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March 2013

Chemical reaction
REACH enters the next phase

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MARCH

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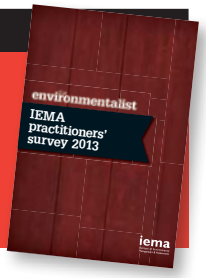

Carbon (GHG) Accounting and Management

An IEMA-Approved 2-Day Training Course

Conestoga-Rovers & Associates (Europe) Ltd (CRA) is pleased to announce new dates for its IEMA-approved Carbon and Greenhouse Gas (GHG) Accounting and Management course. This two-day course is aimed at professionals responsible for measuring, reporting, and managing carbon dioxide and other GHG emissions for their organisation. Also, this course will help organisations develop accounting processes and reduction initiatives for the future introduction of mandatory GHG reporting. The course modules will equip you with:

- *An appreciation of the background to climate change, and the business and socio-political drivers for addressing GHG emissions*
- *The capability to present business cases to senior management to gain commitment for initiatives to measure, reduce and report emissions*
- *An understanding of the key standards and protocols for GHG measurement and reporting*
- *The skills to develop a carbon (GHG) accounting system and to capture your organisation's footprint*
- *An understanding of techniques to reduce carbon and GHG emissions*

The next courses in the UK are planned for 14th-15th May 2013 in Nottingham and 17th-18th September 2013 in London. For more details, please visit www.cra.co.uk or contact us on:

0115 965 6700 or training@cra.co.uk

CRA's training partner, SHEMSI, delivers our IEMA-approved carbon course in Southeast Asia. For details, contact *mail@shemsi.com*.

Introduction of Mandatory Greenhouse Gas Reporting

Defra has announced that mandatory greenhouse gas reporting will be introduced for UK listed companies in 2013. Consultation closed in October 2012 and draft regulations and guidance are being prepared for publication, within the next few months. CRA's carbon course will help to keep you up to date with latest developments.

Simplification of the CRC Energy Efficiency Scheme

The CRC is being modified, following extensive consultation last year. A new CRC Order is being drafted, to come into force on 1st June 2013, and with most of the changes to the scheme taking effect in the second phase, in 2014/15. The carbon course will explain the anticipated simplifications of the CRC.

CRA Europe has teamed with JRP Solutions, an energy management consultancy, and Loreus, an environmental software and training provider, to offer a full service approach to GHG reporting and carbon management.

For further information please contact Nigel Leehane on nleehane@cra.co.uk.

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IEMA works alongside government, the media and industry to enhance the recognition of the profession and promote the importance of practitioners in combating climate change, working towards a low-carbon economy and building a sustainable future.

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Redefining certainty

At a recent debate on the merits of setting a 2030 decarbonisation target for electricity, one of the panel argued against introducing such a goal into the Energy Bill, saying: "We must not get caught in an endless search for certainty." Yet, the EEF and CBI frequently ask government for certainty, particularly when it comes to energy and carbon policy. But is it really possible? If Decc's plans for payments under the renewable heat initiative (RHI) are anything to go by, the answer is only when laden heavily with caveats.

To avoid a repeat of the feed-in tariff fiasco, where abrupt changes to subsidies left it on the losing side of a High Court case, the energy department has created a system for RHI payments that will see increasingly dramatic cuts to subsidies if uptake of technologies is higher than expected.

With different trigger levels for different technologies, plus one for the whole scheme, the RHI is the model for a new kind of certainty: at one extreme the system could see subsidies cut by 57% in 12 months; at the other, nothing will happen at all.

> The RHI is the model for a new kind of certainty: at one extreme the system could see subsidies cut by 57%, at the other, there will be no change at all to payments

But perhaps the real issue is not a lack of certainty, but the creation of uncertainty. As IEMA pointed out following the publication of the second, and last, performance league table (p.5) for the carbon reduction commitment energy efficiency scheme (CRC), by pledging to review the CRC in 2016, the government has undermined what certainty it had brought about by shifting the scheme to a straightforward carbon tax.

The same can be said of a government that outlines strategies to support renewable technologies through long-term contracts for difference in the Energy Bill, but then puts off setting an electricity decarbonisation target (p.6) and, at the same time, publishes a gas-generation strategy that predicts the construction of significant new capacity by 2030.

While certainty may be a big ask, without at least a clear indication of where the government sees future energy and carbon policies, it is seems unlikely that firms will make the big investments needed now to move the UK towards being a low-carbon economy.

Sarah-Jayne Russell
deputy editor

Short cuts

Green energy tariffs

Energy regulator Ofgem is to review the guidelines governing the green energy supply scheme, which aims to provide assurance to consumers that the energy they are buying through a "green" tariff comes from a renewable source and has an environmental benefit over and above that covered by suppliers' existing renewables obligation. The voluntary scheme started in 2010 and there are now 10 certified green tariffs, provided by seven suppliers. Ofgem says it is reviewing the guidelines because the growth of non-certified green tariffs is outpacing that of certified ones, raising implications for continued consumer clarity over the nature of green offers. The regulator is also concerned that the current fuel mix disclosure arrangements – which include details of the mix of fuels used to produce electricity, as well as certain environmental information – may not be delivering sufficient transparency for consumers.

Water saving standard

The Carbon Trust has launched a certification scheme to help organisations tackle their water consumption. The water standard is similar to the trust's well-known carbon standard, and requires applicants not only to measure their water use, but demonstrate that they are reducing consumption year-on-year, either in absolute terms or per unit of turnover. The trust worked with retailer Sainsbury's, drinks producer Coca-Cola and the UK's largest laundry firm, Sunlight, to develop the standard's requirements, which extend to monitoring and lowering the amount of water that leaves premises as trade effluent. Organisations wanting to certify against the standard will have to pass an audit of their water management system. "Addressing water use has, until now, not been high on the agenda for many businesses. However, the harsh realities of future water scarcity mean this needs to change, and fast," said Tom Delay, the trust's chief executive.

Scotland's public sector can cut CO_2 emissions by 27%

Scotland's hospitals, schools and local authorities could cut their carbon footprint by more than one-quarter by 2030, according to the Carbon Trust.

In a report commissioned by the devolved government, the trust analysed existing public sector abatement projects and concluded that, if implemented across the whole sector, CO_2 emissions could be cut by 688,000 tonnes (tCO_2) annually.

Changing behaviours, improving building fabric and installing renewable technologies and more efficient heating and air conditioning systems will provide the biggest savings, says the trust. The sector could save more than 200,000 tCO_2 each year through behaviour change projects, for example. Another 130,000 tCO_2 could be saved by improving heating systems and 48,000 tCO_2 by investing in more energy-efficient IT equipment.

Around half of all the potential annual carbon reductions would be from local authorities (344,000 tCO_2), which account for 62% of the sector's total emissions, while higher education facilities and the NHS in Scotland have the potential to save 158,000 tCO_2 and 123,000 tCO_2 respectively.

Central government in Scotland could save 27,500tCO_2 a year

The trust warns, however, that there are cultural and financial barriers to the deployment of carbon-cutting measures across Scotland's public services. These include a failure to incentivise senior managers to make saving carbon a priority, and to drive the purchase of energy efficient goods through procurement processes.

Shorter working week can help reduce global warming

Reducing working hours over the rest of the century could eliminate up to 50% of the global warming not already locked in, according to analysis by the US Center for Economic and Policy Research (CEPR).

"The calculation is simple: fewer work hours means less carbon emissions, which means less global warming," said CEPR's David Rosnick, author of the report (lexisurl.com/iema14691). He estimates that between 8% and 22% of every degree of warming up to 2100 would be cut by an annual 0.5% reduction in work hours. And, assuming that up to 60% of potential global warming is effectively already locked in, between 25% and 50% of future warming caused by greenhouse-gas concentrations in the atmosphere could be cut by adopting shorter working hours.

Rosnick says policymakers, particularly in high-income countries, have a choice over whether gains from increases in productivity should focus entirely on raising living standards – as has been the case in the US and to a lesser extent in Europe, where working weeks have gradually declined since the 1970s – or whether some of the benefits should be taken as reduced hours.

As productivity rises, societies may choose to work less rather than maximise output, says the paper. "Increased productivity should allow workers to have more time off to spend with their families, friends and communities. This is positive for society, and is quantifiably better for the planet as well," comments Mark Weisbrot, co-director at the Washington-based research organisation.

Rosnick acknowledges, however, that in countries with high levels of income inequality, such as the US, where almost two-thirds of all income gains from 1973–2007 went to the top 1% of households, the majority of workers would have to take an absolute reduction in their living standards to work less.

A shorter working week would only be possible if future gains from productivity growth are more broadly shared, he says.

CRC league table reveals near 8% fall in emissions

Top-ranked firm questions methodology as construction comprises third of top 12

The second, and final, league table for the carbon reduction commitment energy efficiency scheme (CRC) reveals a total reduction in participants' carbon emissions of 7.63% compared with their collective performance in 2010/11.

The data, released by the Environment Agency after being delayed for almost five months, show that 74% of organisations reported lower CRC emissions in year two of the scheme, with CO_2 emissions from the 2,097 scheme participants in 2011/12 falling by 4.64 million tonnes.

Construction company BAM Group was the league champion, posting a reduction in absolute emissions of nearly 65%, from 41,808 tonnes of carbon (tCO_2) in 2010/11 to 14,826 tCO_2 (see panel, below).

Skanska, another construction business, came second, followed by Motorola Solutions UK and Manchester City Council – one of 13 councils in the top 30.

Of the 22 organisations in first place in 2010/11, only Arena Coventry remains near the top of the table (16th), with others ranked as low as 1,401. This is largely because the performance criteria no longer rate organisations wholly on their early-metric score – energy-saving measures put in place before the start of the scheme. In 2011/12, 60% of participants' performance is linked to their absolute emissions, the percentage change in annual CRC emissions, and a growth metric, which is the difference in scheme emissions per unit of turnover or revenue expenditure.

League winners BAM worked on the new Co-op head office

Despite the overall reduction in carbon emissions, and claims by Decc that participants are improving their energy management, the table reveals that almost 25% of organisations increased their CRC emissions in 2011/12.

The table is the last, following the government's decision to scrap it as part of plans to simplify the scheme. IEMA has warned participants to continue to monitor their CRC emissions, however, as they will still be expected to submit performance data to the agency. Policy director Martin Baxter said: "Accurate data underpins the CRC as an environmental tax and affects how much money companies will pay for their allowances."

The view from the top of the table: BAM Group

Construction company BAM moved from 230th place in the first CRC league table to 1st in the 2011/12 rankings, having – according to the assessment methodology – reduced its absolute emissions by 64.54%. Sustainability manager Jesse Putzel says the cited cut does not tell the whole story. "Anyone familiar with energy and carbon management knows, you can't make a reduction on such as scale unless there has been a significant change to the business or you were really bad before," he told *the environmentalist*. Neither explanation applies to BAM, which actually reduced its carbon emissions by around 2,500 tonnes over the 2011/12 CRC period – a 17% cut in absolute and normalised emissions. Putzel says the CRC methodology fails largely to reflect the transient nature of the construction industry, where emissions depend on type and scale of projects and tend to vary significantly from year to year. "The CRC rules are geared more towards energy use in static sites, so offices, for example. Our emissions are mainly from gas oil [red diesel], rather than from electricity, and varies with each building project," he explains.

Short cuts

Green and pleasant land?

Natural England has published a review of landscape change in England from 1940 to 2010 (lexisurl.com/iema14792). It reveals that the area covered by urban settlements has nearly doubled over the past 70 years, from 5% to 9% of land area, through the growth of existing urban areas and the creation of new towns. The planning system has managed to largely contain urban development, however, with the use of green belts and brownfield policy producing a "more sharply defined edge to urban areas than existed before," says the report. It also highlights the impact of industrial activity on the landscape, finding that quarry faces, spoil tips and subsidence pits, for example, have significantly changed landforms. A more recent change to the landscape, particularly in the uplands, is the emergence of onshore wind farms.

UK GHGs fall again

After a rise in greenhouse-gas (GHG) emissions during 2010, the UK produced 7% fewer GHGs in 2011, bringing total output to a record 28.5% below 1990 levels. Final Decc emissions figures for 2011 confirm that the country returned to long-term reduction trends, with GHGs falling to levels below that of 2009. The mild winter played an important role in curbing emissions, with GHGs from UK homes falling 23% year-on-year, as less gas was burned for heating. Meanwhile, GHG emissions from industrial processes fell 13% and business emissions were down 3%. The bulk of reductions came from cutting CO_2, levels of which dropped by almost 8%, while methane production fell 2% and nitrous oxide levels declined 3%. There was also a 3% fall in total electricity demand, though consumption was still 15% higher than in 1990. Decc has also published provisional data on energy generation in 2012. They confirm that low-carbon technologies provided 29.6% of UK electricity last year, up from 26.7% in 2011. Wind generation increased from 4% to 5.5% of total supply. Visit environmentalistonline.com/UKCO2 to read more.

In Parliament

Energy Bill lacks a carbon target

It's the half way stage in the great Energy Bill marathon in parliament. The committee stage is done, but there will be a chance to make final amendments at the report stage, and then it is off to the Lords for the whole process to be repeated. So where does the Bill now stand?

After the draft received a mauling from the energy and climate change select committee, the government introduced a number of changes, including an amendment that will allow the secretary of state to set an unspecified decarbonisation target after 2016, and the creation of the fifth carbon budget by the committee on climate change (CCC). I argued at the committee stage that this change was too vague: the secretary of state could, after 2016 decide to do nothing, or set a target that did not relate to the needs of low-carbon energy generation. I then tabled, unsuccessfully, an amendment that placed an industry-wide emissions cap of 50g CO_2 per kWh of electricity generated by 2030.

So is that the end of the matter? I'm not sure it is, since there are moves afoot to put forward a cross-party amendment to be discussed later in the Bill's passage that would require the secretary of state to put an early target range into the Bill.

The need for a decarbonisation target in the Bill is real, and not just a theoretical aspiration. It has received support from across the business and investment community. In essence, it is about framing all the contents of the Energy Act, as it will become, in terms of the direction of travel of energy policy, so that investors can be clear about the future landscape.

Events over the next few months will determine whether the Bill will provide the means to drive the low-carbon economy forward effectively or will instead provide a useful, but far less certain outline "framework" for longer-term commitments. Watch this space.

Alan Whitehead, Labour MP for Southampton Test and energy and climate change committee member

REACH 'functioning well'

The regulatory regime monitoring the use of chemicals in Europe is performing well, according to the European Commission, but action is needed to improve the quality of dossiers and to reduce the costs of compliance for small businesses.

In its first review of the REACH Regulation, which requires organisations manufacturing or importing chemicals to gather information on the properties of substances to help manage them safely, and to register the information on a central database, the commission concluded that the regime is on track to deliver its objective of protecting the natural environment and human health.

More than 30,600 dossiers on more than 7,800 substances have logged with the European Chemicals Association (ECHA) since REACH's launch in 2007 (see p.21), and the review claims this information is improving risk-management procedures.

However, the commission also confirms that many dossiers are noncompliant and that registrants were failing to assess effectively the bioaccumulative and toxic properties of chemicals. "We are off to a good start. But there is still work to be done," acknowledged Janez Potočnik, EU commissioner for environment.

Following the review, the ECHA revealed that it had identified problems with two-thirds of the dossiers it had checked for compliance during 2012. Common shortcomings included failures properly to identify substances and inadequate chemical safety reports. Ahead of the next registration deadline on 31 May, ECHA has launched a "dossier quality assistant" tool for its IUCLID 5 software programme to help firms check their registration documents.

Sustainability = profitability

Sustainability is paying off for a growing number of firms, according to a US study.

