the environmentalist

IEMA Transforming the world to sustainability

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Graphic illustrating research from the European Environment Agency summarising the likely effects from climate change on different EU regions

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Power of the professional

Unless you have been living under a rock for the past year, you will know that politics has taken on a defiantly populist flavour of late. The recipe seems to involve finding hairline cracks in society and making them wider through a combination of fear and uncertainty. The problem with wide cracks is that we can all fall into them if someone strong is not holding our hand.

The issue is not just about primal, tribal thinking. We are also having to fight the 'people are tired of so-called experts' trend. Suppression of knowledge and learned thinking is the last thing society needs in a time of 'fake news' and 'alternative facts', and there is no intellectual or moral argument to support this view. It is beyond uncomfortable; it is a concerning sign of division winning over unity.

So what do we do about it? The challenge for the environment and sustainability profession – one which thrives on learning and enables the right decisions and outcomes in everything it does – is a steep one. I think what we need to do is confidently offer professional counter arguments to policies, regulations and political shifts that we know are wrong – and we will have a stronger voice if we do that in partnership with other professions.

Over the past few months, I have been meeting chief executives of various professional bodies to explore how IEMA can work with accountants, architects, marketers, health and safety experts and others to create a loud, coherent and unwavering expert voice that kills the belief that the voice of the expert is dead. We know it is alive and well, and the world has never needed us more than it does now.

Those discussions are still in their early stages, but the signs are good. Interest in taking back the agenda appeals to professionals everywhere it seems, which is reassuring. We need to make sure whatever the sound of these aggregated voices, they remain passionate yet professional. That is our strength. That is the power of the professional. So, where the world is seeing too much division, we seek unity – in thinking, of voice and striving for the right outcomes. Stay with us to ensure you are part of this, and ensure someone strong is there to hold your hand.

> Suppression of knowledge and learned thinking is the last thing society needs in a time of 'fake news' and 'alternative facts'. We need to offer counter arguments to policies and political shifts that we know are wrong, and do so in partnership with other professions

Tim Balcon, CEO of IEMA

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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New head of the US EPA sets his focus on economic growth

Scott Pruitt, the new head of the US Environmental Protection Agency, has said that growing the economy and protecting the environment can go hand in hand.

Addressing staff at the regulator's head office in Washington, Pruitt said: 'I believe that we as a nation can be both pro-energy and jobs, and pro-environment. We don't have to choose between the two. I think our nation has done better than any in the world at making sure that we do the job of protecting our natural resources, and protecting our environment, while also respecting economic growth.'

He warned that regulators should not act outside their legal mandate but instead provide businesses with certainty: 'Those that we regulate ought to know what we expect of them so that they can plan and allocate resources to comply. That's really the job of the regulator, and the process we engage in.'

Pruitt's nomination by president Trump, confirmed by a 52–46 vote in the Senate, has been controversial. As Oklahoma attorney-general, Pruitt sued the EPA 14 times, while his LinkedIn profile describes him as a leading advocate against the agency's 'activist agenda'.

During his confirmation hearing, Pruitt was asked by senator Bernie Sanders whether he thought climate change was caused by human activity. He replied that he believed it 'impacted' rather than 'caused' climate change and argued his personal opinion was immaterial.

US environmental groups have reacted with dismay to Pruitt's confirmation as EPA administrator. 'As [Oklahoma] attorney-general he put dirty energy interests and other polluters ahead of protecting public health,' said Margie Alt at Environment America. 'Instead of taking steps to reduce pollution, he sued to stop the agency he will now lead from enforcing critical clean air and water protections.'

Shell reveals decommissioning plans

Proposals for retiring oil installations in the North Sea have been published for consultation by Shell. The oil company wants to leave the legs of four rigs along with their contents at the Brent field site.

Shell has four installations in the area, north-east of Shetland. At their peak, they delivered 500,000 barrels of oil a day but almost all of the resources that can be recovered economically have been extracted.

The proposals from the Anglo-Dutch multinational include securing 154 wells, removing the tops from all four platforms, recovering debris on the seabed and extracting the oil trapped in underwater storage cells. It also hopes to leave the concrete structures, including the legs supporting the platforms and their contents, in the seabed.

According to Shell, these were constructed nearly 50 years ago and were not designed to be removed. The safety risks of removing them outweighs the environmental benefits, it claimed.

But campaign group Greenpeace accused Shell of trying to wriggle out of decommissioning rules agreed under the OSPAR Convention on marine protection. These state that oil and gas installations should be brought ashore for decommissioning unless there are compelling reasons not to do so. The campaign group backs the recommendation to leave in place the concrete legs, but wants the removal of oil residues inside them.

Doug Parr, Greenpeace chief scientist, said decisions on decommissioning the rigs could set a precedent for other oil fields that are due to be retired. Shell estimates there are 470 oil and gas installations in the North Sea due to be decommissioned over the next 30 years. 'At some point the cells will break down, so they should be rendered safe,' Parr said.

Shortcuts

Waste treatment blow

The environment department (Defra) has decided to continue to allow residue from energy-from-waste plants to be sent to hazardous waste landfill sites. The UK has been short of outlets for this type of waste, known as air pollution control residue, a fine powder that remains once gases have been cleaned. For several years, the Environment Agency has allowed for it to be disposed at landfill if the waste exceeds the limits for leaching set by the 1999 EU Landfill Directive by up to three times. In 2010, Defra pledged to withdraw the exemption. Since then, the waste industry has been working on technologies to recover the waste and use it in products, such as a replacement for aggregates in concrete. Defra has now dropped plans to phase out the derogation over two years, citing a lack of alternative disposal solutions as the main reason. Jacob Hayler, executive director of waste trade body the Environmental Services Association, said the decision would damage investment in alternative treatment technologies.

Recycled medals

Metals in outdated and unwanted mobile phones and small electrical appliances will be recycled and forged into the medals awarded to Olympians and Paralympians at the Tokyo games in 2020. The organisers of the games hope to recycle around 8 tonnes of metal – 40 kg of gold, 2,920 kg of silver and 2,994 kg of bronze – derived from equipment donated by people across Japan. This will be enough to produce the 5,000 medals that will be awarded to athletes at the Olympic and Paralympic games in 2020. Collection boxes will be installed in more than 2,400 offices and stores of Japanese telecoms firm NTT DoCoMo from April. Japanese gymnast and three-time Olympic gold medallist Kohei Uchimura said: 'Computers and smart phones have become useful tools. However, I think it is "mottainai" [or wasteful] to discard devices every time there is a technological advance and new models appear. I think there is an important message in this for future generations.'

Businessplans

Swedish motorcycle and garden equipment manufacturer **Husqvarna** is to have its greenhouse-gas emission (GHG) reduction target approved by the Science Based Target Initiative (SBTI). The SBTI works with firms to set targets that are consistent with the global effort to keep temperature increases well below 2°C. The Husqvarna Group is committed to reducing its emissions intensity by 10% across its value chain by 2020 and its absolute GHG emissions by 33% by 2035 compared with 2015 levels. Measures being taken to achieve the targets include switching from petrol to battery products and generating energy from solar panels on its own buildings.

Spirits business **Bacardi** has reported progress in meeting many of its key social and environmental commitments. The firm said it had already exceeded 2017 targets under its 'Good Spirited' global environmental sustainability initiative (see *the environmentalist* March 2016, pp38–40), including improving water use efficiency by 1.8% over the 2015 financial year to 46.4% and reducing greenhouse-gas emissions intensity by 20% compared with 2006. Seven of the 29 facilities have already achieved the company's zero waste to landfill goal and the whole business is expected to have met it by 2022.

A joint project by **Caffè Nero** and recycling firm **First Mile** aims to collect waste coffee grounds in Greater London and re-purpose them into pellets for wood burners. The coffee retailer said that by July its baristas in 122 Caffè Nero outlets across Greater London will have helped to repurpose 218 tonnes of used coffee grounds into 98 tonnes of biomass pellets. The two businesses are also exploring how to refine oils from the coffee waste to create biodeisel.

Meanwhile, **Costa Coffee**, part of the Whitbread Group, has launched a nationwide cup recycling scheme. It will be available in more than 2,000 stores and guarantees the recycling of any paper takeaway cup, including those from competitors. Costa's waste partner **Veolia** will transport them to specialist waste processing plants. Costa claimed the scheme was the first of its kind among coffee shop retailers.

Youngsters pessmistic about future

Most young people are anxious about climate change, with those in China singling it out the issue that makes them most fearful for the future.

Education charity Varkey Foundation polled more than 20,000 young people aged 15 to 21 in 20 countries, from Argentina and Australia to the UK and US, about their attitudes and wellbeing. It found that 66% of those born between 1995 and 2001, known as Generation Z, were anxious about climate change, which came behind extremism and global terrorism (83%) and conflict and war (81%) as posing the greatest threat for the future. The one exception was in China, where 82% of young people said they were more concerned about climate change than any other threat. Figures for the UK and US were 62% and 59% respectively.

Society's ability to address climate change was seen by most respondents as more difficult than dealing with other issues young people were concerned about, including growing inequality, the ongoing refugee crisis and poor education provision in many developing countries. Nonetheless, 84% were optimistic that technology would solve problems in the future.

Overall, young people were pessimistic about the future. In 16 countries, more young people said they believed the world was becoming a worse place to live. Vikas Pota, chief executive at the foundation, said: 'Young people are a generation that is deeply pessimistic about the future of the world. They are not strongly influenced by politicians and think that their governments are doing far too little to solve the refugee crisis – one of the greatest challenges of our age.'

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Respondents were also asked why their country was a good place to live. Young Italians (45%) and Indonesians (30%) cited the natural environment as the main reason they liked their homeland.

Sweden aims for zero net emissions

A new climate law in Sweden promises zero net greenhouse-gas emissions by 2045 and a 70% reduction in domestic transport sector emissions by 2030.

The proposed legislation would enter force on 1 January 2018 and the bill paving the way for its introduction was signed last month by Isabella Lövin, minister for international development co-operation and climate. It makes the government and future administrations responsible for pursuing policies that are based on the climate goals. For the first time, Sweden will have long-term climate goals beyond 2020 and a council that independently reviews policy associated with these, she said.

The new law, which is being examined by Council on Legislation before it is presented for a final vote in the Swedish parliament, the Riksdag, was part of climate policy framework agreed by seven of the eight main political parties. It also includes new climate targets and the creation of an independent climate policy council to provide advice to policymakers.

Targets include zero net emissions by 2045. Emissions from activities in Swedish territory would have to be reduced by at least 85% compared with 1990 levels, with the 100% target achieved through supplementary measures, such as increased uptake of carbon in forests and land, and investments in offsetting projects in other countries. Under the plans, emissions in Sweden that are not covered by the EU emissions trading system would need to decline by at least 63% by 2030 compared with 1990 and by 75% by 2040.

Lövin said: 'There will be no more arbitrariness in climate policy. The large majority of the Riksdag supporting the framework enables a long-term approach and stability, which is exactly what climate policy needs. The transition presents enormous opportunities in the form of jobs, better health and competitiveness.'

Doubts cast on biomass impacts

Biomass can emit more CO_2 per unit of energy than most fossil fuels, according to a report from think tank Chatham House, which warns against assumptions that the organic matter is carbon neutral.

Most renewable energy policies treat biomass as though it has a zero carbon footprint at the point of combustion, the report notes. The EU Renewable Energy Directive, for example, considers only supply-chain emissions from biomass and counts combustion emissions as zero. The methodology assumes carbon has been absorbed during the growth of the trees or that the timber is harvested from a sustainably managed forest or from one that is growing. However, these ignore what happens to the wood after it is harvested, and the carbon sequestration that would have occurred if the trees were not chopped down. Also, the efficiency of dedicated biomass plants can be lower than those running on fossil-fuels, depending on their age and size.

The report was written by policy analyst Duncan Brack, who was previously special adviser to former energy secretary Chris Huhne. Black concluded that only wood residues that otherwise would have been burned as waste or would have been left in the forest and decayed rapidly could

be considered to be carbon-neutral over the short to medium-term.

The Renewable Energy Association said the report was misleading. Dr Nina Skorupska, chief executive of the trade body, said: 'This report hangs on the fallacy that it takes decades for a forest to recapture carbon. That isn't true. A well-managed forest is continually growing and it locks in carbon at an optimal rate.' The biomass supply chain is monitored in detail to ensure greenhouse gases are cut by at least 60% compared to fossil fuels, though in reality reductions are often closer to 80%, she added.

The UK's largest power station, Drax, is converting from coal to biomass (pp32–35).

Forward thinking needed on materials

New materials need to be designed with recycling and reuse in mind to avoid disrupting recycling systems, the Green Alliance says in a new report.

The think tank was commissioned by three organisations – government agency Innovate UK, the High Value Manufacturing Catapult, and the Engineering and Physical Sciences Research Council – to investigate how different materials could be reused, recycled and remanufactured. Such circular economy approaches could lower costs for British manufacturers and increase competitiveness, it said.

The report outlines a methodology developed by the four organisations to assess the resource productivity of three novel materials and processes: carbon fibre reinforced polymers, bioplastics and the materials and technologies used in 3D printing.

The report suggests increasing the use of waste materials and by-products to make bioplastics, which would lower waste cossts in the agricultural and food and drink sectors in the UK. Commercialising bioplastic production from waste would also enable British manufacturers to compete with Brazilian sugar cane and subsidised US corn that now dominate supply chains.

To realise these opportunities, the Green Alliance recommends that the government support new technologies and sectors through its planned industrial strategy. It said the government could assist by providing the information designers and manufacturers need to think through the whole lifecycles of their materials and to identify barriers to recovering value from them. It could also support collaboration between sectors and along supply chains to develop new applications for recovered materials, as well as fund research into more recyclable materials and new recovery technologies.

Short cuts

Palm oil target success

Most UK palm oil imports are now from sustainable sources, according to latest data from the environment department (Defra). The government pledged in 2012 to obtain 100% of palm oil from certified sources by the end of 2015. In its final annual progress review, Defra said 87% of UK palm oil imports have certification from the Roundtable on Sustainable Palm Oil (RSPO), based on Oil World data. Under this measure, 62% of imported palm oil was from 'segregated and mass balance' palm oil, which is derived from a mix of certified and non-certified sources. The equivalent figure in 2010 was 15%. Companies bought certificates (GreenPalm) from suppliers of certified palm oil for 25% of imports, up from 19% in 2010. Overall, imports of RSPO-certified palm oil more than tripled between 2010 and 2015.

BBC counts carbon

The BBC is expanding its commitment to sustainable production by announcing that all factual, comedy, drama, entertainment and daytime TV programmes from April will have to track their carbon footprint using the Albert carbon calculator for TV production (see *the environmentalist* August 2015, pp24–27). The calculator, developed by the BBC and now managed by the Bafta Albert Consortium, enables production companies to estimate the footprint of a programme by inputting information from across the production process, such as studio use and time spent in editing suites. The BBC said completing a footprint was already the standard for most productions, made by its own studios and independent production companies. The decision to make the scheme mandatory is supported by PACT, the trade association representing the commercial interests of UK independent television and media companies. Its deputy chief executive, Max Rumney, said: '[Our] members understand the importance of transitioning their productions to environmental sustainability and welcome the BBC's commitment to this goal by making the use of the albert production calculator mandatory.'

Climate change threatens more conflict

Climate change could lead to more armed conflict if left unchecked, the executive secretary of the United Nations Framework Convention on Climate Change has warned.

Patricia Espinosa (pictured) told a session of the annual Munich Security Conference last month: 'Climate change is the threat multiplier that worsens social, economic and environmental pressures, leading to social upheaval and possibly even violent conflict.'

Espinosa called for the climate change narrative to go beyond environmental risks, such as drought and resource scarcity. 'This story must be carried forward to show that already vulnerable communities become more desperate, more vulnerable and more susceptible,' she said. 'People are displaced in their country or to other countries. Add in conflict or predatory criminals or several concurrent crises and your humanitarian situation quickly escalates into a security risk.'

She said a failure to reduce emissions and build society's capacity to cope with the impacts of rising temperatures would result in more disruption, more instability and more displacement: 'The world will be less stable, less secure.'

She argued that exceeding the Paris agreement commitments and delivering the UN sustainable development goals would help to reduce the risk of conflict and increase stability: 'We [must] take real, meaningful action on climate change and the SDGs at the urgent speed science says is required.'

Also on the panel was Finland's president Sauli Niinistö. He feared the Arctic region and its natural resources could become a flashpoint for conflict. 'We have already seen flag planting,' he said, referring to the new Russian military bases in the region. 'Tensions will rise,' Niinistö predicted.

Sheldon Whitehouse, a US senator and member of the Senate Committee on Environment and Public Works, said

there was a risk that meaningful action to combat climate change would come too late or be scuppered by politicians who did not consider it a priority.

Whitehouse said he endorsed the views contained in a 2009 letter to President Barack Obama from US business leaders, including Donald Trump. It stated: 'If we fail to act now, it is scientifically irrefutable that there will be catastrophic and irreversible consequences for humanity and our planet.'

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BS 8555 update

The standard that guides organisations through a phased implementation of an environmental management system has been updated to reflect ISO 14001: 2015. BS 8555 can help firms to integrate environmental management into business processes and evaluate the supply chain, British standards body BSI said. The standard allows organisations to implement and maintain an environmental management system (EMS) using a step-by-step approach, with the option to stop at any of the five stages. The phased approach enables an organisation to choose the pace it implements an EMS and to maximise the areas of greatest potential return on investment, BSI said. BS 8555 has been reformatted and the language amended so that each phase follows a clear structure. David Fatscher, head of market development for sustainability and services at BSI, said that the phased approach would benefit small organisations with less money.
bit.ly/2lRRtiU

Legal warning

The UK's continued failure to tackle nitrogen dioxide pollution could result in court action, the European Commission has warned. The commission has issued the UK government with a formal request to comply with the Ambient Air Quality Directive. The commission said that, since 2010, the UK had persistently been in breach of maximum levels for nitrogen dioxide set by the directive in 16 areas, including London, Birmingham, Leeds and Glasgow. Similar requests have been sent to France, Germany, Italy and Spain. Governments of the five countries have two months to act, after which the commission could refer the case to the European Court of Justice. The UK government has already lost two court cases on air pollution. In November, the High Court ordered the government to draw up a new air quality plan by July 2017. Consultation on its new plan is expected to start in April.
bit.ly/2kppZnM

New PAS 2030

A standard specifying requirements for the installation of energy efficiency measures in existing buildings has been updated by BSI. The British standards body has expanded PAS 2030 to include details on design aspects that require installer validation, as well as specific methods, processes and procedures to be used in commissioning the installation of energy-efficiency measures and the handover of projects. The training, skills and competence of the people undertaking installation are also covered. The revised PAS 2030 is applicable to both commercial and residential buildings. It does not include requirements relating to certification by independent third parties. That is covered by PAS 2031, which is expected to launch this month. Meanwhile, the government has launched guidance on the minimum energy efficiency standard that will come into force in privately rented commercial buildings from April 2018.
bit.ly/2l4Hvhq

Record CEnv registrations and MIEMA successes

Last year, IEMA registered the highest number of Chartered environmentalist applications worldwide, surpassing the collective input of 26 other international licenced bodies.

