consultation.

Energy efficiency

Later in 2022 we should see legislation to improve and strengthen the Energy Savings Opportunity Scheme (ESOS), with the aim of increasing participating businesses' uptake of energy efficiency measures.

ESOS is a major policy for improving business energy efficiency via provision of high-quality information about energy savings. Acting on these recommendations helps businesses reduce energy consumption and costs, as well as contributing to net zero by reducing emissions.

The changes will improve audit quality through reporting standardisation, including a net-zero element in audits and the requirement for participants to publicly disclose high-level recommendations. There are plans to extend the scope to include medium-sized businesses, and to make action on recommendations mandatory.

While mandatory obligations may not be popular with businesses, which face a difficult economic period, they could be key in making operations more sustainable.

Waste not

The waste sector will see drastic changes, with packaging waste management overhauled. The plastic packaging tax due to come into force in April gives businesses an incentive to use recycled plastic in plastic packaging.

A deposit return scheme in England, Wales and Northern Ireland will mean producers and retailers of PET plastic, glass, aluminium and steel drinks containers must take back empty vessels once they become waste. They will have to sign up to the Deposit Management

Organisation and report on how many containers were produced and how many were recycled. There will be legally binding recycling targets, and the scheme aims to achieve a 90% collection rate after three years.

Meanwhile, extended producer responsibility schemes will set minimum recycling targets, and an overall recycling rate for the packaging waste that falls within their scope to reach 73% by 2030.

The cost of managing packaging waste will fall on producers, and will move from recovery costs to net costs of collection, sorting, recycling and disposal. By introducing a single point obligation (a single producer responsible for the cost of managing a packaging item), schemes will focus on those who are best placed to reduce packaging and increase its recyclability. We can also expect movement on plastic plates, cutlery and polystyrene cups.



European electronics

It will be interesting to see how the UK reacts to new EU e-waste measures. The EU Commission has put forward legislation to establish a common charging solution for all relevant devices, under which USB-C will become the standard port for all smartphones, tablets, cameras, headphones, portable speakers and handheld games consoles. It would also unbundle the sale of chargers from that of devices, improving consumer convenience and reducing their environmental footprint.

Clearing the air

Late last year, the WHO cut recommended limits for air pollution and urged nations to tackle the issue. It was the first such update for 16 years, and the guideline limit for the most damaging pollution (particles from burning fossil fuels) has been halved. The new limit for nitrogen dioxide, mainly produced by diesel engines, is 75% lower.

The UK response was non-committal, citing "ambitious targets on air quality" that will be set via the Environment Bill, and stating "we must not underestimate the challenges these [new limits] would bring, particularly in large cities and for people's daily lives".

A consultation on the proposed new targets is expected in early 2022 and will be a good indication of where the UK stands on its commitments. Certainly, with the climate emergency, and the recent 'adapt or die' message from the Environment Agency, you would hope the environment will be at the forefront of legislation. 

"The UK government has set the world's most ambitious climate target"

NEIL HOWE is senior legal author at Cedrec Information Systems.

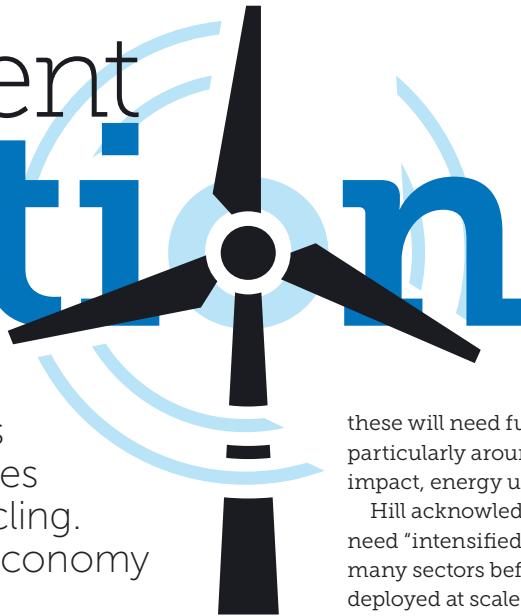
In permanent rotation

The first generation of wind turbines is reaching the end of its lifespan, prompting the renewables energy industry to consider recycling. **Huw Morris** reports on circular economy potential in this area

Once it was on the horizon. Then it became a growing problem that threatened to cause a crisis. Now, finally, Chris Hill thinks the UK is on the cusp of a major breakthrough. At stake is not only a significant step in the transition to net zero, but also a spin-off circular economy, packed with business opportunities and thousands of jobs.