The fourth annual global survey of executives and managers by the Boston Consulting Group (BCG) finds that more than a third (37%) of the 2,600 responding from commercial organisations say that sustainability-related actions have added to their company's profit in the past 12 months. This is a 23% increase on the previous year.

Nearly half (48%) of those surveyed also report that their firm has changed business model as a result of sustainability opportunities – a 20% increase on the 2012 figure. Customers' preference for sustainable products and services, and resource scarcity are cited as the two main drivers for change. "Consumers, especially in Europe, are increasingly aware of a product's sustainability credentials and are willing to pay a premium for environmentally sound products and services," the report said.

The results of the latest BCG survey demonstrate that pursuing sustainability-related strategies is increasingly seen as crucial for maintaining competitiveness. Sixty per cent of respondents report that sustainability is already key to remaining competitive, while a further 31% claim it will be in the future.

In total, 70% of respondents believe their organisation's commitment to sustainability – in terms of management attention and investment – will increase significantly over the next year.

Survey respondents were asked to rank the top three sustainability challenges facing their organisation over the next three years. Energy scarcity and energy price volatility is regarded as the number one priority, with 78% of those polled placing it in their top three. This was followed by: waste and waste management (52%); limited access to raw materials (51%); climate change (37%); and water scarcity (28%).

The report makes it clear that many large companies are turning to their supply chains to reduce energy use, simplify packaging, mitigate commodity price risks and meet customer sustainability expectations.

"It's all about meeting the needs of our customers. My team are always on hand to provide advice and guidance and make the necessary practical arrangements too."

Kayley, RRC Customer Services Manager

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Cameron focuses on energy efficiency

Energy-savvy businesses will win the race for limited resources, the prime minister said at the launch of Decc's energy efficiency mission. "Businesses that are best insulated from energy price shocks will be the most successful," David Cameron argued, noting that energy consumption is forecast to grow by one-third over the next two decades.

The mission aims to make the UK the most energy efficient economy in Europe, by pulling together various government policies – from the green deal and green investment bank to the smart meter programme and the electricity market reform – into a coherent whole rather than a series of disjointed schemes. "There is so much to this ambitious, exciting agenda – but if we are honest, we are not telling the story effectively," conceded energy minister Greg Barker.

"We see energy efficiency as always being the policy call of choice when it is the cheapest option," he added.

Meanwhile, Marks & Spencer has announced that all of its new outlets will have "green" clauses as standard in lease agreements to help the retailer meet its Plan A commitment to reduce energy use in M&S stores, offices and warehouses by 35% against 2007 levels by 2015.

At the same time, the retailer has agreed to include similar green clauses in the leases of 70 existing stores, in a deal with the Better Buildings Partnership – a collaboration of the UK's leading commercial property owners working together to improve the sustainability of the existing commercial building stock.

"Big carbon reductions from the UK's building stock cannot come only from new stores. Seventy per cent of current commercial buildings will still exist in 2050, so if we are genuinely going to tackle the problem we have to invest in eco-solutions for existing buildings," said Clem Constantine, Marks & Spencer's director of property.

The clauses will facilitate the sharing of information and data between the landlord and the retailer on electricity and gas use, as well as water consumption and waste streams. M&S aims to generate significant carbon reductions and encourage investment in energy-efficient building technologies through the initiative.

EIA Update

iema

Revising the EIA Directive

IEMA has completed two expert roundtables, 13 member workshops and numerous meetings with the government, devolved administrations, statutory consultees, developers and NGOs to gather comprehensive evidence on the implications for the UK of the European Commission's proposals to revise the Environmental Impact Assessment (EIA) Directive (2011/92/EU). While aspects of the commission's proposals are sound, they go too far and must be scaled back if future EIA is to be effective for developers, communities and the environment into the 2020s. Changes are also needed to prevent the revised Directive introducing new avenues for delay and legal challenge. IEMA is redrafting article 5 (scoping) and identifying consequential changes, so as to provide an alternative approach that will lead to more effective and proportionate EIA. IEMA's position, to be published in late March, will also identify areas where clarity is needed.

GLVIA3 prepares for launch

IEMA and the Landscape Institute will jointly launch the third edition of the *Guidelines for landscape and visual impact assessment* (GLVIA3) next month. The revised guidance places greater emphasis on collaboration in the assessment process. It also promotes greater use of professional judgment in effectively applying the most relevant principles and approaches, and in setting out the specific context of the development and receiving environment. As such, GLVIA3 places the power of LVIA in the hands of those best placed to deliver effective assessments. With such power comes the responsibility to deliver proportionate assessments, however, which is something the guide reiterates throughout its chapters. The need for LVIA professionals to work within the framework of a wider EIA is emphasised and GLVIA3 also includes more on cumulative effects assessment, with a whole chapter dedicated to the topic.

IEMA is hosting a webinar to launch GLVIA3 on 10 April, and a short series of workshops around the UK will follow to promote the new guide. The workshops will be held in: London (30 April), Cardiff (1 May), Birmingham (2 May), Newcastle (8 May), Glasgow (9 May) and Manchester (10 May).

New EIA regulatory guidance

The communities and local government department is to consult on guidance to replace *EIA circular 02/99*. Based on the findings of the Taylor review of planning guidance, the new guide will be relatively short and focus on interpretation of key regulatory steps and the government's views on the application of EIA legal findings. The aim of the guide is to ensure that planning authorities apply EIA legislation correctly and avoid additions that can lead to disproportionate assessments. IEMA also understands that the *Practical guide to EIA*, which was published in 2000, is to be scrapped.

ISO calls for views on 14001

ISO has launched a survey asking users of ISO 14001 and ISO 14004 for their opinions on potential changes to the environment management standards.

Following the latest round of discussions on revisions, ISO is polling practitioners about the extent to which new editions of the standards should consider areas such as resource efficiency, pollution prevention and organisational strategy.

The survey, which closes on 30 April, asks specifically for feedback on annex A of 14001 and the guidance in 14004 on implementing environment management systems, and for views on whether the environment should be considered in business activities such as product design, marketing and procurement.

The technical groups working to update the standards have identified a series of "future challenges" on issues relating to sustainable development, corporate responsibility, communication and business management. And ISO is also looking for users' views on whether the standards should address topics like accountability for environmental performance, life-cycle approaches and influence-on-value chains.

Lesley Wilson, committee manager for 14001 at BSI, said: "These 'future challenges' include a commitment to make environment management an integral part of an organisation's overall strategy. This would potentially strengthen the need for commitment by top management contained in the current version of the standard."

Martin Baxter, IEMA's policy director and the UK representative on the 14001 working group, urged environment professionals to complete the online survey at iso.org/iso/14001survey2013.

"It is essential that the experience of users of 14001 is taken into account," he said. "IEMA encourages as many people as possible to participate in the survey, as it will help inform the future direction of environment management standards."

Meanwhile Greg Roberts, environment consultant at EEF, urged organisations to start considering the revisions. "Firms can, even at this early stage, benefit greatly from considering the effect the main changes will have on their business," he said.

Permitting changes for MRFs

Operators of materials recovery facilities (MRFs) in England and Wales will have to report weekly on the waste they process from April 2014, under proposed amendments to permitting rules.

Following the failure of a voluntary code of practice for MRFs aimed at improving the quality of materials being recovered, Defra has published draft regulations that will amend the Environmental Permitting Regulations (England and Wales) 2010 and force firms to report on their operations.

Under the proposed changes, which are being consulted on (see p.12), operators of plants taking delivery of more than 1,000 tonnes of mixed waste a year will have to provide accounts to the Environment Agency on the amount, and type, of waste they are receiving and sorting each week. They will also have to list the amount of glass, plastic, metal and paper they have recovered, and the amount of waste that could not be reused.

The Environmental Services Association (ESA), which represents the waste industry and developed the voluntary code of practice, welcomed Defra's decision to make the scheme compulsory. "MRFs are a vital part of the recycling supply chain and there are many excellent ones that consistently produce high-quality material which meets their customers' needs. However, not all are up to scratch," commented Matthew Farrow, director of policy at the ESA. "This is a sector where proportionate regulation can boost investment and green growth."

Meanwhile, Wrap revealed that adopting new circular business models could help the clothing sector improve its environmental credentials and provide a good return on investment. In its examination of alternative business models, Wrap concludes that if retailers were to offer to resell their own goods, they could see payback on capital investment in just over two years and prevent clothes ending up in landfill.

"The traditional model of buy-use-dispose can be improved when you consider the significant commercial value that can be realised from used clothes," said Liz Goodwin, Wrap's chief executive.

Short cuts

Extreme weather in 2012

New figures from the Association of British Insurers (ABI) highlight the impact on businesses of extreme weather events in 2012, which was the wettest year on record in England and Wales and second wettest in the UK. In total, insurers handled 486,000 claims last year for flood and storm damage from homeowners, businesses and motorists. Settling these claims cost £1.19 billion, the highest annual figure since the £3 billion paid in 2007. The ABI reports that insurers handled 47,000 business property claims following flood and storm damage in 2102, and paid out £373 million in compensation to affected companies. The average claim payout for flood-damaged properties – both domestic and commercial – was £18,200. Another £40 million was also paid by UK insurers to cover business interruption, which helped firms continue trading while repairs were made to their damaged premises.

Cement sector targets

Greenhouse-gas (GHG) emissions from one of the UK's most energy-intensive sectors could be cut by 81% on 1990 levels by 2050, if cost-effective carbon capture and storage (CCS) technology is developed. In a new report outlining the cement sector's strategy to cut GHG emissions up to 2050, the Mineral Products Association (MPA) reveals that cement makers have already managed to reduce emissions by 55% against 1990 levels. According to the MPA, taking measures such as improving the energy efficiency of plants, sourcing 80% of energy from alternatives to fossil fuels – particularly those derived from waste – and cutting emissions from transport by 60%, will result in a 62% reduction in total GHG output from the sector against 1990 levels by 2050. While the report concludes that an 81% reduction in GHGs is possible, such cuts are reliant upon the decarbonisation of the UK's electricity supply and the wide-scale deployment of CCS. To read this story in full, visit environmentalistonline.com/cement.

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INSPIRING LEARNING

Recent Prosecutions

Biffa fined £105k after pollution reaches aquifer

One of the UK's largest waste management firms has been fined £105,000, and ordered to pay more than £26,900 in costs, after decomposed waste from one of its landfill sites leaked into a source of drinking water for residents of Sunderland. Biffa Waste Services pleaded guilty to five counts of breaching its environmental permit during 2010 and 2011, when leachate from its Houghton Le Spring site escaped the landfill's protective lining and into groundwater.

Leachate is a liquid containing toxic substances produced by decomposing organic matter and, under environmental permits, must be controlled by landfill operators. However, after the substance was found in groundwater near the Houghton Le Spring landfill site in April 2010, an Environment Agency investigation discovered that the construction of an access road had damaged the site's lining system, enabling the leachate to escape. Biffa had discovered the escape, but it failed to notify the regulator, which is also a requirement of the site's permit. And, on a separate occasion, inadequate controls at the site resulted in a leachate storage tank overflowing and spilling the liquid out of the site.

Graham Donachie, pollution prevention team leader at the Environment Agency, said that management failings on the site had contributed to the pollution. "This case highlights the need for landfill operators to have in place effective and comprehensive operating and monitoring practices," he said.

Biffa apologised for the incidents and confirmed that, while the aquifer had been affected by the leachate, there would be no impact on the safety of drinking water. The firm has since undertaken remediation work, including working with the agency to design a new access road; continuing to remove and treat the contaminated water; and increased monitoring of groundwater.

Contractors kill protected species

The firm managing a hydro-electric scheme in Perthshire has been fined £4,000 for failing to prevent two contractors polluting the River Lyon and damaging the habitat of endangered freshwater pearl mussels.

Shawater Limited pleaded guilty to allowing A&C Construction and Chic Kippen and Son to carry out unlicensed work at its site on the banks of the River Lyon and the Inverinian Burn, which resulted in "extremely serious" incidents of silt pollution over a period of 13 months.

An investigation by the Scottish Environment Protection Agency (Sepa) found that between September 2009 and October 2010, the contractors built a pipeline, a ford and an access track at the Inverinian hydro scheme without a licence under the Water Environment (Controlled Activities) Regulations 2011 (a CAR licence). Shawater, which oversaw the construction, had a CAR licence for the site, but it did not cover these works. The firm also failed to prevent silt from the works entering the waterways, and polluting the habitat of freshwater pearl mussels, which are protected under the Habitats Directive. The pollution damaged the riverbed, killing and injuring mussels. To read this story in full visit environmentalistonline.com/shawater.

£25k penalty for AD spill

Cannington Limited, which operates one of the UK's largest anaerobic digestion plants, has been fined £25,000 after 60 tonnes of highly polluting liquid digestate flowed from a storage tank at its site in Somerset into a local stream.

The Environment Agency visited Cannington's Swang Farm in February 2012, after a member of the public reported a ditch close to the site was full of "green slime". An investigation found that a pipe to one of the digestate lagoons had come away from the tank, resulting in the liquid fertiliser being pumped onto the ground.

The firm admitted two breaches of the Environmental Permitting Regulations 2010, including causing pollution and storing waste outside a permitted area. In fining the firm, magistrates said the pollution could have had "disastrous" consequences had it not been detected early. The agency confirmed it continued to closely regulate the plant.

Case Law

EIA screening can take mitigation into account

In *TWS v Manchester City Council* [2013] All ER (D) 203, an application for judicial review of the authority's decision to grant planning permission for a football stadium was dismissed. The High Court agreed with the authority's conclusion that an environment impact assessment (EIA) was not required, and that the council was entitled to consider mitigation measures when assessing the significant impacts of the proposed development.

The court upheld the decision by the council to grant planning permission, saying the authority's screening opinion was not, as the claimant alleged, "irrational". According to the judgment, the council had: directed itself on the applicable statutory requirements; took into account government guidance; and applied the relevant criteria.

Judge Lindblom ruled that it was up to the court to intervene where an authority has acted "irrationally", but not to quash a decision just because someone might disagree with it. The effect on the environment had to be "significant" for an EIA to be required, but significance was not a "hard-edged concept" – the assessment of what was significant involved the exercise of judgment.

The screening opinion was also lawful on the basis that it depended on possible future mitigation. While an authority cannot conclude that a development is unlikely to have significant effects on the environment simply because all such effects were likely to be eliminated by mitigation, it can take into account remedial measures contemplated by conditions and/or undertakings when completing an EIA screening opinion.