The Society for the Environment (SocEnv) registered 407 CEnv registrations in 2016 from all licenced bodies. Almost 55% of the registrations (221) were through IEMA. The next highest body registered 66, with 186 other applications processed by the remaining 25 awarding bodies.

All members who apply for Full membership of IEMA are automatically assessed to become a Chartered environmentalist because the two standards are closely aligned. IEMA processed its highest number of MIEMA applications during 2016, which contributed to the significant upswing in CEnv registrations. IEMA has also revealed the current pass rate for MIEMA applications which, at the end of February, stood at 90%. The emphasis mentors and assessors have put into supporting people through the process is paying off, and has resulted in an increased uptake and an improved pass rate, said IEMA.

Head of professional standards Claire Kirk said this shift demonstrated improved member engagement. 'To see such an increase in the number of members seeking professional recognition through Full membership, and so many being successful, is fantastic,' she said. 'It indicates that the new membership standards are really resonating with members and that, despite the current anti-expert rhetoric being thrown around by politicians and the media, IEMA members and their employers continue to see value in high-level professional recognition that celebrates knowledge, experience, skills and influence. I look forward to welcoming in many more Full members throughout this year.'

The past 12 months has been a period of reform for IEMA. The changes –including the member level review, brand refresh and a renewed focus on enhancing value for members – have been positively received by members.

Corporate governance: 'More accountability to society needed,' says IEMA

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The government's proposed reforms to corporate governance must place long-term sustainability targets ahead of short-term financial gain, IEMA has said.

In its response to the green paper, IEMA stressed that, although a financial framework is important to the UK's continued economic growth, greater investment must be made to ensure corporate sustainability is both commercially viable and environmentally sustainable. The green paper states: 'The UK has long been regarded as a world-leader in corporate governance, combining high standards with low burdens and flexibility.' IEMA believes that, to remain a world leader, the UK needs to directly address the imminent issue of sustainability. Tougher requirements are also needed on transparency, accountability and stakeholder engagement.

Martin Baxter, IEMA's chief policy advisor, highlighted the need to reassess governance to embed long-term sustainability ahead of short-term fiscal gain. 'Companies have a critical role to play in enhancing economic and social value in a way that is low carbon, resource efficient, enhances natural capital and respects human rights,' he said. 'Current corporate governance practice places undue emphasis on short-term financial performance to the detriment of long-term decision-making in companies.

'Greater accountability to society is needed through enhanced corporate transparency and directors' accountability. This approach needs to be more clearly embedded throughout the government's reform of corporate governance. It must also be reflected in the way that boards engage with employees and stakeholders, in executive pay awards, and in the way that companies report.'

The consultation focuses on the challenges of 'increasing shareholder influence over executive pay and strengthening the employee, customer and supplier voice at boardroom level.' In its response, IEMA has called for greater accountability through enhanced corporate transparency and directors' culpability. 'Companies have a crucial role to play in improving economic and social value in a way that is resource-efficient and low-carbon, enhances natural capital and respects human rights,' it says. This embedded sub-culture of sustainability will plant the seeds for a more maintainable supply-chain and reaffirm public trust, IEMA adds.

'We do not believe that effective corporate governance should be differentiated on the basis of company ownership structure,' said Baxter. 'If there is a genuine desire from the government to improve trust in companies, then underpinning transparency and accountability safeguards need to apply equally to public and private companies. This means extending non-financial reporting.'

New places available on MIEMA scheme offering upgrade support

The road test of IEMA's new Full membership standard launched last month, and there has been exceptional interest from members eager to be among the first to be assessed against the new criteria.

Members had been given the opportunity to test the new membership application and assessment methods, and provide feedback on each element ahead of full roll-out of the standard later this year. With all 25 free places on the upgrade support programme filled within two weeks, IEMA made a further 25 available on 1 March to enable more members to upgrade to the new-look MIEMA with the support of an assessor.

By helping to pilot the new standard and the refreshed application and assessment routes, members can help to finalise the new gold standard for environment and sustainability professionals. Full members have always been able to inspire change in their organisation as well as influence initiatives and lead the sustainability agenda through workplace discussions, improving infrastructure and turning their vision into practice. The standard – set to launch in the summer – has been updated to ensure environmental management principles continue to be suitably celebrated and protected. It will also give members from a sustainability background the chance to have their expertise and experience recognised.

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Associate and Practitioner members are encouraged to make the most of this exciting opportunity to experience the new process and secure one of the free remaining places on the upgrade support programme.

Industrial strategy: an opportunity to accelerate transition to a sustainable economy

The government's green paper *Building our Industrial Strategy* sets out proposals to improve living standards and economic growth by increasing productivity and driving growth throughout the country. As an overall objective, it sounds great when viewed from a jobs and economic perspective, but it begs the question: green growth or growth at any cost?

The proposals in the paper are structured around ten 'pillars':

1. Investing in science, research and innovation.
2. Developing skills.
3. Upgrading infrastructure.
4. Supporting businesses to start and grow.
5. Improving procurement.
6. Encouraging trade and inward investment.
7. Delivering affordable energy and clean growth.
8. Cultivating world-leading sectors.
9. Driving growth across the whole country.
10. Creating the right institutions to bring together sectors and places.

The paper reaffirms the government's commitment to meeting targets under the Climate Change Act and supporting the shift to a low-carbon economy – although it stresses that this must only be at minimal cost to UK businesses, taxpayers and consumers. It is surprisingly silent, however, on the issue of resource productivity and the need to move to a circular resource economy. This seems like a missed opportunity. With the devaluation of sterling increasing the costs of imported materials, the need to extract maximum economic value from materials and resources multiple times over is a way of enhancing the competitiveness of UK businesses.

The government must use the industrial strategy to accelerate the UK's transition to a low-carbon, resource-efficient economy; one that gives a progressive outlook for the UK's future outside the EU. There is an opportunity, both here and in the forthcoming 25-year environment and carbon emissions reduction plans, to set long-term economic and environmental outcomes that fix the conditions to unlock investment, enhance natural capital and provide employment and export opportunities for UK business.

IEMA would welcome member views on the green paper. Please send these to m.baxter@iema.net and IEMA will ensure that the environment and sustainability profession makes a positive contribution.

Martin Baxter is chief policy advisor at IEMA.

Environment Works

Tackling the environment agenda: how materiality assessment can help

Every so often, the environmental market goes into a tailspin. Very uncomfortable for most; extremely unsettling for juniors and new starters; and potentially a business opportunity or unique selling point for sophisticated players. But the latter are few.

The latest tailspin is due to several factors. To cite an IEMA theme, we are in the 'perfect storm' of change, demand and increased scrutiny. What to do? Throwing in the towel is not an option. Neither is hiding away.

My advice to clients is always the same: know your business and be confident in what you do. You are probably a lot better than you think you are and probably have a much higher level of understanding, perhaps without the formal training or letters after your name. In short, it does not matter if you are the chief financial officer or head of marketing, perhaps with sustainability as one of your roles, or a seasoned practitioner with more than ten years' experience in environment and health and safety (EHS).

The key word here for March is 'materiality'. This is a particularly useful part of the GRI G4 guidance. For a firm foundation in EHS issues, assess what is material – what affects your business and what do people care about? Consult diverse stakeholders – it will be surprising what you learn and it is often an enlightening experience. You may find, for example, that operating an ethical business practice and employee wellbeing are just as important as safety considerations.

When material issues have been established build your targets, plans and operating procedures around them. This approach is always credible and you are more likely to get stakeholder buy-in and achieve your goals. Try not to copy and try not to over-promise. Sometimes, EHS goals are reached in stages; there is nothing wrong with that. Quantitative goals may be a second stage after initial

risk assessment. The business case for sustainability is the third stage but arguably the most important. Protecting the environment and conserving resource use will, in the short and long term, save you money.

Whatever the approach, my March message is simple: do not be distracted by the 'environmental noise' out there. Stay true to your plan – document it, implement it, measure it and get your teams on board so that everybody shares the same environmental goals and is equally rewarded for achieving them.

Nicky Spooner, head of consultancy at Environment Works.

Poor assessments put Natura 2000 sites at risk

Failure to assess properly the impacts of developments is exacerbating the degradation of Europe's natural heritage, a report from an NGO has found.

According to Justice and Environment, appropriate assessment (AA) of how a development would affect a Natura 2000 site sometimes falls short of the standards demanded by the European Court of Justice, which has clarified in case law specific aspects of the process under the Habitats Directive. 'When projects are permitted without proper assessment or by brushing aside scientific data, it often constitutes a breach of EU nature protection law,' said Slim Vahtrus, chair of Justice and Environment. 'While developers and authorities may consider assessments too burdensome, they must remember that it is Europe's natural habitats that bear the real burden.'

Article 6(3) of the Habitats Directive states that a project or plan should be halted if proof is lacking that it will not have significant effect on a protected area. However, the NGO found approaches vary in different member states. In some countries, an AA of the impact of development on a Natura 2000 site is carried out as part of an environmental impact assessment (EIA) or strategic environmental assessment (SEA); in others, a standalone AA is carried out; in others still, the need for an AA triggers a full EIA or SEA procedure, so no standalone appropriate assessment is performed, even

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though protection of Natura 2000 sites is the sole reason for assessing potential impacts.

The report, *Making Natura 2000 Impact Assessments Truly Appropriate: NGO proposal for an Action Plan*, notes that, although sharing similar features, there are also important differences between AA, EIA and SEA procedures, most notably in the scope of the assessments, public participation requirements, and the assessment and decision-making criteria.

Justice and Environment recommends three possible approaches to ensure an AA is always conducted. First, if an EIA or SEA has to be carried out, perform the AA as part of the same procedure to reduce the administrative burden and ensure that the results are given due attention. Second, if the AA is carried out as part of the EIA or SEA procedure, careful attention must be given to the different assessment criteria and the role in the decision-making process of AA on the one hand and of EIA or SEA on the other hand. Third, if an assessment of impacts on a Natura 2000 site is needed, an AA should be used instead of a full EIA. This final recommendation is because the AA is a more targeted and more efficient for such cases, said the NGO.

Article 6 does not contain specific provisions requiring the competent authorities to set up a public participation procedure in relation to the AA. Nonetheless, the report advises that best practice is to involve the public and environmental NGOs, in line with the public participation principles enshrined in the Aarhus Convention.

Update on transposing the EIA Directive with IEMA's Josh Fothergill

The consultation period on transposing the amended EIA Directive in the UK ends on 16 March (p16). Consultations have taken place across EIA regimes in the UK and departments are now analysing responses to see whether the proposed draft regulations require further amendment before launching on 16 May.

IEMA has responded to each consultation, engaging with members to gather views. It is fair to say the consultations have been a mixed bag, with Scotland's approach gaining most support among members.

Member concerns in other regimes have focused on the risk posed by the way the UK government has proposed to interpret key requirements around competent experts and how the revisions to scoping will work. Although members appreciate that the government has attempted to bring clarity to these areas – which are poorly defined in the EIA Directive – the majority opinion is that the regulatory proposals generate more questions than answers.

Hub of information

IEMA has launched an EIA transposition hub on its website's IA policy page (bit.ly/2m3V40F). The hub provides access to: every IEMA response to the consultations on transposing the amended directive; all presentations and webinars delivered at member engagement events; and guides, briefings and webinars relevant to forthcoming changes to both the EIA process and the new or revised environmental topics that will require consideration.

IEMA will update the hub during the year. This will include guides on: EIA and assessing greenhouse-gas emissions; assessing health in EIA; and assessing best and most versatile agricultural land.

Launch events

IEMA has planned for the launch of new and amended EIA Regulations, with an event in London, hosted by CBRE, on 16 May and a webinar setting out the key details on 17 May. IEMA is also participating in a webinar for RTPI members on 8 March.

MPs scrutinise post-EU chemical controls

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Chemicals regulation is essential to UK firms and must remain in some form after Brexit, according to witnesses appearing before a cross-party group of MPs.

The parliamentary Environmental Audit Committee is examining the future of chemicals regulation once the UK leaves the EU. REACH, the main EU regulation governing chemicals, has come under particular scrutiny because it is not possible to transfer it directly through the government's planned Great Repeal Bill. The regulation is reliant on governance at EU level, where a specialist agency with a large, continuously updated database of chemicals has been established. Chemicals is the second biggest manufacturing sector in the UK and exports 55% of its products to the EU, according to the environment department.

Michael Warhurst, executive director of campaign group CHEM Trust, pointed out that, as REACH also applied to countries in the European Economic Area, a similar free-trade agreement with EU could see the regulation continue to apply in the UK. Such an arrangement would place the UK in a similar position to Norway, which can participate in REACH but not vote on decisions relating to the regulation, he said.

However, the Chemicals Industry Association (CIA) said it did not believe this model was feasible because the government plans to leave the single market. Its policy director Nishma Patel told MPs the chemicals industry would also want to continue to have a say over regulation.

Patel said the CIA was considering the feasibility of a system of mutual recognition between systems in the UK and EU. 'For example, if we take the first pillar of REACH, the registration, the data requirements to submit a registration dossier would essentially be very similar or identical. It would mean one registration would cover you for UK and EU manufacturing and supply because many of our companies are not only based in the UK but have counterparts in Europe.'

If the EU decides to ban or restrict a specific substance, the UK may decide to follow suit if it was in the national interest or take its own approach if it was not, Patel said. Similarly, if the UK wants to ban a substance, the EU could then consider doing the same. 'That [is] a potential mutual-recognition type of model that could work. Obviously, the detail would [depend] on whether the EU and the UK can agree on that sort of mutual recognition.'

Tech UK, which represents companies in the digital economy, found its members overwhelmingly wanted to keep REACH because it gave them access to the single market. The body wants any national regulation to mirror REACH so that the UK maintains the same list of chemicals that companies have to report on and updates it simultaneously.

What will the UK's exit from the EU mean for the environment?

The question all environmentalists in the UK are continuing to ask is: 'What will the country's departure from the EU mean for the environment, climate change and biodiversity loss?'

In my opinion, Brexit is the single biggest threat, not only to the UK but to European environmental protection. The EU has been (and continues to be) the unsung hero of environmental protection across the continent. There are more than 2,000 EU environmental laws protecting everything from the air we breathe, to nesting sites for birds and the cleanliness of beaches and bathing waters. Many of these have been driven by UK experts and elected representatives.

But prime minister Theresa May appears determined to stick to deadlines and, with the triggering of article 50 looming, there is a lot at stake and a lot to lose. Environment secretary Andrea Leadsom has stated already that 'slashing regulations for farmers' will be a top priority for the government. Does she mean weakening of EU emissions ceilings or plant and bird protections we must adhere to? What else is she planning to slash and what key EU environmental standards is she seeking to opt out of? Or will the EU demand that any deal on Brexit protects them?

The European parliament's environment committee has investigated the impact of Brexit on its work. The committee's report made it plain that the UK must abide by Europe's environmental regulations as part of any deal to leave the EU. Environmental challenges are cross-border issues and EU countries will want guarantees that the UK will continue to pull its weight tackling climate change, fighting cross-border air pollution and protecting migratory species.

Environmentalists must make themselves aware of the threats and be prepared to ask awkward questions of the negotiators. Writing to ministers or constituency MPs, local papers and broadcast media, pointing out the EU protection afforded to local Natura 2000 sites or levels of air pollution in cities, is effective and helpful.

The Brexit government must not be allowed to start a bonfire on good EU environmental protection.

Catherine Bearder, Liberal Democrat MEP.

In court

Problems at landfill site costs Suez more than £500,000

After a four-year investigation, Suez Recycling and Recovery has been fined £180,000 and ordered to pay £325,000 costs for a series of offences in 2012 and 2013 at its Connon Bridge landfill site near Liskeard, Cornwall.

The firm pleaded guilty to six offences under the Environmental Permitting (England and Wales) Regulations 2010. These included allowing leachate to exceed permitted levels; letting leachate overflow from an extraction point; and unlawfully discharging contaminated water.

Truro Crown Court was told the Environment Agency began having concerns about management of the landfill in 2012, which was run by SITA UK, a subsidiary of the global Suez Environment Group. Heavy rain caused leachate levels to rise rapidly beyond limits specified by the site's environmental permit.

Officers visited the site in January 2013 and found two watercourses, the Widowpath and Connon Streams, smothered in sewage fungus for about 4 km. The agency said it was the worst outbreak of sewage fungus in the area for 20 years. Its investigations uncovered spillages of leachate on to uncontained areas of the site; surface water contaminated by leachate; and that leachate had compromised water quality in a groundwater drainage culvert beneath the site.

At the same time, residents were complaining about the worsening smell. The agency said it was apparent the site operator was struggling to regain control of the landfill. Officer Simon Harry said: 'People living close to Connon Bridge landfill will not have forgotten the appalling odours that emanated from this site in 2013. The negligent failings of the landfill operator resulted in pollution both by odour and to local watercourses.'

He added that the judge had acknowledged the distress caused to the local community by the odour. The agency said the costs awarded by the court reflected the work that went into investigating and prosecuting the case, which it described as complicated and technical.

A statement from Suez said: 'Like many other landfill sites around the country, Connon Bridge experienced issues managing leachate and landfill gas during the exceptionally wet weather conditions experienced throughout 2012. We have not sought to shy away from these shortcomings and pleaded guilty to six of the 11 charges at the earliest opportunity, co-operating with the agency throughout. We contested the remaining five charges and these were not pursued.'

The site is due to close at the end of next year.

£100,000 cost of river pollution

Imerys Minerals has been fined £75,000 and must pay £25,000 in costs after polluting a river with a hazardous chemical.

Truro Crown Court was told the French-owned company ignored the manufacturer's warnings when it chose to let almost 500 litres of a hazardous chemical enter one of its pollution treatment systems in July 2013.

The company was cleaning out a redundant storage tank at its Rocks Dryers site near St Austell, Cornwall, which contained an estimated 474 litres of Jayfloc 85. The chemical is a flocculent used in china clay processing and is classified as hazardous and harmful to aquatic life. The manufacturer's guidelines say the chemical should not be allowed to enter drains, surface waters or groundwater due to its toxicity. But Imerys staff flushed the chemical out of the tank and into the site's effluent treatment system, which includes a series of settlement lagoons. They believed it would be heavily diluted before entering Rocks Stream, a tributary of the River Par, although they did not carry out a risk assessment for the task.

In a statement, Imerys said it had made changes to its procedures to ensure there was no repeat: 'Imerys takes its environmental responsibilities very seriously and has a good track record of compliance and co-operation with the regulators in what is a challenging and environmentally sensitive industrial sector.'

