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# the environmentalist

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November 2015

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Managing cyber risks





MARY PERSUADED  
HER COLLEAGUES TO  
SWITCH OFF THE LIGHTS  
AND SAVED HER  
COMPANY £20,000



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like Mary  
say:**

I'm an Energy Manager and I've been looking at our wider sustainability strategy to introduce a more holistic approach. It's a shift from thinking about environment as a compliance issue to ensuring that sustainability is at the heart of what we do.

We've been massively creative in our approach and linked our sustainability performance to our bonus scheme. We basically said "Turn off the lights, print on both sides of the paper, take the train and you'll

get a share of the savings." Along with a range of other initiatives – some of which were suggested by staff members – we're making a real difference. It's a brilliant way to raise awareness of how every individual can have a positive impact within a business and can make change happen.

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# November

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# A huge pinch of salt

Environment and sustainability professionals at Volkswagen have probably been keeping a low profile since news broke in September that the German-owned automotive company had fitted software in diesel vehicles to enable them to perform better in mandatory tests and therefore meet emissions standards for nitrogen oxide (NOx).

Volkswagen, whose brands include Audi, Porsche, Seat and Škoda as well as VW, has admitted that about 11 million cars worldwide, including eight million in Europe, are fitted with the so-called “defeat device” (p.4). The US Environmental Protection Agency, which uncovered the deception, says the software turns off emissions controls when driving normally and turns them on when a vehicle is undergoing an emission test. This results in cars on the road emitting up to 40 times the NOx emissions than the US standards allow.

VW employs almost 600,000 workers, has 118 production plants worldwide and reported sales in 2014 worth more than €202 billion. It is inconceivable that such a large, global company, with a public commitment to become the “world’s most environmentally compatible automaker” by 2018 should deliberately cheat tests to protect human health and the environment. The company’s 2014 sustainability report states: “Growth can only take place hand in hand with responsibility and environmental protection.” Fitting a device to cheat tests and ensure vehicles comply with regulations suggests that the environment has been sacrificed for growth. The sustainability report also says “environmental considerations are factored into every decision we make”. It is unclear who at VW sanctioned the fitting of the defeat device but, whoever it was, it is clear that he or she was not considering the environment.

Dieselgate may speed up the introduction of more robust testing of vehicles so the process better replicates actual driving conditions rather than artificial ones. Although reports suggest some in the European automotive industry have been lobbying to weaken the commission’s plans for a new test cycle, EU industry commissioner Elżbieta Bieńkowska said in October that the test procedures would be an “appropriate answer to the shortcomings of laboratory testing and will considerably reduce the risk of defeat devices being used”.

Whatever the policy outcome, the scandal will cost VW a huge amount of money in fines and the costs of repairing the affected cars. Its reputation is tarnished and it is likely to take years to recover. As for its sustainability objectives, best take them with a huge pinch of salt.

It is inconceivable that VW, with a commitment to be the world’s most “environmentally compatible” auto firm by 2018, should cheat tests designed to protect the environment



Paul Suff, editor

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# Climate talks make progress

The negotiating text for a global climate deal has become more balanced following talks in Bonn, quelling concerns among some countries that the draft was biased, the head of the UN's climate change negotiations has said.

Christiana Figueres (pictured), executive secretary of the United Nations Framework Convention on Climate Change (UNFCCC), admitted at a Chatham House conference on climate change that the text had moved from nine to 32 pages and was more wordy and less coherent than that drawn up by the co-chairs of the working group tasked with coordinating the draft agreement. However, she claimed this was not "terrible news", since countries had been more involved in drafting the draft than previously.

"I can't emphasise enough how important it is for governments to finally take ownership of the text," Figueres said. "We move from an incomplete text to something that is definitely comprehensive, as declared by many countries at the end of the talks, and we moved from a version that was deemed to be biased to one that is now balanced."

Some progress was also made on long-term goals for climate adaptation and on how a global reporting regime



on emissions could work, said Jennifer Morgan, global director of the climate programme at the World Resources Institute. The draft text now also includes clauses on market mechanisms, such as carbon pricing.

However, Morgan said more work was still required on financing climate adaptation and mitigation, in particular on meeting the pledge to provide \$100 billion made at the 2009 Copenhagen talks. Another sticking point was loss and damage, or how to compensate developing countries for climate change impacts that are difficult or impossible to adapt to, she said.

International environment ministers will examine the negotiating text at a two-day meeting in Paris in early November.

## Cyber attack a nuclear threat

The risk of a serious cyber attack on civil nuclear power plants is increasing, according to a study from policy institute Chatham House.

The report, *Cyber security at civil nuclear facilities: understanding the risks*, says the growing reliance on digital systems and use of commercial "on-the-shelf" software leave nuclear power plants increasingly vulnerable. The study, which examined the range of potential cyber threats to nuclear installations, also found a lack of awareness of risks among senior executives. It warns that the industry is mistaken in believing nuclear facilities are protected from cyber attack because they are "air gapped" – isolated from the public internet.

"Not only can air gaps be breached with nothing more than a flash drive, but the commercial benefits of internet connectivity mean that nuclear facilities may now have virtual private networks

and other connections installed, sometimes undocumented or forgotten by contractors and other legitimate third-party operators," says the report.

Most nuclear workers also lack training in spotting and combating potential attacks which, combined with communication breakdowns between engineers and security personnel, leaves staff with little understanding of key cyber security procedures, the study found.

Recommendations to boost security at civil nuclear sites include developing guidelines to measure cyber risk in the industry, such as through an integrated risk assessment that takes into account security and safety measures, and promoting good IT hygiene, such as forbidding the use of personal devices.

