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FOR ENVIRONMENT AND SUSTAINABILITY PROFESSIONALS

November 2017
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The impact of the Modern Slavery Act two years on



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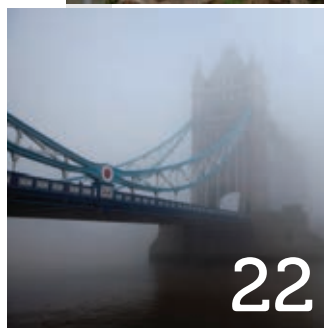
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TIM BALCON, CEO OF IEMA

No COP out on IEMA's watch

While we spend every day of every year focusing on environment and sustainability, this month it's the turn of global leaders to turn their attention to international action on climate change.

Between 6-17 November, the 23rd session of the Conference of the Parties to the UN Framework Convention on Climate Change – more commonly known as COP23 – will take place in Bonn, Germany. Over two weeks, thousands of delegates from across the world will convene to discuss, debate and update on progress made since COP21 – the now defining Paris Accord.

COP23 doesn't quite seem to have generated the same pre-fanfare of Paris in 2015 (and the less said about the approach of some nations, post-Paris, the better). But have no doubt – this is an incredibly important milestone for international politics, our environmental future and our profession.

There will be some extremely interesting movements afoot; delegates are due to create an Accord rulebook during the meetings, so future activity could be shaped by what happens in Bonn. Most crucially, world leaders and other "non-state actors" will define the global and local profile of environmental policy and practice during these two weeks.

There will be new outcomes to action, so it will be our profession's job to turn the rhetoric into reality, and it's IEMA's role to support you. You can rely on us to keep you informed while Bonn is in full swing and afterwards, as IEMA policy experts Martin Baxter and Nick Blyth will both be at the talks to host and present at key COP23 events.

They'll be reporting to you live from Bonn with the kind of news and insight you won't see in the mainstream media. This is a real signifier of IEMA's enhanced profile and impact on global-level activities, and ensures that, as a member and through your role, you are uniquely connected into activities of global gravity.

There will be lots to talk about after COP23 closes its doors and even more for us to do. Together, as a membership, we'll bring all of the talk to life.



IEMA Transforming the world to sustainability

IEMA is the worldwide alliance of environment and sustainability professionals, working to make our businesses and organisations future-proof. Belonging gives us the knowledge, connections and authority to lead collective change, with IEMA's global sustainability standards as our benchmark. By mobilising our expertise, we will continue to challenge norms, drive new kinds of enterprise and make measurable progress towards our bold vision: transforming the world to sustainability.

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ROUNDUP

ENVIRONMENT &
SUSTAINABILITY
NEWS AND VIEWS

GLOBAL WARMING

'Reduce unfair burden'

Low-income countries need more help tackling "vastly unequal" impacts of climate change, the International Monetary Fund (IMF) warns.

In its latest *World Economic Outlook* report, IMF explains how low-income nations will bear the economic brunt of global warming – despite contributing very little to greenhouse gas (GHG) emissions.

The adverse consequences of higher temperatures will hit poorer countries the hardest and require further international collaboration to mitigate the damage.

Hits to agricultural output, labour productivity, capital accumulation and human health are all more likely in these countries, owing to the fact that they are often some of the hottest places on earth.

In addition, economic constraints mean they are less able to put in place effective adaptation strategies.

The report calls on the global community to mitigate GHG emissions before they create "more irreversible damage".

"Rising temperatures would have vastly unequal effects across the world, with the brunt of adverse consequences borne by those who can least afford it," it says.

"With advanced and emerging market economies contributing the lion's share to the warming that has occurred so far, helping low-

income countries cope with its consequences is a humanitarian imperative and sound global economic policy."

A whole chapter was dedicated to this subject in the *World Economic Outlook* report, which warns that countries must invest in infrastructure, activity diversification and technology innovation to increase resilience.

It also says that populations may respond to changing climatic conditions by relocating geographically, which could have important cross-border ramifications, with climate change likely to create "economic winners and losers".

As well as suffering economically, it is thought that higher temperatures in already hot countries could potentially trigger more frequent epidemics, natural disasters, famines, armed conflict and refugee flows.

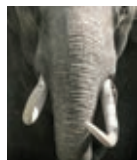
Adapting to these consequences necessitates vast investments, including boosting infrastructure, reinforcing coastal zones, and strengthening water supply and flood protection, the report says.

"The international community will have a key role to play in fostering and coordinating financial and other types of support for affected low-income countries," it concludes.





SHORTCUTS



UK government proposes ban on ivory sales

Britain will impose a ban on ivory sales to help bring an end to the poaching of elephants under plans announced by environment secretary Michael Gove.

The UK is the world's largest exporter of legal ivory, stimulating demand in countries like Hong Kong and China, despite the elephant population falling by almost a third in the past decade.

"The decline in the elephant population fuelled by poaching for ivory shames our generation," Gove said. "These plans will put the UK front and centre of global efforts to end the insidious trade in ivory."



Prince Charles warns 'plastic is now on the menu'

The Prince of Wales has warned humans are close to reaching the point where all the fish we eat will contain plastic, thanks to the eight million tonnes entering the ocean each year.

Speaking at a conference in Malta, he said that throwaway, convenience lifestyles had caused the problem, and that it was "utterly crucial" we transition to a circular economy.

He said this would help establish a harmonious relationship between humans and the ocean, adding we must "remember that it is the ecosystem that ensures our survival".



Scotland approves ban on fracking

The Scottish government has announced an "effective ban" on the development of unconventional oil and gas, after a four-month public consultation.

Some 99% of the 60,000 consultation responses opposed fracking, with fewer than 1% in favour. As well as environmental concerns, many doubted the economic benefit.

PHOTOGRAPHY: ISTOCK

FUEL SOURCES

New era for solar power

Solar PV capacity increased faster than any other fuel source last year for the first time ever, according to a report from the International Energy Agency (IEA).

It shows that solar additions grew by 50% in 2016, with China responsible for almost half the global expansion as it becomes increasingly concerned about its air pollution problem.

Renewables accounted for almost two-thirds of net new power capacity worldwide last year, according to the research. This is expected to increase 43% by 2022.

"What we are witnessing is the birth of a new era in solar PV," said the IEA's executive director, Fatih Birol.

"We expect solar PV capacity growth will be higher than any other renewable technology through 2022," he continued.

By that time, it is predicted that China, India and the US will account for 66% of the global renewable energy expansion, which will grow twice as fast as gas and coal combined.

In addition, renewable electricity is expected to increase by more than a third to over 8,000 terawatt hours, accounting for 30% of worldwide power generation – up from 24% in 2016.

China will remain the undisputed leader of renewable electricity capacity expansion up to 2022.

Already, the nation is three years ahead of its solar capacity targets, according to the report.

However, 70% of Denmark's electricity generation is predicted to come from variable renewables by that time – more than in any other country – while Ireland, Germany and the UK's share of wind and solar should exceed 25%.

ENERGY

CCS could boost UK economy by £160bn

The societal and economic benefits of deploying carbon capture and storage (CCS) on the east coast of the UK would be as much as £163bn, according to a new study.

Led by low-carbon power specialist Summit Power, the research suggests that these benefits would significantly outweigh the estimated CCS operating costs of £34bn.

It also shows that CCS deployment would create massive new regional employment and investment opportunities, including approximately 225,600 jobs, and £5bn in environmental and health benefits.

John Scowcroft, Global CCS Institute's executive adviser for Europe, the Middle

East and Africa, says the research reaffirms the role CCS technology can play in delivering economic, societal and climate benefits: "CCS is a well tested and versatile technology, which has been proven as essential to meeting international climate change commitments," he said. "This study provides data to support the need for rapid CCS acceleration and makes the sustainable base case for CCS as a central pillar in a new energy economy."

CCS traps the CO₂ from coal and gas power plants and buries it permanently underground so it cannot warm the climate, with the UN previously concluding that it was "hugely important" to tackling climate change.



IEMA IN THE NEWS

Brexit and beyond: IEMA's core principles

The UK's short-term focus must be on fully transposing the European Union's environmental acquis into UK law to ensure continued environmental protection and provide much-needed post-Brexit certainty, says IEMA.

There is an immediate challenge to incorporate all existing environmental law into the UK statute books before the Brexit deadline, IEMA said. Longer-term, the UK must take the "unprecedented opportunity to reshape the policy landscape" to deliver better environmental outcomes. To support the process, on 3 October IEMA published *Brexit and Beyond: IEMA Core Principles for the Environment*.

The document outlines three overarching goals for environmental safeguarding outside the EU and sets out key governance considerations on transparency, scrutiny and accountability and eight underpinning principles that strengthen the UK's policy approach.

➤ Find out more at bit.ly/2kBm8V2

IEMA reports 8% growth in global ISO 14001 data

Data on the uptake of the international environmental management system (EMS) standard ISO 14001 shows that the number of certificates issued worldwide has grown 8% over the past year.

IEMA reported that the data published by the International Organization for Standardization (ISO) shows a global year-on-year increase of almost 27,000 certificates between 2015 and 2016. The worldwide total of accredited ISO 14001 certificates reported now stands at 346,190, up from 319,324 in the 2015 data report.

The UK has held its position as fourth in the global league table for the fourth consecutive year, with 16,761 certificates. However, its total is down from the 17,824 reported last year – the only nation in the top five to report a year-on-year dip.

➤ Read more at bit.ly/2fWd1Jo

MEMBERSHIP

Two new Fellows named

Following on from October's news, where almost 30 new Fellow members were revealed, two further leaders have now achieved FIEMA status – and there are more to come next month.