Case law

The order of local plans

In *DLA Delivery v Lewes District Council*, the Court of Appeal upheld the High Court's decision that the making of a neighbourhood plan (NP) did not have to await the adoption of other documents on future local development.

DLA Delivery challenged the council's decision to allow the NP, which had been prepared by Newick Parish Council, to proceed under the Town and Country Planning Act 1990 (TCPA) before its statutory adoption under the Planning and Compulsory Purchase Act 2004 (PCPA). The claim was dismissed in the High Court in July 2015.

Justice Lindblom quoted passages of *Gladman Developments v Aylesbury Vale District Council*, which he said were applicable in this case. In summary: under para 8(2)(e) of the TCPA, the NP did not have to await the adoption of any other development plan; the NP could address housing needs unless or until there was an adopted development plan setting a housing requirement for the same period; and, if the planning authority later produced a development plan containing new 'strategic policies', it would, under the PCPA, prevail over any inconsistent policies in the NP.

The judgment emphasises that the purpose of para 8(2)(e) in the TCPA is to ensure an appropriate degree of consistency between an NP and the strategy of an adopted development plan. An NP may include policies allocating land for particular purposes even when there are no 'strategic policies' in the adopted development plan. This may be either because there are no relevant strategic policies or the strategy itself is redundant due to it running out of time.

Jen Hawkins

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New regulations

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In force	Subject	Details
1 Feb 2017	Environment protection	The Financial Assistance for Environmental Purposes (Scotland) Order 2016 amends the Environmental Protection Act 1990 to enable Scottish ministers to give financial assistance for the purposes of meeting requirements relating to river basin management plans. bit.ly/2jGkq2G
2 Feb 2017	Waste	The Producer Responsibility Obligations (Packaging Waste) (Amendment) Regulations (Northern Ireland) 2017 amend the 2007 regulations by increasing recycling targets for plastic and glass for 2016 to 2020. The target for recycling of glass by re-melt for 2016 and 2017 is continued for 2018 to 2020. bit.ly/2k9X8mC
6 Feb 2017	Environment protection	The Plant Health (England) (Amendment) Order 2017 implements three EU directives (2016/715, 2016/764 and 2016/1359) that apply controls against the introduction of phyllosticta citricarpa, xylella fastidiosa, epitrix cucumeris, epitrix similaris, epitrix subcrinita and epitrix tuberis. bit.ly/2iILLC8
9 Feb 2017	Pollution	The Air Quality Standards (Amendment) Regulations (Northern Ireland) 2017 transpose requirements from directive 2015/1480, which revises required sampling methods for the assessment of ambient air quality. bit.ly/2jf8Zf8
11 Feb 2017	Environment protection	The Plant Health (Import Inspection Fees) (Scotland) Amendment Regulations 2017 amend the 2014 regulations to apply reduced charges for checking imports of specified eligible products for the 2017 calendar year. bit.ly/2k7PeGu
1 Mar 2017	Energy	The Contracts for Difference (Standard Terms) (Amendment) Regulations 2017 amend the 2014 regulations to allow the secretary of state to set different payments for generators under a CFD (contract for difference). This information will be in the form of standard terms. bit.ly/2lPtHmR
1 Apr 2017	Taxation	The Scottish Landfill Tax (Standard Rate and Lower Rate) Order 2017 sets the standard and lower (specific qualifying material) rates of landfill tax for disposals in Scotland on or after 1 April 2017. The rates are £86.10 and £2.70 respectively. bit.ly/2liMTwh
2 Apr 2017	Energy	The Renewable Heat Incentive Scheme (Amendment) Regulations (Northern Ireland) 2017 amend the 2002 regulations to introduce cost-control measures for installations accredited before 18 November 2015 and falling within the small and medium biomass tariffs. A two-tier tariff and an annual payment cap of 400,000kWhth will be put in place for eligible heat payments. bit.ly/2kpdpoc
1 Jan 2018	Ecodesign	Regulation 2016/2281 establishes the ecodesign requirements for air heating and cooling products, high-temperature process chillers and fan coil units. This equipment must be designed and manufactured to satisfy requirements under the regulation. Further deadlines – 26 September 2018 and 1 January 2021 – also apply. bit.ly/2i8Skgv
1 Mar 2018	Hazardous substances	Regulation 2016/1179 updates classification and labelling of specified substances under the CLP Regulation 1272/2008. Lead is classified as toxic for reproduction category 1A at particular concentrations relating to its powder form and the massive form. Classifications for substances, including copper oxide, bisphenol A, glass microfibres, lead powder and massive, copper(II) oxide and dicopper are updated. bit.ly/2chZxnJ

This legislative update has been provided by Waterman's Legal Register available at legalregister.co.uk

Latest consultations

10 Mar 2017
Combustion plants

A consultation on proposals to transpose EU Directive 2015/2193 on medium combustion plants (MCPD) has been published by the Scottish government. It is also seeking views on how to control nitrogen dioxide emissions from high-emitting diesel generators. The Scottish government is proposing to transpose the MCPD through the Integrated Authorisation Framework. The directive must be transposed into legislation by 19 December 2017, with requirements for new plants coming into force in December 2018. Older plants must comply from 2024 or 2029, depending largely on size.
bit.ly/2h9iNFE

16 Mar 2017
Impact assessment

The Department for Business, Energy & Industrial Strategy is consulting on legislation in two areas that will need amending to transpose the revised EU Directive on environmental impact assessment (2014/52/EU). The first concerns draft regulations to replace existing legislation insofar as 2014/52/EU applies to consents under ss 36 and 37, and variations under s 36C, of the Electricity Act 1989. The other seeks views on amending regulations relating to consenting regimes for offshore hydrocarbon-related developments, including pipelines and onshore pipeline projects.
bit.ly/2ksQgBl; bit.ly/2lkQudo

24 Mar 2017
Clean vehicles

The European Commission is consulting on plans to revise Directive 2009/33/EC on the promotion of clean and energy-efficient road vehicles. The consultation is part of the commission's impact assessment of options for a possible revision of the directive to better support EU policy objectives on climate change and air pollution and to stimulate the market for clean vehicles as well as increase competitiveness.
bit.ly/2i0EVqx

4 Apr 2017
Planning process

Proposals to revise the planning system in Scotland have been published. They consist of 20 proposals for improving the process, including: enhancing national spatial planning and policy; developing a more transparent approach to funding infrastructure; ensuring infrastructure planning delivers low-carbon solutions and new digital technologies; and making better use of resources.
bit.ly/2j0B0I4

18 Apr 2017
Heat and energy efficiency

The Scottish government designated energy efficiency as a national infrastructure priority in June 2015, to cover heat decarbonisation of domestic and non-domestic buildings. District heating networks were identified as important for meeting Scotland's future heat demand. The government is now consulting on developing a regulatory framework for district heating and ensure that Scotland's Energy Efficiency Programme (SEEP) achieves its broad objectives to reduce energy demand and decarbonise heat supply in buildings.
bit.ly/2kScoDV

30 May 2017
Energy strategy

The Scottish government has published a draft energy strategy setting out its vision for the future up to 2050. The consultation is one of a series on energy, and includes on local heat and energy efficiency strategies and regulation of district heating (above).
bit.ly/2ja2pFL

New guidance

Carbon footprints	Consultancy Carbon Footprint has developed a code for carbon management. It describes best practice for measuring and managing carbon for a business, products, services, projects and events (bit.ly/2lOSqIO). Carbon Footprint says the code is an internationally recognised standard that enables a business to promote its low-carbon credentials, while giving customers confidence that a globally-approved process has been followed and verified.
Non-financial reporting	Software company Greenstone has produced a guide to choosing the right non- financial reporting framework from eight common ones: GRI, UNGC, SDGs, IIRC, CDP, ISO 26000, DJSI and SASB. The guide provides a summary of each framework, including what is covered, how it is used, and who it is aimed at (bit.ly/2kSccVr). Greenstone featured in the recent *environmentalist* review of non-financial reporting software (see January 2017, pp14–20).
Emissions trading system	The Environment Agency has updated its guidance for existing and new participants of the EU emissions trading system (ETS) and participants in the small emitter and hospital opt-out scheme (bit.ly/2lOIleV). It has five sections: assessing whether a site has obligations under the ETS; how to apply for a permit; adhering to permit conditions; how to report changes; and appealing against decisions. The agency has also produced separate revised guidance on the ETS for aircraft operators (bit.ly/1zxE0A3). Both guides cover phase III of the system.

THE STATE OF THE PROFESSION

PRACTITIONERS' SURVEY 2017

the environmentalist

IEMA Transforming the world to sustainability

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PRACTITIONERS' SURVEY 2017 – THE HIGHLIGHTS

Annual survey of IEMA members reveals modest pay growth but gender gap persists

Although uncertainty abounds as 2017 progresses, environment and sustainability professionals are expressing high levels of job satisfaction and optimism that they can meet the challenges of the year ahead. Almost seven in ten are satisfied or very satisfied with their current role, with just 6% dissatisfied, according to the latest IEMA practitioners' survey.

On their single biggest challenge or opportunity for 2017, IEMA members are focused mainly on understanding how changing laws and regulations will affect their work. Improving work–life balance, changing jobs, upgrading IEMA membership and increasing their overall impact are also high on the agenda. Despite the uncertainties around Brexit and a US president sceptical about anthropogenic climate change, just 17% feel demoralised about the global challenges and unpredictability ahead. They are outnumbered by the 43% who are optimistic, with 35% somewhere in the middle.

On reward, pay growth has been steady, with median earnings – the mid-point in the range – of £39,000, compared with £38,180 a year earlier. A stubbornly wide gender pay difference persists, however. For full-time employees it is 16.7%, much higher than the national figure of 9.4% and the same as we reported a year ago.

The survey reinforces the reputation of the profession for having a strong commitment to continuing professional development (CPD). Some 89% of IEMA practitioners engaged in CPD activities in 2016 to further their career goals. Filling skills gaps (56%), training or mentoring other staff (28%) and improving environmental performance (24%) were regarded as the biggest direct benefits of CPD.

This commitment to development appears to be paying off in terms of the career progression seen in the sector. More than half (56%) of practitioners reached management or leadership positions last year, while 17% moved to more senior roles.

THE TOP FINDINGS

- The median annual salary in the 12 months to January 2017 was £39,000, while the average or mean was £44,008.
- Median salaries for business and industry roles were higher at £41,000 than those in consultancies (£37,750) or the public sector (£35,547). Salaries were highest in the financial and legal services sector, where the median was £49,000.
- Some 62% received a pay increase in 2016, but this was down slightly from two-thirds in 2015 and much lower than in 2014, when 73.5% had an uplift. Self-employed members were less likely to benefit from a pay increase, with only 37% reporting a rise in earnings in 2016.
- By region, the highest median salary was found in eastern Scotland (£41,650), while Northern Ireland had the lowest (£30,558).
- The gender pay gap for the profession remained at 16.7%. However, full-time women in the 25–29 age bracket earned £2,000 more than their male colleagues at the median.
- An IEMA Graduate member can expect a starting salary of around £25,000 a year. The median for Practitioner members (PIEMA) is £38,000, while that for a Fellow is £70,900.
- Almost two-thirds (61%) of those surveyed had a form of postdoctoral qualification, with just 1% having no formal qualifications.
- Our survey found 3% to be entry-level members, 41% to be IEMA Practitioners and 56% in management or leadership roles. Across the sample, 17% moved into a more senior role in 2016 and 13% switched sideways.
- Continuing professional development activities were undertaken by 89% of members in 2016. The most popular pursuits were reading *the environmentalist* and other key materials, and participating in IEMA webinars.
- Job satisfaction rates are high, especially among 'career changers', of whom 80% are happy with the move they have made. Among all respondents, 69% are either satisfied or very satisfied with their current role; just 6% are not.

Salaries by

Industry and sector

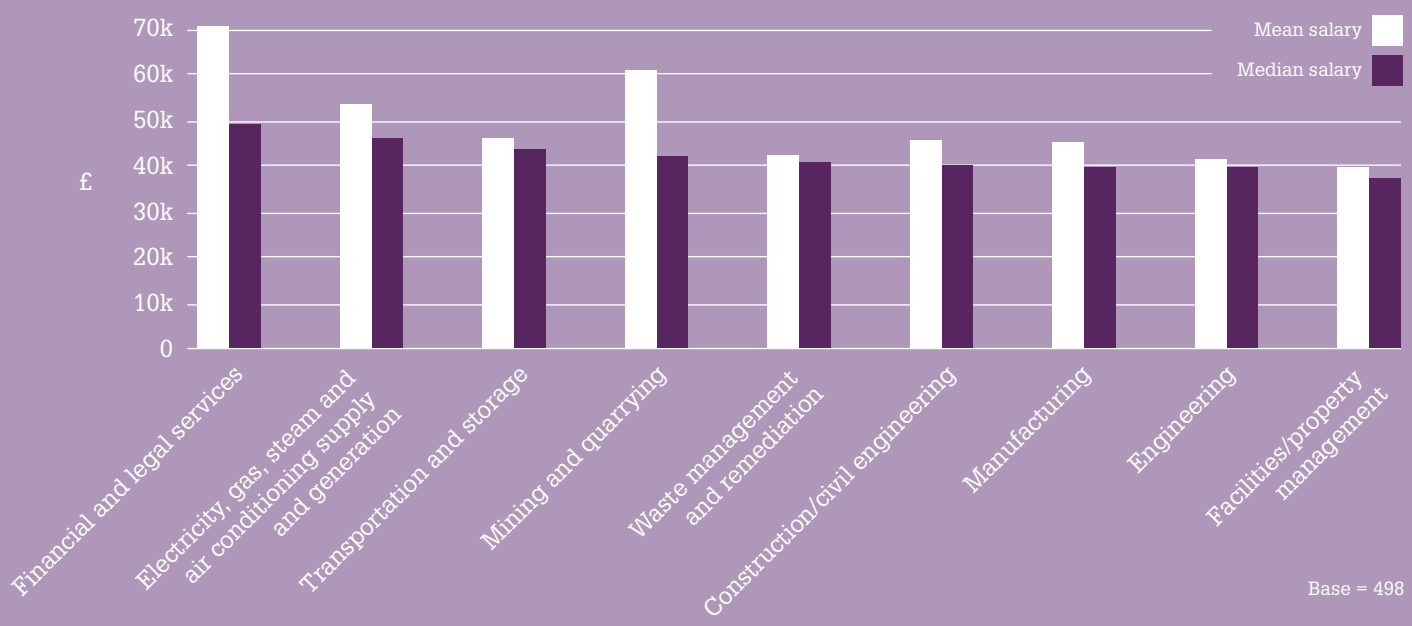
The pay headline of the practitioners' survey this year is slow but steady earnings growth. The median annual salary for full-time environment and sustainability professionals stands at £39,000, up by around 2% on £38,180 one year ago. The average or mean salary is £44,008, also up from last year's figure of £43,812.

This headline figure compares favourably to the median of £37,675 recorded for professional occupations in the 2016 Annual Survey of Hours and Earnings (ASHE) published by the Office for National Statistics (ONS) – although it slightly lags behind the national median of £40,627 for science, research, engineering and technology professionals.

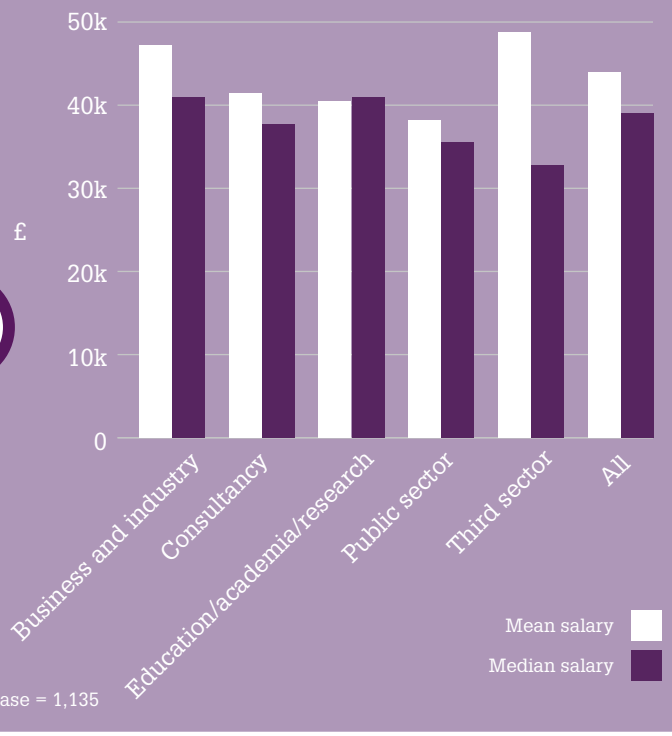
The 2017 survey finds that the median annual salary for professionals working in business and industry stands at £41,000 over the 2016 calendar year, compared with £37,750 for colleagues working in consultancy. Pay in the consultancy sector appears to have dipped, although this may be explained largely by sampling variations (see below).

The survey reveals a surprisingly high median salary for respondents from academia and research, which stands at £41,000, level-pegging with corporate roles.

Salary by industry



Salary by broad industrial sector



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It should be noted, however, that this figure is based on a smaller sample than other groups. Likewise, the findings for the third sector should be treated with caution due to the small sample size.

For business and industry roles, the mean salary of £47,207 illustrates the impact of some significantly higher salaries at the top end. By subsector, higher pay rates are most likely to be found in financial and legal services, which has a higher median salary (£49,000) than any other sector this year and a mean of £70,339. For the past few years the top spot has been occupied by the mining and quarrying sector, reflecting high salaries in oil and extraction. But this year the median in this sector has dipped to £42,000 from £52,500, although the mean is the second highest at £60,790.

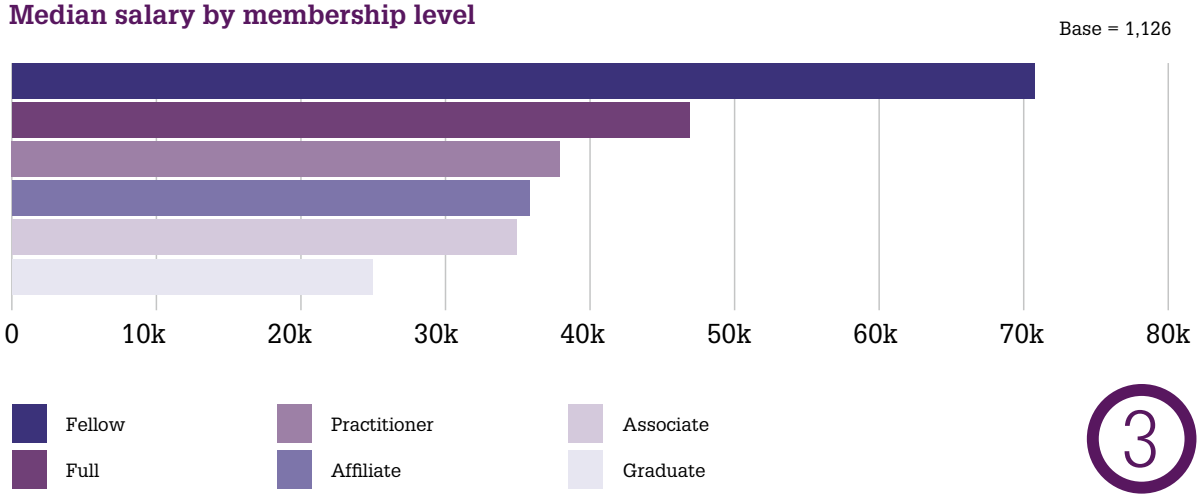
The lower figures for consultancy salaries this year may be explained partly by the fact that the sample contains a very low proportion of respondents from planning or management consultancies, and these tend to offer higher salaries than engineering and environment/sustainability consultancies (both recording a median £37,000). For the very small group of professionals working for management consultancies, the median salary is £51,000 a year. Consultants fare better in pay terms than employees in the public sector (£35,547), where government-imposed pay restraint continues to bite. Although the public sector does not suffer the skills shortages of engineering or construction, reports of difficulties recruiting specialists or professionals to meet the numerous challenges the services face are increasing.