*On pp.20–22, consultant Rosa Richards looks at managing cyber threats as part of environmental risk management.*

### Short cuts

#### Marketing power proof

Environmental consultancies should work on brand awareness to drive growth, according to analysts at Verdantix. The firm's global survey of 312 heads of environment, health and safety found a preference for 74 brands in the consulting, software, verification and IT services markets. ERM, Ramboll Environ and AECOM had the highest brand preference among consultancies, while Bureau Veritas, KPMG and BSI ranked highest in the verification sector. SAP came top in relation to software and IBM was the best performer in technology services. There is often a direct connection between brand preference and inclusion on tender shortlists, Verdantix said. "The EHS market is not known for flashy advertising and heavy marketing. This shows in low levels of brand awareness. Marketing drives growth, but environmental engineers rarely give this 'fluffy' function the respect it deserves," said David Metcalfe, chief executive at Verdantix.

#### Energy reduction pays

Businesses will be able to benefit financially from reducing energy demand at peak periods after the launch of a service by electricity supplier SmartestEnergy. Businesses signing up to the demand side response service will receive payments in return for reducing consumption when demand on the grid is high. They will receive payments for taking part even if they are not called on to cut demand, according to SmartestEnergy. The firm will undertake technical set up, testing of equipment and software, as well as performance monitoring and payments on behalf of participants. Businesses will be able to reduce demand in several ways, including powering down part of their operations, shifting them to a different time of day or generating their own energy onsite. "Many customers are already exploring energy efficiency and we want to help them realise commercial benefits," said chief executive Robert Groves. EnerNOC is providing the software.



## In parliament



Capacity crunch? Is storage the answer?

The capacity of UK power stations to provide for the highest likely demand this coming winter is increasingly marginal and again there are forecasts of tightening capacity margins. This is not helped by some gas-fired power stations being mothballed and the closure of some coal-fired plants as they wear out and fail to meet important pollution standards.

But I don't think that the lights will go out this winter. The National Grid has developed a number of back-up programmes, and additional power can be supplied through interconnectors from Holland and France. However, if the rate of power station closures without replacements continues, there certainly could be a crunch in a few years. It is the nature of those replacements, though, that ought to give us pause for thought. Even after the recent government announcements curtailing the development of renewable energy, there is already a vast amount of renewables in the system – about a quarter of Britain's overall installed capacity. The problem is that these installations are scattered across the country and are, to a greater or lesser degree, intermittent – they do not generate all the time.

This is where storage comes in. Increasingly, electricity can be stored effectively in batteries and this technology is particularly suited to dispersed renewables. It is not that renewables do not generate well, but they often do so when the system does not need their power. Attach battery storage to large wind farms or large solar arrays and, hey presto, you have a much more reliable stream of output.

I'm not saying that batteries will solve all our problems: we will undoubtedly need to combine new conventional power stations into the energy mix for many years, but I do think government ought to get seriously behind the next stages of battery storage development.

**Alan Whitehead**, Labour MP for Southampton Test and a member of the House of Commons' energy and climate change committee.

## Tougher NOx tests urged

Campaigners and MEPs have urged an EU committee to reject proposals by the European commission that would allow the motor industry to exceed limits on nitrogen oxide (NOx) emissions in real-world emissions (RDE) tests. They claim the car industry is continuing to lobby for weak rules on testing even after the revelations that VW cheated emissions tests, highlighting flaws in the system.

The EU technical committee on motor vehicles (TMCV) was due to decide on the commission's proposal as the *environmentalist* went to press. Real-world testing has been in discussion since the Euro 6 emissions regulations were agreed in 2007. The regulation stipulates that vehicles should not emit more than 80mg/km of NOx in normal road conditions.

Under current plans, implementation of the RDE testing rules will be phased in between September 2017 and September 2019. The commission's proposal allows manufacturers to exceed NOx limits through "conformity factors" (CF). It has suggested a CF of 1.6 during the implementation period, which would in effect set the NOx limit at 128mg/km. This would reduce the CF to 1.185 or 95mg/km from September 2019.



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Submissions by member states on the commission's proposals seen by campaign group Transport and Environment (T&E) reveal that some countries are lobbying for even higher conformity factors. The European Automobile Manufacturers' Association (ACEA) wants a CF of 2.75. It argues that the RDE package must be technically and economically realistic. Eric Jonnaert, secretary general of ACEA, said manufacturers need to plan for the changes without risking the role of diesel in cutting carbon dioxide emissions.

Greg Archer, vehicles programme manager at T&E, said: "Given the urgency to regain the credibility lost because of the VW scandal, a clear and ambitious timetable for the introduction of RDE must be agreed."

## Limited scope for CO2 cuts

European policymakers have been warned that targets for lower CO2 emissions from energy-intensive industries are out of reach without the introduction of mitigation technologies.

Researchers at Chalmers University of Technology in Sweden found limited scope to cut emissions from oil refining and production of cement and steel. Improving energy efficient and changing to fossil-free fuels are two options often mentioned to cut emissions, but it is possible to tackle only a limited amount of emissions with these measures in the production of cement and steel, said the study.

"Plants have very long lifespans, so implementation of new solutions takes a long time. If the EU is serious about reducing emissions by 80–90% by 2050, the issue of how to finance the development and implementation of innovative process technology must be brought to the table now," said researcher Johan Rootzén.

The study says a large-scale demonstration of carbon capture and storage (CCS) must be established urgently. Plans for CCS in the UK have suffered two setbacks, however. First, Drax is halting funding of the White Rose CCS scheme. The operator of the UK's largest power station said it would fulfil its role in completing the feasibility and technology development (FEED) assessment, but would not invest further.