Graham Dalrymple (*above right*), managing consultant at RSM UK Consulting LLP, and IEMA's policy lead Nick Blyth (*above left*) have both successfully been assessed against the Fellow membership standard. They now join the "new generation of ambassadors for sustainability", which is a worldwide network of sustainability experts and business leaders. IEMA would like to congratulate them on their achievement.

Further to Graham and Nick's applications, a second group of nominated Fellows is set to be revealed soon. The Fellows Appointments Committee met on 21 September to discuss and approve a list of people put forward for Fellow membership by IEMA and members. Their new memberships are currently being processed, and they will feature in the December issue of TRANSFORM.

➤ Do you know someone who should be a Fellow member?

Find out more about what 21st-century Fellow members are, do and achieve at www.iema.net/membership/fellow-membership/ plus details of how to nominate



UK CONSTRUCTION WEEK

The golden age of infrastructure

Members and industry influencers met in Birmingham on 11 October at IEMA's conference to see the launch of the institute's latest publication.

A Golden Opportunity: Delivering future-fit infrastructure for the UK through enhanced sustainability skills was revealed at the IEMA Skills & Sustainable Infrastructure Conference, part of UK Construction Week. The event and the publication both examine the UK's new "golden age of infrastructure", and the role of sustainability skills in delivering the nation's sustainable infrastructure plan.

The report, available for free at iema.net, states that there is a "golden opportunity to deliver future-fit infrastructure for the UK through enhanced sustainability skills". Using member-generated research, the document reports that there is a solid base of sustainability skills across UK infrastructure – not yet fully optimised – and whole-life asset understanding is an urgent priority for improvement.

➤ Download your free copy of the report at iema.net today



NICK BLYTH

Biodiversity net gain: a new duty?

Significant attention is on the development of the government's 25-year environment plan, which aims to achieve the overall ambition to be "the first generation to leave the natural environment of England in a better state than it inherited".

From the content of the plan (setting objectives for 2040), to interfaces with other parts of government, via governance and reporting, there is much to do to bring together a coherent set of actions with performance milestones that will lead to a markedly better environment.

Given the importance of biodiversity, which in many areas is declining, it's crucial that action is taken to halt biodiversity loss and embed policies that will lead to restoration and enhancement.

In the infrastructure sector, there are positive initiatives helping to address this decline. For example, the government's road investment strategy states that, by 2020, Highways England must deliver no net loss of biodiversity, and that by 2040 it must deliver a net gain. East West Rail has a commitment to "delivering a measurable net biodiversity gain and positively contributing to the conservation of nature in the region". Some construction and housebuilding companies also now have similar commitments.

As the application of biodiversity net gain gets translated into practical application, supported by initiatives such as the joint principles developed by IEMA, CIRIA and CIEEM – Biodiversity Net Gain: Good Practice Principles for Development – the question is whether a duty should be placed on developers to require this in the future. Also, as natural capital accounting tools become better established, should developers be required to deliver wider net-positive natural capital too?

NICK BLYTH policy and engagement officer at IEMA
@nblythiema



GOVERNANCE

Members vote at 2017 AGM

IEMA's 2017 Annual General Meeting was held on 20 September, and all agenda items were successfully voted in by members.

Members in attendance voted to confirm the minutes of the 2016 meeting, receive and accept the directors' report and accounts, and reappoint Streets LLP as IEMA's financial auditor. Two other business items were also passed – to confirm the appointment of Shaun McCarthy OBE, and reconfirm Professor Martin Bigg, as non-executive directors. In appointing McCarthy to the IEMA board as part of his role as chair of the IEMA Professional Standards Committee, CEO Tim Balcon thanked previous chair Gillian Gibson for her extensive and tireless contributions to both committees.

➤ To find out more about IEMA's governance, go to www.iema.net/about-us/iema-governance



SUSTAINABLE DEVELOPMENT

IEMA signs up to the further education sector's SDG Accord

At the end of September, IEMA pledged its support to the Environmental Association for Universities and Colleges (EAUC) Accord, the further education sector's collective response to the UN's sustainable development goals (SDGs).

The accord aims to inspire, celebrate and advance the critical role that education has in delivering the SDGs and the value this brings to governments, business and wider society. Signatories,

including IEMA and a range of educational establishments representing over 12 million students, will annually report on their progress and share their learning with each other, both nationally and internationally. Progress will be collated and presented at the annual UN High-Level Political Forum.

➤ The EAUC is seeking further signatories from leaders of institutions, university and colleges as well as students, academic and facilities staff. Visit www.sdgaccord.org

NETWORKS



IEMA FUTURES

Vision of cities to come

IEMA Futures hosted the first of a series of events at Leeds University on 12 November, asking "What would your sustainable city look like?". Professor Andrew Gouldson opened the event, encouraging us to think about changes we can make today and the radical systematic changes needed to be truly sustainable.

We then heard from Catalicity managing director Sandra Norval, who inspired the audience to think far outside the box, drawing on students' understanding of utopia and dystopia in popular science fiction: "Your imagination is the limit".

Students then split off into groups to create sustainability visions for infrastructure, transport, energy, food, and health and wellbeing.

We hope this is just the first in many events that encourage young people to believe in themselves and their vision for sustainable living.

➔ **Keep up to date with @IEMAFutures on twitter, facebook and LinkedIn**

TESLA

Electrifying glimpse of future

Around 25 IEMA members, including CEO Tim Balcon, visited Tesla Knutsford to learn more about Tesla's all-electric vehicle range. This was particularly timely, given the UK ban on new diesel and petrol cars by 2040.

The event was informal, with members able to peruse and speak to technical staff before presentations on charging, power-train, range, battery life, manufacturing, performance,

safety, auto-pilot features, including AI, use of and ownership of data.

Given the move to all-electric by several manufacturers, sustainability professionals have a huge opportunity to provide best-practice advice on reducing environmental impact.

The NW Network would like to thank Tesla Knutsford.



SUSTAINABILITY

Sustainability reporting centre stage for NW

On 11 October in Manchester, the IEMA North West Steering Group hosted a corporate sustainability reporting event.

This engaging breakfast event offered a range of case studies on leading sustainability reporting, including future trends.

The event commenced with an overview of the evolution of corporate sustainability reporting from Carmel Campbell, director of Be Sustainable. This was followed by presentations describing how Skanska UK and Marshalls have integrated sustainability reporting into their business processes.

Jake Atkinson, an accountant at Skanska UK, shared a financial perspective of the business benefits of a sustainability culture that works closely with the environment sustainability team and focuses on natural capitals and social impact.

Chris Harrop, marketing director and director of sustainability at Marshalls, guided members through the benefits of transparent, live reporting from both a brand and customer perspective. He stressed the importance of auditable standards of environment and ethical performance in their supply chain and products.

As a result of the positive feedback from this regional event, IEMA will bring these discussions to other members in an upcoming webinar.

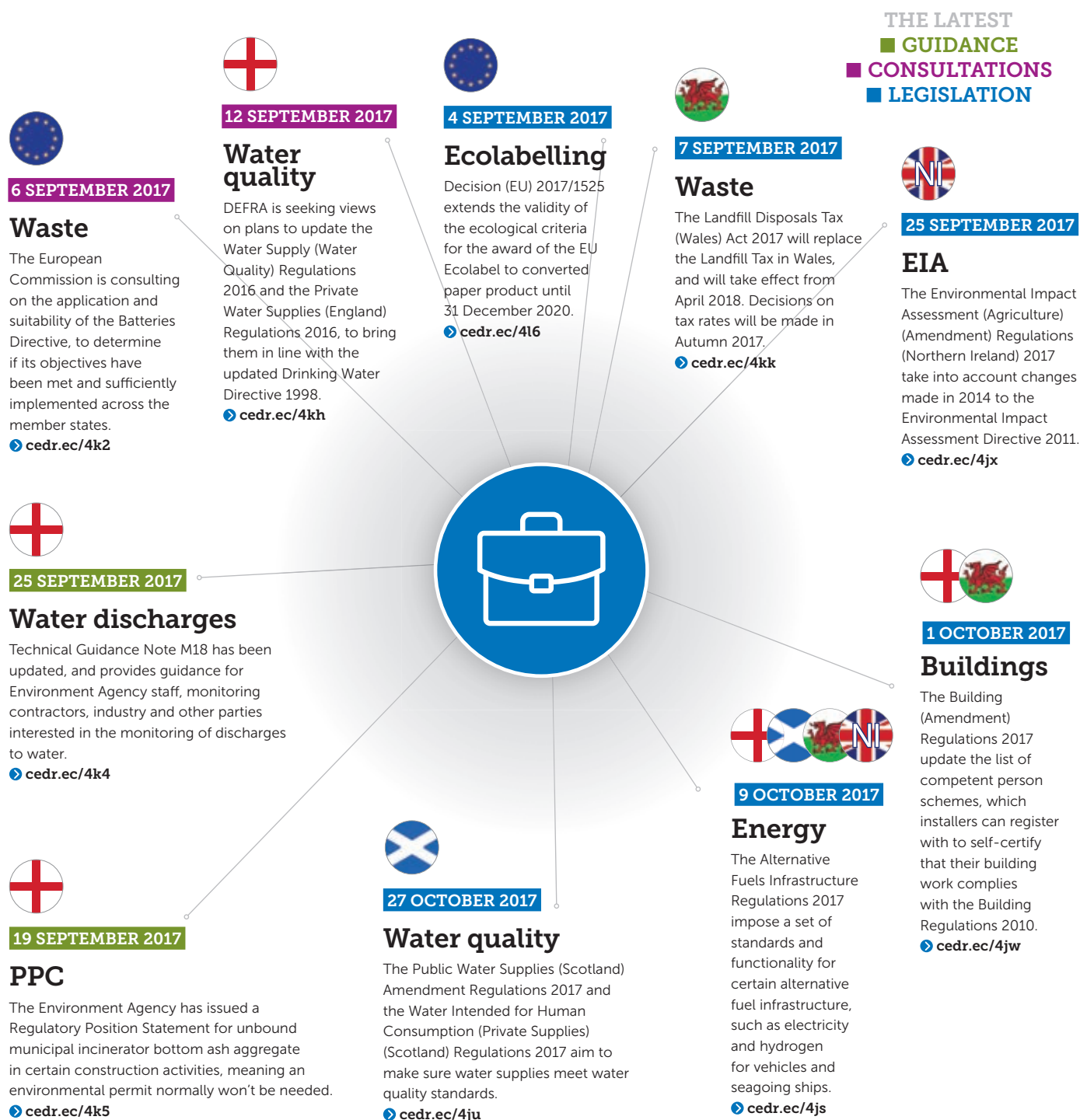
WELCOME TO NETWORK NEWS

The networks are all about members. They are a place where members can show their passion and can work together to discuss, debate, and influence decisions. From regional issues to global concerns, the pages of this magazine are an opportunity to use your voice and share your views. Each month the networks will provide an update on their activities.