Overall, median salaries for environment and sustainability professionals have risen by just 2.5% over the past three years.

Salaries by

Level of IEMA membership

Median salary by membership level



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Pay is influenced by a host of factors, but individual skills, knowledge and experience are among the most important in determining salary and potential for pay progression. As in previous years, the 2017 survey finds a clear route to pay progression through the IEMA membership levels.

The median for members who have achieved the status of Fellow (FIEMA), for example, is £70,900, which is around double that of Associate or Affiliate.

For Graduates, headline starting salaries have been static since the economic downturn that began in 2008. When the online HR service XpertHR published its annual survey of graduate starting salaries in August 2016 it found the median – £23,000 in 2016–17 – to have been frozen for the eighth successive year. Unlike XpertHR's benchmark, the median starting salary of £25,000 for IEMA Graduates has risen by £500 since the 2016 survey. Although the 2% increase in starting salaries for graduates between the 2016 and 2017 surveys mirrors the overall rise in median salaries for practitioners, the relatively small uplift also reflects less demand for university leavers. A survey last year by the Association of Graduate Recruiters revealed an 8% drop in vacancies since the 2015 poll. The number of vacancies had fallen most in construction, retail and engineering, and compared with 13% rise in demand for graduates the previous year.

The steps in salary between membership levels are significant, suggesting that the professional requirements members need to upgrade are well rewarded in salary terms as well as career progression. For those at graduate level, the findings suggest that a pay premium of more than 50% can be achieved by upgrading to the new Practitioner (PIEMA) grade. Likewise, the median salary for those who achieve Full IEMA membership (MIEMA) is 34% higher than the going rate for those at Associate level.

The status of IEMA Fellow, intended to recognise the visionary leadership of the profession, commands a median salary 51% higher than that for Full members. At this level, the range of salaries is much wider depending on sector and individual role, with the mean reaching £85,925. The mean salary for MIEMAs is £53,585, while that for a PIEMA is £41,896.

Changes to salaries by IEMA membership status between 2016 and 2017 reveal that the median salary for a Fellow increased by 4%, from £68,000 to £70,900. Median salaries for Full members have also risen, by just over 3%, from £45,000 to £47,000. In contrast, median salaries for Associate members have declined by 5% since last year's poll, from £37,000 to £35,000.

However, over the past few months many former Associates have upgraded to Practitioner level, which IEMA introduced in June 2016. PIEMA level is described by IEMA as a new stop on the membership journey, and is designed to bridge a perceived gap between Associate and Full membership. IEMA says it demonstrates to employers that the individual is equipped, connected, fully up to date and in touch with learning opportunities that will help them deliver their sustainability programmes. PIEMA is aimed mostly at those working across organisations at an operational level. The 2017 practitioners' poll shows that a PIEMA earns around 8% more than an Associate.

Salaries by

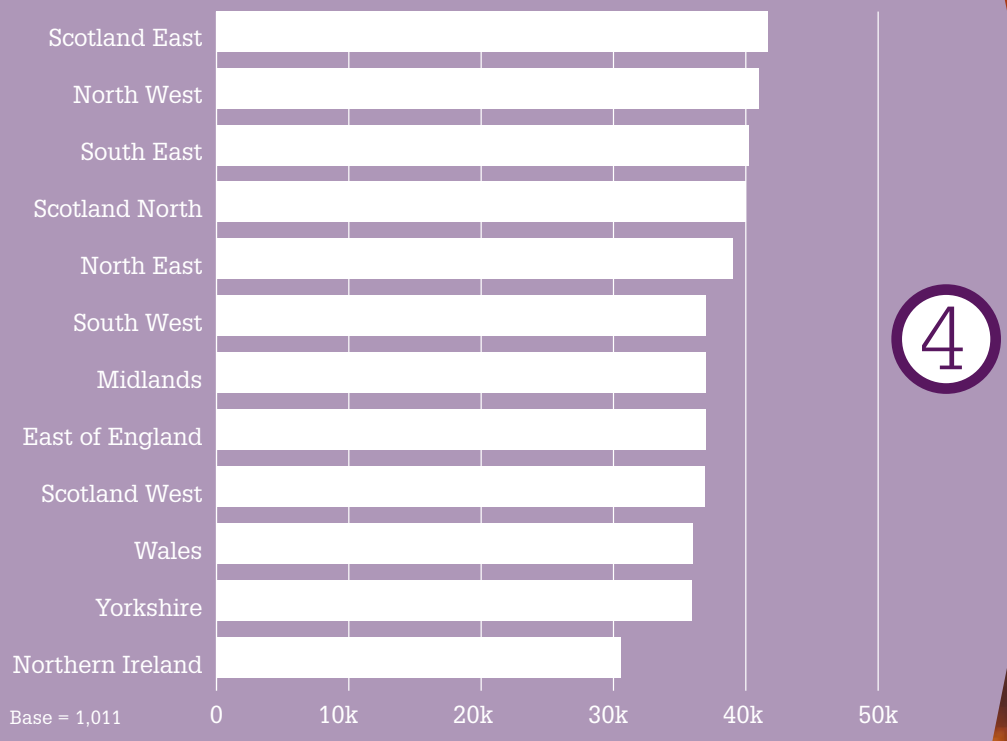
Region

Most professional occupations tend to command significantly higher wages in London and the South East than in any other area of the UK, but this does not hold true in the environment and sustainability professional jobs market. Instead, Scotland often occupies some of the top spots in the salary league tables, and this year is no exception.

Although at £40,250 the median salary for practitioners in the South East is slightly above that for the sector as a whole, chart 4 shows that the highest medians by region can be found in Eastern Scotland (£41,650) and the North West (£41,000). With the cost of living so much higher in the South East, however, this does raise questions about affordability for environment and sustainability professionals working in London, for example.

The South West, Midlands and East of England all show a median annual salary that is below the national figure (£39,000). Meanwhile Northern Ireland, which has among the lowest pay levels in the UK according to the 2016 ASHE survey, sits at the bottom of the earnings table this year, with a median annual salary of £30,558.

Median salary by region



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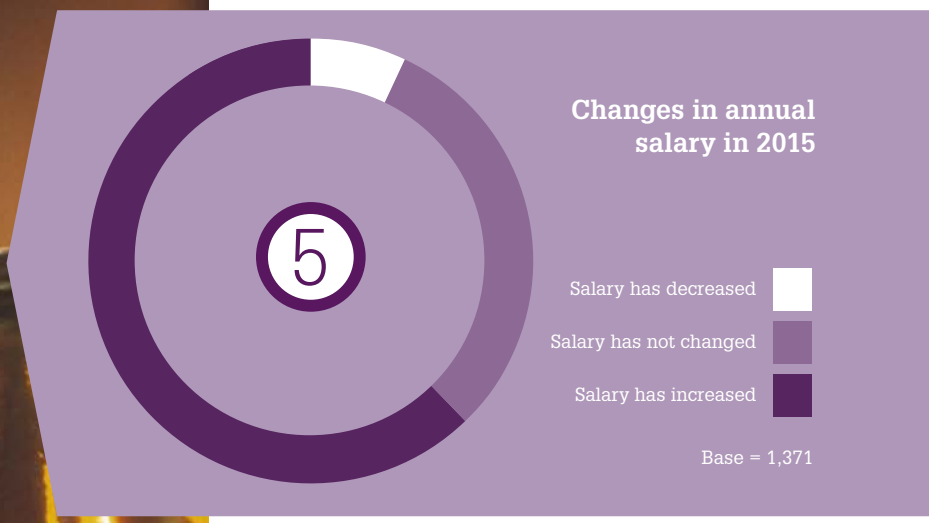


Changes to salaries

Rises and prospects

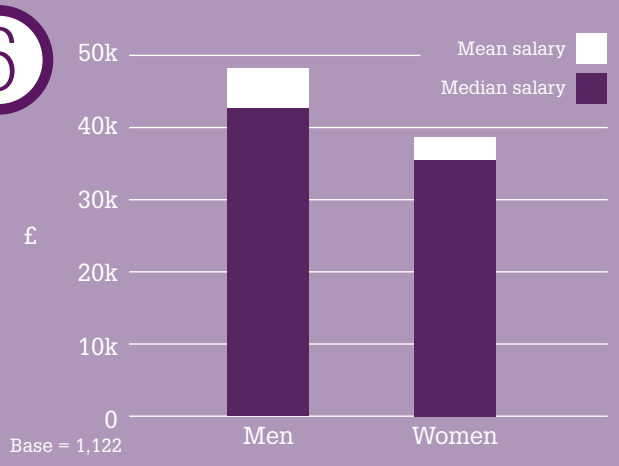
Pay levels and increases generally across the economy are still suffering the effects of the 2008 downturn, although 2016 was slightly more positive in pay terms due to low inflation and modest pay growth. The economy has been resilient since the EU referendum, with the UK posting the fastest growth rate in the G7 economies last year. Improved global economic conditions have led the Bank of England to upgrade its 2017 growth forecast to 2%, while EEF, the manufacturers' body, described the outlook for the sector as 'upbeat' in its February 2017 monthly briefing. Yet high levels of uncertainty and rising inflation led the Resolution Foundation and others to speculate that rising prices and low productivity will plunge the UK into a further phase of falling earnings in real terms.

The 2017 IEMA survey reveals that 62% of environment and sustainability professionals received an increase to their base pay in 2016 compared with 2015. Pay for 7% decreased, while base salary for a further 31% was unchanged.

Figures for self-employed professionals tell a different story. Almost one in three (30%) were paid less in 2016 than in the previous year, while more saw their base pay stand still (41%) than increase (37%). Becoming self-employed holds many benefits for environmental professionals, such as greater flexibility and work fulfilment, but the findings suggest that it is far tougher for this group to secure yearly pay increases.

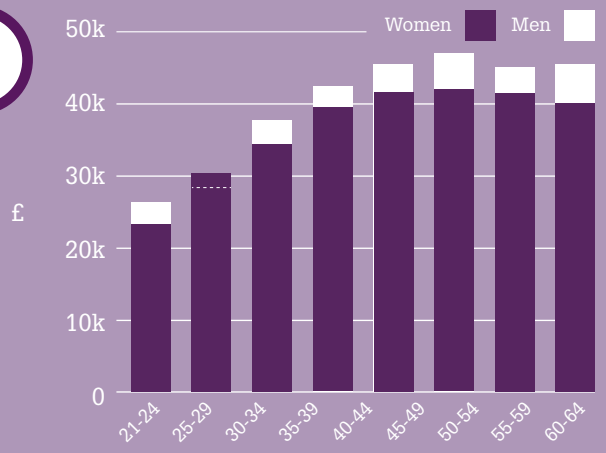
Salary by gender

6



Salary by age and gender

7



Diversity

Age and gender

The gender pay gap 2013–16

	2013		2014		2015	
	Mean	Median	Mean	Median	Mean	Median
Men	£45,368	£39,000	£47,970	£41,200	£45,211	£40,000
Women	£37,358	£33,050	£38,432	£35,000	£36,938	£35,000
Pay gap (£)	£8,010	£5,950	£9,538	£6,200	£8,273	£5,000
Pay gap (%)		15.3		15.1		12.5

	2016		2017	
	Mean	Median	Mean	Median
Male	£50,278	£42,000	£47,503	£42,000
Female	£37,797	£35,000	£38,091	£35,000
Pay gap (£)	£12,481	£7,000	£9,412	£7,000
Pay gap (%)		16.7		16.7

8

On a national, whole-economy basis, the gender pay gap continues to narrow slowly for full-time employees and was 9.4% in April 2016 for median hourly earnings, the ONS reports. Although this was the smallest since the survey began in 1997, it has shifted relatively little over the past six years.

In contrast, this year's IEMA survey reveals that the gender pay gap for environment and sustainability professionals is 16.7%, unchanged from last year. The mean gap (based on average earnings of £38,091 for women and £47,503 for men) has narrowed slightly to 20% from 25% in the previous year, however. As table 8 illustrates, the gap is much wider than that recorded between 2013 and 2015, when it had been narrowing – as small as 12.5% in 2015.

Some caution should be exercised in making comparisons between the national statistics and the practitioners' survey because the former are calculated using hourly earnings, not annual salaries. It is also worth noting that neither the official statistics nor the practitioners' survey results include salaries for part-time workers. Whereas women make up 41% of the overall IEMA suvey sample this year, they account for 78% of the part-time workers responding to the poll.

Nevertheless, the findings should be concerning for the profession in terms of the barriers to women's progression both in career and pay terms. *the environmentalist* reported in October (pp20–23) on some of the reasons why women seem to be under-represented in parts of the environment and sustainability profession and are generally paid less. The oft-cited reason is that women leave to raise children, and if they return it is to part-time or non-management jobs. Women respondents to the annual IEMA practitioners' survey tend to be younger, when earnings are lowest. This would depress the overall median for women.

The IEMA survey findings corroborate the national picture of a gender pay gap that increases with employee age (chart 8). One key survey finding is that female, full-time IEMA professionals in the 25–29 age bracket tend to earn more than their male colleagues – with a median annual salary of £30,000 compared with the median of £28,000 for men in the same age group. Yet, from age 30 this gap reverses and widens, with earnings for men in the 55–64 band more than £5,000 a year higher than their female counterparts'.

The gender pay gap is likely to be increasingly in the spotlight from 6 April 2017 when employers with more than 250 staff will be obliged to report their gender pay gap publicly in the form of six specific calculations (there is no obligation to report by occupational group or grade). It is hoped that this transparency will clarify what organisations are doing – or not doing – to remove barriers to progression of women through the pay scale.

Qualifications, roles and job satisfaction

Snapshot of a profession

Given the mix of specialist knowledge and transferable skills required of environment and sustainability professionals, members tend to be highly qualified and have careers that are rich in their diversity, while being supported by the IEMA skills map.

Almost two-thirds (61%) have gained a postgraduate qualification, most commonly a master's degree, while 4% have completed a doctorate. Those working in environment and sustainability have studied a variety of subjects, from theology to metallurgy, although the most common area is environment or earth sciences. Geography and engineering or architecture are also very popular. Of those who studied for a second academic qualification (such as a master's), 33% did not take a break after their first degree. At the other end of the scale, 21% returned to study at least seven years after their initial qualification. Understandably, second qualifications tend to be more specific to the environmental and sustainability discipline, with 66% either studying environmental management/assessment or another related subject. Some undertake a qualification in business studies or law at this stage.

The survey reveals that 41% perform a practitioner role; 56% have reached management or leadership positions; and 3% are starting out in an entry-level role.

IEMA members are likely to have significant work experience, with a median ten years spent in an environment or sustainability role. Although the majority of participants remained in their current job role during 2016, 17%, switched to a more senior position, either as an internal promotion or by moving to a different employer. A further 13% moved sideways.

This job mobility is also demonstrated by the fact that almost one-third of respondents consider themselves to be 'career changers', having moved into environment and sustainability as a second career. Fully 80% of these practitioners are satisfied or very satisfied with their move. The main reason given for the change is a personal interest in environment and sustainability issues, which may explain the high levels of motivation among this group.

More generally, job satisfaction is high, with 69% either satisfied or very satisfied with their role, with just 6% expressing dissatisfaction.

When asked what advice they might give to someone wanting to move into an environment or sustainability career, the number one tip is to volunteer or undertake an industry internship. Having a relevant degree was important, as well as thinking about how to make the most of transferable skills and seeking mentoring opportunities.

Details of the 2017 survey

The results of the 2017 IEMA practitioners' survey are based on data provided by 1,451 individual members. The online survey was carried out between the end of December 2016 and 20 January 2017 and asked members about their pay and career experience over the 2016 calendar year.

The sample broadly reflects the spectrum of IEMA membership type, with 4% Graduates, 17% Affiliates and 9% Associate members. The largest group is in the new operational grade of Practitioner, while one in five has gained full membership status (MIEMA) and 2% are IEMA Fellows. Members also hold a range of additional licences or accreditations, such as membership of GACSO, the Global Association of Corporate Sustainability Officers (3%), which is part of IEMA, or Chartered Environmentalist (6%) status.

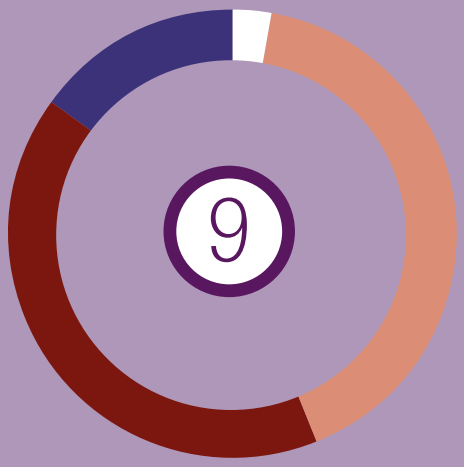
By sector, almost half of the respondents work in business or industry roles. Some 31% work in consultancy, usually environmental or sustainability organisations, but also engineering, health and safety or management consultancies. A further 16% work in public services, while much smaller proportions are in academia or research (3%) or the third sector (2%).

More than half (54%) work for large organisations with more than 1,000 employees, while 17% work for employers with between 251 and 1,000 staff. A further 14% work for medium-sized employers (with between 50 and 250 staff) and the remaining 15% are at small organisations (fewer than 50 staff) or start-ups or operate as sole traders.

Our analysis of pay rates uses base pay data, excluding overtime, bonuses or other elements of variable pay. Most headline findings use both the mean, or average, and the median, or midpoint in the range of values. Where only one figure is shown the median is used. The Office for National Statistics considers this to be the more accurate measure of average earnings because it reduces the impact of very high or very low figures.