Meanwhile, the closure of the SSI steelmaking plant at Redcar has cast doubt over plans for an industrial CCS network on Teesside. The steel producer was one of four "anchor" companies involved in the project, which aimed to cut the region's annual CO2 emissions by 25% from 2024. Spokesperson Neil Kenley commented: "It's too soon to draw conclusions, but the strength of the Teesside Collective is that we are more than any one plant, however large that plant might be."



# Defra opens up on 25-year plan for the environment

Environment secretary Liz Truss says she wants to move away from the jumble of “contradictory targets and controls” governing the natural environment to a new approach that maintains improvement and which values nature systematically for all the benefits it provides.

Launching a 12-month project to develop a long-term plan of continuous environmental improvement, which is called “Open environment”, Truss said it would include smarter regulation, involve voluntary organisations more and make better use of data and technology.

She said Defra bodies, such as the Environment Agency and Natural England, would in future work towards a shared purpose rather than follow separate or isolated strategies, with resources focused on frontline staff: “I think we’re not yet getting the best out of [Defra] organisations. Currently, for example, each has its own HR department. I want to get to a position where we’re concentrating resources on frontline experts, not on duplicating functions between different parts of Defra.”



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Truss championed the use of “citizen scientists”, local volunteers trained to collect environmental data rather than leave it to professionals. Greater use of technology is also on the agenda, with Truss citing the use of DNA tests by Natural England to detect the presence of great-crested newts in water. She promised that Defra’s 8,000 datasets, including at least 2,000 on the natural environment, would be open to the public by next summer. “We want to equip people and businesses to exploit data in their decision-making and enable developers to design powerful new applications,” she said.

## IEMA focuses on sustainability

Alignment, culture, engagement and ownership are the issues organisations need to focus on to embed sustainability, according to speakers at IEMA’s second national conference on sustainability.

In a session hosted by chief executive Tim Balcon, four senior professionals outlined how to fully integrate sustainability. Bekir Andrews, group sustainability manager at Balfour Beatty, said alignment was key. “Think about what the business is trying to achieve and how you can use sustainability to attain those goals,” he said. Eileen Donnelly, director of sustainability at PZ Cussons, singled out ownership as the crucial element. “I don’t have a sustainability strategy; I have a sustainability approach, which is owned by everyone,” she said. Donnelly warned that a standalone strategy risked sustainability being a “bolt-on”.

Munish Datta, head of Plan A property at Marks & Spencer, advised those embarking on embedding sustainability to identify supporters and secure some early “quick

wins”, particularly ones that have a financial benefit. He also told the audience to align performance management systems with sustainability outcomes. Hazel Smith, EHS director at GSK, said it was important to align sustainability with the organisational culture: “It has to become part of the operational culture of the business.”

Earlier, Mark Gough, executive director at the Natural Capital Coalition, told the audience of environment and sustainability professionals that they had to learn to engage others in their business to drive forward the sustainability agenda. “We have our own language and acronyms. We understand them but others may not,” he said. Gough advised them to talk more with their colleagues from other departments and to relinquish control of the agenda. “We need more integrated thinking and to better understand what other departments do,” he said. “An integrated approach means you contribute but are no longer in overall control.”

### Short cuts

#### SO<sub>2</sub> and NO<sub>x</sub> limits

MEPs have backed proposals to limit sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) and dust emissions from medium-sized combustion plants, such as electricity generators or heating systems for domestic, residential or industrial use. The European commission estimates there are about 143,000 combustion plants with a thermal input of between 1MW and 50MW but, unlike their larger and smaller counterparts, their emissions are not regulated at EU level. Under the plans, the limits for new plants would take effect within three years. For existing ones, with a thermal output above 5MW, the maximum emission values for SO<sub>2</sub>, NO<sub>x</sub> and dust would come into force from 2025. The smallest plants, with a thermal input from 1 to 5 MW, most of which are operated by small or medium-sized enterprises, would have to comply with emission limit values from 2030. EU council ministers still need to approve the new limits.

#### Natural capital protocol

More than 40 companies are to test the natural capital protocol, which is being developed by the Natural Capital Coalition and aims to help businesses improve their decision-making by standardising how their relationship with nature is measured and valued. Ten companies will test the protocol in depth against specific business applications, including: assessing water use opportunities and risks in site-specific locations (Dow Chemical); identifying the drivers of environmental impacts along the supply chain to inform raw material procurement strategies (Hugo Boss); investigating how natural capital assessments can enhance the management and reporting of environmental issues (F Hoffmann-La Roche); and exploring how to bring the results of a natural capital assessment into strategic business decisions (Kering). Other businesses will test specific aspects of the protocol, and will involve a range of different geographies and sectors. The testing programme will be led by the Cambridge Institute for Sustainability Leadership.



## Business plans

**Siemens** is aiming to be carbon neutral by 2030 and to halve its carbon emissions by 2050. The German-owned industrial company's CO<sub>2</sub> emissions currently total 2.2 million tonnes and it plans to invest €100 million over the next three years in measures to reduce the energy footprint of its production facilities and buildings. The firm says that, by investing in energy management systems and automation systems for buildings and production processes, it will save €20 million a year on its energy costs. To achieve carbon neutrality by 2030, Siemens will use distributed energy systems at its production facilities and office buildings to optimise energy costs; employ low-emission vehicles in its global car fleet; and move towards using a "clean power" mix.

Fast-moving consumer goods company **P&G** has announced it will reduce absolute greenhouse-gas emissions from its facilities by 30% by 2020. The target has been developed with conservation group WWF and, says the firm, is based on the best available science. The company, whose brands include Ariel, Fairy and Pampers, says the target ensures it is supporting global efforts to prevent global temperatures exceeding 2°C.

**BT** has been ranked top in the FTSE 100 carbon reporting performance league table for the second year running. The firm, which narrowly beat Marks & Spencer, scored 94%. The rankings score each company on its carbon measurement and reporting; strategy and targets; emissions reduction; and stakeholder engagement.