➔ **For further information, visit: www.iema.net/engage/networks/**



NEW REGULATIONS



INCOURT

IN COURT

United Utilities fined £666,000 over human sewage leak



▲ The River Medlock suffered pollution after waste leaked into watercourses

United Utilities has been handed a huge fine over a “negligent” leak of untreated sewage effluent into the River Medlock and Glodwick Brook in 2014. The incident saw human sewage in an amount comparable to “eight Olympic swimming pools” leak into the watercourses over a three-day period. The leak is believed to have originated from a faulty tank that inspectors had believed to have been fixed.

The company adds this to its list of 205 convictions, with three major fines being handed down in the past three years alone.

The pollution went undetected for three days until a member of the public alerted the Environment Agency to a “grey sludge”. It had a profound effect on wildlife, with approximately 50 adult fish, including brown trout, killed.

United Utilities pleaded guilty to the charge of causing a water discharge not under and to the extent authorised by an environmental permit.

However, sentencing judge John Potter took further umbrage at the track record of the defendants. Speaking at the sentencing, Judge Potter stated: “By far the most serious feature of this case is the defendant company’s dreadful record of previous offending.”

He also commented that the incident was “neither accidental or unavoidable” while explaining that the company’s size and annual turnover of over £1 billion left it liable to the higher band of sentencing.

The fine would have been around £1 million, were it not for the early guilty plea submitted by United Utilities. The eventual fine of £666,000 was in addition to costs of £32,000. Mark Easedale, the environment manager for Greater Manchester, commented: “The Environment Agency takes pollution incidents very seriously and this case should send a strong message to companies of the potential consequences if they damage the environment.”

OTHER NEWS

Illegal waste carriers challenged by government agencies

A joint operation by the Environment Agency and the Driver and Vehicle Standards Agency (DVSA) aims to cut transportation of illegal waste and improve road safety in England.

After signing a Memorandum of Understanding in September, both agencies hope this new agreement will punish non-compliant drivers and their vehicles. The agencies will share information with each other, to improve vehicle and driver safety standards and make roadside enforcement on waste carriers more co-ordinated.

Their combined enforcement powers will ensure companies are meeting their legal requirements, and challenge waste being moved to poorly performing or illegal sites. For the first time, tackling waste crime will be more efficient, as both organisations will be using prevention tactics and intervening earlier in the waste chain.

Speaking to the staff of both agencies after the agreement was signed in London, Sir James Bevan, chief executive of the Environment Agency, stated that one of the main aims of the agreement is to protect people and their communities from how much influence waste and vehicle crime can have on them. DVSA’s chief executive, Gareth Llewellyn, hopes this new intelligence-sharing initiative will help to meet DVSA’s goal to protect the public from unsafe drivers and their vehicles as they will be able to work with rule-breakers more effectively.

With waste crime costing businesses and taxpayers £1bn per annum, unsafe operators should be reported to the DVSA to reduce this figure. In addition, the Environment Agency is encouraging businesses to check with them if the firm they employ to take their waste away is a fully registered waste carrier.

CASE LAW

Urban extension legal challenge rejected

A claim for judicial review of a planned urban extension to Canterbury on air quality grounds has been dismissed in the case of R (on the application of) v Secretary of State for Communities and Local Government & Ors.

An air quality assessment that formed part of an environmental statement was submitted in March 2016 by Corinthian Mountfield in relation to an urban extension of 4,000 homes, together with a variety of other forms of complementary development. The air quality assessment

monitored the impact of the development upon air quality, both in the vicinity of the site and also in the city centre, designated an air quality management area. The report determined that no excessive NO₂ pollution would arise.

The professor of health policy at the University of Kent, Stephen Peckham, disagreed with the report, suggesting that flaws in traffic modelling had led to underestimated levels of pollutants that would arise in the future from the development.

The proposal was not called in by the Department for Communities and Local Government.

The claimant believed this disagreement should have been called in under Directive 2008/50/EC on ambient air quality and cleaner air for Europe, which includes a requirement to ensure that threshold values of pollutants are not exceeded. Mr Justice Dove held that he could see no justification for a broader interpretation of Directive 2008/50/EC, and the judicial review was dismissed.

CONSERVATION

Earth's sixth mass extinction

Human overpopulation and overconsumption has resulted in a 'biological annihilation' of wildlife in recent decades, with the Earth's current sixth mass extinction more severe than previously feared.

Scientists believe the planet is experiencing a global epidemic of population losses, with approximately 32% of known vertebrate species and 40% of mammals decreasing.

By examining the fossil records, it was also established that the extinction rate of species among vertebrates over the past century has been up to 10 times faster than the 'normal' rate over the past two million years.

However, this problem was found to be just as severe among plants and insects, with the latter experiencing declines of approximately 45% over the past 35 years – with obvious consequences for the rest of the food chain.

The research points to larger population losses and assaults on biodiversity in the next two decades, making it "one the most severe human-caused global environmental problems".

It is thought that there is only a very small window of effective action – two or three decades at most – as human behaviour continues to reflect the 'fiction' that perpetual growth can occur on a finite planet, painting a dismal picture of the future of life. **T**



Sustainable change in Saudi

Chris Seekings meets regional
environmental champion
Dina Hasan Al Nahdy and
finds out how one of the world's
largest oil-producing nations is
carving out a greener future

Sustainability expert, CEO of a successful environmental services company, Leadership in Energy and Environmental Design (LEED) consultant and chairman on a national committee. Already an impressive list of accomplishments, Dina Hasan Al Nahdy is even a Guinness World Record holder. Her remarkable achievements coincide with her homeland of Saudi Arabia repositioning itself within the environment and sustainability sector after decades as a major oil producer.

2030 vision

Al Nahdy has been at the forefront of that transformation, and, after telling her of my upbringing in the Middle East, followed by some ribbing about my flawed Arabic, our conversation begins with me asking what she thinks Saudi will look like in coming years, and whether its dependence on oil will ever diminish.

"Well, diminish is a strong word. I don't think that will happen," she admits. "But our government has a vision that is well strategised – it realises that we cannot depend on oil forever, and we are working very hard to diversify." She tells me the country is now concentrating its efforts on scaling up its use of renewable energy, and that the government wants a "very large percentage" of its power to be sourced in this way.

Much of this plan is laid out in the country's 'Saudi Vision 2030', which aims to increase non-oil revenue sixfold by the end of the next decade, and hike its non-oil exports up from the current 16% of GDP to 50%.

In terms of energy sources, Saudi wants to create a vast pool of solar energy in the north of the country. However, this will not come without a cost to the public. "Our utility bills are going up, because the government was previously very generously covering the costs," she explains. "But that is a good thing in my eyes, as it means the whole community is realising there was a problem we were not taking care of before." ➤



Interview

➤ Dina Hasan Al Nahdy receiving her honorary doctorate in environmental sustainability from the UN

It has also reaped benefits for her own business, ENTEC, which has been offering environmental services since 1995. Al Nahdy tells me that when she used to approach an organisation, there was little interest because it was too expensive, but new energy and water efficiency has changed all that.

"Today is a totally different story," she tells me. "From private businesses to ministries and the regular community, they are all realising the importance of minimising our usage, and recognising the shift to renewable energy." As she explains, the volume and size of green projects in Saudi has increased dramatically. "We are busier than ever implementing water treatment plants, carrying out environmental baseline assessments, LEED-certifying factories, and providing international training courses."

Trying tourism

Part of diversifying the country's economy involves several 'mega-projects', one of which has already been inaugurated – the \$4bn Red Sea Project. Saudi sees tourism as a big part of its future, with this project planned to feature various resorts spanning 125 miles of the western coastline, including 50 untouched islands, natural reserves, inactive volcanoes and heritage sites. "There is a lot of natural beauty in that area, and this project will absolutely have to be done on an environmentally friendly basis." She goes on to tell me how sustainable tourism will be an important feature of the project, citing a particular coral in the area, renowned worldwide for its beauty, as something that needs to be preserved. "This is going to create so many jobs, creating a giant boom in this type of sustainable business, in implementing the project itself and then maintaining it."