Jen Hawkins and George Hobson

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New Regulations

In force	Subject	Details
1 Jan 2013	Taxation	The Air Passenger Duty (Amendment) Regulations 2012 amend the 1994 Regulations. Regulations 3, 4 and 6 came into force on 1 January 2013 and relate to the notice period for aircraft operators to register for air passenger duty and for the inventory of operators. The Air Passenger Duty (2012 Act) (Commencement) Order (Northern Ireland) 2012 supports the introduction of provisions of the Air Passenger Duty (Setting of Rates) Act (Northern Ireland) 2012. lexisurl.com/iema14139; lexisurl.com/iema14374
2 Jan 2013	Hazardous substances	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 implement the recast EU Directive 2011/65/EU. The Directive imposes harmonised restrictions on the use of listed hazardous materials in 11 categories of electrical and electronic equipment. lexisurl.com/iema14142
3 Jan 2013	Ecodesign	European Commission Regulation 1194/2012 implements EU Directive 2009/125/EC with regard to ecodesign requirements for directional lamps, LED lamps and related equipment. It will apply to special purpose products from 1 September 2013. Further products will be covered from either 1 September 2014 or 1 September 2016. lexisurl.com/iema14373
7 Jan 2013	Pollution	The Pollution Prevention and Control (Scotland) Regulations 2012 establishes an integrated pollution control regime for Scotland by implementing the EU Industrial Emissions Directive (2010/75/EU). lexisurl.com/iema14386
9 Jan 2013	Built environment/ green deal	The Building Regulations &c. (Amendment) Regulations 2012 amend several regulations relating to buildings that were introduced in 2010, including the Building Regulations 2010. Changes include future payment liabilities that apply under a green deal plan and measures relating to the renovation or replacement of the thermal element of a building to comply with the recast EU Directive on the energy performance of buildings (2010/31/EU). Most of the amendments came into force on 9 January 2013, others come into force in April or October 2013, and some in 2019 and 2020 (check Schedule 1 for timetable). Also, the Energy Performance of Buildings (England and Wales) Regulations 2012 consolidate the Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007 to include subsequent amendments. lexisurl.com/iema14379; lexisurl.com/iema14380
26 Jan 2013	Built environment	The Energy Act 2011 (Amendment) (Energy Performance of Buildings) Regulations 2012 amend section 11 of the 2011 Act to ensure it is consistent with the requirements of EU Directive 2002/91/EC on the energy performance of buildings. lexisurl.com/iema14381
27 Jan 2013	Green deal	The Energy Performance of Buildings (England and Wales) etc. (Amendment) Regulations 2013 amend the Building Regulations 2010 and Energy Performance of Buildings (England and Wales) Regulations 2012 to provide measures relating to the green deal scheme, including a requirement to provide information on a building in the scheme and the validity of energy performance certificates containing green deal information. The Energy Performance of Buildings (Scotland) (Amendment) Regulations 2013 introduce similar requirements in Scotland by amending the 2008 Regulations. lexisurl.com/iema14389; lexisurl.com/iema14580
27 Jan 2013	Chemicals	European Commission Regulation 34/2013 amends annexes II, III and IV to Regulation 396/2005 on maximum residue levels for 2-phenylphenol, ametoctradin; *Aureobasidium pullulans* strains DSM 14940 and DSM 14941; cyproconazole; difenoconazole; dithiocarbamates; folpet; propamocarb; spinosad; spirodiclofen; tebufenpyrad; and tetraconazole in or on certain products. The Regulation applies from 1 October 2012. lexisurl.com/iema14612

Latest Consultations

2 Apr 2013
Hydropower

The Environment Agency is consulting on a range of options for future river flow and water abstraction standards for run-of-river hydropower. The outcome will form the basis of updated hydropower good practice guidelines, which will be published later in 2013.
lexisurl.com/iema14631

4 Apr 2013
Permitting

Proposals to amend the Environmental Permitting (England and Wales) Regulations 2010 have been put out for consultation by Defra and the Welsh assembly government. Suggested changes include: exempting waste businesses from having to secure planning permission for certain operations before an environmental permit is issued; establishing a registration scheme for low-risk discharges to groundwater from some ground-source heating and cooling systems; and simplifying how regulators maintain duplicate public registers containing information connected with permit determinations.
lexisurl.com/iema14626

5 Apr 2013
Emissions trading

The Greenhouse Gas Emissions Trading Scheme Regulations 2012 came into force on 1 January 2013 (lexisurl.com/iema14145) and place new duties on regulators. To recover the costs of exercising these new duties, the department of the environment in Northern Ireland and the Northern Ireland Environment Agency are proposing to introduce new charges in the 2013 version of the consolidated greenhouse-gas emissions charging scheme.
lexisurl.com/iema14629

8 Apr 2013
Emissions from machinery

Emissions from engines in non-road mobile machinery (NRMM), such as excavators and bulldozers, are currently governed by EU Directive 97/68/EC. The commission says that, despite the emission limits imposed on NRMM, plant remain significant sources of air pollution, particularly of nitrogen oxides and particulate matter. The commission wants to overhaul the Directive and has issued a consultation to inform its impact assessment and legislative proposals due later this year.
lexisurl.com/iema14393

15 Apr 2013
Energy standards

The Scottish government has issued a consultation on future energy standards for buildings in Scotland. The proposed standard follows the recommendations of the Sullivan report in 2007 for further abatement. The planned changes should deliver a 45% reduction on 2007 emissions from new homes (21% on 2010 standards) and a 60% reduction on 2007 emissions from new non-domestic buildings (43% on 2010 standards).
lexisurl.com/iema14398

26 Apr 2013
Materials recovery

Draft regulations imposing a mandatory code of practice on materials recovery facilities (MRF) are the subject of a new consultation (p.9). The aim of the proposed MRF regulations is to help stimulate the market to improve the quality of the material produced by MRFs. Defra and the Welsh assembly government want to incorporate the MRF regulations, alongside a number of other amendments, into the Environmental Permitting (England and Wales) (Amendment) Regulations 2013 (see above).
lexisurl.com/iema14627

New Guidance

Stack emissions	The Environment Agency has published the ninth version of its technical guidance note on monitoring stack emissions (lexisurl.com/iema14633), which is the technical reference for its certification scheme (MCERTS) and operator monitoring assessment (OMA) scheme. The note focuses on areas where practical guidance is necessary, including: the legislative framework; the role of MCERTS; different approaches to stack-emission monitoring; sampling strategy; and the hierarchy of different methods. The guide also has an index of monitoring methods, which the agency says will be particularly useful for operators of installations falling under the Environmental Permitting (England and Wales) Regulations.
Pollution inventory	Updated guidance notes on pollution inventory reporting for activities covered by the Environmental Permitting (England and Wales) Regulations have been published by the Environment Agency. The six notes cover: chemical treatment of waste, including oil (lexisurl.com/iema14634); combustion activities (lexisurl.com/iema14642); incineration (lexisurl.com/iema14636); landfill (lexisurl.com/iema14635); mining and quarrying (lexisurl.com/iema14637); operators of waste transfer stations (lexisurl.com/iema14638); and refineries (lexisurl.com/iema14639).
Waste	Recent changes to regulations mean that anyone who transports waste while going about their normal business activities will need to be registered as a waste carrier by January 2014. To help those organisations that potentially have to register, the Environment Agency has published a guide on registration and responsibilities (lexisurl.com/iema14641). It covers who needs to register; the activities that need to be registered; how to register; making changes to a registration; and the responsibilities of a waste carrier, broker or dealer.

Laying down the law

Sniffing out trouble

Simon Colvin reveals why odour is a hot topic at the moment, particularly for businesses operating in the waste and manufacturing sectors

Odour is increasingly being reported as the reason for noncompliance with environmental permits. The issue has for a long time been the focal point for local authorities exercising their statutory nuisance powers. However, it is also now becoming the focus of more private nuisance claims by local residents and businesses, as demonstrated by *Barr v Biffa* [2012] EWCA Civ 312 and, more recently, *Anslow v Norton Aluminium* [2012] EWHC 2610 (see panel below).

It is in relation to environmental permits and nuisance that we have seen the most significant recent developments.

Controlling odours

The Environment Agency's H4 odour guide was published in March 2011, although a draft had been available for some time prior to that. Among other things it details the foundations of odour control: standard permit conditions; the requirement for odour management plans; and control measures, from engineering solutions to the cessation of the permitted activities.

The guidance also outlines a monitoring approach that centres on sniff testing and the use of the FIDOL parameters; which measure the frequency, intensity, duration, offensiveness and location of the smell.

Those familiar with H4 and odour will know that it is a very subjective area, prone to different interpretation with a high degree of uncertainty. As a result, the agency is often reluctant to respond using its enforcement tools, despite the fact that H4 provides a framework for tackling fugitive odour emissions.

Private claims

A worrying trend for operators is the increasing number of third-party claims from local residents and rising group litigation orders. Often specialist "odour-chasing" law firms are acting on no-win-no-fee agreements, meaning there is very little risk to claimants – they have nothing to lose other than their time.

The damages awarded where these claims succeed are often quite limited, from a few hundred to a few thousand pounds per claimant, but the costs can mount up where there are a number of claimants. In addition, there are often not insignificant legal costs for operators defending these claims.

Of most concern to operators is the threat of an injunction to prevent odours continuing. An injunction could require the temporary suspension of a manufacturing process until, for example, a solution is found to prevent the fugitive odour emissions. The associated costs and reputational damage of an injunction could be very significant.

Businesses should understand the basis on which an injunction will be granted and what they can do to try and protect against such an eventuality. Injunctions are often only granted in circumstances where there is a real danger that without an injunction the odour would continue.

Preventative action

The *Anslow* case highlighted that a court is unlikely to grant an injunction where an operator is:

- taking proactive steps to prevent any further fugitive odour emissions – by investing in additional abatement equipment, for example;
- engaging with local residents and businesses to manage their concerns – such as through resident liaison groups or helplines; and
- complying with an environmental permit – although this will not be a determining factor.

The overriding message is that, in the event of fugitive odour emissions, operators need to be proactive in taking control of the situation, even if this involves the voluntary temporary cessation of operations.

This should help to ensure that an operator can retain an element of control, in avoiding being subjected to a statutory notice served by the regulator, or a court-imposed injunction. If an operator can retain control in this way, then often they will be able to determine when operations should recommence, as opposed to the agency or a court making that decision.

As activities that generate odour are more frequently coming into close contact with residential communities and other businesses, conflict relating to odour is likely to increase. Operators need to act now to ensure they have processes in place to minimise the risks to their businesses.

Barr v Biffa

In this landmark case, the Court of Appeal reversed a High Court ruling that compliance with an environmental permit could defeat a nuisance claim. The case concerned a landfill site close to a housing estate in Ware, Hertfordshire. Thirty claimants brought a nuisance claim against Biffa – the operator of the site – for smells arising from the operation. Biffa had a waste-management permit that was subject to conditions aimed at controlling, minimising and monitoring odours. However, the Court of Appeal ruled that the permit did not authorise new smells.
environmentalistonline.com/biffa

Anslow v Norton Aluminium

Local residents succeeded in a private nuisance claim against a nearby aluminium foundry for odour emissions. The judge ruled that, although the claimants had failed to establish a legal nuisance by way of noise, smoke, fumes and dust, they had established an unreasonable interference with the use of their properties because of odour.
environmentalistonline.com/anslow

Simon Colvin is a senior associate in the environment practice at Pinsent Masons LLP. Follow him on twitter @envlawyer.

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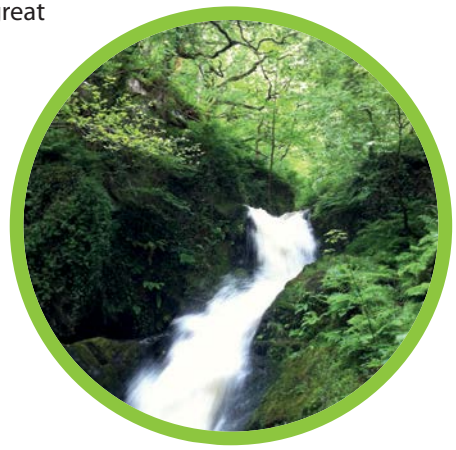

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Smarter connections

With the rollout of smart meters across the UK due to start next year, **Peter Brown** reports on how energy firms are preparing and the challenges they face

The government's smart metering implementation programme started in 2011 and aims to have a smart gas and electricity meter installed in every home and small business by the end of 2019. The project is currently in the foundation phase as energy companies prepare for the challenges of installing 53 million smart meters, a process Decc expects to begin in late 2014. In the non-domestic sector alone, 3.6 million electricity and gas meters will be replaced.

Smart meters record energy consumption in much more detail than conventional ones, allowing consumers to monitor and control accurately their own energy use via a display unit in the building. They can also be read remotely by the energy supplier, which means an end to estimated billing.

Decc's impact assessment for the smart meter programme estimates the total cost of implementation to be £12.1 billion, and that it will result in a gross benefit of £18.8 billion. The majority of that benefit will be in reduced energy bills for consumers, with the energy department estimating that households could save, on average, £25 a year by 2020. Savings for non-domestic consumers are estimated at a cumulative £1.76 billion, with most of that (£1.75 billion) coming from reduced energy consumption.

Putting meters on trial

The smart meter rollout is one element of the UK's transition to a smart grid, a transformed energy network in which distributors have greater insight into consumption patterns. In theory, a better understanding of energy use will allow suppliers to manage distribution more cost-effectively, take advantage of microgeneration sources and limit supply to non-essential uses at peak times.

The UK's largest smart meter trial is under way as part of the customer-led network revolution (CLNR), a project in the northeast of England. The three-year, £54 million initiative is the recipient of the biggest single grant from Ofgem's low-carbon networks fund, which was launched in 2010 to encourage distribution network operators to invest in smart grid technology and solutions.

CLNR, a joint effort between distribution firm Northern Powergrid, British Gas, Durham University and consultants EA Technology, will assess the impact of a range of low-carbon technologies on the existing electricity network infrastructure. The project involves the installation of smart meters in 14,000 residential and business properties in cities including Durham, Leeds and Newcastle, as well as in some of the UK's most sparsely populated areas. Around 2,500 of these

A CLNR smart meter at home

customers are also trialling equipment, including solar panels, heat pumps and electric vehicle charging points.

The trials aim to explore both customer and network flexibility solutions. British Gas is managing the smart meter installations and it says that the response so far has been very positive, with less than 2% of customers opting out of participation. Some pilot options made available to consumers, such as time-of-use tariffs – where energy usage is charged at a higher rate during peak times in exchange for a lower rate at other times – proved so popular that the trial was oversubscribed.

Additional insight

Initial analysis of data from 5,500 smart meters in the trial has provided some interesting findings, such as that residential energy use on Mondays and Fridays is different from other weekdays. This analysis would not have been possible with the quarterly readings that energy suppliers previously relied on.

This added level of insight has benefits for both consumers and suppliers. Consumers participating in the trial are now using data from their meters to take advantage of previously unused features, such as dishwasher timers that can be programmed to run the appliance only during off-peak times. Suppliers can, for the first time, link energy consumption habits to customer demographics, allowing them to observe differences in energy use between, for instance, a family and a retired couple. This could lead to more tailored energy tariffs.

Other customer flexibility options being explored include demand side response (DSR), which enables the supplier to communicate directly with customers and request, for instance, that they do not use an appliance at a specific time owing to demands on the network.

Allan Row, CLNR project manager at British Gas, explains: "It's not about controlling the appliance. We send a message to the customer and they have discretion whether or not to adhere to it. We don't want to interrupt customer comfort levels. It's about gauging customers' flexibility around those load and generation profiles."

Indeed, Row claims, when the correct financial incentives are in place via time-of-use tariffs, customers are more than happy to transfer discretionary energy usage to off-peak times.

Northern Powergrid (NPG), meanwhile, is leading on the network flexibility side and has had some success with DSR trials for industrial and commercial customers. NPG is offering financial incentives to customers who are able to provide additional generation or load-reduction capacity during times of peak demand. Sites, including a web-hosting business with standby diesel generation and a mining plant with combined heat and power generation, have participated in successful trials, with smart meter data being used to verify customer response to requests from NPG.

Success factors

There are several other large-scale smart meter trials under way around the UK. Low Carbon London (LCL), a project between UK Power Networks, EDF Energy and Imperial College London, has, for example, installed 6,000 smart meters in domestic premises across the capital in a trial that will run until 2014.

Data from the meters in the trial instantly show householders the amount of electricity they are using each time they boil a kettle, turn on a microwave or use a washing machine. The meters also display historic consumption in kWh and cost.

Rich Hampshire, senior business consultant at IT firm Logica (now part of CGI), whose "instant energy" prepayment solution is being used in the LCL trial, believes that educating consumers about the potential benefits of smart meters is essential to the success of the government's strategy.