**Willmott Dixon** has pledged to halve its carbon emissions by 2020 compared with 2010. The target is to emit 50% less emissions per million pounds of turnover than in 2010, when the construction firm's emissions totalled 18,150 tonnes and its emission intensity – tonnes CO<sub>2</sub> equivalent per £m of turnover – was 18.3.

**PepsiCo** has saved more than \$375 million since its environmental sustainability goals were set in 2010. The firm said it had diverted 93% of its waste from landfills in 2014, surpassing its goal of 90% on recycling and reusing, and had cut its water use per unit of production by 23% since 2006, exceeding the 20% target set for 2015.

## ESOS compliance still slow

Fewer than 500 companies have complied with new energy efficiency regulations as the deadline nears. Around 10,000 companies are covered by the energy savings opportunities scheme (ESOS), but the Environment Agency says it has been notified of compliance by just 489.

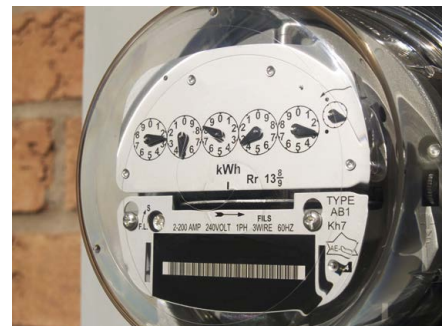
It expects that number to increase as the 5 December deadline approaches. "The notification rate has started to rise and we expect that it will continue to do so as the deadline approaches. We are monitoring the notification rate and have also carried out some further awareness-raising work," the agency said in a statement.

Concern had been raised by industry commentators over the slow start to meet the December date. In October, the agency said it did not plan to enforce non-compliance until the end of January, as long as companies explained by the original deadline why compliance had not been possible. They must also provide evidence of efforts towards compliance, including proof of appointment of an independent assessor.

The agency stressed that the deadline had not been extended, but rather reflected its willingness to use discretion over enforcement. Evidence of efforts made towards compliance will be taken into account in considering any enforcement action, its compliance guidelines stated.

The extra time to complete audits has been welcomed by industry. Darryl Mattocks, managing director of Enistic, said: "The difference for some of our larger clients is extreme. We can do a more thorough job and identify more savings."

Companies can also meet ESOS through the energy management standard ISO 50001, and the agency now says



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firms have until 30 June 2016 to achieve certification. But commentators do not believe that, even though the agency has in effect extended the 50001 deadline, more companies will take this route instead of basic ESOS compliance.

"They've made their decision already so it's too late to change tack," Mattocks said. David Cockshott, sales and marketing director at Inenco, said complying with 50001 was significantly more complicated. "You're not going to start now and be done by June," he argued.

Martin Hockaday, environmental sector manager at certification body NQA, said there was still time to gain certification by June, however. "If an organisation already has an ISO 14001-based environmental management system, it would be possible to set up a system in time for us to audit it," he said. He argued that 50001 was the best route to ESOS compliance because certification demanded proof of continuing improvement, which forced businesses to implement energy efficiency measures. "ESOS is just a piece of paper else," he said.

Tom Johnston, general manager of certification services at BM Trada, agreed that certification to 50001 was still possible if an EMS was already in place.

### Government launches its energy efficiency tax review

ESOS regulations are being considered alongside other policies and taxes in a consultation aimed at simplifying energy efficiency for business. Proposals include introducing a single tax and reporting scheme to replace several overlapping ones, including the CRC scheme, climate change levy, climate change agreements and mandatory greenhouse-gas reporting.

The Treasury argues that policies on business energy efficiency need to be simplified to reduce compliance costs.

Many firms have welcomed the review. Nearly two-thirds (63%) of IEMA members polled earlier this year agreed that rationalisation was necessary for firms affected by multiple schemes. More than 80% strongly agreed that, by targeting such schemes at the very largest companies, the government had overlooked the importance of stimulating action across the wider business community. IEMA has been conducting workshops with members to inform its response to the consultation (see p.33).



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## In court

### Severn Trent fined £480,000 for double pollution incident

Pollution of a pond and then a brook in Rotherham, south Yorkshire, has cost Severn Trent Water almost £500,000 in fines and costs. The utility company had already been warned about previous incidents when these ones occurred.

Sheffield Crown Court fined the company £480,000 after raw sewage twice leaked from a 35-year-old pipe into Slacks pond in Bramley, near Rotherham, on 25 February and 26 March 2014. Sheffield Piscatorial Society uses the pond and the pollution killed dozens of fish. The second incident also resulted in sewage polluting a nearby brook and prevented a farmer accessing the field under which the pipe ran, leading to the loss of a crop of rapeseed.

The court was told that the Environment Agency had twice formally warned the company before the incidents and that the pipe had ruptured in the same location four times in 12 months. "We were particularly concerned that, after two formal warnings from the agency about sewage leaking into fields and watercourses the third rupture was undetected by Severn Trent and there was then yet another incident in the same location," said a spokesperson for the agency.

Planning permission had been granted in October 2013 to replace the pipe, but Severn Trent did not complete the work, which cost £275,000, until August 2014. Judge Mark Gargan said the company should have acted more quickly and had been negligent. "It seems there is no real adequate explanation of why the matter took until August 2014," he said.

Severn Trent was fined £240,000 for each offence and ordered to pay prosecution costs of £13,675.38 plus a £120 victim surcharge.

The agency said the fine was one of the largest imposed on a water company. In March, United Utilities was fined £750,000 by Preston Crown Court for polluting Duddon estuary in Cumbria with 7 million litres of sewage; and, in November 2014, Southern Water received a £500,000 penalty after discharging untreated sewage at Swalecliffe Brook in Kent in July 2013.