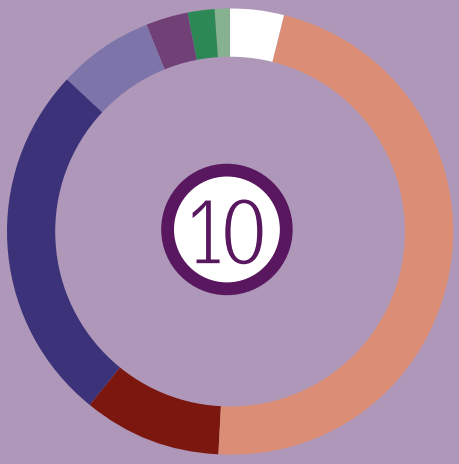
Because the questionnaire was broadened from looking solely at the salaries of working professionals, this year all members of all grades, including Students, were invited to participate.

Seniority of role



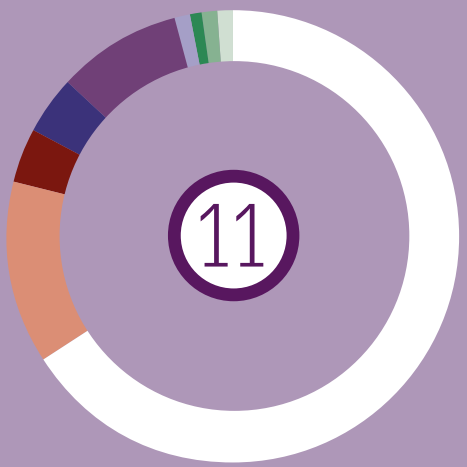
Base = 1,364

Level of highest academic qualification gained



Base = 1,388

Change in role in 2016



Base = 1,364

Skills, knowledge and experience

Professional development

Continuing professional development (CPD) is crucial in keeping environment and sustainability professionals up to date with good best practice and enabling them to thrive as they adapt to changing circumstances. The majority (89%) of IEMA members undertook CPD activities in 2016. Moreover, only 1% reported that their main reason for doing so was because their employer required them to. The most common motivation (cited by 48% of respondents) was to develop knowledge and skills for their role.

One group of professionals that can find it difficult to prioritise CPD is the self-employed. Nevertheless, 81% of respondents undertook some during 2016. Unlike employees, they usually pay the costs themselves, although 22% of self-employed members said an employer had paid. Overall, around half of all respondents undertaking CPD said their employer had funded it, while for 27% it was free. A further 15% said they had paid, while 8% had shared the cost with their employer.

One development that has made CPD more accessible for self-employed and part-time workers has been the growth in online learning, such as webinars. Although reading *the environmentalist* (86%) and other key materials (68%) top the list of the CPD undertaken by respondents, the popularity of IEMA webinars is close behind (62%). There is also a relatively high level of access to in-house training. Whereas most surveys, such as Cardiff University's Skills and Employment Survey, show the volume of workplace training declining in

Professional development activities

Base = 955

- Reading the environmentalist
- Reading key materials
- IEMA webinar(s)
- In-house training
- Another training course
- Attending other events/conferences
- Other webinar(s)
- A CPD Workshop
- Attending IEMA events or conferences
- Mentoring
- IEMA-approved /certified training course
- An academic course

12

Organisational benefits of CPD

Base = 1,265

13

- Fill skills gaps
- Train/mentor other staff
- Boost environmental performance
- Improve organisational reputation
- Upgrade IEMA membership
- No perceived benefits
- Save energy
- Save money
- Strengthen business case for investment
- Reduce emissions
- Reduce pollution
- Save carbon
- Gain promotion
- Save water

recent years, the IEMA practitioners' survey found that 47% had taken part in in-house training in 2016, while 37% had attended another type of training course.

CPD benefits both the individual and their organisation, a factor to bear in mind as skills shortages look to loom large in 2017. The Recruitment and Employment Confederation's JobsOutlook survey in December 2016 found that half of employers were anticipating a shortage of suitable candidates for at least some permanent roles this year. More positively, the practitioners' survey reports that 56% of respondents agree that CPD helps their organisation to fill skills gaps. The ability to train or mentor other staff (28%) is also reported as a direct benefit, while other organisational impacts include boosting environmental performance (24%) and improving organisational reputation (22%).

The benefits of CPD are not always straightforward to quantify, however, with 13% of individuals unable to report a specific advantage. This supports the case for ensuring that members use the IEMA skills and benefits maps, and CPD tools to the full to ensure that their learning is targeted to support their career and role objectives. Lastly, there are thought to be some tangible financial benefits for employers that invest in CPD. Of the one in ten practitioners who reported saving their organisation money, 76% reported success in reducing their employer's overheads, while 15% enabled taxation reduction.

In June 2016, IEMA unveiled its revised skills map. It embeds sustainability into all members' career paths and covers three key areas: **core knowledge** – fundamental knowledge and understanding of sustainability and how it translate in a business context; **depth of knowledge in a technical discipline** – including understanding of key policy and legislation and knowledge of tools, techniques and systems; and **working in environment and sustainability** – including communication, leadership for change, and project and programme management skills.

Sarah Welfare is an HR writer.

The passing of Old King Coal?

The government wants all coal-power plants in the UK to close by 2025. Do attempts by the Yorkshire energy firm Drax to diversify show how to save a coal-based business from the environmental brink? **Alex Marshall** reports

So comprehensive has been the five-year transformation of Drax power station – one of the UK's largest coal-fired plants – that even those opposed to burning fossil fuels are impressed. 'For me, the interesting story around Drax is, when you look at what's happened there compared with other coal plants in Europe, it's unprecedented,' says Dave Jones, power and carbon analyst at climate think tank Sandbag.

Ten years ago, the plant, near Selby, North Yorkshire, was burning almost 40,000 tonnes of coal a day in its six 660 MW capacity boilers. It emitted more than 22 million tonnes of carbon dioxide and was not only the UK's biggest polluter, but also one of Europe's top five. Given that, it was unsurprising when it became a focal point for protests and was the home of the UK's first climate camp. But last year, in stark contrast, it emitted just over 6MTCO2. That is still more than 1% of the UK's annual greenhouse-gas emissions, but Drax has plummeted down the ranking of Europe's most polluting sites (see panel, p34).

The reduction in emissions is largely a result of Drax converting three of its boilers to run on biomass, a move that requires more than seven million tonnes of wood pellets a year (the third unit converted in December 2016, after the EU approved a subsidy guaranteeing Drax an electricity price of £105/MWh until 2027).

Drax's journey is far from complete, however. Last November, the government fulfilled a long-held promise and issued a consultation on ways to ensure coal-fired generation in the UK stops by 2025. Simple economics may halt it sooner since the UK's carbon price floor and the low price of gas are making coal uncompetitive. That is seen, in part, by Drax's declining profits. In 2015, its gross profit was £409m, down from the previous year's £450m.

Drax has evidently realised time is being called on its three remaining boilers given it is spending only £10m on refurbishing them in 2017, far below the usual £25m. It is a clear reflection it expects to use these boilers only sparingly from now on.

The way forward?

Questions are being asked about the sustainability of burning biomass in the first place, with American NGOs targeting Drax because it imports so many wood pellets from the US. But could its biomass activities be hit? And what happens after 2027 when renewables subsidies are due to end? Importantly, can Drax adapt?

One solution, says Ben Caldecott, director of the Sustainable Finance Programme at Oxford University's Smith School of Enterprise and the Environment, is for Drax to diversify as a supplier of clean energy, focusing on storage and flexible capacity. 'It either needs to do that and make a compelling case for its future or employ a managed run-off strategy minimising capital expenditure and maximising dividends before winding down completely. I wonder whether investors would prefer the latter strategy to the former.'

Drax has already decided which of those options it is going to try. Andy Koss, chief executive of Drax Group's power arm, says: 'A number of investors have been asking, especially with the end of subsidies in 2027, "What are you going to do?" and "How will you move forward?". And I think we've not just started to answer those questions, we've started to deliver on them.'

Plan A is to convert remaining coal-fired boilers at Drax to run on biomass, Koss says, as well as expand the company's biomass supply business in the south-eastern US. It has pellet manufacturing bases in Louisiana and Mississippi and Koss hopes these will soon supply woodchips to other plants in Europe and

Asia, as well as to itself. DONG Energy announced last month that it is going to replace coal at its power stations with 'sustainable' biomass by 2023, an indication that there are potential customers. In the UK, the 420 MW Lynemouth power plant in Ashington, Northumberland, is being converted to biomass, while SIMEC has announced plans to convert its 363 MW Uskmouth plant in south-east Wales.

In December, Drax published a strategy setting out how it would reinvent itself and move beyond biomass and coal. First, it plans to venture into gas by buying four projects totalling 1.2 GW capacity – two already with permits; two in the process of obtaining them. It hopes to win contracts for these plants in the government's 'capacity market' auctions so they can be paid to provide power at times of high demand. Drax is also buying Opus Energy, an SME energy supplier, to complement its Haven Power brand that targets large businesses. Finally, it is investigating energy storage.

That range of activity is wide, but Koss says all parts of the strategy build on the company's knowhow (Drax Group's chief executive, Dorothy Thompson, used to run gas plants). The underlying theme is to reposition Drax as a flexible power firm. 'It's all about looking at how the market is changing,' Koss says. 'It used to be that whenever you did, a project was about the margins you could command – "What are power prices doing?". But in future it'll be much more about what services the National Grid needs. So clearly it needs to decarbonise the grid and we see biomass as very much part of that. But there is also the increase in intermittent generation – wind and solar – and that means there's a growing need for plants or technologies that can keep the grid stable [by reacting to sudden changes in power demand].'

This is where the gas plants come in. The energy supply side of Drax's business will help with that too, since its customers may be able to provide 'demand side response' services to the grid, where they cut their energy use at times of high demand.

Drax's emissions ($MtCO_2$) – rank among EU's largest polluters		
2008	22,299,778	4th
2009	19,851,702	4th
2010	22,392,487	4th
2011	21,465,607	4th
2012	22,694,684	5th
2013	20,319,513	5th
2014	16,595,193	6th
2015	13,192,780	6th
2016	6,090,000*	44th

** Estimate based on generation data.*
Source: Sandbag

Not out of the woods

Unfortunately for Drax, each part of its new strategy faces challenges, in particular the plans to convert more coal to biomass. 'For me the biggest challenge is to convince the government that this is the right thing to do, or just actually allow us to compete,' Koss says. Currently, the government is not allowing biomass conversions to bid for further renewables subsidies, known as contracts for difference, and government sources have told *the environmentalist* some civil servants feel it overpaid Drax to convert the last boiler.

However, in November 2016 the government launched a call for evidence on how it should treat biomass in future bidding rounds. Drax insists it should get contracts to convert more of its plant to biomass because it is cheaper than wind and solar schemes if you include the costs of back-up generation and new grid connections. The government has heard that argument for many years and has yet to change how it evaluates projects.

Environmental NGOs are also still raising questions around biomass by pointing out it could lead to an increase in carbon dioxide. This would happen if, say, demand for biomass increases harvesting rates in naturally regenerating forests so they are cut every 60 years rather than every 70. In that instance, emissions could be at least three times higher than coal, according to a model produced for the former Department of Energy and Climate Change (Decc). In March 2015, Decc commissioned consultancy Ricardo AEA to examine the likelihood of such scenarios, but its report has yet to emerge.

Some campaigners argue a more fundamental issue that trees take a long time to regrow. 'The fact is burning biomass leads to an increase in carbon dioxide,' says Adam Macon, campaign director at Dogwood Alliance, a US NGO that works to protect forests in the southern US and has campaigned against Drax's operations there. 'The question isn't what can be done to make biomass sustainable; it's whether it should be happening at all.'

Dogwood Alliance and others, including high-profile American NGOs such as the Natural Resources Defense Council (NRDC), have also questioned the sustainability of the biomass that Drax is burning. Some 48% is sawmill residues, and much of the rest consists of branches and bark that would otherwise be burned at roadsides or left to rot. Some 22% is 'thinnings' – trees removed to help others grow (see panel, p35). Some of that harvesting has occurred in the wetlands of the US south-east's biologically-rich bottomland hardwood forests, and Dogwood goes as far as to claim that some areas have been clear-cut.

Koss denies all these criticisms. Drax's sourcing policy says it cannot 'adversely affect protected or vulnerable biodiversity', and claims of harm 'have been investigated' and 'found not to be true'. Drax's latest annual report also points out far more wood is growing in the US south's working forests than is removed, making the point that carbon stores are increasing as demand for biomass is rising.

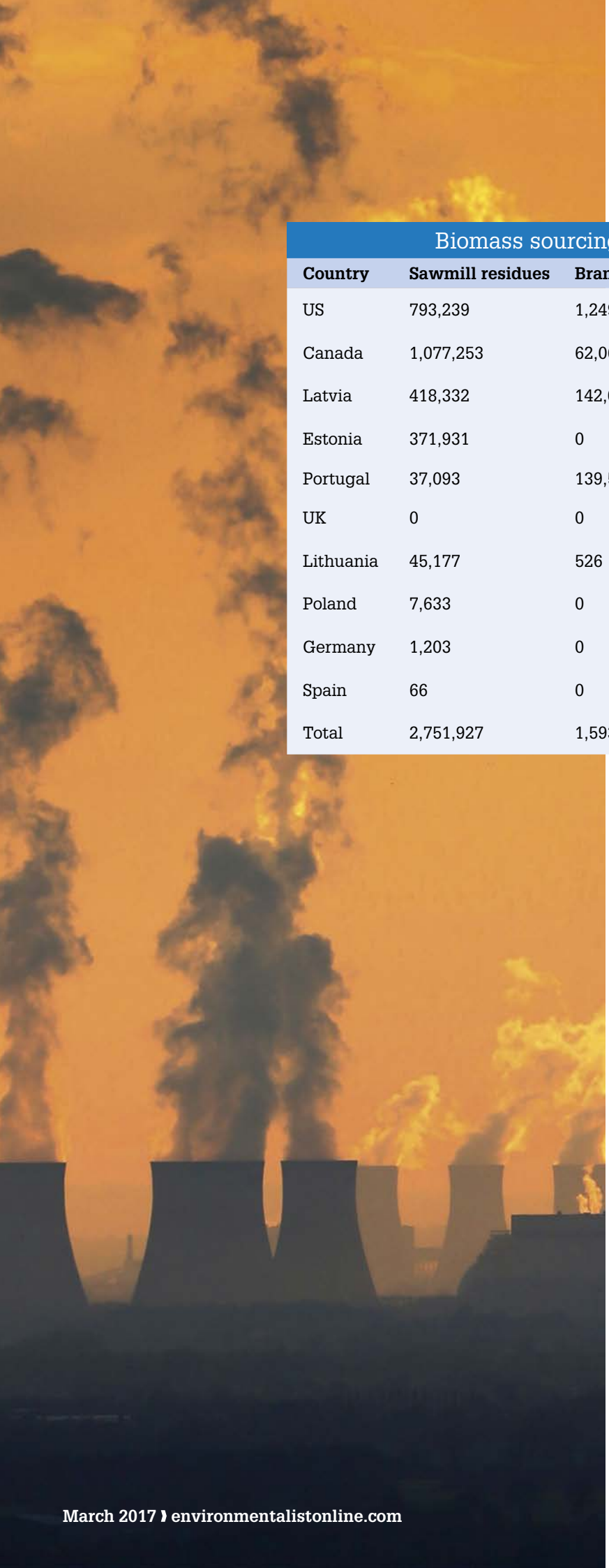
Despite those points, it is easy to see the government deciding not to wade into further controversy by giving Drax subsidies to convert the rest of its plant. 'There's a lot of questions being asked around biomass and we'd be very surprised if the UK government awarded it more contracts,' says Sandbag's Jones.

Drax's planned gas projects also face a problem, in that they need to secure 15-year capacity market contracts to allow construction to begin. The firm has yet to win any contracts and the price offered in recent auctions has been too low to make much new gas viable. However, Koss is not worried and sees it as only a matter of time before the schemes go ahead. 'The government seem to be absolutely insistent that they need new gas plants on the system,' he says. 'You do need a contract, but there's a good opportunity for [us] to get the clearing price we need.'

Longer term plans

Drax's possible move into storage is a longer-term idea, Koss admits. The company has set up a research and development team, which is looking at all areas of the business. 'Storage is the panacea for many people in terms of solving the big problem that you can't store electricity. So, whether there's something in it [for us], [it is] maybe not batteries which seem to be maturing as a technology, but some of the second-generation stuff.'

The same team is also examining how to cut biomass costs further so the plant can operate without subsidy and at how Drax can use demand-side response technologies. It is not looking at carbon capture and storage, in which Drax was heavily involved until the government dropped its £1bn competition, but Koss will not rule out a return to the technology since CCS is so important to the future of energy supplies. 'All that work is very much linked with our strategy,' he says. 'We see ourselves as a business here for the long-term. How do we create long-term, high-quality diversified earnings?'



Biomass sourcing by Drax – 2015 (tonnes)

Country	Sawmill residues	Branches	Thinnings	Other	Total
US	793,239	1,249,787	1,017,976	74,443	3,135,445
Canada	1,077,253	62,064	18,520	1,282	1,159,119
Latvia	418,332	142,095	100,806	121	661,354
Estonia	371,931	0	136,998	2,915	511,844
Portugal	37,093	139,521	56,302	3,539	236,455
UK	0	0	0	132,267	132,267
Lithuania	45,177	526	902	0	46,605
Poland	7,633	0	501	0	8,134
Germany	1,203	0	111	0	1,314
Spain	66	0	108	7	181
Total	2,751,927	1,593,993	1,332,224	214,574	5,892,718

Brexit beneficiary

There is one other source of uncertainty for all businesses now: Brexit. So far, the impact on Drax has been small, Koss says, even though, at a time of a falling pound, it continues to import most of the material it burns from Europe or North America – in 2015, only 2% of its biomass came from the UK.

Drax buys its currency five years in advance, so it made a profit from the post-referendum fall in the value of sterling. Koss says Drax is well protected until 2021. He admits Brexit will have impacts beyond sourcing fuel, however: 'What does Brexit mean generally? It's uncertain. Do we remain part of the internal energy market? Do we remain part of the customs union? Of the EU emissions trading system? The UK says it'll pull out of Euratom [the EU nuclear body], so how does that affect new nuclear? There's lots of uncertainty and it's difficult to make big investment decisions for the future.'

For Drax, that may not be a bad thing. 'Of course there is a potential opportunity, because if people aren't investing [in things like nuclear], it's important that existing plant and operators continue to deliver,' Koss says. He does not spell out what that means, but it is clear: if Brexit slows energy investment, the government may be forced to allow Drax to convert further units to biomass rather than risk security of supply problems. It could even allow it to carry on burning coal.

Some environmentalists may baulk if either of those things happen, but what they cannot argue about is that Drax is changing and perhaps much faster than many expected.

Alex Marshall is an environment writer.