There are seemingly many contradictions between a deeply conservative country, which each year attracts millions of Muslims on pilgrimage to Mecca, and one that sees itself as a potential top international tourism destination. However, Al Nahdy says that she does not envisage any issues: "The authorities and government expect this to be one of the top 10 tourist areas in the world. I am sure they would have taken that into consideration."

Saudi struggle

Al Nahdy's success appears in sharp contrast to the many stories that emanate from Saudi about women's role in society. Indeed, it was only last month that Saudi women were finally given the right to drive after almost three decades of campaigning. I ask her whether she had experienced many difficulties getting to her position? "Of course it was a struggle. There was a time when I couldn't go to a ministry myself and sit in a meeting with men, and I would have to send one of my male head managers instead," she says. She also reveals how difficult it was just to get the registration of her company in her name, as

"To take care of and preserve an environment takes everyone; it's not one person or one entity"



it was considered very strange for a woman to be in this field of work. "But today is a totally different situation," she insists. "Twenty years ago it was a struggle, 10 years ago it was difficult, but women are now able to do the same as men, they can go to business meetings and sign contracts, so things have changed dramatically – thank God," she laughs.

Al Nahdy is keen to highlight how the struggle for gender equality is a worldwide problem, not one exclusive to Saudi. "When I met Angela Merkel, she asked me about women's situation in Saudi. I said, listen, German women are still not getting equal salaries to men, this is a worldwide issue – and she agreed." While Al Nahdy is a firm believer that women have a right to equality, she adds: "I don't differentiate between female and male, what matters to me is the competence of the person and their performance, not their gender or nationality."

Lasting legacy

It was Al Nahdy's parents who got her interested in the environmental sector, teaching her at a young age to care about the environment and to preserve rather than waste. With a background in finance, she supervised and controlled all strategic and business aspects of her company, securing a local strategic partner, which has seen the firm grow in size and scope. She then went on to receive an honorary doctorate from the UN in environmental sustainability.

Despite her work on a whole series of environmental projects, Hasan Al Nahdy says that raising awareness in the general population is key to lasting change, but knows it will take time. "Behavioural change is not easy anywhere in the world. We have had a whole community that has been used to things like wasting water, and now they need to re-train themselves so it starts to become a self-discipline," she says.

It is this that led to her instrumental role in an initiative that not only raised environmental awareness in Saudi but made the whole world sit up and take notice.



Hand-in-hand

In 2013, Al Nahdy devised a plan to get everyone in the community involved in a project that would highlight the importance of sustainability and their responsibility to help protect the environment. The result? A 10,235m² hand painting of Saudi Arabia across the largest environmentally friendly canvas on earth – setting a Guinness World Record.

The initiative was called the hand-in-hand project, symbolising the collective effort needed to protect the environment – not that it was all smooth sailing. “Initially, it was supposed to be 8,000m², but then I heard someone else was working on the same record! The people at Guinness wouldn’t tell me what size the others were working on, so I bumped it up to 10,235m², and, since then, our record hasn’t been broken.”

More than 1.2 million people took part in the project from all

walks of life – from royalty to children – each segregating waste before making their mark on the canvas, with all the materials environmentally friendly. “At the end of the day, to take care of and preserve an environment takes everyone. That’s why we called it hand-in-hand – it’s not one-sided, it’s not one person, or one entity; it needs to be the whole community.”

Although awareness is increasing in Saudi, Al Nahdy is always looking to others that can share their expertise in areas such as environmental training, consultancy, and water treatment technology. Throwing down the gauntlet, she says: “If there are any freelancers or companies that see themselves as capable of coming here and providing services that will fulfil our needs, that’s what we’re looking for.”

I have found this interview enlightening, and it has left me hopeful for Saudi, but does Hasan Al Nahdy see herself as an advocate for change? “I am an Aquarius, so I am all about change and freedom,” she jokes. “I see tremendous change, but everything takes time, and it must be subtle and stable, without losing our traditions.”

DINA HASAN AL NAHDY is CEO of environmental services company ENTEC and chairman of the Environment Committee, Jeddah Chamber of Commerce and Industry

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Building blocks

With blockchain's potential to embed trust into digital and physical asset transactions, **Robbie Epsom** asks what role it could play in achieving the UN sustainable development goals

Blockchain has been touted by some as a ground-breaking new technology, on a par with the internet, that will revolutionise the financial system, remove the need for centralised institutions (such as banks and regulators), save the environment, the rainforest, the healthcare system and even free speech.

These might sound like unrealistic, far-reaching claims. However, with a quick internet search one can find numerous studies, or real-world projects, attesting to the progress being made in each of these areas. Granted, some have had more success than others, but the ambitions are there.

Road to renewables

Blockchain is essentially the algorithm that underpins bitcoin. At its core, blockchain is a decentralised network of digital records or 'ledgers' linked to

a particular asset, whether that be a bitcoin, a food product or even a written blog. Blockchain keeps track of every transaction made and its accuracy is guaranteed through the combined independent verification of the entire network.

Information on the history of ownership, financial data and any other important information is assigned to a unique signature known as a 'hash'. If someone alters that information, that unique code no longer works, ensuring authenticity.

The sustainable development goals (SDGs) are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. There are 17 goals, all of which are underpinned by more tangible targets requiring global co-operation, fast action, transparency, better management of resources (or assets) and trust. These goals were created

in response to major sustainability challenges, such as resource scarcity, waste generation, greenhouse gas emissions, water scarcity, poverty and inequality. With blockchain providing greater transparency, many existing positive actions trying to tackle these major issues can start to gain traction.

Blockchain is already making a big impact. For example, the UN's Kimberley Process Certification Scheme, set up following a series of reports exposing the link between the diamond trade and the financing of conflict, is piloting blockchain technology to create a seamless and continued global process. This is helping to achieve SDG 10 – Reduced Inequalities by verifying that diamonds are, in fact, conflict-free.

Tackling poverty (SDG 1) and inequalities (SDG 5 – Gender Equality and SDG 10 – Reduced Inequalities) are important aims of the SDGs. BanQu is using blockchain technology to provide

farming communities in developing countries with an economic 'identify' on the blockchain, regardless of how little land or income they might have and regardless of gender. This not only allows them access to credit but also opens them up to the global economy.

As a life-cycle assessment consultant, one of my favourite applications of blockchain is to monitor the procurement of raw materials through the supply chain by 'asset tagging' them with sustainability data. This creates a tracking system that verifies a product's source data as it moves across a supply chain, sending automated alerts about unexpected deviations that could signal potential tampering or environmental conditions that might pose health and safety issues. This would allow for full transparency and traceability throughout the supply chain, ensuring that products are actually sourced in line with their sustainability claims (for example, conflict mineral legislation, such as 3TG). It would also allow transparency across a product's life-cycle, supporting SDG 12 – Responsible Consumption and Production.

This concept is being put into action by UK-based company Provenance, which has piloted tracking fish through the supply chain to guarantee that sustainable claims aren't falsified as the product moves from the point of being caught to the supermarket shelf.

Customers looking to buy 'sustainably caught' fish can be sure that the claim associated with that fish hasn't been duplicated and their purchase is supporting the sustainable fishing industry. According to Provenance, this works by allowing traditional fisherman to send a simple text message to register a catch; this creates a new 'asset' on the blockchain with a unique ID and every time that fish product moves through the supply chain, the blockchain ID is sold with it. This unique ID can also have other environmental data attributed to it, such as life cycle assessment data,

'This technology has the potential to both speed up and instigate action towards the global sustainability goals'

along with relevant audit information to demonstrate the fish were caught legally and sustainably. This supports SDG 12, and SDG 14 – Life Below Water.

Eliminating waste

A German company called Slock.it is developing a 'Universal Share Network' powered by blockchain and using the Ethereum Computer. This will allow underused assets such as temporarily vacant apartments, office space, shipping containers or machinery to be used, creating an automated and fully verifiable infrastructure for the 'sharing economy', which also contributes towards SDG 12.

In October 2016, Wal-Mart partnered with IBM to use blockchain to track a 'packaged produce' item in the US and a pork product in China. This allowed it to obtain vital data for each product on how and where the food was grown or reared and who inspected it. When a contaminated product is identified, they can find exactly which farm it originated from and recall only those products affected rather than the entire range; this will save thousands of tonnes of food waste (SDG 2 – Zero Hunger).

The range of applications speaks volumes for the potential this technology has to both speed up and instigate action towards the global sustainability goals. Siemens' collaboration with LO3 Energy, for example, already demonstrates action under SDG 7 – Affordable and Clean Energy. This could transform the

market for localised energy generation, as it allows local energy networks that can separate from the main grid (during extreme weather events, for instance). It could also significantly reduce costs and encourage uptake of renewable energy and storage technology. This could potentially be done through existing technology, but blockchain provides the 'trust' that allows the trading of energy to take place outside a decentralised system.

It's also worth considering the campaign in the US by the residents of Flint (Michigan) to combine blockchain with the internet of things to build more trust into their water network. This is an example of SDG 6 – Clean Water and Sanitation, and should ensure there is never a repeat of the contamination emergency of 2014-16.

Cards on the table

These examples only scratch the surface of blockchain's potential to help achieve the SDGs. To meet the goals, we must collaborate on a global level and with 'trust' fully integrated. I think blockchain might be the tool to help us do this.

There are many other things that need to happen (from policy to corporate leadership action and technological advances) to tackle global sustainability challenges. But one thing is clear, blockchain has the potential to be a very effective tool for sustainability and will enable faster and more transparent action.

As global supply chains start to do business through the decentralised blockchain network, it may even allow progress in sustainability to take place faster than policy and trade agreements.