### CJEU rules on chemical disclosure

The Court of Justice of the EU (CJEU) has ruled against public disclosure of data on the volume of hazardous chemicals manufactured in or imported to the EU.

The environmental law body, ClientEarth, and the NGO, International Chemical Secretariat, argued that the REACH Regulation required the European Chemicals Agency to disclose the amount of chemicals manufactured or imported. But the CJEU ruled in favour of the agency, stating that disclosure could undermine commercial interests. "The [agency] was entitled to take the view that the disclosure of the precise tonnage of the substances registered would have undermined the commercial interests of the persons concerned," it said.

The CJEU also ruled against a second claim by the two organisations that placing chemical substances on the market would lead to them being released to the environment, which would render them emissions. In its judgment, the CJEU stated: "The manufacture of a substance

or placing it on the market cannot per se be regarded as the release of that substance into the environment."

### Sewage breach costs pub £154,716

The Spirit Pub Company has been fined £150,000 for failing to treat effectively sewage from the Cross Keys Inn in Guisborough, Cleveland.

The inn has an environmental permit so that it can discharge treated sewage effluent into a nearby stream. However, on 21 April 2014 brown effluent from the inn was found in the watercourse. The Environment Agency warned the inn to take immediate action but, on 24 April, effluent was again found going into the water from the inn's outfall.

The company pleaded guilty at Teesside magistrates' court to two charges of breaching its permit conditions and one for not sufficiently maintaining the sewage treatment works. It was fined £50,000 for each offence and ordered to pay costs of £4,596 and a victim surcharge of £120.

## Case law

### A waste recovery or disposal operation?

Lafarge had applied for planning permission to extract sand and gravel from a quarry in Leeds. The planning conditions included restoration of a public footpath. The firm proposed using recovered waste materials to reinstate the footpath and applied to the Environment Agency for a permit. The application and an appeal to the Defra inspector were rejected.

In *R (Lafarge Aggregates Limited) v Secretary of state for environment, food and rural affairs*, the High Court had to decide whether the proposed operations were "waste recovery" under art 3(15) of the revised Waste Framework Directive, and therefore eligible for a standard rules permit, or "waste disposal", which required a bespoke permit. The court held that Lafarge's proposed operations did not clearly fall within one of the recovery operations listed in annex II to the directive, so it looked at whether they fell within art 3(15). This rested on whether the waste served a "useful purpose" in replacing other materials – an approach established by *Abfall Service AG (ASA) v Bundesminister für Umwelt, Jugend und Familie*.

The court found that the planning condition requiring restoration of the path was not conclusive in ascertaining whether the waste served a useful purpose. It also said the inspector had been entitled to consider other approaches for the restoration and, on the balance of probabilities, to conclude that non-waste materials would not be used in the circumstances, so waste materials were not required as a substitute. Lafarge's arguments therefore related to matters of weight, not the legality of the inspector's decision, said the court in rejecting the application for a judicial review.

Emma Lui

Lexis®PSL

# New regulations



In force	Subject	Details
20 Jul 2015 	Waste	The Hazardous Waste (Miscellaneous Amendments) (Wales) Regulations 2015 amend certain statutory instruments related to environmental permitting, landfill allowances, hazardous and non-hazardous waste. <a href="http://bit.ly/1LtBxYr">bit.ly/1LtBxYr</a>
22 Jul 2015 	Environment protection	The Pollution Prevention and Control (Fees) (Miscellaneous Amendments and Other Provisions) Regulations 2015 amend a range of legislation relating to the offshore oil and gas industry to introduce additional fees. <a href="http://bit.ly/1OpZSn7">bit.ly/1OpZSn7</a>
1 Aug 2015 	Finance	The Aggregates Levy (Registration and Miscellaneous Provisions) (Amendment) Regulations 2015 amend the 2001 Regulations, restoring some exemptions from the levy provided for in s17(3) and (4) of the Finance Act 2001. <a href="http://bit.ly/1MmxUtd">bit.ly/1MmxUtd</a>
4 Aug 2015 	Energy	The Capital Allowances (Environmentally Beneficial Plant and Machinery) (Amendment) Order 2015 amends the 2003 Order, while the Capital Allowances (Energy-saving Plant and Machinery) (Amendment) Order 2015 amends the 2001 Order. Technology and product lists have been revised in both cases. <a href="http://bit.ly/1M6xELR">bit.ly/1M6xELR</a> ; <a href="http://bit.ly/1FI0AF9">bit.ly/1FI0AF9</a>
17 Aug 2015 	Hazardous waste	The Hazardous Waste (Amendment No. 2) Regulations (Northern Ireland) 2015 amend four pieces of legislation to bring directly into force the amended list of the EU Waste Decision – 2000/532/EC, as amended by 2014/955/EU. <a href="http://bit.ly/1gm4BIQ">bit.ly/1gm4BIQ</a>
14 Sept 2015  	Hazardous substances	The Priority Substances Directive (2013/39/EU) requires action to reduce emissions of 45 named substances to water, and introduces 11 further named substances. The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015 amend the 2003 Regulations to bring into force sections of the directive. Definitions are updated and additional deadlines set for the introduction of programmes to tackle emissions of the additional 11 named priority substances and to achieve good surface water chemical status. <a href="http://bit.ly/1FI0AF9">bit.ly/1FI0AF9</a>
14 Sept 2015 	Planning	The Town and Country Planning (Miscellaneous Amendments) (Scotland) Regulations 2015 modify a range of legislation concerning wildlife protection, environmental impact assessment and planning procedures in Scotland. The definition of a European site under the Conservation (Natural Habitats, &c.) Regulations 1994 is updated in relation to sites under the Birds Directive (1979/409/EEC). The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 are amended to reflect the implementation of the EIA Directive (2011/92/EU). Further amendments clarify EIA duties, definitions and requirements for the EIA process. To support these changes, a range of legislation is amended to clarify time periods for the determination of multi-stage EIA applications. <a href="http://bit.ly/1Y3liLd">bit.ly/1Y3liLd</a>
14 Sept 2015 	Water	The Water Environment and Water Services (Scotland) Act 2003 (Modification of Part 1) Regulations 2015 update references to three EU directives – the Water Framework Directive 2000/60/EC, Groundwater Directive 2006/118/EC and Priority Substances Directive 2008/105/EC (all as amended). <a href="http://bit.ly/1NrA6ON">bit.ly/1NrA6ON</a>
16 Sept 2015 	Hazardous substances	EU regulation 2015/0182 amends 850/2004 on persistent organic pollutants to include hexabromocyclododecane (HBCDD) in annex 1, which prohibits production, use and import of HBCDD. <a href="http://bit.ly/1gm2zse">bit.ly/1gm2zse</a>
29 Sept 2015 	Environment protection	EU Directive 2015/1513 amends 98/70/EC on the quality of petrol and diesel fuels and 2009/28/EC on promoting the use of energy from renewable sources. 2015/1513 requires suppliers of fuel or energy to reduce by at least 6% by 31 December 2020 the lifecycle greenhouse-gas emissions per unit of energy of fuels used in the bloc by road vehicles, non-road mobile machinery, agricultural and forestry tractors and recreational craft when not at sea. <a href="http://bit.ly/1Q76Oo0">bit.ly/1Q76Oo0</a>