Ascending the learning curve

Environment manager Deborah Southwell tells **Paul Suff** how Birmingham City University made the transition to the revised 14001 standard

Securing ISO 14001: 2015 certification just a few months after starting a new job was the challenge facing IEMA member Deborah Southwell. She joined Birmingham City University in September 2016 and, just four months later, auditors from certification body NQA completed their review of the institution's environmental management system.

Southwell admits that it felt like a tall order, but says the process helped her to assimilate the environmental sustainability issues facing the institution, identify where improvements could be made and to engage university colleagues. 'Coming in to deliver the transition to the latest version of 14001 in such a short timeframe was a big challenge, but it was also a real opportunity to look at what we were doing and ask: is it working? Are we securing continuous improvements? What do we need to change?'

Working together

Organisations have until September 2018 to transition to 14001: 2015, the revised international standard for environmental management systems. Many have already done so. An effective gap analysis, plotting the differences between the old (2004) and new versions, can ease the change. This was the starting point for Birmingham City University.

Environment practitioners in UK universities tend to share best practice and many are members of the EAUC, the Environmental Association for Universities and Colleges. Southwell says she spoke to others about their approach to making the transition, including environmental colleagues at the University of Worcester: 'Universities are really open and are keen to collaborate. The EAUC encourages practitioners to share ideas and knowledge. Speaking to people going through the same thing is a good way to test your ideas and ensure you are on the right track.'

Birmingham City University partnered with Coventry University to audit each other's EMS and their compliance with 14001: 2015. 'Coventry's environment manager carried out a peer audit of our EMS,' says Southwell. 'It was a really useful exercise for the gap analysis. Having a fresh, external pair of eyes look at our system was good for spotting things you might not notice internally. It helped to identify the key areas in the new standard for us to focus on.'

Birmingham City University is a member of the EcoCampus scheme, a commercial service that offers a flexible, phased approach to implementing an environmental management system for the higher and further education sector (see panel, p38). The tiered scheme runs from bronze to platinum. Birmingham achieved platinum status in 2013, which is broadly equivalent to 14001, having secured certification to the international EMS standard in 2011.

Reviewing the changes

Engagement across the organisation was key to the university making the transition to 14001: 2015 and meeting the January deadline, says Southwell. 'Given the tight timeframe and the need to get buy-in for any changes we would have to implement, I decided to get input from as many of my colleagues as possible,' she says. Southwell also spoke to students, giving a lecture on the university's environmental management system and the transition to 14001: 2015 to those on a master's course. 'I used it to get a student perspective on environment issues facing the university. It also gave students an insight into what they might face in their careers.'

EcoCampus offers institutions access to workshops, guides, software – including a full document control system with pre-written templates – and opportunities

About Birmingham City University

Birmingham City University has more than 24,000 students and 2,800 staff on three campuses. It is investing £280m in its estate, including a major expansion of the city centre campus at Eastside. This involves extending its Curzon building and, later this year, opening a new home for the Birmingham Conservatoire.

The university's Faculty of Computing, Engineering and the Built Environment has several courses that cover sustainability issues, including: an MSc in environmental sustainability; an MSc in environmental surveying, which focuses on the environmental challenges faced by professionals in the construction industry; and an MA in planning built environments, which looks at climate and environmental change, resource pressures and the rapidly evolving social, legal and political contexts in which planners operate.

Last autumn, Birmingham City University joined with nearby Aston University to dedicate three days of the second-year teaching timetable to the impact of climate change on business and society, with the aim of ensuring students are equipped to join the organisations that will be grappling with its effects in future. As part of the programme, business leaders from Jaguar Land Rover, Siemens, and Foster and Partners spoke to students about the challenges and opportunities posed by climate change in their sector. Professor Julian Beer, deputy vice-chancellor at Birmingham City University, said at the time: 'We want to help students understand how global warming will hurt their future, the need to adapt to the stresses of a changing climate, and the potential for innovation to fix impending problems and open up new opportunities for transformation and growth.'

Birmingham City University was ranked 31st in the 2016 People & Planet university league, which assesses UK higher education establishments on their environmental and ethical performance. The university tops the institutions classed as 2:1 universities with a score of 52.2%. It scored 100% for its environmental policy, and auditing and environmental management system. It was 39th in 2015.

to network with peers from other universities and colleges, all of which Southwell took advantage of. At the university's environment committee meeting in October, Southwell used a spreadsheet provided by EcoCampus to perform a PESTEL analysis of the requirements of the revised standard and how issues may affect the university. 'The spreadsheet format encourages you to keep information clear and simple,' she says. 'Too much and there is a risk people will switch off.'

The committee meets three times a year and has up to 15 members, including the assistant director and heads of services, such as estates and facilities, as well as senior lecturers. A PESTEL analysis is commonly used to examine and monitor factors that have an impact on an organisation and Southwell used the tool to determine which internal and external issues would affect the ability of Birmingham City University to achieve the intended outcomes of its environmental management system. These goals are: enhance the environmental performance of departments and schools within the scope of the system; fulfil compliance obligations; and achieve environmental objectives.

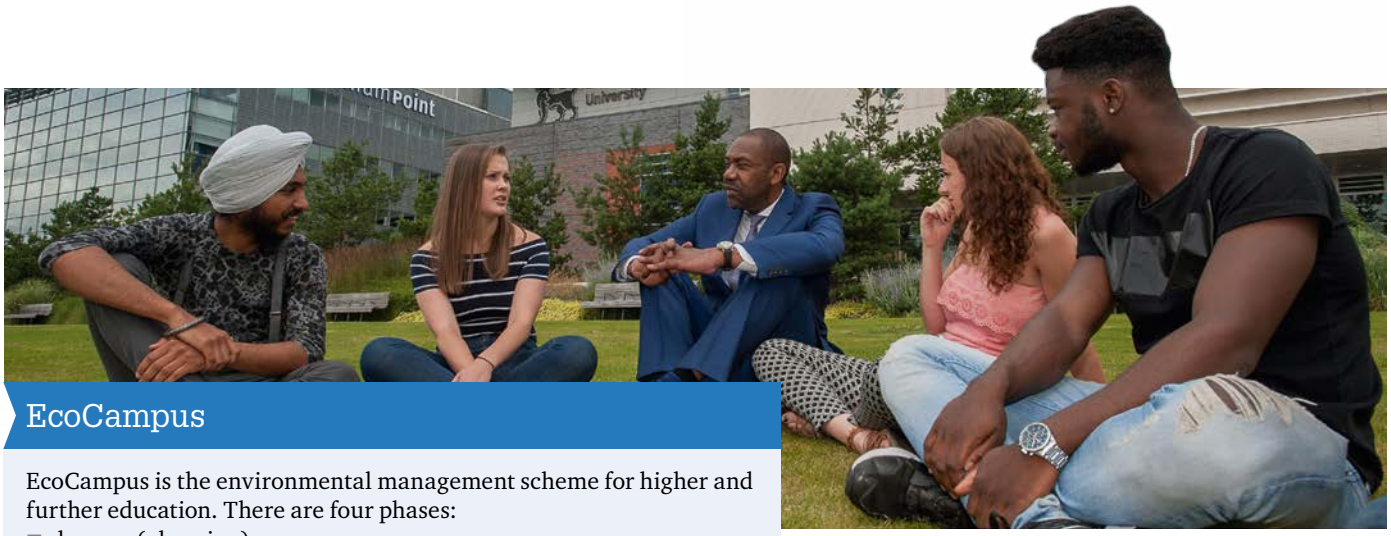
'14001: 2015 requires organisations to understand their context, identify interested parties and their needs and expectations, and consider risks and opportunities,' says Southwell. 'So we got the committee to consider the external and internal implications for the university in the six PESTEL areas: political, economic, social, technological, legal, and environmental.'

Discussion focused on the risks and opportunities in each. Questions under the political heading asked how changes to government policy might affect the higher education sector and Birmingham City University. Social issues examined ranged from the effects of climate change on society to changing demographics, while environment concerns included availability of resources.

Wide support

Southwell concedes that the established support for the environment among senior management at Birmingham City University was hugely helpful in achieving a successful transition: 'I'm lucky that the environment is on people's agendas. There is strong buy-in for good environment management at all levels across the university. At the top, our environmental policy is signed off by the vice-chancellor and the president of the students' union, while the management review of the environmental management system goes to the senior management group. Colleagues are also proactive. The group assistant director of campus services is responsible for things with big environmental impacts, such as the waste services contract, transport and cleaning, and she "gets" that environment is important and will come to me with ideas for improvements. Environment management is also built into the performance reviews of facilities managers and building supervisors.'

Senior management commitment to the environment was evident during the NQA audit in January. 14001: 2015 requires the organisation's top managers to demonstrate their commitment to establishing, maintaining, reviewing and improving an environmental management system. Southwell says



EcoCampus

EcoCampus is the environmental management scheme for higher and further education. There are four phases:

- bronze (planning);
- silver (implementing);
- gold (operating); and
- platinum (checking and correcting).

Each phase contains minimum requirements that lead towards implementation of a fully operational environmental management system (EMS). The platinum award conforms with the requirements of the international environmental management standard ISO 14001. The scheme provides training, consultancy, e-learning and software as well as third-party verification by certification body NQA for gold and platinum awards.

At the start of February, 47 institutions were included in the EcoCampus register. Of these, 18 were platinum and five had made the transition to 14001: 2015. As well as Birmingham City University, they are: Bloomsbury Colleges (Birkbeck, London School of Hygiene and Tropical Medicine and SOAS); Manchester Metropolitan University; University of Braford; and University of Worcester.

For more information, visit moodle.loreus.com

the auditors interviewed the chief finance officer to test this: 'He only started in October but was keen to meet the auditors on his own. They were impressed and it was a real demonstration of senior management buy-in and ownership of the system.'

The university's ambition to manage its impacts well is reflected in the new buildings under construction. 'All our new buildings must be at least BREEAM excellent and the carbon reduction and energy officer, who is a BREEAM assessor, is on a two-year secondment to ensure the £280m we're investing in new facilities meet our environment aspirations,' says Southwell.

Assessment of performance

Auditors spent the equivalent of five working days at the university. 'We had two auditors for two days and one on the final day,' says Southwell. The first day focused on the clauses relating to organisational context and interested parties, how the university's policy objectives and targets link to department and individual personal development plans, and the aspects and impacts register, including the new requirement for lifecycle assessment. The auditors also visited sites, such as halls of residence.

Day two was concerned with leadership, monitoring and measuring, procedures for emergency business response and sustainable procurement issues. The final day examined the university's approach to constructing new facilities and refurbishing buildings. The auditors also required the univeristy to complete its own gap analysis tool.

The auditors identified four opportunities for improvement, one concerning the aspects and impacts register. Southwell says: 'We highlight where there is a compliance obligation against an aspect. Although this is fairly standard for universities, it gets flagged as a significant aspect even if the risk of non-compliance is very low. The auditors have suggested we revise this so we plan to alter our scoring methodology so that low-risk issues no longer flag as red.'

Lessons learned

Southwell believes the greater emphasis in 14001: 2015 on leadership is one of the best changes to the standard because it provides environment managers with the opportunity to talk to senior managers and win their support for the sustainability agenda. The language adopted in the new version, in particular the use of terms such as risk and opportunities, has helped. 'They are business terms, so people in departments such as finance understand them. The inclusion of opportunities is also good and means we do not just focus on the negatives but what savings can we generate from making environmental improvements.'

However, Southwell said more thought is needed regarding the requirements in the revised standard for lifecycle thinking. 'We based our lifecycle assessment [LCA] on our aspects to see where we could have an influence and generate improvements. It was a useful exercise, but I'm not sure how in-depth the assessment by auditors of this will be going forward. NQA suggested that we limit the LCA process to our significant aspects. That would make it more manageable and we could review them on an ongoing basis and reflect any changes in our LCA.'

Her main advice for practitioners starting the transition to 14001: 2015 is to speak with others in a similar role who have been through the process. 'I talked to my colleagues in other universities. It helped a lot to understand what the auditors are looking for.'

Moreover, it is a good opportunity to take a step back and use the process to review and revise the organisation's approach to environmental management.

From whisky to salmon

David Burrows reports on a process being developed in Scotland to feed farmed fish with distillery leftovers

Whisky and salmon feature high on any list of food and drink associated with Scotland. And for good reason: the country has a growing international reputation for food and drink, with total sales of £14.4bn at the last count in 2014. The target for this year is £16.5bn – and the acceleration is set to continue with the announcement this month of new ambitious growth targets for the period to 2030. But is this sustainable given the additional resources required and the extra waste created?

No – and the government knows it. 'We want Scotland to be recognised as an international leader in the sustainable use of our biological resources," says Paul Wheelhouse, minister for business, innovation and energy. The governing SNP has identified the bioeconomy as one of four priority sectors in which it can make the biggest environmental and economic impact and in October 2016 it unveiled a £1.5m funding package to support companies working in this area.

A wee dram

The country's whisky industry alone produces more than 4 million tonnes of bio-based waste and byproducts a year, while the fish and beer sectors produce 190,000 tonnes and 53,682 tonnes of 'leftovers'. Better use of these will produce economic benefits of between £500m and £803m, according to *Circular Economy: sector study on beer, whisky and fish*, published in 2015 by consultancy Ricardo AEA.

The figures grabbed headlines and turned heads among Scottish ministers in Holyrood. 'Our food and drink industry is already outshining the rest of the UK; imagine what making the most of the sector's waste and byproducts will do,' Richard Lochhead, former cabinet secretary for rural affairs, food and environment, said at the time.

Fast-forward two years and the first seeds of activity are starting to germinate. Among them is a new technology that takes low-value byproducts from Scotland's whisky distilleries and turns them into high-value, locally produced feed for the country's aquaculture sector. 'We didn't set out to start a company from this but [the process] worked much better than we ever thought,' says Nik Willoughby, chief executive at Horizon Proteins.

The company started as a research project at Edinburgh's Heriot-Watt University. In 2014 it was spun out into a business thanks to a £600m cheque from the high-growth programme operated by Scottish Enterprise. The funding helped to commercialise the concept. Two large-scale trials have since taken place and, by the end of this year, the first production hub should be operating at a whisky distillery in north-east Scotland owned by drinks giant Diageo.

The £3.5m hub – paid for by the investment firm West Coast Capital – will be fed by 150,000 tonnes of pot ale, a major byproduct of the whisky-making process. For every litre of alcohol about eight litres

of pot ale is produced, but most is reportedly spread to land, discharged at sea or treated as wastewater. Some is used for cattle feed, but the energy demand for this is high and the returns are low – a tonne of pot ale syrup will typically fetch £30-£90. Horizon's process is low energy and (potentially) highly lucrative.

A fishy tale

Willoughby describes the process as a form of chromatography. First the solids are removed through centrifugation, leaving an enhanced distiller's yeast (that can be used as feed) plus a protein-rich liquid. This liquid is passed through an absorption column to which the protein 'sticks'. 'We then change the conditions and it unsticks,' says Willoughby. The result is a protein solution that is concentrated and dry. 'Water is an enemy of biological processes,' he says, 'so our process hugely concentrates the protein and in doing so we transport ten to 20 times less water.'

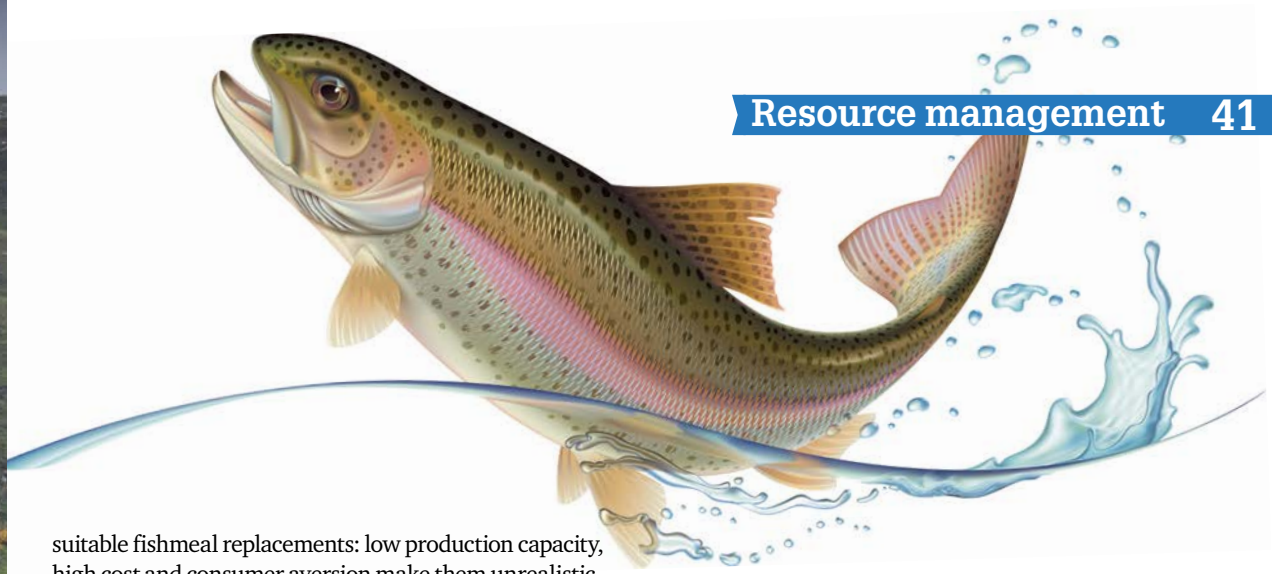
The product smells strangely fishy, but it is a vegetable protein, derived from barley. At 90%, the protein content is far higher than the benchmark for fishmeal (75%) and its lack of 'anti-nutritional elements' sets it apart, Willoughby claims. There are few feeds like this out there, he adds, and at the top end it is worth £1,500 a tonne – a notable mark-up on the £90 a tonne for turning pot ale into cattle feed.

A 12-week trial in Norway, using the output from one of the pilot plants at a distillery in Dufftown, Moray, suggests the protein works well for salmon growth. Horizon states: 'There was no mortality and the growth rate was not affected, so no negative impact when replacing the standard soya protein commonly used. These preliminary trials were very positive and we are now gearing up to launch another trial to push into higher inclusion levels and with the purity of the barley protein, we are confident to be able to replace more of the fish meal protein.'

Nonethess, feed manufacturers are likely to introduce the protein gradually. Global salmon feed production relies on three major protein sources: soymeal, fishmeal and animal protein. In the UK, there is a higher proportion of ingredients from marine resources and imported vegetable protein sources such as soy, both of which come with environmental baggage. The concerns relating to overfishing are well known but replacing fish protein with soy simply removes one environmental burden and replaces it with another: rapidly rising demand for soy to feed fish and other livestock has been linked to deforestation.

'The future of fish feed is a blend of alternatives [and] no single source will dominate as fishmeal has,' noted Lux Research in a report published in July 2015, *Tightening Fishmeal Supply Creates Opportunities for Aquaculture Feed Alternatives*. Lux suggested that demand for fishmeal could exceed production well before 2020, and by 2025 there could be a 16 million tonne shortfall.