"It's not just about installing the smart meter, it's about the education programme that goes with it," he says. "It's about consumers recognising that they have the ability, for the first time, through feedback, to take control of their energy expenditure."

Hampshire points to the example of a project in Växjö, Sweden, which demonstrates how critical consumer engagement is to the successful deployment of smart meters and related technologies. Over the duration of the trial, some residents were given access to a web-based feedback system that offered detailed insight into their energy consumption habits and costs. The system included a competitive element, whereby householders could compare their consumption with their peers and win prizes based on reductions in their energy usage.

Among residents with access to the website, average electricity consumption decreased by 17.5% over three years. For those without access to the site, the reduction was just 1.29%. The results from residents who were actively engaged with the website outstrip the UK government's estimates of a 2–3% energy consumption saving made possible by the installation of smart meters. While acknowledging that market conditions are different in Sweden, Hampshire thinks this trial has useful lessons for energy companies in the UK as they face the challenge of educating their customers around the benefits of smart meters.

"In Sweden, they used the stories of those higher-level savings to promote awareness, by getting those people as advocates," he says. "It's not just about marketing campaigns but things like taking the

information into schools and using it as part of learning projects, developing online platforms and running competitions around energy saving."

The importance of effective consumer engagement was also shown in the Netherlands. In 2009, the Dutch government had to rein back its planned compulsory smart meter installation programme after consumer groups exposed serious security flaws in the proposed technology. In response to this and related concerns, Decc has produced a data privacy framework, which sets out the conditions for supplier access to consumers' energy consumption data and gives consumers control over how it is used.

Research into public awareness and attitudes around smart meters, published by the energy department in August 2012, reveals that the process of consumer engagement still has a long way to go before it can claim widespread support for the national rollout.

The survey showed that 49% of energy bill-payers in the UK had heard of smart meters and that 5% claimed to have had one installed. However, given that the second figure wildly overestimates the number of actual smart meter installations, it seems likely that many respondents failed to understand what a smart meter is.

Again, while 32% of respondents supported the idea of a national smart meter rollout, 20% were opposed and 48% were undecided. Decc acknowledges that concerted education efforts from both the government and energy suppliers will be essential if smart meters are to be embraced by the public.

Complex market

In addition to the consumer engagement challenges, some metering experts believe there are also technical issues that could seriously hamper the industry's ability to meet Decc's target of a full rollout by the end of 2019.

One major technical challenge facing the smart meter programme is the issue of interoperability. The government is establishing a centralised data and communications company (DCC), which will manage the communication of data to and from smart meters. All meters and communications hubs installed by the UK's energy companies need to be able work with each other and with the DCC to ensure that consumers can seamlessly switch supplier when they choose. The complexity of the UK's deregulated energy market makes this a big challenge.

To address this issue, the government has developed smart metering equipment technical specifications, the second version of which (SMETS 2) has been sent to the European Commission for ratification. The energy department claims that SMETS 2 includes the necessary specifications for fully interoperable smart metering equipment, allowing manufacturers to begin production and suppliers to start procurement, confident that any equipment produced under SMETS 2 will be suitable for the national rollout.

Others, including Mark England, chief executive of smart grid and metering technology provider Sentec, are not so confident. England believes there are unresolved technical issues in SMETS 2, in particular the lack of final specifications for the home area network – the system that allows smart meters and domestic appliances to communicate with each other. According to England, ambiguity on such matters will prevent energy companies from fully engaging with the smart meter rollout.

"I know for certain that some of the energy suppliers are sitting on their hands and refusing to take part in any trials because they say the specifications are not fit for purpose," he says. While England believes suppliers can still learn valuable lessons from trials conducted with currently available smart meter technology, he maintains that manufacturers will refrain from producing SMETS-compliant products in numbers sufficient to support the national rollout until they know exactly what the final specifications will be. This puts the government's 2019 target in jeopardy.

"I can't see anyone committing to large volumes of products in the next two years because it's far too risky, it doesn't make sense," he comments.

The government's own figures give some sense of how far away the rollout of compliant meters is. According to the first annual progress report of the smart metering implementation programme, published in December 2012, of a total of 622,900 smart-type meters installed in domestic properties by September 2012, only 300 were compliant with SMETS 1.

England is also concerned that the government has not yet awarded contracts for the communications and data services with which all smart meter manufacturers and energy suppliers will have to work. The UK has been split into three regions for the award of these contracts which could, England explains, result in three different providers using three different communications protocols: GPRS, long-range radio and ZigBee (the specification for a suite of communications protocols) being the three front-runners.

In that situation, meter vendors would need to make their products compatible with all three different types of communications hub. "This has to make it more expensive for the UK," says England. "It would mean more testing, more inventory problems and fewer economies of scale. Until we know the communications service providers and what devices need to be

The CLNR trial includes installing energy-efficient equipment

integrated, no one can start to design products. It's a large risk to embark on a product development process when you don't know what the final specifications will be."

Infrastructure challenge

Whether or not these challenges can be overcome in time to meet the government's deadline, it is clear that the transition to a national smart grid represents a major challenge for the UK's infrastructure.

Dave Roberts, future networks director at EA Technology, compares the challenge to the conversion of telephone networks from 52kB dialup in the 1990s to modern-day 20MB broadband. "Much of the technology has not been used at scale or in a UK context before," he says, "so there is always a risk that things won't operate as intended when they are implemented on a large scale."

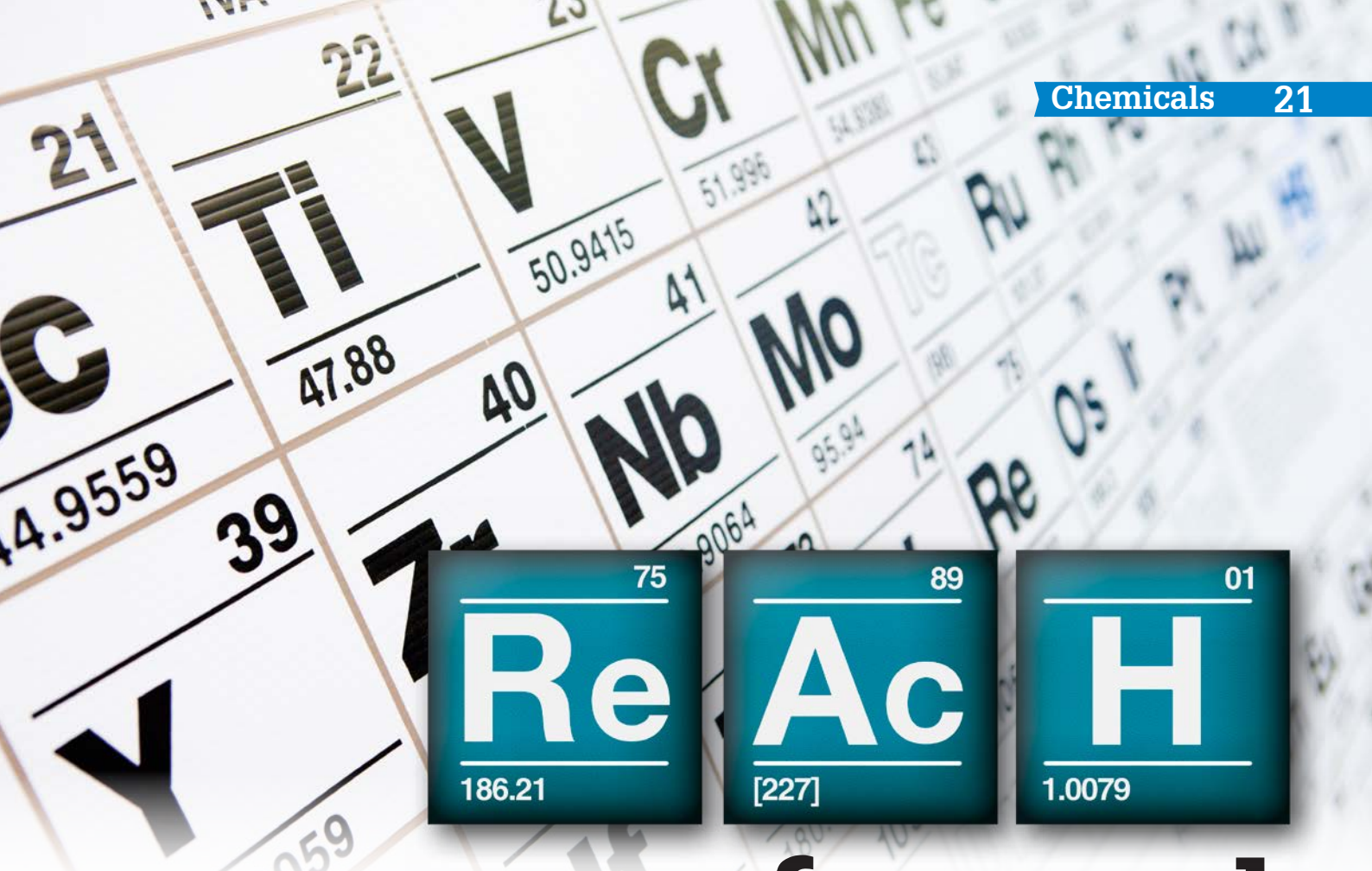
That makes trials, such as the CLNR project, invaluable, he argues, since they allow energy distributors to gather data on issues, including network loading and operation within statutory voltage limits – data that can then be shared with other operators around the country. "The challenge is that much of the technology is new and it has not yet hit the volumes, on a global basis, to bring the prices down," he adds.

The smart meter rollout also poses significant challenges for the energy suppliers themselves, in terms of how they adapt to a new market for smart energy solutions. "They need to become smart-enabled utilities," argues Hampshire. "How are they going to change their businesses to respond to the new challenges of more intermittent demand, more embedded generation? Smart meters will provide greater volumes of data to drive those decisions, but suppliers will need to evolve back-office systems to take account of it."

And, adds Hampshire, as well as issues of technical interoperability, the industry needs to come to terms with commercial interoperability. "A lot comes down to clarity in the market rules and mechanisms," he says. "If I want to use someone's physical infrastructure to deliver my proposition, how do I pay them for it? What are their obligations to allow me to do that?" These regulatory and legislative questions need to be addressed before the smart grid can become a reality, he believes.

Ultimately, as challenging as the smart meter rollout target is, Hampshire thinks it's just one element of a much wider issue. "Smart meters create an information and communications infrastructure that allow you to operate smart homes," he says. "We're all heads down, trying to solve the acute problem of getting smart meters deployed. If we look to the longer term, this is really about solving the chronic problem around making our energy use more sustainable and keeping bills affordable."

Peter Brown is a freelance journalist.



forward

The next major REACH deadline is 31 May 2013. **John Barwise** examines the ongoing challenges facing the regulation of chemicals across Europe

EU Regulation 1907/2007 came into force on 1 June 2007. Commonly known as REACH, the regulation governs the registration, evaluation, authorisation and restriction of chemicals in Europe. Its primary purpose is to protect human health and the environment from the potential risks associated with the use of chemicals.

The European Commission published its five-year review of REACH in February (p.6). It concluded that the system is functioning well, but that the quality of registration documents was a concern. More than 30,600 dossiers on chemicals have now been registered with the Helsinki-based European Chemicals Agency, (ECHA), which was created to help implement REACH.

The scope of REACH broadens on 31 May 2013 as it extends to low-tonnage chemicals that currently fall outside the regulation. There is concern, however, that many companies are ill-prepared for its expansion.

Chemical detox

In 2003, WWF mounted one of the environment movement's most ambitious and successful campaigns. Blood samples were taken from more than 350 people, including leading EU politicians, as part of the organisation's detox biomonitoring programme.

Chemical analysis of the blood samples was unequivocal: all those who took part in the tests were contaminated with chemicals whose long-term effects were largely unknown. Backed up by hard scientific evidence, the campaign received wide publicity across Europe and did much to persuade policymakers in Brussels that the principles of protecting human health and the environment should be enshrined in legislation.

The chemicals industry at the time was concerned that the cost of implementing REACH would undermine international trade, particularly with the US, which could result in significant job losses across the EU. There was concern too that access to information rules might breach confidentiality, leading to a loss of business and intellectual property. The sector vigorously opposed WWF's campaign and lobbied hard against some REACH requirements, arguing that chemicals are an integral part of daily life and that proof of exposure was not proof of harm, adding that chemical properties in some products, such as penicillin, actually save lives, and that anything taken in excess can be harmful.

But the detox campaign was much more than a publicity stunt. Biomonitoring is essential to better understand the pervasive characteristics of some chemicals in the environment.

Tony Long is director of the European policy office at WWF and helped lead the detox campaign. He says: "The biomonitoring of politicians, officials and three generations of the same families pushed the draft REACH legislation to the forefront of political debate in Brussels and the national capitals in 2005 and 2006. "It wasn't always comfortable locking horns with industry on blood testing, especially with accusations that NGOs were engaging in scaremongering. But the chemical industry had failed to do biomonitoring of its own; it was therefore somewhat defenceless in the face of this new exposure information."

Threats fail to materialise

The initial concerns of the chemicals industry have proved to be largely unfounded and, in many ways, the benefits of implementing REACH have outweighed the costs. Guy Thiran, director-general of Eurometaux, the body for the non-ferrous metals industry in Europe, acknowledges that REACH has been a valuable, though resource-hungry, exercise. The industry has always considered REACH a "responsible" investment, he says.

Since the introduction of the regulation, global chemical sales have continued to grow and although the EU share of the market is now 21%, compared with 30% in 2003, it remains the world's largest exporter of chemicals. Furthermore, turnover among European chemical companies has risen in absolute terms.

The loss of export trade has not really materialised because similar regulations were introduced in the US under the high-production volume (HPV) challenge programme. This initiative too was influenced by environmental campaigners seeking an international response to growing concerns about the impacts of hazardous chemicals in the environment. The HPV programme and the subsequent chemical assessment and management programme have helped to harmonise international legislation on the production, labelling and use of hazardous chemicals.

In Europe, REACH has streamlined chemicals management by replacing 40 pieces of legislation and creating a level playing field for existing and new substances. The hazards and risks associated with chemicals are now systematically identified, closing the knowledge gap for thousands of existing substances and providing valuable risk-management information on their acute and long-term effects.

Furthermore, the supply chain and downstream users receive relevant information on the safe use and application of chemical substances in production processes, which ensures safer working conditions.

In its summary assessment of REACH's positive impact on occupational and public health, the commission's enterprise and industry directorate concluded that it would lead to a reduction in respiratory and bladder cancers, mesotheliomas, skin disorders, respiratory diseases, eye disorders and asthma. Overall,

REACHing common standards

One of the key benefits of REACH is that it establishes common standards across the internal market so that the same rules apply to all businesses. This reduces compliance and regulatory burdens and harmonises assessment criteria for the safe management of chemical substances used or imported into the EU.

The Health and Safety Executive (HSE) is the competent authority for REACH in the UK, working in partnership with the Environment Agency and other government departments. The HSE has responsibility for enforcing compliance, evaluating selected prioritised substances and proposing restrictions.

This is particularly important for substances of very high concern (SVHC), which are those with serious consequences for human health or the environment. SVHC are defined as having carcinogenic or mutagenic characteristics, as toxic for reproduction or as bioaccumulative.

Substances classified as of very high concern – there were 138 listed by the ECHA at the end of 2012 – must be authorised before they can be placed on the market and those that fail the authorisation process may be banned.

Currently, 27 chemicals have been placed on the REACH authorisation list, which means they can only be used with permission after a certain date.