This legislative update has been provided by Waterman's Legal Register available at [legalregister.co.uk](http://legalregister.co.uk)




# Latest consultations




9 Nov 2015

## Business energy efficiency

 The Treasury has issued a consultation setting out its proposals for improving the effectiveness of existing measures to boost business energy efficiency. The move came after the chancellor pledged in his summer budget to review the business energy efficiency tax landscape. The proposals include abolishing the carbon reduction commitment (CRC) energy efficiency scheme and replacing other energy tax policies with a single tax and reporting regime. As well as the CRC, the consultation considers the climate change levy (CCL); climate change agreements (CCA); mandatory greenhouse-gas (GHG) reporting; and the energy savings opportunity scheme (ESOS). [bit.ly/1LiP9vw](http://bit.ly/1LiP9vw)


12 Nov 2015

## Compliance assessment

 The Scottish Environmental Protection Agency (Sepa) is seeking views on proposals to change its compliance assessment scheme (CAS), which was introduced in 2009. Sepa says the aim is to make CAS fairer, and more consistent and proportionate for those it regulates, with greater focus on breaches that cause most harm to the environment. [bit.ly/1jcWz7v](http://bit.ly/1jcWz7v)


24 Nov 2015

## Diffuse pollution

 Defra is consulting on new rules to tackle diffuse water pollution from agriculture in England. The environment department is planning to introduce a small number of basic rules for farmers through legislation, which will aim to improve the efficiency of farms and help to reduce water pollution from agriculture, in particular from phosphorus. [bit.ly/1L5u1qG](http://bit.ly/1L5u1qG)


4 Dec 2015

## Waste management

 Proposals to alter requirements for applicants to demonstrate financial provision for waste management activities have been put out to consultation by the Scottish Environmental Protection Agency. The regulator is proposing to change the way it calculates financial liability for waste management sites and how it requires applicants to demonstrate adequate financial provision for waste management activities. [bit.ly/1WMUcWX](http://bit.ly/1WMUcWX)

4 Dec 2015

## Waste and resource efficiency

 The Welsh government is consulting on a draft public sector

waste and resource efficiency plan. It covers four main areas: waste prevention, with the aim of reducing the ecological and carbon footprint of waste in the sector, and establishing sustainable procurement practices; preparation for reuse – by improving, promoting and developing items for reuse and redistribution; recycling – improving the separation of the most valuable resources; and other recovery and disposal – including recovery of the energy and value of resources that cannot be recycled. [bit.ly/1Lyjfey](http://bit.ly/1Lyjfey)

10 Dec 2015

## Environmental cost protection

  Proposals to revise the costs capping scheme for eligible environmental legal challenges in England and Wales have been put out for consultation by the justice department. The need to amend the regime has arisen because of judgments in three cases – the Court of Justice of the European Union (CJEU) in *Edwards v Environment Agency* [2013]; the subsequent judgment of the Supreme Court in the same case; and the judgment of the CJEU in *European Commission v UK* [2014] – as well as plans by the government for a wider reform of judicial review. [bit.ly/1NOBuME](http://bit.ly/1NOBuME)

# New guidance

## Contaminated land

Defra has released an update (v.1.071) to the contaminated land exposure assessment (CLEA). The update ([bit.ly/1PYKayc](http://bit.ly/1PYKayc)) includes the library datasets from the Defra research project SP1010 – development of category 4 screening levels for assessment of land affected by contamination – and fixes a problem in v.1.07 by adding new chemicals. CLEA software is used to: derive generic soil assessment criteria using generic assumptions about the characteristics of contaminants and people likely to be present onsite; obtain site-specific soil assessment criteria by entering data on the characteristics of contaminants and people likely to be present onsite or by adopting a non-generic approach; and assess whether a measured concentration in soil would present a potential risk to human health.

## Integrated reporting

The International Integrated Reporting Council (IIRC) has published a competence matrix ([bit.ly/1Li1H4s](http://bit.ly/1Li1H4s)) focusing on a global approach to training in integrated reporting. The council describes it as a first step towards providing clear guidance on the skills and experience needed to be an effective practitioner in integrated reporting and is aimed at helping organisations to achieve consistency in the level of skills required.