Hill, operational performance director at ORE Catapult, has been grappling with one of the thorniest problems facing wind energy. Wind turbines have an average lifespan of 25 years – and many of the first generation are now coming to the end of their lives. While up to 90% of a turbine is recyclable, their blades, which are made from composites of resins and fibres, remain a huge obstacle.

Now the Energy Transition Alliance (ETA), a partnership between ORE Catapult and the Net Zero Technology Centre, with input from the National Composites Centre and the University of Leeds, has investigated alternatives to landfill and incineration. It believes up to 14 mechanical, thermal, chemical and reprocessing technologies show promise for recycling (see *Recycling technologies under investigation*, right). However,



RECYCLING TECHNOLOGIES UNDER INVESTIGATION

Mechanical

- Grinding
- Cement kiln co-processing

Thermal

- Pyrolysis – decomposing materials at high temperatures in an inert atmosphere
- Fluidised bed pyrolysis
- Microwave assisted pyrolysis
- Steam pyrolysis

Chemical

- Solvolysis – using solvents to recover chemical products and high-grade carbon fibre
- High temperature and pressure solvolysis
- Low temperature and pressure solvolysis
- Electrochemical

Reprocessing

- Milled fibre (post-grinding)
- Chopped fibre (post-pyrolysis solvolysis)
- Pellets
- Non-woven mat
- Component re-use.

these will need further development, particularly around their environmental impact, energy use and cost efficiency.

Hill acknowledges the technologies need "intensified investment" across many sectors before they can be deployed at scale. Earlier efforts to recycle blades have been hampered by a failure to match recovered materials to the needs of the supply chain and end-products, he admits. "Engagement with the UK supply chain is the first step for us: recycling is only of benefit when the recovered materials have saleable end-products that prevent deployment of virgin materials."

"Wind industry manufacturers and operators are beginning to set ambitious targets for achieving zero-waste turbines within the next 20 years. There is also a hotbed of research into lifetime extension of turbines, pushing towards 40-years, as well as exploring alternative materials. Recycling these first-generation blades is the first step in achieving zero waste."

Opportunities to be had

The ETA estimates the global offshore wind industry will need to decommission 85GW of capacity, including 325,000 blades, by mid-century. Recycling all major components could generate 5,000 UK offshore wind sector jobs. However, a more advanced circular model, involving remanufacture and refurbishment of turbines and components, would extend this to 20,000 extra jobs – this would amount to an increase of a third on the UK government's current 2030 target.

Recycling turbines is also an opportunity for onshore wind, according

DECOMMISSIONING WIND TURBINES: IN NUMBERS

25

The average lifespan of a wind turbine

85GW

The amount of capacity the global offshore wind industry needs to decommission by the middle of the century

5,500

The number of Scottish onshore wind turbines facing decommissioning in the next 30 years.

34,000

The number of onshore wind turbines across Europe known to be 15-plus years old

60,000

The amount in tonnes of fibreglass to be produced from decommissioning Scotland's wind farms

90,000

The amount in tonnes of resin and balsa to be produced from decommissioning Scotland's wind farms

to Zero Waste Scotland. Around 5,500 wind turbines will need to be decommissioned in Scotland by 2050, potentially generating 1.25m–1.4m tonnes of materials.

Ferrous metals such as steel and iron make up the biggest cohort of waste and are currently exported for recycling. More than 60,000 tonnes of fibreglass and 90,000 tonnes of resin and balsa materials will also be produced, all of which are landfilled. Zero Waste Scotland chief executive Iain Guillard sees a "fantastic opportunity" to embed circular solutions into the resource management of these materials.