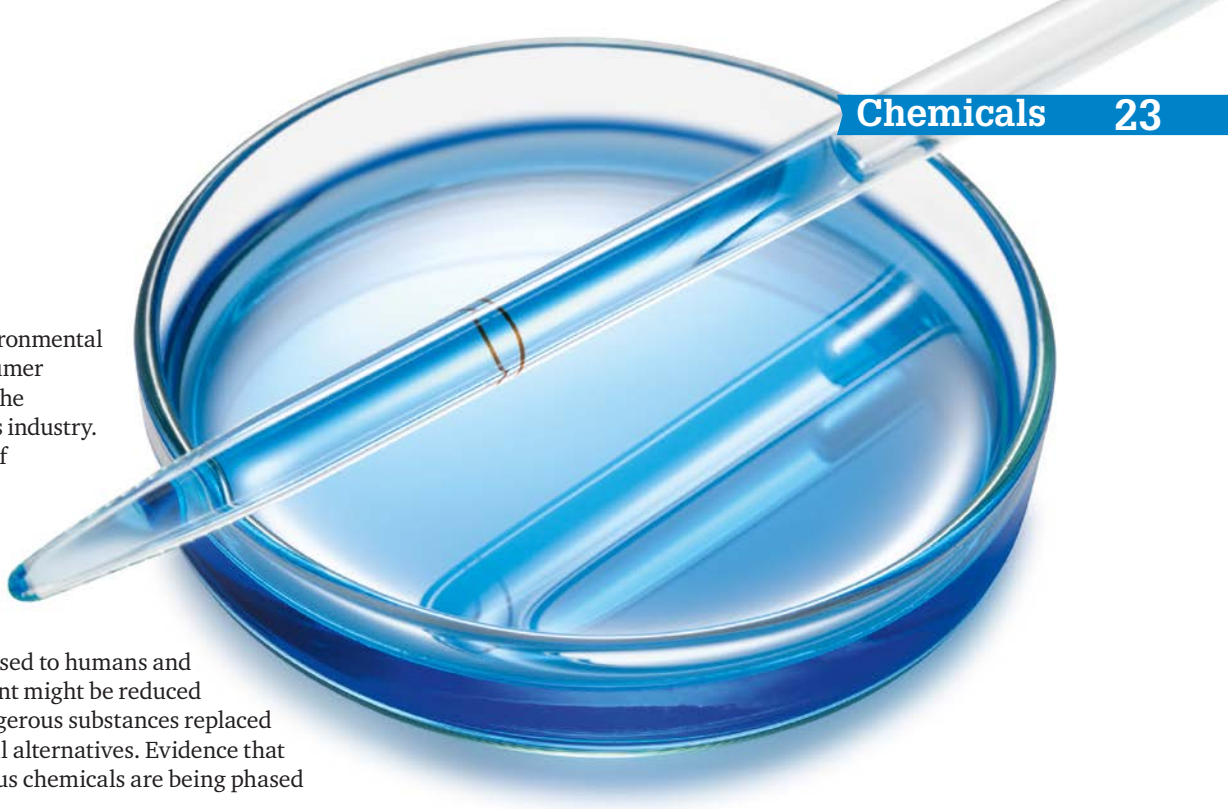
In the UK, REACH safety data sheets are issued by the HSE, along with guidance on how to determine whether compliance with the regulations is required for particular substances. These explain the obligations and registration procedures for those substances covered by the regulation.

The HSE also provides guidance on the Classification, Labelling and Packaging Regulation (1272/2008) (CLP) – a generic classification and labelling regime for hazardous chemicals. CLP came into legal force in all EU member states in January 2009 in response to an international agreement for the introduction of a harmonised system across the world. The transitional period for implementing CLP will be completed in 2015. This is to give suppliers and users of chemicals time to adapt.

Since its adoption in 2007, the chemicals industry has responded well to REACH by ensuring that manufacturers and others are fully aware of the regulation and what is required to ensure compliance.

The Chemicals Industry Association established REACHReady in 2006, ahead of the regulation, to provide advice and support to its members in the implementation of the Regulation.

REACHReady provides a confidential and comprehensive service to help organisations fulfil their specific registration and authorisation needs. This service includes training and consultancy services, as well as regular updates on the latest REACH developments and additional advice on the CLP.



REACH has improved environmental protection, bolstered consumer confidence and enhanced the reputation of the chemicals industry.

Despite the high level of optimism surrounding the initial launch of REACH, some of its key objectives have yet to be realised, however. It was expected that the number of chemicals exposed to humans and released to the environment might be reduced and some of the more dangerous substances replaced by innovative, less harmful alternatives. Evidence that some of the more hazardous chemicals are being phased out is, to date, patchy.

At a conference organised by the German chemicals company BASF in September 2012, Bjorn Hansen from the commission's environment directorate, declared that it was too early to say that REACH is achieving its objectives. He went on to comment: "We're seeing at least anecdotal evidence that [REACH is] starting to look like it's working." Hansen added that this was itself an achievement, given that it had been in operation for only five years.

Elephant in the room

Yet, despite the plethora of information and guidance on REACH (see panel, left), there is mounting concern that many UK firms are still unaware of their wide-ranging legal responsibilities under REACH.

There is a common misconception that REACH applies only to the chemicals industry, which is not the case. Under the regulation, manufacturers, importers and all downstream users are responsible for identifying, assessing and managing the risks posed by chemicals and for providing appropriate safety information to their users. Failure to comply can result in substantial costs and heavy fines.

A recent survey by the manufacturers' organisation, EEF, revealed a lack of awareness of the implications for manufacturers, especially among smaller companies. EEF declared that the scale of the ignorance of REACH "remains worryingly high", and reinforced fears that companies are failing to recognise the full scope and significance of the regulation.

"REACH continues to be the 'elephant in the room' for many companies, which are either unaware of the implications or still believe it is a chemicals-only issue," comments Gareth Stace, head of climate and environmental policy at EEF. "REACH has serious requirements for all manufacturers who are facing either restricted use or banning altogether of some substances."

The EEF survey shows that 20% of UK manufacturers believe REACH is not applicable to them, while a further 30% say it is not important to their business. According to EEF, a more worrying aspect of the poll findings is that even where smaller companies were aware of REACH, half were not monitoring developments. Stace warns that this could have serious consequences for businesses. "For many companies there is the very real risk of lost business if they are unable to advise their suppliers whether their products contain certain materials and, where they do, how their use is being monitored," he says. "Furthermore, if companies don't plan for substance bans, it could prevent production entirely."

Lowering the limit

REACH sets a series of time limits for the registration of chemicals based broadly on volume of production or imports per year and level of risk. The registration deadline for annual volumes of more than 1,000 tonnes was November 2010 – chemicals classed as "highly toxic" and produced at more than one tonne per year also had to be registered by the same date. For chemicals produced or imported in annual quantities of between 100 and 1,000 tonnes, the registration deadline is set for 31 May 2013, while for those produced in batches of between one and 100 tonnes each year, the registration deadline is May 2018. Around 30,000 substances are expected to be registered by 2018.

So far, the registration process has cost an estimated €2.1 billion. The ECHA expects the lowering of the quantity threshold in May to add at least another 2,300 chemicals to those governed by REACH, on top of the 7,884 registered since the regulation came into force.

The May 2013 deadline will bring tighter controls on manufacturers, importers and users of hazardous chemicals and will affect greater numbers of small and medium-sized enterprises (SMEs) – those identified by EEF as lacking knowledge about the implications of REACH for their business.

The ECHA has launched the "REACH 2013 – act now" campaign and produced a register of substances identified by industry, which includes those substances that were not already registered by the 30 November 2010 deadline. This will help manufacturers, importers and downstream users that want to check whether a substance must be registered by the end of May deadline.

But EEF and others claim more companies are likely to be affected this time around and are calling on the UK government and EU regulators to do more to raise awareness about the registration process and the downstream legal obligations implicit in the regulation.

The commission's REACH review acknowledges that more needs to be done to reduce the impact of the regulation on SMEs. Among the recommendations to alleviate the perceived "burden" on small firms are for the ECHA and industry to develop more user-focused guidance, with special attention to SMEs, and for the Helsinki-based regulator and national REACH helpdesks to develop activities and guidance on integrating REACH processes early into research and development, and companies' other innovation processes. In addition, the ongoing review of REACH fees aims to lower the costs for SMEs.

Wider impacts

Another issue that requires urgent attention is the impact of REACH on the EU's own campaign to promote resource efficiency and recycling. Recycled products that contain REACH-related substances would have to comply with the regulation.

Recycled plastic products pose particular problems, as they may contain chemical substances that are both difficult to identify and no longer authorised under REACH. This creates problems for manufacturers that rely on waste as a secondary raw material and the added cost of REACH registration could undermine the economic viability of plastics recycling in the future.

Ironically, REACH could seriously undermine the commission's plans to transform Europe's economy into a sustainable one by 2050. In its *Roadmap to a resource efficient Europe*, published in 2011, the commission outlined its plans to increase resource productivity and decouple economic growth from resource use and its environmental impact. According to Hansen at the environment directorate, the commission is working to "ensure that the interface [between REACH and recycling] works in the future."

The future

Beyond 2013, the May 2018 deadline for substances manufactured or imported in quantities of 1–100 tonnes looks set to capture an even larger portion of organisations under the REACH regulation. But perhaps the biggest challenge is what to do about those chemicals that currently slip under the radar of REACH.

Nanomaterials are by definition very small and are measured in grams and kilograms rather than tonnes. The commission has published a legal definition of nanomaterials and a regulatory framework, which is based more on the size of nanoparticles. But, unlike other potentially hazardous substances, it has yet to address the pressing issues of health and safety.

WWF says the commission must ensure the underlying principles of protecting human health and the environment are not undermined."REACH is a major step forward. However, it needs to keep up to date and respond to new threats identified by scientific evidence to ensure a high protection level for human health and the environment. This includes, among other things, the issue of nanoparticles," says Long.

The EU remains divided on what to do about nanomaterials. France already maintains a nanomaterials inventory and Germany wants to extend REACH to nanomaterials. The commission's preference is to amend the annexes of the regulation for those substances already covered by REACH and to undertake an open impact assessment on the possibility of a community-wide nanomaterials register. The REACH review says a draft implementing act could be published by the end of the year, including necessary amendments to the REACH annexes, should the commission consider that further regulation of nanomaterials is necessary.

Meanwhile, NanoReg, a Dutch-led project launched in January, aims to address priority questions on aspects of manufactured nanomaterials such as characterisation, dosimetry, exposure issues, in-vivo and in-vitro testing, life cycle and safe-by-design.

The REACH review was due to be published in June 2012, but was delayed several times because of the complexity of the subject matter and the range of data and information that had to be processed. And, with nanoscience and nanotechnologies developing rapidly – 2012 data reveals that more than 1,300 nanotechnology-enabled products have entered the market over the past few years – the regulation of chemicals is likely to get more complex still.

According to the commission, it will be 30 years before the health and environmental benefits of REACH fully emerge. For now, the immediate concern is to ensure companies whose substances will now be covered by REACH comply.

John Barwise is a director at environmental management and communications consultancy QoL. He is a Full member of IEMA and a Chartered environmentalist.

Shifting gear

Paul Suff discovers how Jaguar Land Rover is driving down environmental impacts across its operations

Lighter, more aerodynamic vehicles, greater use of renewable and recycled materials, and easier disassembly at the end of life are all initiatives being employed by Jaguar Land Rover (JLR) in its journey to improve environmental performance. More efficient manufacturing, strict environmental standards for suppliers and improving logistics also feature in a sustainability strategy aimed at reducing the environmental and social impacts of JLR vehicles across their life cycle, from product design to the end of a vehicle's life.

The company's Range Rover Evoque is its lightest-ever vehicle, with one model 30.9% lighter than the 2012 Range Rover Sport, and it produces 3.8 tonnes fewer greenhouse-gas emissions over a car's life cycle than a comparable Freelander 2. Similarly, life-cycle emissions from the latest Jaguar XJ are 5.2 tonnes less than the previous model. The all new Range Rover, which was launched in September 2012, maximises the use of aluminium, saving up to 420kg on the outgoing model and delivering a 23% reduction in tailpipe CO_2 emissions. And 85% of the materials in the vehicle can be recycled at the end of its life.

On target

Environmental targets set by JLR in 2009 – after its acquisition by Tata Motors – include a 25% reduction in carbon emissions across its EU fleet by 2015, against a 2007 baseline, and similar cuts in operational CO_2 output and waste to landfill by spring 2013. JLR also has 2013 targets for water use (-10%) and emissions from its logistics operations (-15%).

Tailpipe emissions account for 75% of a car's carbon footprint, and improvements in design have seen such emissions from JLR's EU fleet fall by almost 14%, on average, between 2007 and 2012.

The company will report soon on its performance against the 2013 deadline and outline new, stretching targets for 2020. The most recently available data reveals that JLR is on track to meet this year's milestones. Between 2007 and 2012 the firm had, on a per-vehicle-manufactured basis, cut:

- operational carbon emissions by 15%;
- waste to landfill by 37%;
- water consumption by 10%; and
- carbon emissions from inbound logistics – components and materials delivered to JLR's three manufacturing facilities – by 22%;

Meanwhile, emissions from outbound logistics – finished products to market – have fallen by 9% per vehicle since 2008.

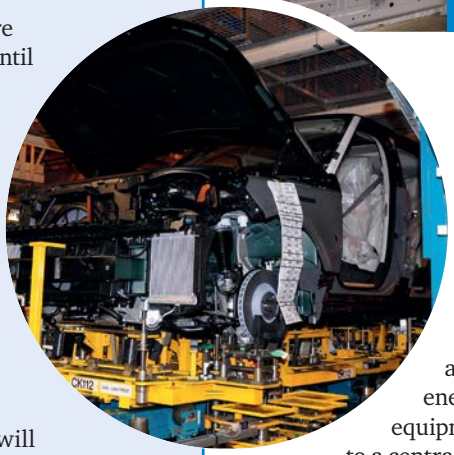
Investment across the business, including £370 million at JLR's Lode Lane plant in Solihull (which produces the fourth-generation Range Rover, Range Rover Sport, Discovery and Defender) will see

Waste: Tying up the loose ends

Most of JLR's scrap metal, wooden packaging, cardboard and plastic is recycled. The hard and soft plastics that protect critical components, for example, are recycled, with the revenue given to Stoke Mandeville Hospital. Disposing of some materials, such as the rubber strings that aid the fitting of door seals, has proven to be more problematic, however.

Up to 35 tonnes of the strings, known as "laces", were being discarded as general waste each year. That was until Lucy Walkerdine, who works in the "trim and final" facility at Lode Lane, noticed that the material was similar to that used for the pencil cases her daughters had received when they opened their Co-op bank accounts. She contacted the company making the pencil cases – Worcester-based Remarkable – and has worked with it to produce matting, comprising 50% tyre and 50% "lace" material.

The plan is to use the material for covers of notebooks made from recycled paper. "The 'laces' were one of the last waste streams going to landfill from trim and final," reports Joe McNamara, lean manufacturing manager at Lode Lane. "This solution will bring us closer to zero waste to landfill."



Range Rover's all-aluminium monocoque

further progress against the 2013 targets. The site, for example, opened an aluminium body shop for the new Range Rover, and its paintshop and trim facilities were upgraded in September 2012.

Alan Volkaerts, operations director at the plant, says the investment is crucial if JLR is to achieve its long-term environmental objectives. He believes the JLR workforce is equally important. "For every environmental target you can read technology and investment and hearts and minds. We aim to engage employees in our environmental goals," he says.

The importance of employee engagement with environmental issues is highlighted by the motto underpinning JLR's blueprint for a sustainable future: "Respect our environment, connect our people and protect our business."