## Marine licensing

The Marine Management Organisation (MMO) has published guidance ([bit.ly/1hqC31a](http://bit.ly/1hqC31a)) on the process and criteria for the recovery of marine licence applications for decision by ministers. Although the MMO is generally responsible for taking decisions, ministers can recover a licensing application and set up a public inquiry, if the application: falls in band 3 of MMO's licence charging scheme, covering the larger and more complex projects; is for an activity taking place wholly or partly in English waters up to six nautical miles from the coast; and could have a significant effect and raise issues appropriate for examination at an inquiry.

# Laying down the law



## Decc decides against wind farms

**Clare Parry** examines the implications of the recent decision by the Decc secretary of state to reject planning applications for four wind farms and an overhead power line in Mid Wales



**D**ecc rejected applications for five onshore wind farm projects in Powys on 7 September after a public inquiry, which started in June 2013 and closed in May 2014. A sixth proposal, to upgrade a wind farm at Llandinam, was approved. However, the future of the project is in doubt after Decc rejected the proposal to install an overhead power line to link it to the national electricity grid.

### Long-running dispute

The Powys case was one of the longest-running wind energy battles in the UK and Wales's longest planning inquiry. Between 2007 and 2009, developers made applications for five wind farms – at Llanbrynmair, Carnedd Wen, Llaithddu, Llandinam and Llanbadarn Fynydd – and for a 132kV overhead electric line to connect the proposed Llandinam repowering scheme, which involves decommissioning and replacing a wind farm, with the substation at Welshpool (see panel).

The case was not decided on the recommendations of the planning inspector but by the energy and climate change secretary, Amber Rudd. The difference between their conclusions is stark. The inspector felt that: Llandinam, Llaithddu and all but five of the proposed turbines at Carnedd Wen were acceptable; the planned facility at Llanbrynmair was acceptable if it used different access; and the 132kV line was acceptable if it was partly rooted underground. The inspector rejected only the Llanbadarn Fynydd wind farm. The secretary of state, meanwhile, concluded that only Llandinam was acceptable.

### Cumulative impact

Of greatest interest to environmental assessment practitioners is the consideration of cumulative impact and the approach taken to consider other solutions.

In terms of cumulative impact, if all the turbines before the planning inquiry were permitted they would have triggered the need for a 400kV grid connection using a network of pylons. Powys County Council and others strongly objected to the construction of new pylons and their impact on the local landscape, although the application for the connection was not before the inquiry.

The substantial number of proposed wind farms in the area in the planning or nationally significant infrastructure projects (NSIP) systems, but which were not before the inquiry, made it difficult to assess the cumulative impacts of the structures at Llanbrynmair, Carnedd Wen, Llaithddu, Llandinam and Llanbadarn Fynydd. Indeed, an application for a wind farm in the area that was not before the inquiry received planning permission from the Welsh government before the secretary of state's decision – although that is now subject to challenge in the High Court.

### The inspector's calls

Whereas the secretary of state did not have to consider the complex permutations of what combinations of wind farms would trigger the need for the grid connection when deciding the applications, the inspector did. He accepted that, in relation to each individual wind farm, the correct question to consider was whether there was any reason why the grid connection could not be provided. This is the conventional approach adopted by planning inspectors in cases where the grid application is not part of the same application. However, the inspector did accept that it was relevant to assess that some combinations of the five schemes would trigger the need for the 400kV line.

Given that the secretary of state found only the Llandinam application acceptable, she did not need to consider the other schemes in the planning pipeline. The inspector, however, found that, although the schemes before him were acceptable, if all the applications in the planning systems were to be permitted that would be unacceptable.

A final issue of interest that emerges from the inspector's report and the decision of the secretary of state is the relevance of alternatives. First, several options for the planned 132kV overhead line to export the electricity from the wind farm at Llandinam were put forward, from laying the line partly underground to an entirely different route. Both the inspector and the secretary of state accepted that the existence of those options was relevant to their consideration and relied on them to reach their decision.

Second, in relation to the proposed Llanbrynmair wind farm, the county council argued that there was an alternative access route for the delivery of components that would have substantially reduced environmental consequences. The inspector accepted in the public interest that the alternative route was relevant and, given the existence of an alternative with reduced consequences, the proposed access route should not be considered acceptable.

### The planning applications

- Llanbadarn Fynydd – 17 turbines; maximum capacity of 59.5MW.
- Llaithddu – 27 turbines; installed capacity of 62.1MW.
- Llanbrynmair – wind turbine generation station of up to 90MW.
- Carnedd Wen – wind turbine generating station of 130-150MW.
- Llandinam – 34 turbines; maximum capacity of 102MW; decommission of an existing wind turbine generating station.
- Power line – 132kV overhead electric line connection between the proposed Llandinam wind farm and Welshpool substation.

**Clare Parry** is a barrister with Cornerstone Barristers. She acted on behalf of Powys County Council in opposing the proposed wind farms.



# Finding a better way to do things

**John Barwise** talks to former Environment Agency chief executive Paul Leinster

**A**fter a career at the Environment Agency spanning 17 years, Paul Leinster stepped down as chief executive on 25 September. Leinster, an IEMA Fellow, joined the regulator in 1998, becoming CEO in 2008. Before leaving his post to join Cranfield University, where he will be professor of environmental assessment and help to develop a strategic centre for atmospheric informatics and emissions technology, Leinster spoke with IEMA member John Barwise about his career and the changing role of the agency.