With all cards on the table, companies and individuals can hold their supply chain accountable, and the power for change is put in the hand of the customer. 📌

ROBBIE EPSOM is WSP principal consultant for environment and sustainability

Farming for the future

Rebecca Nesbit explains why GM foods and agricultural methods should each be judged on their own merits if we are to prepare for an ever-increasing demand for food production while protecting the environment

It's hard to see the facts about genetically modified foods. Activists cry ' Frankenfood ' and ' poison ', while proponents speak of environmental success, so it is perhaps no surprise that they are surrounded in controversy. As a society, however, we need to make decisions about if, and how, we use this technology.

Stakes are high; we can't feed the world's growing population without increasing the amount of food we produce. Without agricultural improvements, more people will go hungry. Meanwhile, we are facing a global extinction crisis, and agriculture is a major culprit.

The current debate serves neither food production nor the environment, so how do we end this bitter stalemate? To make any progress we need to start by distinguishing the product from the techniques.

How do we modify a plant's DNA?

The techniques that we class as genetic modification are by no means our only way of altering a plant's DNA. Decades before genetic engineering tools were developed, breeders began using chemicals and radiation to introduce random mutations. Although many of these mutations are damaging, some are beneficial. This increases the variation available for breeders, allowing them to develop a huge variety of crops. The crops we grow today look very different to their wild ancestors, and this was made possible through mutagenesis breeding.

Next came genetic modification, which introduces whole genes into plants. These genes can be from other organisms, such as bacteria or algae, or can be synthetic genes created in the lab.

More recently, genome-editing tools have been developed, the most famous of which is CRISPR-Cas9. These techniques can

introduce new genes, just as older GM methods do. Alternatively, they can also be used to make more subtle changes to individual DNA base pairs.

The diversity of technologies now used to alter crop DNA highlights the folly of defining a plant by the technology used to create it. Very similar products can be produced in different ways, yet have the same risks and benefits.

What are the benefits and the challenges?

A wide range of characteristics can be introduced into crops to make them healthier, hardier or higher yielding, and these are what determines the crop's impact.

During the research for my book *Is that Fish in your Tomato?* it became clear that putting all GM crops into one category masks the issues, both positive and negative. I needed to judge each crop on a case-by-case basis.

The risks and benefits of vitamin-fortified rice are completely different to those of insect-resistant cotton, for example, and they can't be assessed with generic arguments about the technology that created them. The issues are much better discussed in the context of specific crops.

The GM crops currently grown around the world are almost all resistant to herbicides or insects. Last year, over 99% of the 185m hectares of land planted with biotech crops contained crops resistant to herbicides, insects or both. Herbicide-tolerant crops have brought environmental advantages of 'no-till' farming systems.

Farmers have reduced their reliance on mechanical techniques such as ploughs for weed control. This protects the soil and reduces greenhouse gas emissions.

However, it has also given rise to a common criticism of GMOs: the creation of 'superweeds', which are hard to control.



INSECT-RESISTANT CROPS

Benefits: Where pesticides were previously used to control insect pests, their use has often decreased. Where farmers had little access to pesticides and crops were lost to insects, yields have increased.

Challenges: Insects can become resistant so they are no longer controlled by the crops.



'GOLDEN RICE'

Benefits: This biofortified rice has been developed to reduce vitamin A deficiency, which disrupts the immune system and can lead to blindness.

Challenges: Will the decades of investment pay off, or would money have been better spent on alternative solutions? How do we ensure that communities in developing countries can give full consent for use of new technologies?

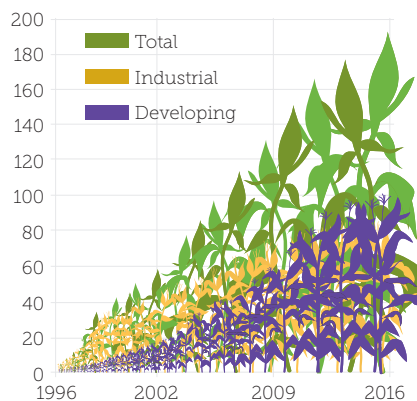


Figure 1: Global area of biotech crops (million hectares).
Source: ISAAA. 2016. Global Status of Commercialized Biotech/GM Crops 2016. Brief No. 52. ISAAA: Ithaca, NY, USA. www.isaaa.org

The crop can survive being sprayed with a specific herbicide, making weed control easier, but some weeds have evolved to survive this spraying.

Both these issues are important for users of herbicide-resistant crops, but they aren't relevant for other types of GM crop. Also, they are by no means restricted to GM varieties.

Herbicide-resistant crops can also be created using conventional breeding techniques, and resistant weeds evolve whenever herbicides are used.

Where do we go from here?

If we're going to reap the environmental and humanitarian potential of GM crops, we must look beyond this kind of commercial crop to those with characteristics that meet the needs of poorer farmers. One example is virus-resistant papaya, developed by academic scientists and now grown by Hawaiian farmers.

Other crops being developed with humanitarian goals in mind include drought-tolerant corn. If approved, this will be available royalty-free to smallholders in Sub-Saharan Africa.

Among the most exciting crops under development are those created using newer techniques of genome editing. In the laboratory, genome editing has been used to create disease-resistant rice and wheat, and enhance drought tolerance in corn. The lower cost has increased the opportunities to work with crops grown on a smaller scale, and scientists are working to develop disease-resistant citrus trees and wine grapes.

Field studies currently under way include early-yielding tomatoes, with the hope this could be used to create varieties that are suitable for a changing climate.

These examples show the future possibilities of GM crops, and we must judge the positive and negative impacts of each one individually.

If we are looking to build an equitable food system that benefits society while minimising damage to the natural world, we can't afford to waste resources by making GM a scapegoat. Banning the use of tools that modify a plant's genome wouldn't solve problems such as superweeds, and it may prevent us from developing crop varieties that support our true objective of sustainable agriculture. 🍅

REBECCA NESBIT is a writer. Her book *Is that Fish in your Tomato?* was published in July 2017

Seeing through the BIG SMOKE?

Although road transport is a major source of air pollution, public transport has a key role as part of the solution. **Andrew Clark** reports

The significant health impacts of pollutants such as particulate matter (PM) and nitrogen oxides (NOx) are increasingly well documented. As these pollutants result from the combustion of petrol and diesel, air quality is a key issue for the public transport sector, which has traditionally been powered largely by diesel.

This is particularly true of road transport, which has been the focus of recent UK government plans to improve air quality

in our towns and cities. It's important to note, however, that public transport is a net contributor to solving these issues. By reducing the number of vehicles, especially private cars, on the road, mass transit reduces emissions from travel and their impact on public health and the environment.

This point that public transport is part of the solution is crucial as policymakers design ways to reduce emissions from transport, and encourage behaviour change.

Recent research in the UK by Greener Journeys demonstrated that a Euro VI-rated diesel car emits 10 times as many per-passenger NOx emissions as a Euro VI-rated diesel bus. And a double-decker bus could take up to 75 cars off the road, at a time when the Department for Transport reports that the number of cars on England's roads is rising by over half a million every year. Without buses, urban congestion in city centres would be 21% higher at peak times, with air quality significantly worse as a result.

Vehicle technology

Reducing local pollutants has been the main driver of bus technology innovation for the past few decades, primarily through implementation of new 'Euronorm' standards for diesel vehicles across Europe.

Recent standards drastically reduce emissions of NOx and PM, and are also rigorously tested, validated and upheld – in contrast to recent scandals around widespread breaches of emissions standards in diesel cars.

In addition, new technologies and alternative fuel types that further reduce environmental impact are emerging. Electric vehicles, with zero-tailpipe emissions, have the potential to significantly reduce air pollution. However, they also bring a raft of new challenges, including operational range, battery technology risk and capital cost, which can be twice that of a conventional diesel bus.

The best way to fund and provide the necessary vehicle charging infrastructure – and associated energy demand – is also yet to be fully understood. There are multiple options when it comes to charging technology, from the 'plug-in' single charge solutions common among electric cars, with charging points located in bus depots, to 'opportunity' charging solutions located at strategic points, such as bus stops or bus stations. An opportunity charge solution can use either inductive or conductive technology.

New fuels

While electric buses will form an integral part of future European bus fleets, other technologies will also have their part to play. Gas buses, which can be fuelled with biogas and typically have lower PM and NOx emissions than even a Euro VI diesel bus, are an option, particularly in locations with abundant gas supply and existing infrastructure.

Other liquid fuels such as biofuels are also being increasingly used, although primarily this is to reduce carbon emissions.

Recent amendments to the Renewable Transport Fuel Obligation will accelerate the use of such fuels in the UK, by requiring transport fuel suppliers to deliver an increasing proportion of renewable fuel. This will be ramped up from today's 4.75% to 9.75% by 2020 and 12.4% by 2032, with a focus on biofuel from waste.

With international and national policy and vehicle technology developing fast, it is clear that a mix of technologies will be necessary. One size will not fit all for the diverse mix of long-distance, inter-urban and urban bus operations across the UK and Europe.

What is clear, though, is that public transport will continue to be part of the solution to tackling environmental and social challenges arising from global travel. 

ANDREW CLARK is head of environmental sustainability at Arriva

ARRIVA: DRIVING CHANGE



As a public transport provider, protecting the environment is an inherent part of Arriva's culture.

We recognise the key role transport services have to play in addressing environmental challenges – one that will grow in importance in a world of population growth, urbanisation and resource scarcity.

Our commitment is to continually reduce the impact of global travel by accelerating a shift to shared mobility, while minimising our own environmental impact as a business. To bring this to life, in 2015 we launched an Arriva-wide environmental strategy; our Journey to Destination Green.