Volkaerts explains that employees work to achieve plant targets that are linked to the corporate goals. "Basically, JLR has some top-level metrics, which are cascaded down to functional leads, like myself. It's my job to turn these into something meaningful for my team," he says. "I know what we have to achieve at Lode Lane in terms of reducing electricity, gas and water consumption, and waste to landfill. These are all on my scorecard and are measured monthly. We have regular forums to see whether or not we're on track."

JLR also asks employees to identify ways to help meet its targets. "They'll report that taps are dripping or where there's a potential air leak, for example, and come up with ideas to reduce waste," confirms Volkaerts

Factories of the future

While product design is the best way for the company to reduce the environmental impacts of its vehicles, improving the energy efficiency of its manufacturing operations as well as reducing waste, water consumption and solvent use provides opportunities for JLR to address its overall environmental footprint.

The company's new engine manufacturing plant in Wolverhampton, which will open later this year, is designed with sustainability in mind and aims to achieve a BREEAM excellent rating. Insulated cladding and maximum use of natural light and ventilation – through automatic louvres – will minimise energy consumption. In addition, all equipment will be metered and linked to a central building management system; waste heat will warm the factory; and harvested rainwater will be used in the manufacturing process.

JLR is also improving efficiency at its existing plants. Much of the Lode Lane site dates from the 1940s, but the construction of new buildings and retrofitting of existing ones, as well as changes to manufacturing systems and equipment, has cut energy consumption significantly. The bodyshop building dates from the 1960s, but refurbishment, including replacing the roof to improve insulation, has saved JLR around 20% on its energy bill. The new visitor centre has photovoltaic panels, which have contributed to the building achieving a BREEAM rating of very good.

The Solihull site also boasts a solar wall. The technology, which was trialled at JLR's training academy in Gaydon, is installed on the most southerly elevations and draws air from outside into a building through a number of tiny perforations in the sun-warmed external metal skin. As the air passes through these perforations it becomes heated. The warm air passes into an air cavity and rises to the top where it is distributed around the building. "It helps to keep the warmth in the winter and to cool the building in the summer," comments Volkaerts.

Replacing sodium and fluorescent lamps with energy-efficient LED lighting and installing passive infrared (PIR) detectors is giving JLR big cost and carbon savings at Lode Lane. The LED lighting reduces energy consumption by 70%, saving more than 1,000 tonnes of CO_2 a year and cutting annual costs by over £140,000. Return on investment for the new lighting was less than two years, while the longer lifespan of LEDs reduces annual maintenance costs. At the same time, PIR detectors have been installed in offices, foyers, corridors, rest rooms and toilets to turn off lights automatically when there is no activity for 15 minutes and provide further savings. "Investment in PIRs means our 'power down' is now more successful between shifts and at weekends," reports Joe McNamara, lean manufacturing manager at Lode Lane.


The body shop uses 328 robots


JLR is replacing solvent-based paints


The new convection oven at work

From welding to rivets and beyond

Lode Lane also provides examples of how changes to the manufacturing process are assisting JLR to achieve its environment targets. The all-aluminium monocoque body structure for the new Range Rover – a world first for a sports utility vehicle – has provided the company with more opportunities to recycle and reuse materials, as well as further reduce energy use.

The press shop, where steel and aluminium is stamped into body parts and panels, is subject to strict recycling targets. Not only do operators such as Brent Powell have to segregate off-cuts of the two metals, they also have to ensure separation of the two grades of aluminium used by JLR. "Contamination between the two shouldn't be higher than 5%," notes Powell. He explains that revenue from scrap aluminium varies between 56% and 92% of the base price, depending on the quality of the material.

Dedicated trailers for scrap steel and aluminium are fitted with transponders that record the weight of the waste and ensure it is tipped into the correct container. In September 2012, JLR signed a long-term supply contract with Novelis, the world's leading producer of rolled aluminium, which includes the recovery and recycling of all the automaker's aluminium scrap, creating a closed-loop recycling system. Recycled aluminium is up to 95% less carbon intensive than virgin aluminium.

Moving to all-aluminium body structures for its vehicles has allowed spotwelding in assembly to be replaced by self-piercing rivets. A total of 3,722 rivets hold together the 403 parts of a Range Rover, and the technology uses less water and energy than conventional assembly techniques. A rivet joint, for example, uses 90% less electricity than a spotwelded one.

"The thing with a steel body shop is that not only do you need heat to weld the parts, but water to cool them down again. So, the aluminium body shop gives us a double whammy, saving both on heat and water, as well as water treatment," says Volkaerts.

Energy savings in the body shop have also come from fitting variable speed drives to the air compressor units that power its 328 robots. Previously the units would constantly be coming on and offline, requiring 500kW of power to restart each time. The introduction of variable speed drives means the units are always on, delivering as much air as is needed and consuming far less energy. Before the conversion, the units were consuming around 30kWh of electricity each year. That figure has now been halved, and electricity costs cut from £2,000 a year to £991.

Rolling out the technology across the Lode Lane plant cost nearly £200,000, but annual savings total £175,000, enabling JLR to achieve a return on its investment in just 14 months. At the same time, the variable drives have cut carbon emissions by 1,532 tonnes a year. McNamara highlights another benefit: "We're not now working the units so hard, so we've got a more reliable system – one that requires little maintenance." Other JLR plants have also introduced variable drives.

Another example of how the body shop is saving energy is its installation of controls to automatically power-down production-line equipment. McNamara says a maintenance engineer noticed that robot motors were still consuming power even during long periods of inactivity. "Each robot takes a break, as a safety feature, but power was still being be used to maintain the 'hold' position of the robot because the system wouldn't allow the robot's brake to engage," he explains. "We developed new software which sends a signal to the robot to engage the brake after one hour of inactivity. That takes power off the motor."

The change, which has now been adopted by the robot's manufacturer, ABB, saves the Lode Lane plant around £35,000 in electricity costs and 260 tonnes of carbon each year.

The revamped paint shop at Lode Lane, which is spread across seven mezzanine levels and is the second largest paint facility in Europe, accounts for up to half the site's energy consumption – about 60GWh of electricity and 250GWh of gas a year. In April 2012, the paint shop replaced an infrared oven with a convection oven, which resulted in a 40% improvement in energy efficiency.

JLR is also replacing solvent-based paints with water-based alternatives. Nigel Smith, engineering manager at the paint shop, explains that solvent use is being further reduced by a new system that allows sprayers to switch between colours without purging the previous colour from their spray guns. All waste paint goes through a washing treatment process to separate solids, which are sent to a cement factory, and solvents, which JLR reuses.

Material change

The all-new Range Rover contains 31.5kg of recycled plastic, while each Evoque has 16kg – the equivalent of reusing 1,000 500ml plastic bottles. The material used to trim the headliner and upper pillars, for example, is made from 100% recycled polyester obtained from plastic bottles and fibres. The recycled materials require 66% less energy to produce, and reduce the production carbon footprint by 54%, says JLR.

More JLR vehicles will be made from recycled materials as preference for aluminium grows. JLR is developing a new alloy, RivAlloy, which has a higher recycled aluminium content and can tolerate higher levels of impurity from scrap. The company is also

Interview Mike Wright

Sustainability at Jaguar Land Rover

Jaguar Land Rover executive director Mike Wright has responsibility for sustainability at board level. His remit covers the environmental impacts from the firm's manufacturing facilities and its products, as well as the company's work with schools and universities, and its global carbon-offsetting programme.

Wright says the development of JLR's sustainability strategy has been organic rather than driven by external pressures, such as regulation. "If you're a global business and you're competing against other great brands, you need to be at least competitive, but ideally leading the sustainability agenda," he explains. "Increasingly stakeholders, including our employees, want to know we are taking these issues seriously."

He believes that policymakers need only outline the broad environmental agenda that business should follow together with a clear set of targets, and leave it to companies to develop the technical solutions. "A lot of policy is well intended, but often sends the wrong signals," he says, citing fiscal support in the UK for electric vehicles (EVs) as an example.

"The challenge for the automotive industry is to develop an alternative to the combustion engine. The answer might be EVs, and JLR is investing heavily in hybrid and EV technology, but it might not. The government should set stretching targets for the industry to reduce emissions and leave it to develop an alternative powertrain rather than incentivising just one technology," Wright argues.

He explains that JLR embraces horizon scanning, looking ahead to 2020–25. He highlights the following three main environmental challenges facing JLR in the years ahead:

1. **Balancing growth and sustainability** – "Our growth plans will involve the development of new infrastructure. Those facilities will still be around in 30–40 years so we need to ensure they are built to the highest standards."
2. **Regulatory complexity** – "Auto products are highly regulated. But JLR generates 85% of its revenue outside the UK. The regulations in the US differ from those in the EU, while China will have its own, which will differ again. JLR needs to manage the complexity of the regulation across all its markets."
3. **Putting something back** – "JLR is an engineering firm and engineers will be key crucial to society to be able to meet the requirements of the future. We have 150 research engineers based at the University of Warwick working alongside academics on future technologies. We want to find smarter ways of doing things."

Mike Wright is executive director at Jaguar Land Rover.

participating in REALCAR2, a project funded by the Technology Strategy Board to develop the aluminium-recycling infrastructure in the UK. JLR is aiming for its vehicles to eventually contain 75% recycled aluminium.

Easy disassembly of a vehicle at the end of its useable life is key to effective recycling of the materials it contains. Currently, 85% of materials in JLR cars are recyclable, and 95% are recoverable.

Transporting materials to JLR plants is another significant source of emissions, with components and materials collectively travelling up to 25 million miles each year. Finished products travel even further, with 80% of vehicles from UK sites exported to 180 countries. In total, JLR products travel some 50 million miles by road, rail and sea, emitting more than 74,000 tonnes of carbon. In 2011/12, JLR reported that carbon emissions from inbound logistics had fallen by 22% since 2007 per vehicle produced.

Scott Hardy, freight strategy manager, reports that the company recorded a 9% drop in emissions from outbound logistics between 2008 and 2012. That's against a significant increase in volume over the five years. "The great thing is that just a small change can have a huge impact," says Hardy. "We are constantly looking for technological innovations, such as telematics on lorries, or driver training so they drive more efficiently." JLR also shares deliveries with other car manufacturers and now moves more vehicles to ports by rail.

Moving forward

Executive director Mike Wright reports that sustainability is an important board-level issue at JLR (see panel, left). "The environmental implications of running our plants and the vehicles we produce are uppermost on our agenda," says Wright, who has overall responsibility for sustainability.

He explains that JLR examines the carbon impact of every major decision it takes, citing the construction of the new engine factory in Wolverhampton and siting a new plant in China – JLR announced in November 2012 plans to build a factory in Changshu, near Shanghai – as examples of the influence of environmental factors on its strategic plans.

"From the off we decided to aim for the BREEAM excellent standard at the new engine factory; it was written into the finance for the plant at the beginning of the project," Wright says. "China is a big market for JLR. And, while the decision to base a factory there is not wholly about reducing our carbon footprint, the fact that JLR will be able to satisfy the growing demand for its vehicles in south-east Asia from a local facility, helping to drive down emissions from logistics, was a factor."

Wright acknowledges that JLR's ambitious plans for growth present big sustainability challenges, but he is confident that the company can be both economically and environmentally successful. "We want to grow and we have to manage that growth so that it is sustainable. That's why our corporate strategy locks together growth and sustainability."

Emissions saved – transport = waste footprint

Transport = distance x carbon intensity

Making waste add up

Will Simpson learns how SITA calculates the CO_2 produced by different waste disposal routes

Aluminium = 2 tonnes

In October 2012, *the environmentalist* looked at how Newcastle Hospitals NHS Foundation Trust brought together a number of waste contracts and issued a single new tender for services that included a number of specific environmental requirements (environmentalistonline.com/dixon). Some of these conditions were fairly commonplace, increased recycling rates, for example; others were not.

After much deliberation, it was SITA that won the contract, partly because as James Dixon, the trust's waste manager explains, every other company tendering admitted they would not be able to provide the necessary data or in the precise format demanded by the trust. "SITA was the only firm that came back to us and was able to say 'you emit 0.8 tonnes of CO_2 per one tonne of waste that you send to our energy recovery facility' and then compare it to what emissions would be if sent to landfill," says Dixon.

Emissions data was the detail that the trust was seeking; a way that it could accurately compare how different waste routes are performing in terms of saving carbon and show, in easy-to-understand terms, what differences its efforts to reduce waste are making.

1 tonne of virgin aluminium = 10,488 tonnes CO_2

Carbon calculator

The secret resides in the carbon calculator that SITA began developing around 2007. This is a mathematical formula that measures how much CO_2 has been saved by diverting waste from landfill into other disposal routes. In the case of Newcastle Hospitals NHS Trust, these include an energy-from-waste plant and an anaerobic digestion facility.

"What we do is look at the fates of the different materials," explains Stuart Hayward-Higham, development director at SITA UK. With materials that are recycled, for example, the firm compares emissions savings made by recycling the waste rather than sending it to landfill, and then calculates the additional carbon saved by preventing new materials, such as virgin aluminium, from being produced.

1 tonne of recycled aluminium = 1,222 tonnes CO_2

"Meanwhile, for RDF [refuse-derived fuel] or the energy-from-waste solutions, we look at the carbon intensity of the treatments. If the RDF is sent overseas, it is generally to plants that are a lot more efficient in their energy use than in the UK," says Hayward-Higham.

He explains that the main difference is not the equipment or the facilities, but that in Europe using heat from energy plants is common practice – through heat grids and suchlike – so a lot more of the energy is being used. "Although shipping and transport adds a burden, the benefit we get at the other end more than compensates for that," claims Hayward-Higham.

SITA looks at the fate of all the different material that it collects, then uses the Defra guidance on measuring greenhouse-gas emissions or the Environment Agency's waste and resources assessment tool for the environment (WRATE) – software that compares the environmental impacts of different municipal waste management systems – to calculate the carbon intensity of each solution.

No easy task

Working out the carbon intensity for each stream is not straightforward, however. "In principle, we would need to calculate the carbon burden of the waste receptacle, ie the bin, including maintenance cost, expected life and ultimate fate, the truck collecting the bin, and the facilities treating the waste," says Hayward-Higham. "Then we'd have to assign a proportion of the carbon capital to each collection."

The firm would also have to assign each customer with a calculation for bin collections based on the miles travelled, the mix of waste collected and the burden of sorting and separating. Then, for each new stream created, it would have to establish a measure for its transport and for the benefit/burden of its ultimate fate.

"But that's not really possible at the moment as the trucks will collect and consolidate a number of customers' bins and we won't be able to sort and separate the bin contents prior to mixing in the truck or follow the contents through the chain of treatment," acknowledges Hayward-Higham.

He explains that SITA is currently working on a method to collect data from the vehicle round – the whole journey plus the sum of bins collected – as well as information collected over time from customers' bins and site audits that will enable the firm to estimate the average contents of clients' bins. "That composition, plus the weight of each bin collected, will provide us with the data we'll use to define the volume and composition of

Emissions from virgin materials (21,000kgCO_2) – emissions from recyded (2,500kg CO_2) = 18,500kgCO_2 saved

the customer's waste/commodity stream," says Hayward-Higham. He says the formula itself is not difficult and uses the example of aluminium to demonstrate how it works: "You take the amount of aluminium collected, then apply the Defra or WRATE metrics, which enable you to calculate the amount of carbon saved compared to using virgin aluminium, giving a total cost."

To calculate the transport emissions involved, SITA tots up the number of miles the ship, for example, travels, and applies a measure for the carbon intensity per mile travelled. "Then you subtract the burdens from the benefits, which gives you a net result," he explains.

Standard practice?

As SITA uses accessible metrics from both Defra and the agency, it seems likely that other waste contractors could easily arrive at the same figures. "There's no reason why anybody couldn't do it, be it a waste company, a consultancy or a hospital itself. It's just about tracking your data," says Hayward-Higham.