Demand for fishmeal will nearly double by then, Lux estimated, creating the need for one million tonnes of alternative high-protein meal, including plant proteins, algae and insects. The report also described how insect protein, recycled waste and algae face challenges as



suitable fishmeal replacements: low production capacity, high cost and consumer aversion make them unrealistic protein sources for aquaculture feed today, Lux concluded.

The aquaculture market

Willoughby is not a lone ranger trying to disprove this. Bloomberg has reported a mergers and acquisition rush with the likes of commodity giant Cargill keen to tap into an aquaculture market that it is 'one of the fastest-growing areas of food production'. Indeed, rising seafood consumption is making fish farming more important – the UN's Food and Agriculture Organization says the world is now eating more farmed fish than wild catches.

Horizon should have no problem finding buyers if the price is right – it is hoping to sign contracts this year. But meeting the production capacity will require a huge effort indeed. In its 2015 report, Ricardo scored Horizon's technology as a seven out of ten in terms of 'readiness' (joint highest among those assessed), with a 'short' timescale and 'high' confidence for success. Production at the first site will be up to 2,000 tonnes a year, with an overall target of 12,000 tonnes of high-protein products for the Scottish feed industry every year by 2022.

The Scottish salmon industry is the principal target. Both the volume and reliability of pot ale supply are hugely appealing to aquafeed manufacturers, says Willougby. 'Unlike some novel proteins, whose levels of availability can fluctuate wildly, the long-lasting success of the whisky industry makes it a highly reliable source.'

Whisky is a defining pillar of the Scottish economy, so there is likely to be no shortage soon of pot ale. Indeed, Ricardo estimated that, in theory, as much as 181,000 tonnes of protein a year could be extracted from the country's nine million tonnes of pot ale and spent wash using Horizon's process. That is almost twice the country's entire protein feed demand of 96,000 tonnes. Given the conservative figure of £1,500 a tonne, the potential annual value of protein in pot ale and spent wash in Scotland amounts to £272m.

Better use of waste

Better use of byproducts and wastes from the beer, whisky and fish sectors alone could generate £595m for the economy. But this requires more collaboration. 'The ideas can look very good on paper but, once you get into the detail, you can see there are challenges,' says Jamie Pitcairn, Scotland director at Ricardo. The key, he adds, is understanding what is available and who needs it. That's the bit that needs to be honed.

A mapping exercise with which he has been involved – alongside Zero Waste Scotland and the Industrial Biotechnology Innovation Centre (IBioIC) – could help. Pitcairn admits it was a tricky task, partly because if products are not a waste there is no regulatory requirement to report on them.

The project identified 27 million tonnes of bioresource arisings 'floating around' in the Scottish economy. This has been broken down into 12 categories, including protein. It is not yet clear how the data will be used, but it could work as a dating scheme, similar to the National Industrial Symbiosis Programme (see *the environmentalist*, September 2015, pp 29–31). Businesses could search for resources that others have no need for; equally there could be 'push mechanisms' to ensure firms with potentially valuable byproducts hunt for willing outlets. 'It has to work both ways because if you have one person that wants to find a partner and another that doesn't it isn't going to work,' says Pitcairn.

Only the Scots could think of feeding their fish leftovers from whisky production, but they seem an ideal match. 'Salmon and whisky are a natural fit,' Willoughby says, 'not only because they're both produced in large quantities in Scotland, but also because the amino acid profile of barley protein is nutritionally very suitable for salmon diets.'

The concept should provide others with plenty of (sustainable) food for thought.

Horizon Proteins – a summary

Horizon Proteins began as a university research project but in November 2014 it was awarded £600,000 from Scottish Enterprise under its high-growth spin-out programme.

The team has developed a low-energy process to extract protein-rich compounds from pot ale, a byproduct from the whisky distilling industry that generally is spread to land, discharged at sea or treated as wastewater. Scotland produces about 2.34 million tonnes of pot ale each year. It is not classed as waste and has little value. Some is turned into cattle feed, but it is a high-energy process and a tonne of pot ale syrup would fetch £30–£90.

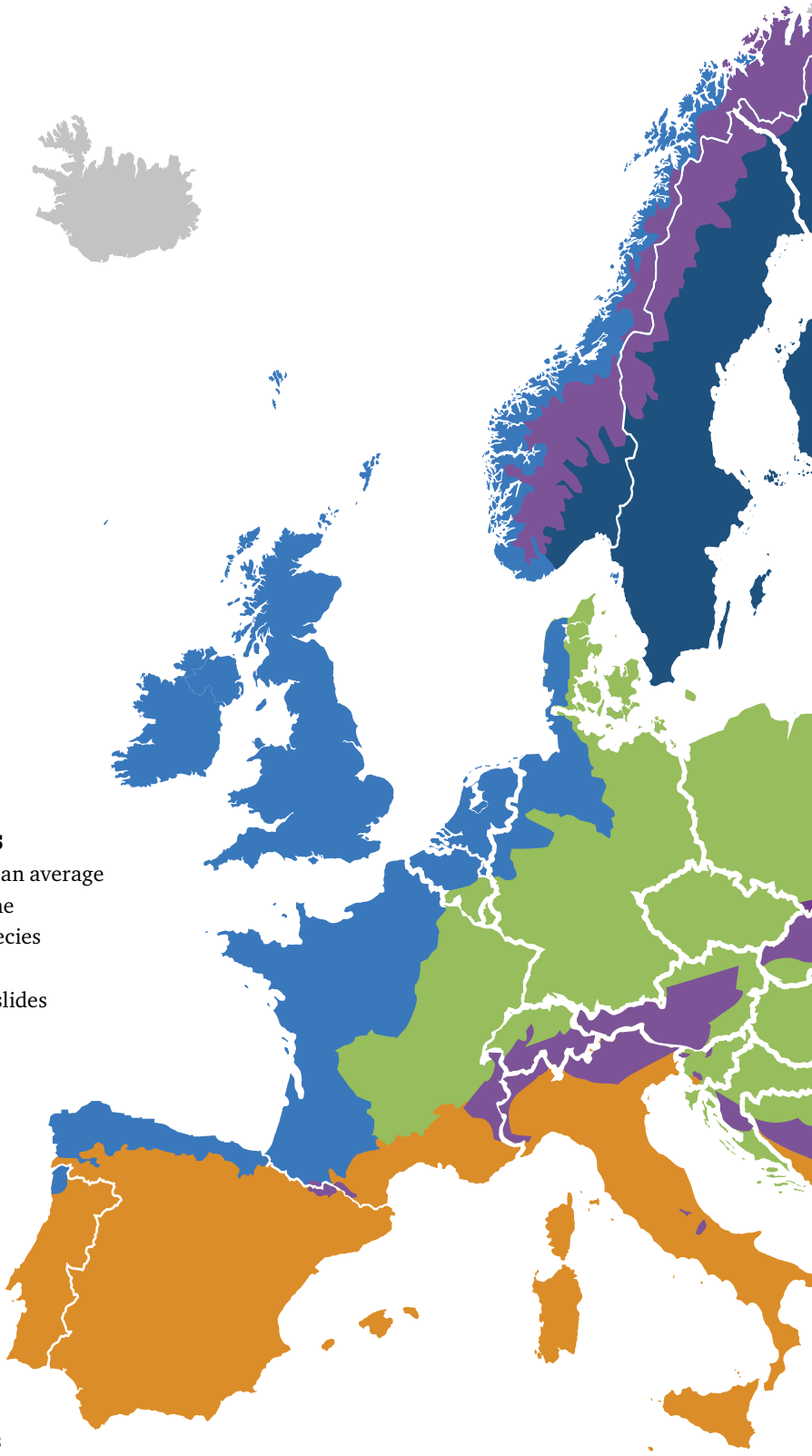
Horizon has adapted techniques usually used by high-value pharmaceutical products to recover the protein in the pot ale. The barley protein is perfect for feeding Atlantic salmon.

Farmed salmon usually eat fishmeal, but its price has quadrupled since 2000 and is far from sustainable. Soy is also used, but that has its own environmental footprint. Given more farmed fish is now eaten than wild, there is potentially big money in developing different protein sources. Horizon says its protein extract is worth £1,500 per tonne. Trials in Norway suggest the salmon react well to it and further tests could even show 'enhanced performance'.

The concept has been tested on a large scale at a site owned by Diageo and the first commercial plant should be up and running later this year. It will take 150,000 tonnes of pot ale from three distilleries and produce up to 2,000 tonnes of extract. By 2022, the output could be as high as 12,000 tonnes.

David Burrows is an environment writer.

Climate change



Arctic region

- Temperature rise larger than global average
- Decrease in Arctic sea ice coverage
- Increasing risk of biodiversity loss
- Some new opportunities for the exploitation of natural resources and for sea transport

Atlantic region

- Increase in heavy precipitation events
- Increase in river flows
- Increasing risk of river and coastal flooding
- Increasing damage risk from winter storms
- Decrease in energy demand for heating

Mountain and tundra regions

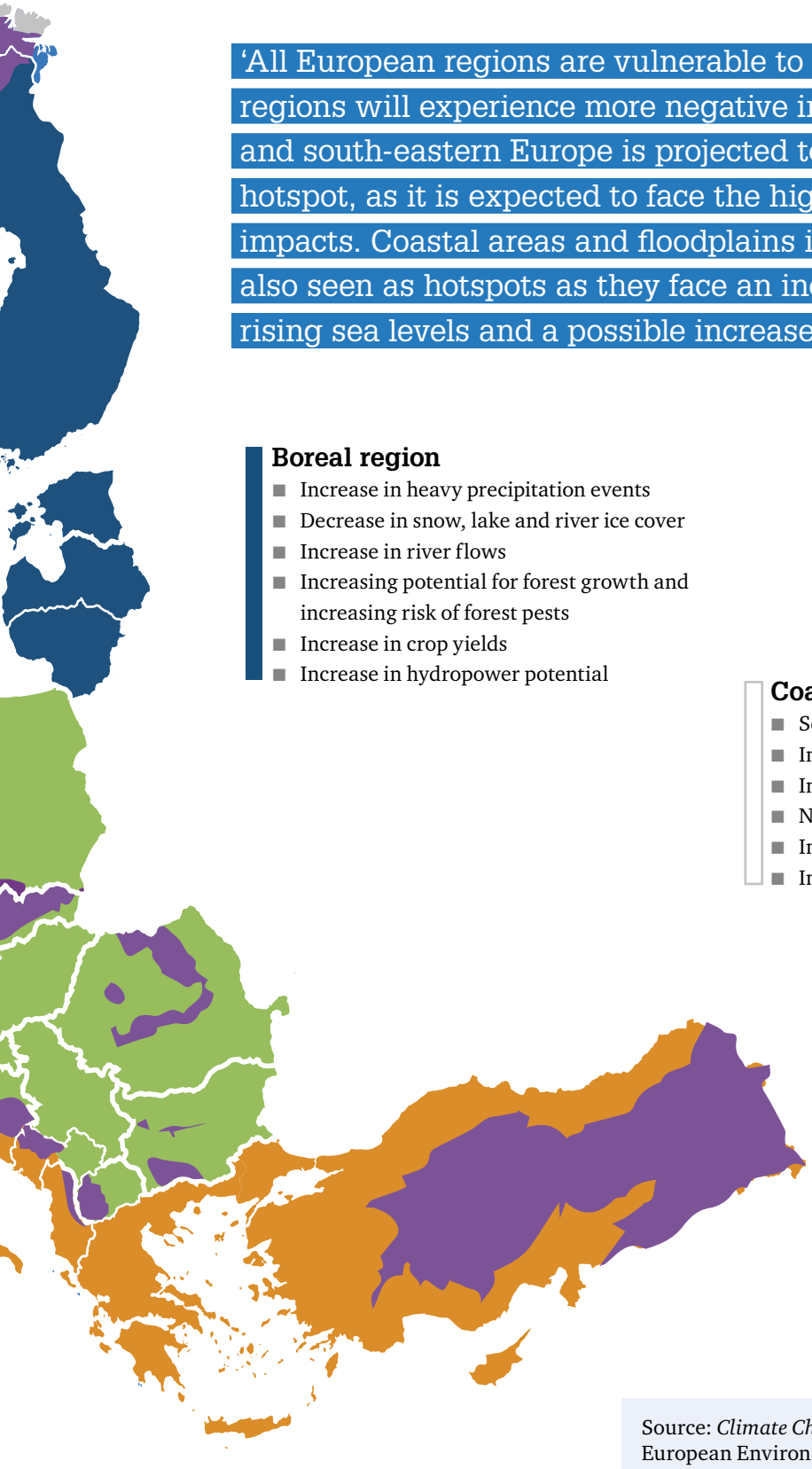
- Temperature rise larger than European average
- Decrease in glacier extent and volume
- Upward shift of plant and animal species
- High risk of species extinction
- Increasing risk of rockfalls and landslides
- Decrease in ski tourism

Mediterranean region

- Large increase in heat extremes
- Decrease in precipitation and river flow
- Increasing risk of droughts
- Increased risk of biodiversity loss
- Increasing risk of forest fires
- Decrease in crop yields
- Increase in mortality from heatwaves
- Expansion of habitats for southern disease vectors

across Europe

'All European regions are vulnerable to climate change, but some regions will experience more negative impacts than others. Southern and south-eastern Europe is projected to be a climate change hotspot, as it is expected to face the highest number of adverse impacts. Coastal areas and floodplains in western parts of Europe are also seen as hotspots as they face an increased risk of flooding from rising sea levels and a possible increase in storm surges'



Boreal region

- Increase in heavy precipitation events
- Decrease in snow, lake and river ice cover
- Increase in river flows
- Increasing potential for forest growth and increasing risk of forest pests
- Increase in crop yields
- Increase in hydropower potential

Coastal zones and regional seas

- Sea level rise
- Increase in sea surface temperatures
- Increase in ocean acidity
- Northward migration of sea species
- Increase in marine dead zones
- Increasing risk of water-borne diseases

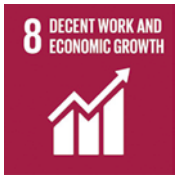
Continental region

- Increase in heat extremes
- Decrease in summer precipitation
- Increasing risk of river floods
- Increasing risk of forest fires
- Increase in energy demand for cooling

Source: *Climate Change, Impacts and Vulnerability in Europe 2016*, European Environment Agency 2017 (bit.ly/2jQte3R).

Work, growth, innovation and equality

Penny Walker looks at corporate action on building a more sustainable, equitable and decent economy in part six of our series on the UN 2030 goals



Decent work and economic growth

For too many, work is underpaid, insecure and dangerous. The International Labour Organization estimates that 327 million people with jobs live in extreme poverty. To help to address this, the UN sustainable development goal (eight) for decent work and economic growth aims to expand the global economy and improve productivity. Targets include full, productive employment for all, regardless of ethnicity, religion, gender, abilities, sexual or gender identity. These issues are also relevant to goal ten – reducing inequality within and among countries (below). Child labour, forced labour, trafficking and modern slavery are also given special attention, as are the rights of migrant workers.

A strategy being adopted by US food business General Mills is to enable local suppliers in lower-income countries to find ways to add value to the products they make. The firm, whose brands include Cheerios, Häagen-Dazs and Yoplait, buys vanilla from hundreds of farming families in Madagascar. Since 2013, it has run a programme in the Sava region, training farmers in how to cure vanilla pods. These sell for significantly more than uncured ones. The initiative is helping General Mills work towards its target of sourcing 100% of its vanilla by 2020 in ways that improve the livelihoods of smallholder farmers.

Decoupling economic growth from environmental impact is a key aspiration underpinning the sustainable development goals. Unilever has set a public goal to decouple its environmental footprint from its underlying sales growth. The fast-moving consumer goods firm is a global partner of the Ellen MacArthur Foundation's Circular Economy 100 programme, which aims to accelerate progress towards a circular economy.

A much smaller player, also contributing to the circular economy, is Rype Office, which refreshes and remanufactures office furniture. One of its clients is Public Health Wales. Sally Attwood, head of strategic programmes and facilities at the health body, says: 'We were moving more than 500 people from nine buildings to one larger building. We wanted a modern workplace to support collaboration and connectivity.'

Rype Office worked with Greenstream Flooring to maximise the reuse of furniture and flooring. Some 94% of more than 2,500 items of furniture were either remanufactured or refurbished. South Wales social enterprise Orangebox made the small quantity of new furniture needed, providing training and work for people who had been long-term unemployed.

Attwood is enthusiastic about the multiple benefits: 'Public Health Wales stands for valuing things, re-loving things, taking care of neglected assets. We wanted to spend our money to create maximum public value.'

Further information

- Ellen MacArthur Foundation Circular Economy 100 Programme – bit.ly/2kmBVGI
- Sustainable Vanilla Initiative – bit.ly/2laBI9M
- Sustainable office furniture – bit.ly/2lfQkDL

Industry, innovation and infrastructure

Meeting the aspirations of the 8.5 billion people forecast to be living in 2030, when the SDGs should be achieved, for decent, healthy lives demands technological innovation and smart infrastructure: mass transit, renewable energy, information and communication technologies, resilient and eco-efficient engineering and construction, clever planning and design.

Targets under goal nine include planning and implementing infrastructure at a regional level rather than be constrained by national boundaries. There is a focus on affordability and equitable access to critical services, both physical (such as water and flood protection) and intangible (internet access and affordable credit). Research, development and innovation are essential to underpin all the other UN sustainable development goals.

Information and communications technology infrastructure is essential for access to markets, services and education. According to BT, people in Africa pay ten times as much of their salary for broadband than those in other parts of the world. BT has delivered free broadband access, via satellite, to SOS Children's Villages, which provide homes for orphaned and vulnerable children in 13 African countries. The free broadband also benefits the wider community, bringing clinics, families and community workers online.

Upgrading and improving physical infrastructure is also badly needed in disadvantaged areas, and it needs to be resilient to climate shocks. In Mexico, it takes ten years on average for road and pavement projects to be completed in low-income neighbourhoods. Mexican building materials business Cemex has developed a microloan programme to help communities fund this infrastructure and complete projects in less than 18 months. The Mejora tu Calle (Improve your street) initiative is providing more than 35,000 such loans to fund paving. Cemex also invests in research and development, one product benefiting from this being porous and insulating concrete to help reduce flooding and improve energy efficiency.

Marshalls is another building materials company heavily engaged in the research and development of products such as permeable surfaces to reduce flash flooding and recharge groundwater. It has also developed what it says is the world's first carbon-neutral paving system, called Bioverse. Group marketing director Chris Harrop says: 'Bioverse consists of reduced-carbon concrete, specially formulated grass seed and a carefully designed sub-base. The elements of the system together create a hardstanding area which is not only attractive and hardwearing, but is also a biosphere which takes carbon from the atmosphere.'