"Decommissioning and refurbishment of wind turbines will release valuable metals like steel and iron, and component parts like gear mechanisms, into circulation, thereby unlocking the potential for economic gain. However, as these materials are currently exported for recycling, the Scottish economy is losing the value of these resources.

"Onshore wind decommissioning is fast becoming a practical problem for many European countries. To date, across Europe, 34,000 turbines are known to be 15 years or older. There will be a big market for decommissioning onshore wind farms over the next decade and, if we act now, Scotland is in a prime position to provide a circular solution and establish competitive advantage." 

HUW MORRIS is a freelance journalist.

"Recycling is only of benefit when the recovered materials have saleable end-products"



If you would like to contribute
a member profile contact:
media@iema-transform.com

Why did you become an environment/sustainability professional?

I was fascinated by how business and the environment could be more aligned. It seemed such an obvious thing to do, with so many win-win reasons for why it would happen. It gives sustainability professionals great purpose to know they are doing their bit to transform people's lives and the planet for the better.

What was your first job in this field?

I was a research assistant at the University of Aberdeen, working on an EU-funded project on rural tourism. We interviewed many businesses in the Scottish Highlands and on Exmoor, and the role of nature in underpinning their success was plain to see.

How did you get your first role?

It was advertised in the national press.

What does your current role involve?

I run a team of six that provides economic advice and evidence to the UK forestry sector. We also promote, manage and develop the Woodland Carbon Code, a UK-wide carbon standard for projects that involve **planting new woodlands** to generate carbon credits. The woodland carbon market has shown how new nature-based markets can be developed with positive impacts on the economic viability of the forest sector. We are involved in cutting edge work on natural capital and carbon markets, and it's exciting to see the potential for forestry.

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

The role has focused more on developing new markets in forestry. Carbon is the main example, but we are looking at biodiversity and water-related opportunities too. However, markets aren't the



CAREER PROFILE

Pat Snowdon, FIEMA

Head of Economics and Woodland Carbon Code, Scottish Forestry

be-all and end-all for integrating nature into the economy. The job also involves looking at how nature can become essential to our wellbeing, whether through regulations, land-use subsidy reform or behavioural approaches to encouraging good environmental practice.

What's the best part of your work?

The innovative work, the sense of shared purpose and the range of people I come into contact with.

What's the hardest part of your job?

Keeping on top of the myriad initiatives and the rapidly changing environment in which the team works.

What was the last development event you attended?

A closed meeting of IEMA members with the Department for Business, Energy and Industrial Strategy on a recent consultation on a mandatory approach to implementing the Task Force on Carbon-related Financial Disclosures.

What did you bring back to your job?

Some great insights into government's current direction regarding carbon disclosure and reporting by businesses. This is an important driver for voluntary carbon markets and the future of the Woodland Carbon Code.

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

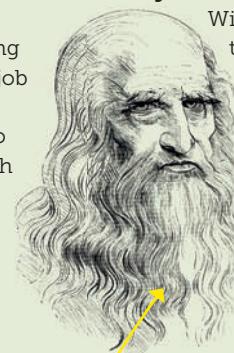
Openness to doing things differently, patience and the ability to spot when a new initiative may bring real change.

Where do you see the profession going?

Environmental markets are going to be key to attract private finance into nature. As shown in the Dasgupta Review, nature is integral to the economy and needs to be properly accounted for.

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

Witnessing a shift in attitude across the economy to prioritise the role of nature in our wellbeing.



What advice would you give to someone entering the profession?

Be patient but trust that the win-win opportunities of nature will prevail.

How do you use the IEMA Skills Map?

It helps me sit back and examine my future skills and development needs.

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

Optimistic, persistent, fitness-loving.

What motivates you?

Making a contribution to how nature can be more integral to our wellbeing.

What would be your personal motto?

Trust your instincts.

Greatest risk you have ever taken?

Sky-diving from 15,000 feet! Workwise, ditching my early career in marketing, returning to university and seeking something environmental.