Air quality is an extremely high-profile issue for our business. A strategic theme of Destination Green is fuel, with an increasingly important focus on reducing local air pollution. As well as working closely with authorities to tackle congestion and improve air quality through public transport provision, we are committed to reducing emissions from Arriva's own fleet. In the UK, the average emissions produced by an Arriva bus reduced by over 50% for PM and 40% for NOx between 2010 and 2016, as we have invested heavily in cleaner Euro VI vehicles alongside emerging technologies such as electric vehicles.

We began operating London's first all-electric bus line in 2014, and are operating an innovative trial of inductive, opportunity charging electric buses in Milton Keynes. During 2017, we will introduce over 470 new buses in the UK, all of Euro VI standard, hybrid, gas or electric.

We are also rapidly increasing our capabilities and understanding of electric vehicles across Europe, operating a steadily increasing number, for example, in the Czech Republic, Netherlands and Slovakia. While electric buses are an integral part of our fleet strategy, other technologies play their part. We currently operate gas buses in a number of countries, including Denmark and the UK, and in Sweden our entire bus fleet is run on biofuel. We're working hard to raise awareness of air pollution and to encourage understanding, use and support of public transport as part of the solution.

Our UK bus business participated in National Clean Air Day this year. For example, in the Midlands we led a campaign including sessions in local schools. Pupils created posters showing key facts, the best of which were displayed on board our buses.

While it is important to celebrate successes, we are looking firmly to the future to fully understand the new technologies and business models emerging to deal with issues such as air pollution, and provide the best solutions for customers.

Case study sponsored by:  **ARRIVA**
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An end to forced labour?

Two years on, what has been the
impact of the Modern Slavery Act?
Colleen Theron reports





New global slavery statistics released in September 2017 state that an estimated 40.3 million people were

victims of modern slavery in 2016.

The report calculates that, of 24.9 million victims of forced labour, 16 million are in the private economy, 4.8 million are in forced sexual exploitation and 4.1 million are in state-sponsored forced labour, including mandatory military conscription and agricultural work. Women and girls accounted for 71% or 29 million of all the victims in 2016.

Modern slavery is prevalent in virtually every sector across the globe. In the past few years, investigations into commodities tainted by slavery have included prawns from Thailand, debt bondage and forced labour in the global electronics industry and claims of the trafficking of migrant workers into the Scottish and Irish fishing industries.

The most recent media reports highlight the issue of child labour and debt bondage as a form of slavery in granite.

Habitat and John Lewis, as a result

of the report and pending further investigation, made a decision to remove black/star galaxy granite from sale.

In a bid to combat, or at least recognise and tackle the scale of the problem, the UK introduced the Modern Slavery Act 2015, which is the first piece of legislation to punish anyone found guilty of human trafficking.

The act introduced a provision on transparency in supply chains

(TISC). Section 54, also known as the TISC clause, which requires that businesses meeting the requirements of the act have to publish an annual modern slavery and human trafficking statement.

Who does legislation apply to?

Commercial organisations that carry on all or part of a business in the UK and supply goods or services with a turnover equal to or more than £36 million are subject to the disclosure requirement.

The act does not restrict the requirements to listed or large companies, nor is it limited by sector or product.

What is modern slavery?

There is no single definition in the act. It defines the offences of 'slavery, servitude and forced or compulsory labour' and 'human trafficking'.

How has business responded ?

The Business & Human Rights Resource Centre published an analysis of company statements under the UK Modern Slavery

Act, concentrating on the performance of the FTSE 100 as a litmus test of business action to combat slavery.

The analysis revealed patchy compliance to the act: a small number of leading companies

have produced rigorous statements, but there was no company that received their top score. Only 15 (56%) of the company statements examined fully and explicitly complied with the minimum requirements of the act.

While the report recognises that a number of companies are revising their practices and procedures to drive change, it states that there is still a long way for firms to progress. It also highlights the decisive role that company leaders can play in setting the culture of the company to tackle the eradication of slavery. However, it acknowledges that the act is driving some change.

Modern slavery
is prevalent in
virtually every
sector across
the globe

Modern slavery



In 2016, CLT enviolaw undertook some research to see how businesses were responding to the act and implementing its requirements.

While over three out of four respondents were aware of the act, there were still 14% that had not heard of it, or were unsure of its existence. 85% of respondents firmly stated that they were aware of the act; however, only one in four felt they had sufficient awareness in relation to what the act requires.

This indicates not only a lack of awareness-raising in relation to the act but also a lack of detail around its implementation and the necessary support that businesses require to effectively challenge slavery.

While the act does not set out what specific due diligence systems businesses should have in place, one thing that is immovable is the requirement for companies to produce a statement. In spite of this, 61% of companies either did not have a statement in place, or were unable to clarify whether or not a statement was in place.

Some 46% of respondents who were aware of the act had yet to produce a statement. This means almost 50% of firms are failing to adhere to the act. Some companies may not have completed their reporting cycle as of the date of the research and so may not have been required to produce a statement, which could affect the percentage of companies reported to be failing to adhere to the act. (All firms were obliged to have produced their statement by 31 September 2017).

While there is always a level of internal risk, that risk increases throughout each tier of the supply chain. As a result of

this, many organisations are working to improve the traceability of products, so ethical trade programmes can begin to leverage practices on a more global scale.

Unfortunately, the lack of implementation internally by businesses was echoed in their commitments to supply chain management, with three out of four companies not following their commitments of the act through to the lower tiers of their supply chain.

Some 47% were unaware or unable to clarify whether supply chain engagement

Organisations are working to improve the traceability of products

occurred. Research by Ergon Associates confirms the failings of companies to report on due diligence.

Media scrutiny and legal cases

The first reported conviction of a UK-based business owner for a human trafficking offence since the inception of the Modern Slavery Act was in January 2016.

Mohammed Rafiq, the owner of UK bedmaking business Kozee Sleep, was convicted of conspiracy to traffic. Rafiq's conviction followed that of two Hungarian gang-masters who were found guilty of supplying the UK factories run by Kozee Sleep and its subsidiary Layzee Sleep with slave labour.

The gang-masters promised Hungarian nationals good wages and housing if they

travelled to the UK. Instead, the workers were detained in overcrowded, squalid conditions, without freedom to travel, and forced to work 10 to 16 hours a day, often for seven days a week, and for less than £2 a day. The court concluded that Rafiq had knowingly employed these trafficked men and "went along with their exploitation as a slave workforce".

Earlier this year, two brothers from Nottingham were jailed for six years on account of modern slavery. The brothers recruited 18 vulnerable men from Poland to work at a Sports Direct warehouse.

In another case involving the trafficking of Lithuanian men to catch chickens for the 'Happy Eggs' brand, a landmark settlement of more than £1m in compensation and legal costs was reached. The deal was the first settlement of a civil claim against a British company in relation to modern slavery.

We have also seen a series of lawsuits being launched by residents in California against Nestlé, Mars and Hershey, claiming that businesses that have been linked to slave labour have deceived consumers through inadequate public disclosures, demonstrating that consumers are willing to take corporate accountability into their own hands.

These cases should provide a cautionary tale for global business. Kozee Sleep was a significant supplier to two key high-street brands and Happy Eggs is a brand that is prevalent in the supply chains of many supermarkets. On the face of it, the act only applies to larger companies that meet the threshold, but to be able to understand the risk in their supply chains, companies are having to carry out due diligence across their supply chains.

Increasingly, it is common for companies to require suppliers to confirm that they comply with the act and that those below them do too. This may leave many smaller companies with little choice but to be proactive to maintain their relationships with larger organisations.

Given the potential reputational impact to companies where modern slavery is uncovered in their operations, taking this issue seriously may call for more than a box-ticking exercise. ①

SLAVERY IN CHARTS





Big drivers for eco-revolution

With environmental legislation tightening, truck and van manufacturers are exploring greener options. **Nigel Carr** explains the drivers for the new eco-technology being trialled in the commercial vehicle sector

Commercial vehicles are set for an eco-revolution. Mounting environmental concerns over the past decade have led to tougher emissions legislation, with the UK government announcing this summer that sales of new diesel and petrol cars and vans will be banned from 2040.

It is the latest in a series of policy decisions aimed at reducing vehicle pollution. The most recent EU emissions regulations – Euro VI, introduced in 2014 – upped the game considerably for truck and van manufacturers. Tests show that the technology used by Euro-VI-compliant vehicles has virtually eliminated particulates.

However, with plenty of older vehicles still on the road, some cities are taking their own lead on cutting pollution. A more urbanised population and the trend for online shopping has increased commercial vehicle traffic dramatically on

urban roads, and charging schemes such as low emissions zones (LEZs) have been introduced for high-polluting vehicles.

London, which has operated an LEZ since 2008, is introducing a new 'toxicity charge' this October, meaning vehicles not meeting Euro IV emissions standards will have to pay £10 on top of the existing congestion charge whenever they drive into the capital. Mayor Sadiq Khan is also planning an ultra LEZ for 2019, which will mean a £12.50 daily charge for vans and £100 for HGVs not meeting Euro VI standards.

Other UK cities have indicated they will follow, while, internationally, Athens, Madrid, Mexico City and Paris have pledged to ban diesel engines from 2025.

This tightening legislation is fuelling a new wave of green technology from truck and van manufacturers. Urban deliveries are a key focus area, and that's why there has been a leap forward in electric and hybrid electric vehicles.

In the UK, Ryder will shortly take delivery of the Iveco Daily Electric van, a 100% electric vehicle with zero emissions. It is offered with one, two or three batteries; more batteries mean a lighter payload but allow longer-range deliveries.