It is a more difficult calculation if a waste company uses another's facilities and has little control over final disposal, particularly where the waste is recycled, however. SITA occasionally makes uses of other companies' waste management facilities for some streams and needs to understand the whole process chain from recovery to how the recycled products are used.

"We are reliant on them and the companies which ultimately use the recycled materials to provide data. But ultimately for an individual customer, their contribution to tonnage will be small and we therefore use industry average burdens/benefits for the individual streams," explains Hayward-Higham.

More than carbon

Carbon is not the only thing that the SITA calculator can measure. The waste management company can also track: energy savings; toxicity; and land usage/land saving resulting from different waste streams.

"Measurements of these aspects are a combination local information, such as plant, truck, and region or commodity stream average data. And we look at recognised data sources for those elements we cannot measure directly," says Hayward-Higham.

He is confident that SITA will soon be able to map out other environmental impacts using the same metrics. "We're becoming more detailed and I suppose a bit more bespoke," he says. "We're currently working on the next generation of carbon models, which will also calculate water savings."

Hayward-Higham points out that recycled materials not only save carbon, but have much wider impacts. "Take a pair of jeans, for example. All the water that you need to grow the cotton, manufacture the material and then prepare the jeans is saved if you recycle them. And this can be measured, again using either Defra or other environmental statistics," he says. "The same goes for cardboard and land use. You can calculate how much land you are saving by recycling one tonne of cardboard by measuring how much land is dedicated to growing the trees that produce one tonne of virgin material.

"What we're trying to do is move the debate on. Carbon is very important, but it's not the only thing that's important. Other wider environmental benefits should also be accounted for."

1 tonne of new clothing = 22,310 tonnes CO_2

Not just a number

One of the motivations behind SITA's work in this area is to ensure the issues of recycling and energy use are more than just a set of numbers on a spreadsheet.

Since the start of the contract with Newcastle Hospitals NHS Trust in January 2011, SITA has helped the organisation to more than triple its recycling rate, from 9% to 30%. That has had a real impact on staff at the trust. "It is about making the whole thing more tangible for people," Hayward-Higham insists. "I think in any tender we try to provide a picture of what we're offering in more than a monetary sense. That means giving them a sense of what they're saving in terms of carbon and other factors so that they know the value of what they're achieving with the work they do."

Key to this is engaging workers, he says, so they can appreciate why recycling is worthwhile. "Generating understanding means we can have an informed discussion about what the organisation can achieve."

1 tonne of recyded plastics = 1,977 tonnes CO_2

It seems likely that other waste companies will be – if they're not already – following SITA's example and providing more detailed and accurate information for large waste contracts. There is also the potential to use similar calculations for the waste from small businesses and domestic householders. Hayward-Higham points out that the potential is there: "Technically, we can already do that. We can weigh the bins as we collect them, we can tag them and know which bins belong to which house. If domestic customers become comfortable with it and they like the idea, then there's no reason why it couldn't happen."

Certainly Dixon at Newcastle Hospitals NHS Trust suspects that other public bodies will be asking for the same sort of detailed data before too long. "I had an enquiry from Northumbria Healthcare, which was doing a waste tender at a similar time and had heard about what I'd specified in our contract. I'm also aware of some trusts in London that, while they aren't necessarily putting a requirement for such calculations in their specifications, are obviously working with contractors to get better data," says Dixon.

1 tonne of new plastics = 3,179 tonnes CO_2

"I hope these methods become more widespread, because they've made such a difference on the ground for us," he says. "Previously we were really operating with our eyes closed. For me it's a great benefit because I can see which areas are not performing very well. I can identify the hotspots that need improving, which we couldn't really have done before."

Will Simpson is a freelance journalist.

Detective work

Successfully tracking down the source of contamination depends on applying the right analysis tools for the job. Scientist **Stephen Mudge** explains

As a forensic environmental practitioner, the questions I am commonly asked relate to the state of the environment and typically revolve around: "Who contaminated this soil/sediment/water?" And the next question is often: "How long ago did this occur?"

It is fortunate that there is a wealth of knowledge on how chemicals behave in the environment and their different degradation or transformation rates. Analytical equipment is also available that can quantify whole suites of compounds and elements rapidly, repeatedly and with low-detection levels. Several new instruments push the envelope even further down the concentration range.

The correct analysis

All this is great, but there still needs to be considerable effort invested in performing the correct analysis to answer the question being asked. If an issue regarding the source of a metal such as lead (Pb) comes up, for example, simply measuring its concentration might not be enough to ascertain the source, especially where it has been transported in water and deposited in another location. In some cases, it may be possible to backtrack a concentration gradient to the strongest signal, but this is frequently not possible.

It would be better in such cases to use the stable isotopes of lead to define its geochemical signature. Samples would need to be collected from all potential sources, as well as from the affected area. It may be that the site has received the metal from several sources, some of which may have changed over time. If there is sufficient discrimination between the isotopes, it would be possible to develop a mixing model and quantify the input from each source.

For example, runoff from a former lead mine in North Wales – Parc Mine in Gwydyr Forest – produces considerable quantities of oxidised iron that provides a mechanism by which other metals might be transported further. The question was how much this particular source was contributing to the contamination relative to other known sources of lead in the area. The stable isotopes – ^{204}Pb, ^{206}Pb, ^{207}Pb and ^{208}Pb – clearly showed that this was a minor contributor and another sub-catchment of the river was the major provider. Measuring the lead concentration alone would not have distinguished between these sources.

Oily mess

Similar approaches are necessary when seeking the source of oil hydrocarbons in the environment. From a forensic standpoint, it is fortunate that both crude oil and many products derived from oil have hundreds, if not thousands, of compounds. These compounds have a range of physicochemical properties that can assist in determining the most likely source and the time since deposition. Short-chain alkanes are readily lost through evaporation and microbial degradation. These processes have comparatively less effect on the long-chain or branched compounds. A simple approach to determining the relative age of the deposition is to look at the ratio of these compounds; a single total petroleum hydrocarbon value cannot be used for this.

Alkanes are common to all these oils and cannot be used on their own to discriminate between sources. In this case, biomarkers, such as the steranes and terpanes that are remnants of the original source organic matter, can often provide a signature and allow source identification. These compounds are stable in the environment for extended periods and have been used to identify the responsible parties when tar balls have washed ashore.

Although these compounds are not difficult to analyse, they are not routinely measured with the other compounds associated with oils. Many commercial laboratories do not normally examine these compounds and may not even have the capability – typically their bread and butter work is monitoring for compliance. Forensic investigations require a much broader range of compounds, as different ones are needed to answer the different questions that may arise (see examples in the panel opposite).

Error prone

Modern commercial laboratories can provide quantitative results for compounds, or elements, with relatively few errors, and today's analytical instruments can provide very good, repeatable results. However, before these data can be used,

consideration should be given to the errors associated with environmental variability; the sampling approach; and the robustness of the proposed post-analytical methods.

Experience has shown that even within a one metre square area of apparently uniform sediment, the concentration of some analytes might vary by 100%. The collection of small sample volumes that do not take into account spatial variability may lead to data that are difficult to interpret and may also mask temporal trends.

Many dioxin, furan, and polychlorinated biphenyl (PCB) congeners may be present in samples, but laboratories and regulators tend to focus only on toxic congeners, of which there are relatively few (seven dioxins, 10 furans, and 12 PCBs). Data for these congeners alone will not necessarily tell you where the compounds may have arisen; only a full suite of congeners can provide such insights.

Separating the anthropogenic input from the natural background might not be an easy task either. Some chemicals, and many elements, are naturally present in soils and sediments and may have been enhanced as a result of ancient activities, such as metal extraction by the Romans. Dioxins, for example, may be discharged from industrial operations, but they are also formed when burning domestic waste and are naturally present in some clays. Context and the environmental and industrial history of a site are all important and help to determine the analytical approach to take, as different physical or chemical species may represent each time period.

After analysis, it may be possible to generate precise ratio values or other measures, which can be applied to models. For instance, the ratio between the different BTEX components (benzene, toluene, ethylbenzene and xylenes) has been used to estimate the timing of a petroleum release into the environment. However, the behaviour of the individual chemicals is highly dependent on several environmental factors, such as oxygen content and temperature.

Applying these data to a decay curve without considering the external factors may also lead to erroneous interpretation. What can be said, however, is that samples with more benzene and toluene (the more volatile components) than ethylbenzene and xylenes will have been in the environment for less time than samples from the same area that have proportionately less benzene and toluene.

Robustness

Analytical instrumentation now generates considerable data for each sample, and this has certainly increased the robustness of further interpretation. The use of multivariate statistics or chemometrics enables environment professionals to investigate vast datasets to determine the underlying structure and sources of variation in samples.

This has many benefits, but the adage about "garbage in, garbage out" still applies. There are several risks associated with the way data are treated before they can be submitted to these statistical methods, including collecting signatures not concentrations, normalisation, missing data and the limits of detection. Again, the correct analysis method must be chosen to accurately identify the source of contamination.

Stephen Mudge is the managing scientist in environmental forensics at Exponent UK.

Analysing oil and oil products in the environment

Question	Analyte	Rationale
Is the pollutant mineral oil or a natural product?	Alkanes	Natural sources of oil tend to have more odd carbon-numbered chain lengths than even-numbered
Is it a crude oil or refined product?	Alkanes and flame ionisation detector trace	There is a limited range in alkane chain lengths in most refined products, and they lack an unresolved complex matter hump
How long ago was it deposited in the environment?	Alkanes, polycyclic aromatic hydrocarbons, isoprenoids	The short-chain and small-ring compounds are more readily removed, leaving the longer chain, bigger ring structures and branched compounds
Is it the crude oil from source A or source B?	Steranes, terpanes, stable isotopes of the alkanes	The biomarkers reflect the original source organic matter and can be used to discriminate between closely related oils. This can be enhanced through the use of stable isotopes of the alkanes
Is it diesel from source A or source B?	Isoprenoids, diamondoids, and sesquiterpanes	Biomarker compounds reflect the original source oil(s) and can be compared to known sources
Is it a "used" oil product?	polycyclic aromatic hydrocarbons (PAHs)	The process of using oil in engines tends to lead to the production of larger PAHs

Professional development adviser

Around 22% of the IEMA membership are Affiliate members, while almost two-thirds (64%) are Associates. A further 6% are Graduate members. Many of these practitioners will be looking to upgrade their membership level over the next few years. Indeed, more than a quarter (28.3%) of members are planning to upgrade their membership in the near future, according to a survey conducted by the Institute in 2012.

To help these ambitious respondents, and all other IEMA members, with their professional development, the Institute has appointed an experienced adviser for members to call on for help.

Dipvandana Mehta – known as Dip – is IEMA's professional development adviser. She can offer guidance, support and practical assistance on your membership, training and upgrade ambitions.

Mehta is an environmental science graduate from the University of Leeds and has a thorough background in training as well as business development. Mehta joined the Institute in October 2012, having previously worked at national environmental regeneration charity Groundwork, in the West Midlands, where she provided environment consultancy services to companies.

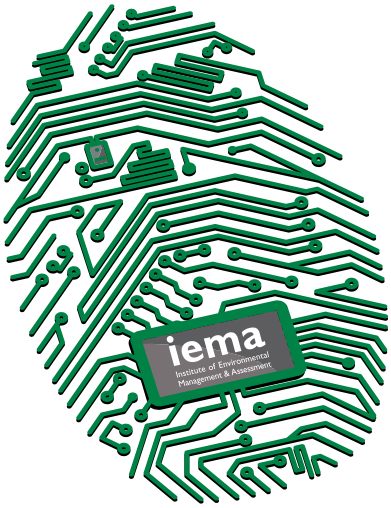
Mehta has already helped many members to upskill through training and advised others on how to upgrade their IEMA membership level. "I'm here to offer any member, regardless of their current membership status, help in achieving their short and long-term career goals," she said. "Based on the contact I've had with members so far, that could be anything from advice about which IEMA-approved training course is right for you, to guidance on writing Full membership papers, and everything in between."

Mehta encourages any IEMA member looking for career development guidance to get in touch. "The advice I offer is a service that all IEMA members are entitled to access. So if you are unsure of your next professional development steps, then please call me. Together we can achieve your goals," she said.

Get ahead with your CPD

Dipvandana Mehta will be taking appointments for telephone sessions from mid-April onwards. To arrange a call, contact her at: d.mehta@iema.net or +44 (0)1522 540069.

Students get sustainable ID opportunity



IEMA is working with the national union of students (NUS) to challenge those studying at universities or colleges to design a new generation of IEMA membership identification.

Through the ethical and environmental department at the NUS, IEMA is aiming to find an innovative alternative to the traditional membership card used by the Institute until 2010. The results of a survey that year revealed that most IEMA members had concerns over the use and appearance of the existing cards and, owing to the associated costs and environmental impact of 15,000 cards being issued a year, the decision was made to cease production of physical cards until a more suitable, useful and sustainable method of ID could be introduced (an electronic version is already available on request).

With a variety of options available, each with its own environmental benefits and costs, the search for the ideal format has proved challenging.

Through the student environmental enterprise competition 2013, IEMA is now looking to those studying environment, design or business to pinpoint what members really need from their membership ID and what form it should take. By combining environmental knowledge with design, creativity and teamwork, the Institute is asking students to transform the way IEMA members think about proof of membership.

The competition judges – James Thorne, head of membership service delivery at IEMA, Jo Kemp, green impact programme manager at the NUS, and Toby Hodgkinson, partner at Opus Print – will be looking for a business case that demonstrates excellence and creativity in the following areas:

- **Usability and appeal** – how will it work in practice?
- **Feasibility on a large scale** – at least 15,000 units.
- **Sustainability** – evidence that potential impacts have been considered and minimised at each stage of the production, use and reuse/disposal phases.
- **Cost–benefit** – does the new ID present any revenue or reuse opportunities at the end of its life instead of disposal?

The most outstanding entry will win £1,000, plus one year's IEMA Student membership. The winner(s) will also be invited to one of IEMA's "Leading the way" events to present their solution to the UK's environment leaders. Following the competition, IEMA will assess launching the winning idea as the new format for membership ID.

To find out more about the competition visit lexisurl.com/iema14675. Members will be updated on the submissions and the winning entry through future issues of *the environmentalist* and via iema.net.

Update your details

Is IEMA sending *the environmentalist* and your membership renewal information to the right address? Perhaps you would prefer to receive your magazine at work rather than at home, or vice versa. To ensure that your key membership materials are reaching you at the correct postal address, and to reduce the risk of any delays to your renewal, please take a few moments to log onto iema.net and make any necessary edits to your profile. Simply click on your name where it is displayed in the top right of the webpage, or log in, to update any out-of-date or incorrect details. That is all you have to do, and your membership record will be updated immediately!

Policy update

Accounting for green power

How organisations account for supplied "green" electricity in their carbon footprints varies considerably and can be contentious. To harmonise practices worldwide, the World Resources Institute is developing new greenhouse-gas (GHG) accounting guidelines specifically for green electricity. IEMA is participating in the development of the guidelines, and has witnessed divergent views emerge on the two main approaches:

- **Consumed scope 2** – counting the GHGs of electricity supplied to, and consumed by, the organisation, mainly using grid-average factors.
- **Purchased scope 2** – counting the GHGs attributed to the generation of purchased electricity, which can lead to zero-emission accounting.

In the UK, Defra guidance for organisations is for all purchased electricity – supplied via the national grid – to be accounted for using a grid average emission factor. This provides an incentive for energy efficiency and onsite renewables, but it does not encourage organisations to switch to "greener" tariffs. Internationally, practice is more varied.