Where the problem is too little water, efficient irrigation is key. Netafim has pioneered drip irrigation technologies for use in agriculture and extractive industries. Research and development is focused on reducing the chemicals needed to keep water clean, and more precise delivery of the right quantity of water at the right time.

Financing the infrastructure of the future is central to insurance business Aviva's target of investing £500m a year from 2015 to 2020 into low-carbon infrastructure, such as energy efficiency measures in NHS hospitals, onshore wind and rooftop solar. Aviva's strategic response to climate change states: 'The transition to a low-carbon economy requires capital. A large proportion of this will need to be directed towards infrastructure.'

Further information

SOS Children's Villages – bit.ly/1wOggSi
Netafim – bit.ly/1KdVzpN

Reducing inequality

Economic growth in countries or regions of widening inequality fails to translate into improved quality of life or environmental protection. According to the UN, the richest 10% of people earn up to 40% of global income, and for the poorest 10% it is somewhere between 2% and 7%. Economic inequality is overlain and accelerated by discrimination, on grounds of race, gender, age, disability, sexuality, religion and immigration status. In many countries, there is legal and institutional backing for equal treatment, but some companies go beyond this.

Targets for goal ten include income growth for the poorest, inclusion, equality of opportunities and outcomes. The cost of remittances home by migrants and the importance of well-managed migration policies are highlighted, as well as inequalities between countries in international trade negotiations.

P&G's worldwide policy prohibits all forms of discrimination based on sexual orientation and gender identity and expression. In Spain the fast-moving goods firm has gone beyond the legal minimum. Doreen Chow, HR leader for company's homecare businesses in Europe, India, Middle East and Africa and sponsor for its gay, ally, bisexual, lesbian employees (GABLE) Europe network, says: 'All of P&G's policies in Spain were reviewed to ensure staff benefits apply equally to same-sex and different-sex couples. These include health insurance, life insurance plans, leaves of absence and other company benefits such as company cars and relocation support.' P&G took part in Spanish Pride

in 2016 and is a member of Stonewall's network of global diversity champions. The LGBT equality charity provides expertise on how to support employees and promote inclusion in countries where the prevailing culture and legal context is challenging. Staff have been trained about unconscious bias, and suppliers are required to follow the sustainable business guidelines, which include anti-discrimination clauses.

For people with disabilities in low-income countries, ADD International is a source of support. The organisation stresses the importance of government action, while also working with businesses to help people with disabilities into jobs. Mosharraf Hossain, director of global policy, influencing and research, says: 'Businesses have an essential role to play in ensuring persons with disabilities are not left behind in development. We urge businesses to work with organisations of persons with disabilities to identify contextually appropriate ways to make their practices more inclusive.' ADD International's margins-to-mainstream project in Bangladesh helped more than 650 people with disabilities to set up their own businesses or do work placements with member companies of the Bangladesh Garments Manufacturers and Exporters Association. Tailored training and advice on workplace accessibility were a key focus.

M&S has UK-based and international programmes to help disadvantaged people through its Marks & Start work placement programme. The firm is also part of Business in the Community's Ready for Work network, helping long-term unemployed people, care leavers, ex-offenders and other vulnerable people to improve their employability.

Businesses can also co-operate with local charities to support people into employment. IEMA corporate member Willmott Dixon Interiors has been working with the Amber Foundation in south-west England. Amber runs residential centres and supports young people who have been homeless, have been affected by substance misuse or have been in trouble with the law. The interior fit-out and refurbishment company has provided work experience placements for Amber clients. It is contributing to the company's long-standing commitment to transform the lives of 10,000 young people by 2020.

Further information

Stonewall – bit.ly/2laH3Oj
ADD International – bit.ly/2jU0mWW
Business in the Community – bit.ly/1zEqd65
Willmott Dixon Interiors – bit.ly/2kJYCn7
The Amber Foundation – bit.ly/2lfdcQx

Penny Walker is an independent consultant. She is facilitating a season of conversations for sustainability leaders in 2017. Go to bit.ly/2lfsGFa for more information.

Ryland Cairns

Environment manager, Muntons

Career file

Qualifications:
BSc, MSc, MTech, PGCertFM, CEnv, MIEMA, CMgr MCMI, CBIFM

Career history:
2015 to date environment manager, Muntons
2015 site manager, Queen Elizabeth Olympic Park, Thames Water
2011 to 2015 South Atlantic water services manager, Interserve Defence
2010 to 2011 South Atlantic contracts manager, Satec
2008 to 2010 research engineer, Cranfield University
2007 process engineer, Severn Trent Water

Why did you become an environment/sustainability professional? Growing up in the countryside enabled me to develop a strong connection with the natural environment. I have been fortuitous to carry this passion on through university and into my profession.

What was your first environment/sustainability job? My first real environmental job involved being responsible for the management of all MoD water, wastewater and waste treatment assets and operations in the Falkland Islands and Ascension Island. I felt incredibly lucky to be helping to ensure effective environmental operations in such unique ecosystems.

How did you get your first role? I studied with the previous manager of MoD water during my MTech in water processes at Cranfield University. His breadth and depth of knowledge relating to the technical, regulatory and environmental management aspects was simply amazing. He attributed this to his MoD role. He was so inspiring that when the position became available I jumped at the chance.

How did you progress your environment/sustainability career? Although I have invested a lot of time in personal study I attribute the team around me as the single biggest contributing factor in my career progress. As a leader, I devote a lot of time developing knowledgeable and empowered teams with strong, shared values. As the team begins to take ownership of their assigned areas it allows me to take a step back and focus on strategic issues and drive improvements. This helps us all progress our environmental careers.

What does your current role involve? Driving environmental performance and compliance for Muntons' food manufacturing site. A key part of this is ensuring effective operation of our award-winning anaerobic digestion plant, leading the transition to ISO14001: 2015, and aligning our environmental reporting with the new GRI standard.

How has your role changed over the past few years? I have increased the time I spend communicating and reinforcing sustainability values internally and eternally. While it is important to set and achieve the right environmental objectives to create a sustainable value chain, it is also important to communicate this to demonstrate that sustainability does pay from a business perspective. I see this as the cornerstone in getting businesses and the government to embrace sustainable initiatives.

What's the best part of your work? On top of doing something I believe in I would say that it is my immediate team that makes this current role extra special.

What's the hardest part of your job? On top of my environmental role my secondary responsibilities involve leading the site's facilities management team. Although this is a discipline that I am trained in and enjoy, I just don't get as much satisfaction out of it compared with some of the great environmental initiatives we have going on.

What was the last development/training course/event you attended? I am currently studying for an MBA, which I am undertaking in sustainability leadership.

What did you bring back to your job? I am using the concept of developing sustainable value chains to help to form our sustainable procurement strategy and ultimately help to set us up for achieving ISO 20400 next year.

What is/are the most important skill(s) for your role and why? Embedding a sustainable culture within a business is key to achieving present and future environmental objectives. Transformational leadership plays a critical role in getting the right values, the right beliefs and the right attitudes to 'stick'.

Where do you see the environment/sustainability profession going? In the current climate I am worried that environmental policies and initiatives could be abandoned in favour of more short-term and popular alternatives. As such I would like to see a greater emphasis on the development of sustainable leaders focusing on long-term goals.

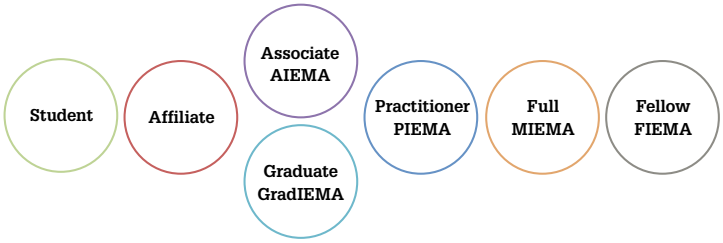
Where would like to be in five years' time? I would like to be looking after environmental strategy, compliance and operations on a small island or a remote location because you feel closer to the positive impacts that you are making.

What advice would you give to someone entering the profession? Invest time in understanding yourself, what aspects of the career you enjoy/find rewarding and then set your goals accordingly. The details may change as you meander through your career but if you stick tight to your core values you can't go too far wrong.

How do you use IEMA's skills map? The map provides a great framework for structuring my and my team's training needs, and communicating these to the rest of the business.

Latest member upgrades

IEMA would like to congratulate the following members on recently upgrading their membership as part of their ongoing commitment to learning and professional development.



Associate (AIEMA)

Marinis Boulmpasakos, GroundSure
Frederick Brocklehurst, GroundSure
Emilie Denyer, GroundSure
Rebecca Fairclough, Watts Group
Sarah Gathergood, GroundSure
Richard Howard Granger, Kier Group
Eleanor Hatton, GroundSure
Sam Holmes, GroundSure
Will Hutton, Eco Age
Matthew John, Tai Calon Community Housing
Maria Poy Lopez, GroundSure
Geraint Matthews, Vinci Construction UK
Heather Nickson, Ramboll UK
Lucien Ollero-Caprani, GroundSure
Cristina Valenzuela Ortega, GroundSure
Mohammad Othman, Nakheel Landscapes
John Paul, Camberra UK
Emma Preston, GroundSure
Harvey Rich, Ramboll UK
Emma Searson, Sellafield
Rochelle Smith, BP Global
Benjamin Taylor, Magnox
Matthew Woodhatch, GroundSure
Shivangi Kumra, PwC
Jemma Short, Landmark Information Group

Practitioner (PIEMA)

Jessica Ager, Environment Agency
Raphael Amiens
Edward Andrews, Westminster City Council
Anthony Baker, Cummins
Martin Bartlett, Industrial Chemicals
Natasha Burke, Wellcome Trust
Hannah Bush
Jacqui Conlon, Keltbray Group
Stephen Critchley, Icopal
Penelope Crookshank, NuGeneration
Martin Cronin, John Sisk and Sons
John Cutler, Strutt and Parker
Sirio D'Aleo, CIRIA
Lucy Darler, Carillion
Kieran Devine
Meggan Edwards
Joe Ellis, Green Element
Oliver Finn-Kelcey, J P Chick and Partners
Pedro Flores, Toureen Group
Ian Gardner, Crown Bevcan
Malcolm Goode, Quartzelec
Kerry Hammick, Environment Agency
Steve Hawtin, Carillion
Leanne Hayward, NuGeneration
Regina Hessemann, SLR Consulting
Tom Hill, Hanson UK
Shaun Hogan, Unipart Powertrain Application
Suzanne Jervis
Rachel Jones, Santia Consulting
Simon Jones, RZSS
Stuart Laing, Johnson Controls Automotive UK
Deborah Lawley, Freyssinet
Holly Leckenby Rye, Leckenby Associates
Belinda Leicester, FPA Consulting
James Meredith, Seddon Construction
Luke Morley, RMD Kwickform
Allan Murphy, Interserve Construction
Andrea Murtagh, RockIT
Alice Newman, Verisk Maplecroft
Michael O'Keefe, O'Keefe Construction
Alison Old
Krishan Pandit, Clancy Docwra
Mark Peters
Paviter Phull, Arcadis Consulting UK
Petra Psenickova, Groundwork West Midlands
Lauren Quinnell, Willmott Dixon
David Reevell, LRQA
Katie Ridley, Northumbria University
Sophie Robinson, Skills Development Scotland
Louise Russell, Sustainable Commercial Solutions
David Taylor, Wo2
Craig Thom, Bear Scotland
Gary Tofts, JC Watson Refrigeration
John Scott
Karen Shaw
Tony Sheridan, John Sisk and Sons
Tom Shield, Mount Anvil
David Shires, Cable Services
Allan Stevens, Jacobs UK
Emma Sykes
Karen Wheeler, Weetabix
Paul Wildin, King Lifting
Michael Williams, Camberra UK
Agata Wolk-Lewanowicz

Full with Chartered environmentalist (MIEMA CEnv)

Laura Allen, Infrastructure and Projects Authority
Matthew Barnes, Crossrail
Marcus Bell, Environmental Protection Strategies
Cara Bentley, Aquila Air Traffic Management Services
Katharine Blythe, MBH Environmental
Craig Bulga, Opus International Consultants
Stephen Byrne, Transport Infrastructure Ireland
Christopher Clement, Cross Country Environmental
Steve Cousins, BP
Helen Dale, Environment Agency
Lauren Darby, British Ceramic Confederation
Nina Davenport, Environment Agency
Laura Duggan, George Best Belfast City Airport
Mark Edwards, UK Green Building Council
Gloria Esposito, Low Carbon Vehicle Partnership
Richard Evans, Moho Environmental Consulting
Martin Guard
Elizabeth Jane Hall
Helen Hall, RES UK and Ireland
Abigail Harrison-Strong, Eni Engineering E&P
Karl Heath, Costain
Martin Hockaday, Carbon Trust
Mark Hoult, West Yorkshire Combined Authority
Simon Hughes, Cunningham Lindsey
Kate Godfrey
Anna Jarmolinska-Nowak, Affinity for Business
Anthony Kubale, Jacobs
Sandra Norval, Catalicity
Richard Smith, Vinci
Bryony Stocking, Horizon Nuclear Power
Georgina Taylor, Amey
Ming Yu Tang, Aurecon
Kate Tomos, Arcadis Consulting UK
Simon Wild, AECOM Infrastructure and Environment UK

Full (MIEMA)

Laurie Read, Amey

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adamshendry.co.uk

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adi-associates.com

Alan Pyke Associates
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allenpyke.co.uk

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amcsafety.co.uk

Ash Design and Assessment
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ashdesignassessment.com

Boyer Planning
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boyerplanning.co.uk

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caas.ie

Carbon Clear
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carbon-clear.com

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cbastudios.com

DLP (Planning)
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dlpconsultants.co.uk

Dustscan
01608 810 110
dustscan.co.uk

Ecological Planning and Research
01962 794 720
epr.uk.com

ECUS
0114 266 9292
ecusltd.co.uk

EDP
01285 740 427
edp-uk.co.uk

Emery Planning
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emeryplanning.com

Geo-environmental Services
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gesl.net

Greenbuild consult
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greenbuildconsult.co.uk

GroundSure
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groundsure.com

Hoare Lea
0113 245 7550
hoarelea.com

Huskisson Brown
01892 527 828
huskissonbrown.co.uk

Ironside Farrar
0131 550 6500
ironsidefarrar.com

KD Environmental
00353 49 854 3471
kdenv.ie

KP Acoustics
0208 222 8778
kpacoustics.com

Landscape Partnership (The)
01603 230 777
thelandscapepartnership.com

Landuse
0207 383 578
landuse.co.uk

Libryo
0203 397 7760
libryo.com

Lichfields
020 7837 4477
lichfields.uk

Marine Ecological Surveys (MES)
01225 442 211
mesltd.co

Mason
0737 550 9566
masonenvironmental.co.uk

MQF
01865 735 122
mqfservices.com

Neo Environmental
0141 773 6262
neo-environmental.co.uk

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pegasuspg.co.uk

Peter Evans Partnership
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ramboll-environ.com

Ricardo
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ee.ricardo.com

Safety & Environmental Consulting
0800 002 9518
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Silkstone Environmental
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spawforths.co.uk

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spgsafety.co.uk

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terrafirmaconsultancy.com

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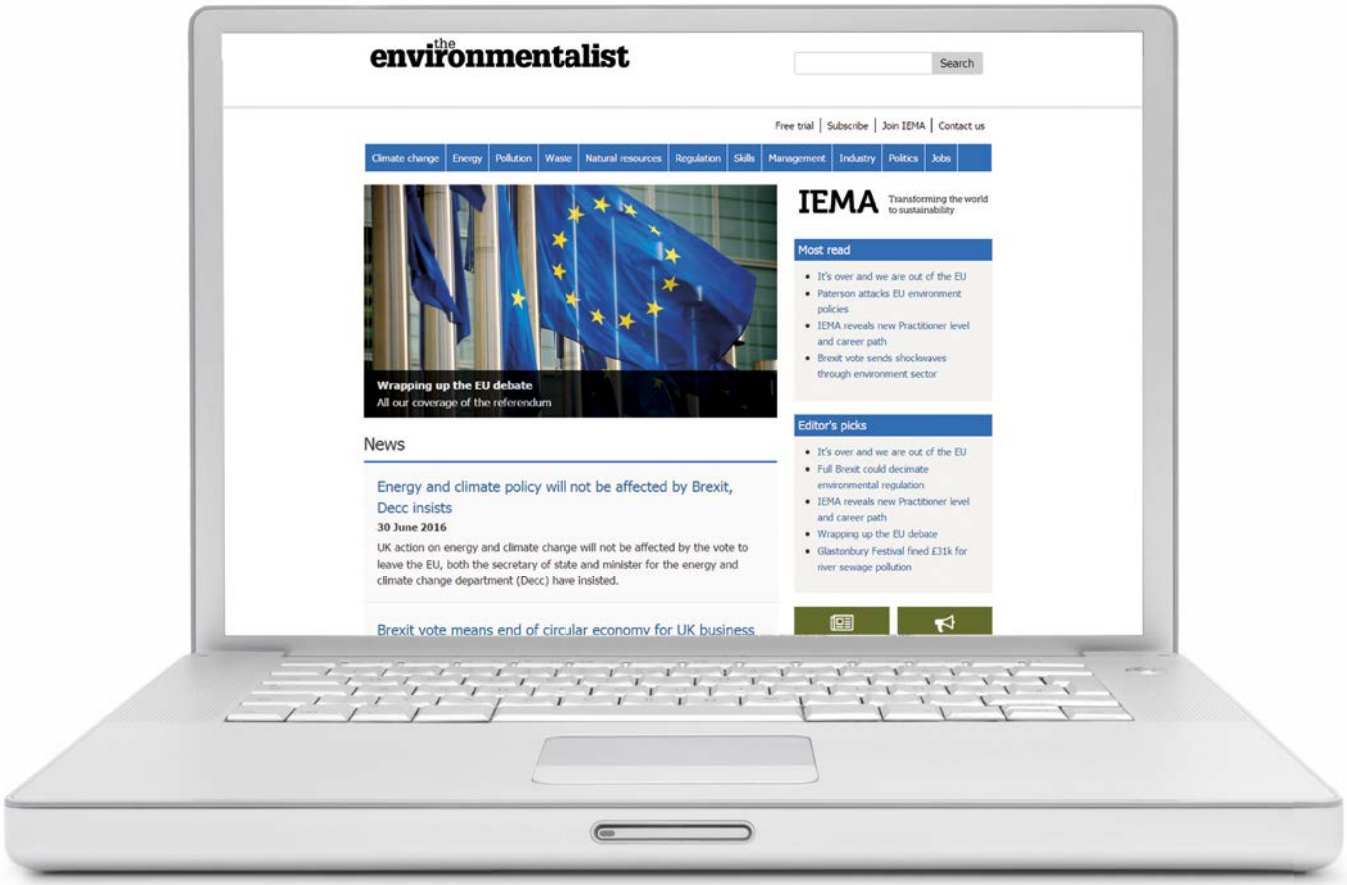

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