This highlights the large weight difference between alternative fuel systems and conventional engines, which puts the former at a disadvantage. To counter this, the UK government is currently running a consultation on extending the legal gross vehicle weight for standard licences from the current 3.5-tonne threshold to 4.25 tonnes for electric vans. For long-haul operations, hybrid engines are more attractive, particularly diesel-electric. These vehicles use diesel power on trunk roads, then switch to electric at city outskirts to meet LEZ requirements. DAF unveiled a concept vehicle last year.

A greener form of hybrid is hydrogen-electric. In the US, Ryder recently became distributor for the Nikola One hydrogen-electric truck. Energy is supplied 'on-the-go' by a hydrogen fuel cell. Its appeal lies in reduced operating costs – the manufacturer estimates half that of diesel – and zero emissions.

Gas engines are another alternative fuel system, offering reduced emissions, quieter operation, fuel costs a third lower than diesel, and a substantial range. The Iveco Stralis LNG (liquefied natural gas) tractor unit recently completed the 1,347km journey from John O'Groats to Land's End on a single fill, pulling a laden trailer. Ryder is currently trialling the Stralis LNG with major customers.

Beyond engines, other emerging green technologies include kinetic energy recovery systems (KERS), which recover and store energy generated by braking. Other new features such as vehicle tracking also have an indirect environmental benefit, improving fuel economy and operational efficiency. Every small innovation contributes towards cleaning up our air. ➔

NIGEL CARR is head of engineering at Ryder UK, which operates a fleet of nearly 20,000 vehicles

THIS MONTH WE ASK...

What are the
challenges and
opportunities of
transposing the
EU environmental
acquis into
UK law?"



Let us know at iema-editor@redactive.co.uk if you have any questions you want answering in a future issue.

The big question



MARTIN BAXTER

Chief policy advisor at IEMA

"Any deviation will shove the burden onto regulators, businesses and professionals"

What we need right now is certainty. The UK has been without comfortable levels of certainty for well over a year and this limits businesses' ability to plan and perform for the long term.

Not knowing which way the legislative and regulatory wind will blow creates business risk, and, because big organisations can choose where in the world they conduct their business, the lack of long-term clarity could lead them to take their investment elsewhere.

Legislative uncertainty also affects the UK's ability to meet targets.

The Environment Agency has an enormous role to fulfil in protecting and enhancing the UK's environment every day, but that is currently severely hampered without long-term certainty.

While transposing the environmental acquis is an administrative challenge, it starts and ends with government. Any deviation from this framework will shove the burden and bureaucracy onto regulators, businesses and professionals responsible for environment and sustainability performance.

Having said that, sustainability professionals should have the chance to highlight areas for improvement – but only once we've established a baseline.

Transposition is both a challenge and an opportunity, and one we should get on with – quickly!



SHARON LASHLEY

Director of Enviro UK Consultants Ltd

"We need to grow our networks and ensure our voice is heard"

As one of the many environment and sustainability professionals delivering projects at grass-roots level every day, I can say there will undeniably be both challenges and opportunities.

The core principles detailed in IEMA's *Brexit and Beyond* guidelines underpin our standard delivery plan and a lot of the legislation will and absolutely should remain. But this presents those who deliver policies and regulators such as the Environment Agency an opportunity to finetune some of the legislative areas.

It is crucial that the environmental sector is included in these discussions, and that there is transparency, scrutiny and accountability. More important, there needs to be a focus on working with other agencies to ensure that we are stronger in our representation, that we can grow our networks and that our voice is heard in government.

We absolutely must continue to lead our profession, manage the risks and opportunities of transposition, collaborate with and involve other interested parties, set realistic SMART targets and objectives and be able to monitor and continuously improve.

We inevitably face challenging times, but if we continue to work to our IEMA *Brexit and Beyond* guidelines and encourage other sectors to recognise these principles, we can not only retain key strategies and legislation but reshape some areas for future improvement.



PROF ANDY JORDAN

Co-chair of the ESRC-funded Brexit & Environment network

"The risk of slippages and oversights is very real"

The referendum and subsequent election have already opened up new political opportunities, in the form of an energetic new secretary of state. Although it sided with the losing side in the referendum, the environmental movement has wisely opted to look forwards. Brexit gives space for new agriculture and fisheries policies. But it also brings huge challenges, the full magnitude of which will become clearer as the Withdrawal Bill inches through.

First, there is so very much to get right. The acquis has many different working parts, including law and policy but also institutions and governance. Second, the legal process of transposition – a highly exacting task – will have to be completed at break-neck speed in London, Belfast, Cardiff and Edinburgh. The risk of slippages and oversights is very real.

Third is acute political uncertainty. The two main political parties can't agree on a timetable let alone a destination, and that is before the EU 27 and the European Parliament have fully entered the process.

Fourth, environment, fisheries and agriculture are devolved matters. New institutions are needed to deliver common policy frameworks – in a climate of deep political distrust. This may require new levels of flexibility, such as common approaches for all of Ireland.

Unfortunately, deep, comprehensive trade agreements will be no more straightforward to explain to the public than 'Brussels'.

CONNECT

SOCIAL AND COMMUNITY NEWS FROM IEMA

23 NOV

IEMA's Leading the way conference 2017



IEMA's 2017 annual conference is your unique opportunity to learn from leading professionals creating our low-carbon sustainable future.

With keynote presentations from sustainability leaders through to panel discussions, sessions and one-to-one networking, IEMA Leading the Way 2017 is your platform to share your experiences and to learn about effective techniques and opportunities for change.

9:30am-12:00pm

Transformational change and climate action

How do we engender, embed and escalate climate action? The opportunities are there, and examples of pioneering practice are blazing an exciting trail. However, understanding

the changing landscape of energy and climate change practice can often be challenging. So let's learn from each other to help us all mobilise action for low-carbon transitions and more climate-resilient organisations.

2:00pm-4:30pm

Change management for sustainable development

Understanding the big issues is one thing; tackling them and taking stakeholders along the journey towards change is quite another. One of the most challenging elements of an environment and sustainability professional's working life is often co-creating and implementing change, but where do you start? Who is doing it well? This session will show you the way.

➤ bit.ly/2yyBgpv



"Discussing implications of #Brexit 4 environment summary: lots rules & regs need 2 b looked at!"

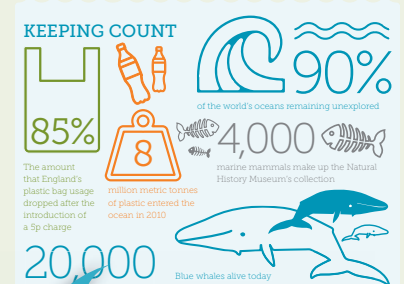
@Adam Woodhall

QUOTE
UNQUOTE



#IEMACONF17 the challenges of 21st c infrastructure @TimBaconIEMA speaking @Ben Vivian

LinkedIn



"Fascinating article in the IEMA Transform Magazine this month about the Natural History Museum's blue whale display. Loved these facts – 90% of the world oceans are unexplored! That's amazing! Thanks IEMA"

REBECCA MCLEAN



WEBINARS



8 NOV

An introduction to 'capitals': relationship capital

With IEMA's broadening focus on strategic corporate sustainability approaches, we recently updated the IEMA Skills Map to include 'capitals'. But what are capitals, and how can you use them to improve your sustainability performance?

➡ To book: bit.ly/2l2nfNU



15 NOV

ISO 14001: making the most of measuring, monitoring and reporting

Are you keen to adopt ISO 14001:2015? Join this free webinar with IEMA and BSI to help you implement an effective management system. Martin Hockaday of The Carbon Trust and a member of our BSI committee of experts on environmental management will explore how to make the most of the new requirements for monitoring, measuring, analysing and reporting – using appropriate indicators and data to drive change.

➡ To book: bit.ly/2yToUva



12 DEC

Brexit and beyond: future UK environment policy

IEMA has developed a set of core principles to guide the UK's transposition of the EU environmental acquis through the Great Repeal Bill, and development of a post-Brexit environmental policy framework.

Join this webinar to learn the latest developments in the transposition with IEMA's chief policy advisor, Martin Baxter.

➡ To book: bit.ly/2zysmlN

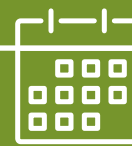


16 JAN

2018 with IEMA: setting the profession's voice for the year ahead

In the first IEMA webinar of the year, IEMA CEO Tim Balcon and chief policy advisor Martin Baxter will outline our plans for the year ahead. You'll hear how we'll be using our combined influence as a profession to impact change, and we'll talk you through policy changes to watch out for.

➡ To book: bit.ly/2yAeAaw



WHAT'S ON THIS MONTH

iema.net/events

9 NOV

BusinessGreen Leaders' Summit

BusinessGreen is hosting an inaugural BusinessGreen Leaders' Summit to mark its 10th anniversary and discuss the future of sustainable business. Bringing together some of the world's top sustainable business thinkers, including climate change minister Claire Perry, Jonathon Porritt of Forum for the Future, Dr Emily Shuckburgh of the British Antarctic Survey and senior executives from IKEA, Carlsberg, Tesla, M&S, Bloomberg and others.

➡ bit.ly/2ikE4Cv

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IEMA20!

23 NOV

ROI full membership and chartered environmentalist workshop

Join the first IEMA event from the re-formed Republic of Ireland region. This is an opportunity to learn more about the process of upgrading to IEMA Full Membership and Chartered Environmentalist status, and the competencies required. It's also a chance to meet other members, and suggest IEMA activities in Ireland.