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

Leonardo da Vinci for his ability to innovate and look across different disciplines. 



QUOTE UNQUOTE



BOOM! Delighted to see the Environment Act on the statute book at last....fitting to be looking down on the #COP26 globe after participating in a panel discussion as Royal Assent granted!

@MBAXTERIEMA



A momentous day – Royal Assent granted by HM to the Environment Act 2021. After a remarkable two-year passage through parliament we have a groundbreaking framework for a sustainable future. Huge thx to ALL involved – truly honoured to have been a part of this @DefraGovUK @ZacGoldsmith @POW_REBECCA

@COP26 @walkwithamal, a 3.5m puppet of a young Syrian refugee that has travelled 8,000km from the Syrian border, arrived at #COP26 for Gender Day. She is here to raise awareness of the disproportionate impact of climate change on women and girls around the world.



IEMA CEO @mukherjee_sarah MBE chairing a session on standards with @isostandards @BSI_UK "Standards are vital, they give assurance to customers and businesses alike." #COP26 @IEMANET



Today is #genderday at #COP26 & IEMA's CEO @mukherjee_sarah MBE discusses her own experience, both at COP & professionally, in addressing #climateaction & the dangers that a lack of #diversity can present to actioning change for a better future. @IEMANET



DATES FOR YOUR DIARY

iema.net/events

THURSDAY 2 DECEMBER

EVENT

Environmental Impact Assessment for Infrastructure Projects Masterclass 2021

Chaired by Dr Rufus Howard, IEMA impact assessment lead, this virtual event will be your ultimate guide to the policies required for successfully conducting environmental impact assessments. A 15% discount is available to IEMA members.

► [Register at bit.ly/EIA_Infra](http://bit.ly/EIA_Infra)

THURSDAY 9 DECEMBER

CONFERENCE

Environment and Sustainability Professionals' Conference

Book your free place at this exclusive, members-only conference for environment and sustainability professionals. Engage with experts in keynotes, panel discussions and workshops, and explore the hard-hitting discussions on COP26, climate change, biodiversity and many more topics.

► [Register at bit.ly/IEMAconf21](http://bit.ly/IEMAconf21)

MONDAY 6 DECEMBER

CONFERENCE

Decarbonising the UK Energy Sector Digital Conference

Explore the latest developments in low-carbon hydrogen, energy storage, carbon capture and storage, and new nuclear power, and discuss the policy, finance and infrastructure required to secure their success in achieving our goal of reaching net zero by 2050. A 20% discount is available to IEMA members.

► [Register at bit.ly/Westmin_Decarb](http://bit.ly/Westmin_Decarb)

THURSDAY 20 JANUARY 2022

WEBINAR

Midlands: EIA – Where we are now

Join our Midlands webinar, where we will look at environmental impact assessment, where we are now and what the way forward may look like. We will be joined by Josh Fothergill from Fothergill Training and Consulting, who will engage attendees in discussion on this important topic.

► [Register at bit.ly/MidlandsEIA](http://bit.ly/MidlandsEIA)

Scotland West's Promoting The Climate Change Agenda event, listed in the last issue, was cancelled.

IEMA is deeply sorry to hear of the accident involving Sacha Dench and the death of her support staff Dan Burton, and our thoughts are with their loved ones. We send our deepest condolences and hope Sacha can recover soon.

If undelivered please return to:

IEMA
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Lincoln
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IEMA

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to sustainability

Upskill your Workforce

Upskilling your staff is vital to driving competitiveness, productivity, resilience and growth. Our range of IEMA certified courses can equip your staff with the right knowledge and skills to achieve your environment and sustainability goals.



Environmental Sustainability Skills for the Workforce

This one-day course is ideal for those working at an operational level, providing learners with a practical introduction to environment and sustainability issues, to make a positive difference within their organisation.

Environmental Sustainability Skills for Managers

This two-day course is intended to support managers and supervisors from any industry sector in understanding the strategic and operational implications that environmental sustainability has on them, their team and department.

Visit: iema.net/skills/training

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