One proposal is for a dual reporting principle that acknowledges the two distinct means of assessing emissions and the GHG risks and opportunities potentially reflected in each figure. This would require companies to quantify scope 2 emissions based on where the electricity was consumed and, where applicable, calculate the emissions associated with purchased electricity separately.

IEMA believes this approach would be an improvement on the existing GHG protocol and tested this through a mini poll of members. The dual approach offers a number of benefits, according to the poll's respondents, including: more complete information for decision making and greater transparency for stakeholders.

Nick Blyth is policy and practice lead at IEMA.

More successful IEMA members

IEMA congratulates the following individuals on upgrading their membership.

Associate

Richard Collins, McLaughlin and Harvey Construction
Simon Flisher, Barton Willmore Partnership
Nora Hoeltzenbein, AMEC
Oliver Hombersley, ISG
Oliver Johnson
Nicholas Ribbons, The Carbon Trust
Jennifer Thomson, Dundee City Council
Matthew Watkins
Rebecca Willcox, Maplecroft

Full and CEnv

John Barwise, QoL
Marek Bidwell, Bidwell Management Systems
Andrew Cuthbert, James Hutton Institute
Christopher Hepworth, Pick Everard
John Laxton, Arla Foods
Richard Lupo, Sustainable Homes
Stuart Nicholas, Atkins
Kenechikwu Onwubuya, Atkins
Christopher Rochfort, MWH
David Smith, Sellafield
Fiona Wilson, URS

Full

Jamie Brocklehurst, Royal Boskalis Westminster
Hosam Jamal, Kuwait National Petroleum
Clare Day, Skanska
Charles Joly, University of Portsmouth
Damian Keaveny, Mansell Construction
Morwenna Vinall, Wearing Contractors
David Wallace, Henry Bros
Matthew Wilson, J T Mackay

Fellow

Emma Nicholson, Rider Levett and Bucknall
Thomas Tang, AECOM

IEMA events

Date	Region	Topic
27 Mar	Midlands	ISO 14001 revision: practitioner engagement on the latest proposals, Birmingham
4 Apr	South East	Social, London
4 Apr	Midlands	ISO 14001 revision: practitioner engagement on the latest proposals, Leicester
8 Apr	Scotland North	ISO 14001 revision: practitioner engagement on the latest proposals, Aberdeen
9 Apr	South East	ISO 14001 revision: practitioner engagement on the latest proposals, London
9 Apr	South East	Proposals for the future EIA Directive: implications for local authorities, London
9 Apr	Wales	ISO 14001 revision: practitioner engagement on the latest proposals, Newport, Gwent
10 Apr	South West	ISO 14001 revision: practitioner engagement on the latest proposals, Exeter
10 Apr	North West	ISO 14001 revision: practitioner engagement on the latest proposals, Liverpool
11 Apr	Northern Ireland	ISO 14001 revision: practitioner engagement on the latest proposals, Belfast
11 Apr	East of England	ISO 14001 revision: practitioner engagement on the latest proposals, Cambridge
12 Apr	Republic of Ireland	ISO 14001 revision: practitioner engagement on the latest proposals, Dublin
Membership workshops		
15 Apr	North West	Full and CEnv membership, Lancaster
18 Apr	South West	Full and CEnv membership, Bristol

Career development in 2013

The findings of the 2013 IEMA practitioners' survey – which are published in a supplement with this issue of *the environmentalist* – reveal that almost half of members (47.6%) conduct their professional development activities by attending IEMA events and webinars. To ensure that those attending Institute events are getting the most valuable experience, IEMA has developed a "blended and cohesive" programme of events for 2013.

Using the IEMA environmental skills map (ESM) (iema.net/skills) as a framework, this year's events calendar will deliver the knowledge and skills crucial for environment professionals and help boost the credentials of all the members who take part. The themes of the events cover the competencies listed on the ESM and the eight areas of environment policy and practice that IEMA is focusing on – skills and the sustainable economy; environmental governance; climate change and energy; environment management; impact assessment; resources; ecosystems and biodiversity; and pollution. Members working at all levels of responsibility, from students to leaders, can benefit from multiple opportunities this year to update their skills and knowledge.

James Thorne, IEMA's head of membership service delivery, says that by moving away from a focus on a traditional annual conference to offering a blend of event styles – webinars, workshops, socials and regional updates – the 2013 events programme aims to "give every member the opportunity to engage in a way and time that works best for them".

Thorne explains: "Based on feedback about the accessibility and cost of IEMA's previous annual events, and our aim to support all members through the skills and policy work of the Institute, we have created a series of events that members can access in different ways and at the most appropriate level of detail for their role."

For example, IEMA's work on the proposed revisions to ISO 14001 allows members to get involved through surveys and consultations, as well as via updates direct from IEMA's executive director of policy, Martin Baxter, who is leading the UK response on 14001. There will also be webinars and face-to-face workshops hosted at locations around the UK during the first half of 2013. Depending on members' level of interest in the revision, and the demands of their role, they have the option to participate in the way that best suits their individual needs and circumstances.

IEMA's webinars, which the Institute started delivering in 2010, have proved very popular for their ease of accessibility; low environmental impact; range of topics covered; quality of content; and expert presenters. The calendar of webinars is being extended for 2013 to feature monthly in-depth updates on key areas of interest for IEMA members.

While the content of each event is important, the professional development support offered by IEMA events does not come solely from the presentations and knowledge of the speakers. Meeting and networking with other members who have similar backgrounds, roles and responsibilities is a crucial element of attending IEMA events, giving members the chance to compare experiences and learn from each other.

Central to this ethos, and a core element of IEMA's events programme, are the local events held throughout the UK and Ireland, which are driven by regional representatives. These members ensure that the information presented, and the networking opportunities on offer, are as relevant and convenient as possible. The regional events, which are currently being planned for the year, also mirror the competencies of the ESM and IEMA's policy horizons, so those attending can be sure that time spent at these events contributes to their ambitions to move up and along the skills map.

"IEMA's events have always been a fundamental part of our membership services and we are building on those foundations to deliver support in key policy areas and professional development," says Thorne. "During 2013, the focus is on the expansion of formats and aligning events with the environmental skills map.

"I'd really like to encourage all members – those who have previously attended events and those who have not yet got round to it – to take a look at this year's events and book onto as many as possible. Going to an IEMA event really is one of the best ways to ignite career and professional development."

For details of all upcoming IEMA events, visit iema.net/events.

Key IEMA events to look out for in 2013

Webinars
- Essential guide to proposed changes to ISO 14001
- Monthly environment management updates
- Monthly EIA Directive updates

Workshops
- Updated guidelines for visual landscape impact assessment
- 14001 revision: practitioner engagement on the latest proposals
- Proposals for the future EIA Directive: implications for local authorities
- Resource management

Membership
- Monthly workshops on upgrading IEMA membership to Full and Chartered environmentalist status
- Further resources online to support members in taking the Associate exam

Leading the way
- Quarterly events aimed at environment professionals working at director level

People power

Thomas Tang reveals how he has helped to engage AECOM's workforce with sustainability, cutting water and electricity use across Asia

If you really want to drive change in an organisation you cannot do it by systems alone, you've got to work with people. And watching our staff get the sustainability message is one of the most enjoyable parts of my job.

I joined international consultancy firm AECOM in 2009, and was given responsibility for understanding the environmental footprint of our offices in Asia. At the time, AECOM had 22 sites and employed 4,500 people and part of my job was to put a system in place to get a handle on the offices' energy, water, waste and emissions, and their cost to the business.

In the subsequent years, AECOM has dramatically expanded across Asia, almost doubling in size, and the challenge has been to continue to tackle its environmental impacts. I'm proud to say that in 2011 we cut electricity use across our offices in Asia by 7% and water consumption by 13% compared with 2010.

This was possible thanks, in part, to new offices, designed to meet exacting environmental standards, and consolidating sites, but also through engaging the workforce with sustainability.

A key element in this has been the effective integration of new businesses, ensuring that their sustainability policies are aligned with AECOM's. With many offices in remote places, modern communication technologies are really important in helping me to build relationships with new senior management teams so that they understand the firm's core corporate social responsibility (CSR) values.

One of the first things I did at AECOM was to build pages on the company's intranet with practical information on sustainability issues, to help staff and to dispel myths. I also worked to build up a sustainability network across offices, making sure each new office has a champion who is my permanent point of contact.

One the most successful tools I've found to convey the importance of tackling environmental impacts has been an office dashboard with metrics for energy, water and waste. Each office is given ownership of its own dashboard and we pull together all the results into a common dashboard. It's a powerful motivator because staff can find out at any time exactly how their office is performing.

Another key initiative has been the creation of a "time bank" where employees doing voluntary work receive paid leave. It enables staff to use their professional skills to do something really meaningful for the wider community that they would have struggled otherwise to find time to do. The scheme has enabled a group of AECOM's landscape architects in China to design a garden for disabled children in a remote village, and another member of staff to help build a school in Cambodia. Projects like these get people excited about their work and promote the feeling that AECOM is a good company to work for, and that's been particularly satisfying.

Equally important in engaging staff with our environmental agenda is the company's annual Earth day sustainability competition, which I helped to establish in 2010. Taking the lead from AECOM offices in the US, we planned to celebrate Earth day, but didn't just want a one-off event and wanted to tap into the skills of staff. The competition asks for ideas on how to improve the environmental performance of AECOM workplaces and to help local communities.

The competition runs in two rounds. In round one ideas are submitted and we select five or six to give a small amount of cash to get the project started. A year later we assess what the projects have achieved and name two overall winners.

In the competition's first cycle, a team of consultants in Kuala Lumpur won the greening offices award for installing a hydroponic garden to grow vegetables. Hydroponic gardens are soilless and allow you to grow a lot of plants in a small space with little water. The project helped to reduce the carbon footprint of the office, while raising awareness of sustainability in the rest of the team. It was a cool project because people could see things growing and evolving.

The community project award was given to a group of colleagues working on an artificial reef in Hong Kong, who developed a school programme to help local children learn more about marine life.

It's important to remember that a business is not driven by the work, but by its people. As long as people are inspired they will deliver good work; the trick is in how to motivate them. Although sustainability and CSR are not the only components in this process, I believe they play a crucial part.

That said, engaging staff is not a case of putting up posters about turning lights off, you have to link sustainability back to the core of your business. At AECOM, our business is infrastructure; it's about water, energy and transport. And I've found that, when I talk to individuals about how their work can impact the environment and society, they understand the sustainability message. And once they get it, they feel more motivated in their day-to-day work.

Dr Thomas Tang, FIEMA CEnv, is director of corporate sustainability at AECOM, Asia.

MWH

MWH Treatment

Environment and Quality Advisor – Heywood

MWH Treatment is implementing an integrated Health, Safety, Welfare, Environmental and Quality (SHEQual) management approach. As industry leaders, we pride ourselves on our high standards, focus on effective SHEQual management and have a strong culture of continuous improvement.

We require someone to join the team to advise on Environmental and Quality management in offices and particularly on our UK construction sites.

A willingness to travel widely and a full driving licence are also essential. A car allowance or hire cars will be provided.

- Providing support to the SHEQual Department, reporting directly to the Environment and Corporate Responsibility Manager but assisting the Business Process Development Manager on a shared time basis
- Assisting with the operation of the Environmental Management System (ISO14001 standard) and Quality Management System (ISO 9001 standard)
- Providing support to construction projects on environmental and quality issues, including document production where necessary
- Analysing current and future procedural needs of the business
- Providing training on environmental and quality issues
- Collation of environmental and quality data for monitoring targets
- Supporting other functional areas of the business including proposals, procurement, business services and design
- Assisting construction projects with Considerate Constructors Scheme adoption
- Consulting with Environmental Regulators

Qualifications

- Degree qualified (preferably in an engineering, science or environmental topic) or a diploma in environmental management (IEMA accredited).
- Experience of environmental management within the construction industry
- Experience of writing formal environmental management documents and undertaking environmental audits
- The ability to identify key issues, evaluate data and draw informed conclusions

If you would like to learn more about the above position and our other SHEQual roles available please contact Emma O'Rourke emma.orourke@mwhglobal.com. Closing date: 1 April 2013.

BEAR SCOTLAND

Environmental Advisors

Vacancies have arisen for Environmental Advisors in BEAR Scotland's Perth and Edinburgh Offices. The successful applicants will contribute to delivery of environmental assessments for trunk road maintenance projects. The successful applicants will also be responsible for providing advice and guidance to ensure that BEAR's work complies with legislative requirements relating to all environmental activities it undertakes.

Essential requirements:

- Member (or working towards) professional membership of Institute of Environmental Assessment and Management (or equivalent).
- Relevant degree (preferably at Masters Level) or equivalent year's experience.
- Previous experience of undertaking environmental assessments – preferably in road industry.
- Good understanding of environmental legislation / regulations.
- A full approved UK driving licence.

Desirable

- Knowledge of highway design codes (DMRB / MCDHW) relevant to Environmental Management.
- Experience of air quality &/or noise assessments / management.
- Experience of waste management plans.

For a job description, person specification and application form, please contact 01738 448600 or email recruitment@bearscotland.co.uk.
Closing date: Friday 12th April 2013.

www.bearscot.com

RPS

Creative people making a difference

EIA Project Manager

Abingdon or London - To £35,000

We are seeking an enthusiastic and capable EIA project manager to join the Environmental Team in our large new multidisciplinary office at Milton Park, Abingdon, Oxfordshire.

You will need to be capable of understanding the complexities of EIA's and consenting processes for large infrastructure projects and to manage the projects alongside existing Director's and project managers. The role requires coordination of specialist consultant inputs into such projects, to critically review their work to ensure compliance with law and best practise, and also to be aware of and be capable of careful budgetary control over the projects.

It is a demanding and interesting role and any experience of renewable energy, and in particular nationally significant infrastructure projects, together with a very good working knowledge of EIA, will place the candidate in a very strong position. Commercial acumen is essential.

The successful candidate will take a key role in strengthening the successful and established planning business working as part of a multi-disciplinary team.

EIA Consultant

London -To £37,000

We are looking for an Environmental Impact Assessment Consultant to join the Team in our London office.

You will need to hold a degree in an Environmental discipline and have experience of working within a Consultancy environment. You will need to have a good understanding of EIA topics/ best practice together with a good knowledge of planning and environmental policy & legislation. Finally, you will need to demonstrate excellent Communication and Organisational skills.

Health Impact Assessment Consultant

Brighton -To £25,000

We are looking for a Consultant to join the Health Impact Assessment Team in our Brighton office.

Ideally, you will hold a degree in environmental sciences with a health-related bias (biological, bio-medical, epidemiological, eco-toxicological, etc.). Any experience of working within a consultancy environment would be a distinct advantage.

You will need to have good written and oral communications skills, together with the ability to conduct research independently.

For all of these roles, we offer a very competitive salary and benefits package and the opportunity to develop your career with one of the UK's leading Environmental Consultancies.

To apply, or for more information, contact Geoff Thorpe, Recruitment Manager, RPS via e-mail at geoff.thorpe@rpsgroup.com

RPS is an equal opportunities employer

Our Company

RPS is a leading multi-disciplinary consultancy with the expertise to support clients through the development process, from planning to design to implementation.

We are acknowledged as experts in planning, transport, landscape and environmental consultancy and we are award winning architects, civil, structural and mechanical and electrical engineers.

RPS has grown into one of the world's pre-eminent consultancies by maintaining its local connections whilst underpinning these with the resources and knowledge of a global business.

We employ 5,000 people in the UK, Ireland, the Netherlands, the United States, Canada, Brazil, Africa, the Middle East, Australia and Asia. Our international presence allows us to undertake co-ordinated and integrated projects throughout the world.

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