➡ bit.ly/2yTroD8

7 DEC

IEMA North West Christmas social

Spread some seasonal cheer with the North West region – your local hub for environmental policy, legislation and regulation, networking and professional development. Our Christmas social lets you meet members from within and outside the network, catch up with old connections, and extend your network as you meet others.

➡ bit.ly/2hRsB9w



Why did you become an environment and sustainability professional?

My personal interest is in the environment and politics. I find it fascinating how laws and policies are intensely influenced by institutions or people in authority.

What was your first job in this field?

I was a graduate environmental engineer at the Tata Steel Works in Port Talbot; the coalface of environmental management, almost literally.

How did you get your first role?

I sent my CV to the environment department at the steelworks, which needed cover for a lady on maternity leave. I got an interview, and was offered the job. After that, I was encouraged to apply for the graduate scheme, which I then joined in 2007.

What does your current role involve?

I work for Natural Resources Wales, permitting and regulating the EU Emissions Trading Scheme, the Carbon Reduction Commitment Scheme and the Energy Savings Opportunity Scheme. There are only two of us covering Wales so it's quite busy, but the schemes are the frontline of the EU effort to reduce climate change, so it's a pretty rewarding job.

How has your role progressed?

I started off working in environmental management, ISO 14001, applying permit conditions in the steelworks, before moving on to waste management, but the elephant in the room was always climate change. In 2012, Tata Steel paid for me to do a master's degree in environmental dynamics and climate change, which opened the door to work in carbon accounting and reduction as well as helping towards my Full Member

application to IEMA and my Chartership. I joined NRW as a climate change specialist, but because of my varied background I also dabble in EPR (Environmental Permitting Regulations) work.

What's the best part?

I enjoy inspection visits as it's sometimes tricky to understand an entire installation just from reading their permit. I like to see things firsthand. It also helps to build good relationships. The more conversation between regulator and operator the better.

What's the hardest part of your job?

I find the enforcement and sanctions part the hardest. Our purpose is to help everyone comply with the regulations, and if we get to the point where we have to take enforcement action or apply financial penalties it feels like we've failed; but it's part of the job.

What was the last development event you attended?

An IEMA-organised seminar on the Well-being of Future Generations Act and the Environment Act, two groundbreaking pieces of legislation passed in Wales. The Wales Region is putting on some great events.

What did you bring back to your job?

A headache. Although groundbreaking, they aren't simple pieces of legislation, because they establish processes that are important to sustainable development. I'm accustomed to very specific actions and procedures.

What are the key skills for your job?

Critical analysis is the most important, followed closely by communication skills. Several



CAREER PROFILE

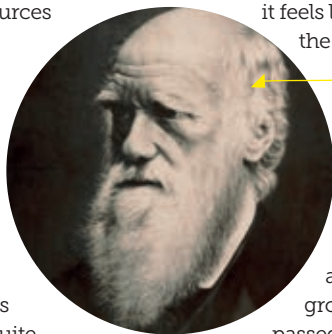
Chris O'Brien MIEMA CEnv

Senior permitting officer, EUETS, CRC & ESOS, Natural Resources Wales,

regulations allow the regulator discretion over whether companies are penalised or not. It's important to be able to step back, look at the history of the issue, check any precedence, potential environmental harm and make an objective decision.

Where is the profession going?

Short term, I don't have a positive outlook, with Brexit looming and the anti-science movement getting up some worrying momentum. With carbon budgets and the Welsh Acts, it seems there is still a progressive momentum on environment, but it needs organisations like IEMA to keep pressure on the legislators, reminding them of their obligations.



Where would you like to be in five years?

In **Lake Tahoe**, setting up the US carbon cap and trade system and snowboarding in my spare time. How often are national elections in the US?

What advice would you give to someone entering the profession?

To be a master of sustainability you have to be a jack of all trades. Keep learning about as many different aspects of the profession as possible. If you write procedures for an environmental management system, make sure you use IEMA's webinars and events to keep in the loop with environmental impact assessment, ecology, waste regulations, environmental permitting, community projects, climate change science – as much as you can find. Read the same story in different newspapers. The more you understand, the better placed you'll be to bring people onboard with the environmental agenda.

How do you use the IEMA Skills Map?

I use it primarily for mentoring. The Wales Region runs workshops for people looking to progress to full membership, and a key component is meeting the competencies required. It's surprising how many members think they have big gaps in their experience or learning, but realistically a sustainability professional may have many different skill sets. And just because you don't get paid to volunteer, doesn't mean key aspects of that activity don't contribute to your skills.

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

Charles Darwin; fairly predictable for a biologist!

What motivates you?

I'm motivated by the news more than anything else. One of the books on my MSc reading list was *Collapse* by Jared Diamond. I think this, and his *Guns, Germs & Steel* should be required reading for sustainability professionals. You see links between environmental degradation, socio-economics and global conflicts.

What would be your personal motto?

Leave it better than you found it. Not a bad mindset for any environmentalist. If my partner Jess is reading this, that also applies to my car! Stop leaving **pork scratchings** packets behind. 🐷



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for the Full Member profile

LATEST MEMBER UPGRADES

ASSOCIATE (AIEMA)

Aaron Roberts, Waterman Infrastructure and Environment Ltd

Amy Bennett, Employer – Smurfit Kappa UK

Anthony Jackson, Delphi Diesel Systems Ltd

April Sotomayor, Peterborough Environment City Trust

Basia Jaskot-Smolko, GallifordTry / Morrison

Benjamin Richardson, Helistrat Management Services

Christopher Jones, Bouygues UK

Claire Storey, KP Snacks

Dorian Banks, Johann Borgers GMBH

Duncan Petrie, Self-employed

Ed Brown, IEMA

Emma Buyers, IEMA

Faris Mansoor, Costain Ltd

Fiona Bussell, Network Rail

Gemma Vernon, EnviroCentre Ltd

Grace Agumadu, Central Bank of Nigeria

Hannah Gilmore

Hefin Clarke, Mitsubishi Power Systems Europe Ltd

James Ryder, Dyer and Butler

Janis Murphy, Warburtons Ltd

Jennifer Fitzgibbon, J Murphy and Sons Limited

Joshua Gladwell, Johnson Matthey Plc

Kate Ellis, First Ark

Katherine Wilson, Durham University

Keeley Williamson, IEMA

Kimberley Holland, Emcor Group Inc

Leif Waldoock, Arla Foods UK Plc

Maria Demmon, Siemens Plc

Maria Turnbull-Kemp, IEMA

Michael White, High Speed 2

Michael Wood

Nana Guar

Neil Weston, EDF Energy

Nicholas Monk, Southend-on-Sea Borough Council

Nina Klause, Schofield Lothian

Paul Nellist, Nathaniel Lichfield and Partners

Paul Phillips, McVitie's (UK) Ltd

Phil Thomas, Health & Safety Management UK Ltd

Philip Smith

Prem Krishnan, Self-employed

Rebecca Cranshaw, Eurostar International Ltd

Russell Hodgson, Hodkinson

Sarah Baylis

Sarah Marsden

Sharon Gower, Environment Agency

Shona Brown

Simon Pitsillides, FBRH Consultants Ltd

Steve Crookes, EDP Renewables

Stuart Parkin, Keltbray Group

Yvonne Hemmings

Zinzi Dzuda, Virgin Trains

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Rachel Kennedy, BP Global

Jon Treacher, Ramboll Danmark A/S

Felix Chamberlain, Network Rail

Polly Gourlay-Philipp, Skanska UK Plc

Nina Riehle, WSP Parsons Brinckerhoff

Adam Priestley, Jacobs UK Ltd

Adam Chivers, Sellafeld Ltd

Paul Donald, Environment Agency

Morwenna See, Marine Management Organisation (MMO)

Martin Sprange, Keltbray Ltd

Ronaldo Lacson, Serco Middle East (JBI Properties Services Company)

Warren Willshaw, Five Oceans

Environmental Services LLC

Gennara Iaconianni, Imerys Minerals Ltd

Russell Harris, T R Training

Jane Radford, Shutdown Maintenance Services Ltd

Francis Robson, Cenex

Graham Gunthorpe, Argent Group Plc

Alexia Laird, Canary Wharf

Contractors Ltd

Joanne Taylor

Emma Hill, CH & CO Ltd

FULL WITH CHARTERED ENVIRONMENTALIST (MIEMA CENV)

Andrew Wilkins, CH2M Hill

Hannah Rose, Clancy Docwra Ltd

Ahmed Elidrisy

Adam Ajzensztejn, Teva Pharmaceutical Industries Ltd

Christopher Jackson, Rolls Royce Plc

Kamran Fazil

Graeme Hannah, BRE

Katerina Robinson, First Group Plc

Barry White, Jennings O'Donovan

and Partners

James Pay, Brookfield Multiplex

Construction Europe

Luke Olly, Central England Co-operative

Peter Lumb, University of Cambridge

Clare Wharmby, Carbon Forecast Ltd

Ozunimi Lilian Iti

Sarah McMonagle,

Atmos Consulting Ltd

FELLOW (FIEMA)

Graham Dalrymple, RSM UK Consulting

Nicholas Blyth, IEMA

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You will assist the team in the fulfilment of the SHEQ strategy, promoting Environmental initiatives and advising on compliance with Environmental regulations.

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We reserve the right to close the vacancy once we have received sufficient applications, so we would advise you to submit your application as early as possible.

Due to the high numbers of applications we receive for our vacancies, if you do not hear from us within 4 weeks of the date you apply; please assume that your application has been unsuccessful for this position

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