**You arrived at the agency with a chemistry degree and a PhD, having worked at a number of high-profile firms, such as SmithKline Beecham and BP International. How important was it to have this background when you started at the regulator?**  
I think it gave me the ability to see something from both sides. What we were trying to do in terms of protecting and improving the environment, and then the challenges the businesses face in doing that – I knew what it was like on the other side. A big driver for me in joining the agency was that I'd seen environmental regulation and health and safety legislation in more than 30 countries. And I wanted use the learning from those places to come up with a way [of regulating] that was less bureaucratic but still delivered the protection of people and the environment.

**You were at the agency for more than 17 years and had to deal with a wide range of political masters, all with their own agendas for taking the organisation forward. What have been the highs and the lows, and the biggest challenge?**  
Weather is the biggest challenge. Sometimes it would just be nice to know when there's going to be too much or too little water. I've been an avid follower of weather forecasts; I like to get the long-term datasets on where we are with water resources but extreme weather happens and I often reflect I've seen too many "once in a lifetime" events already. We had the biggest tidal surge on the east coast for 60 years in 2013 and the wettest winter in 2013–14. I remember in 1998 was probably the first floods I'd experienced and since then we've been having regular flooding.

We've also had events like the Buncefield explosion [in 2005]. So the agency introduced something called Think big, act early to ensure it is prepared. It's seldom

that you would ever regret opening an incident room, but you would sometimes regret not opening one.

Then we've had to deal with challenges around resources and how you manage those. But for me I don't see them in highs and lows. Rather, I see them as a set of circumstances: some of those we can influence; others we just have to respond to. I always made the best case possible to invest in the work that the agency does because it delivers fantastic value. One accolade I will remember was when I went in front of the public accounts committee and the chair ended the session by saying he'd like to congratulate the agency on demonstrating value for money. That meant a lot.

**One of the biggest challenges facing the agency is a cut to its budget. Can it continue to cope?**

The role of the chief executive is to maximise the benefits with the available funding. That isn't by working harder and harder, it's by finding better ways of doing things. Over the years, the agency has found ways to reduce some of its process cost – by more than 50% in some cases – by finding smarter ways of doing it.

The agency has four main funding streams and you need to understand them to understand the organisation. The first one is the capital budget. This includes money for flood and coastal risk management activities, and now, for the first time, the agency has a six-year settlement to 2021 for this. That enables the agency to put in place a programme of work. There's also a budget for flood and coastal risk management revenue to fund operating expenditure and that has gone up and down; it went up slightly over the past year. The agency also receives a significant amount of money from its core regulatory work. That is funded by charges from regulating businesses and issuing licences, so, in a way, is protected. Lastly, the agency receives grant-in-aid and that's the bit that has seen the largest reduction. It goes on some of the pollution prevention work the agency does as well as some of its spatial planning and waste crime work.

Over the past two years, the government has given additional money for waste crime. The whole waste industry shifted and changed in the time I was at the agency. When I started, bin lorries collected waste from homes and put it in landfill. Now, the waste licences are more than 80% of all the process industry the agency regulates – a significant number. It is also this strange business, which goes from the highly competent large companies at one end to organised crime at the other.









**The scale of the cuts over the past few years, with 3,000 job losses and possibly more to come, is bound to make the remaining agency staff feel more vulnerable. Is this having an adverse effect on motivation and on staff morale?**

Along with all of the public sector, there is this feeling of uncertainty at the agency; and the role for the CEO and senior managers is to help people see that the work of the organisation is valued. But the agency is not exempt from the pressures on the public sector. Again, for me, the important thing is that the agency continues to demonstrate that its work is vital for England and vital for the environment. It needs to be protecting people and protecting and improving the environment.

**The government's aim to reduce red tape is reducing the number of environmental regulations. Do you think this is a good thing? Are there any risks in taking this approach and how does the agency manage the impact?**

I think it's helped. There are checks and balances the agency requires. If you look at the regulatory landscape, the agency scores regulated sites, A being good, F being poor. Some 96% of the sites it regulates score A to C; 4% score D, E or F, where they need to improve. The approach that you use for the 96%, I think, needs to be slightly different from the approach adopted for the poor performers, and the agency needs to strike the right balance. It needs to think about those two groupings and what's the appropriate approach for both, and not think everybody's either good or bad.

If you can make – and I think this is what's happened in the red-tape challenge – the guidance clearer by reducing the amount but not the effect, so somebody can read something and go “oh that's what I need to do”, that has to be good. Also, one of the things the agency did in introducing the environmental permitting regulations was to take 40 sets of regulations and directives and create one set of regulations. That has to be good too.

**There's a sense that we're moving towards a more self-regulatory system, for example the pig and poultry assurance scheme and, more recently, the trialling of the environmental permitting regulations assurance scheme for wider businesses under EMS plus. Do you think we are moving now towards a system where businesses are becoming more self-policing and supported by the agency rather than regulated by it?**

No, and I think there is a world of difference between being a regulator and a manager. Sometimes, in the past, I think the agency was trying to step into the role of manager, but it is for managers to manage and for regulators to regulate – be the check.

Do I believe in regulation? Absolutely. Regulation has delivered huge benefits for people's health and for the quality of the environment. Emissions and discharges have come down, and pollution incidents reduced. Some sites, unfortunately, are bad neighbours. So how do you get the bad neighbours to become good neighbours? If they won't change the agency will enforce and prosecute.

**You mention helping firms to be good neighbours, where the agency can support the local community being affected by a site. Do you see this as a sort of a new development, to bring together stakeholders to make industry part of the community?**

When I worked in industry, in some places the community was the main workforce for a particular plant, so there was an automatic link between the two. The agency should have a relationship with the community and with the site, and should not be in the middle. I would love to see every site in the country with a community-liaison panel and people holding the company to account, but that does not mean there is no need to regulate.

It is unlikely that a waste site being run by an organised crime group is going to have a community-liaison panel. The agency needs to be stricter and firmer. Companies need to earn autonomy and the right to have a reduced regulatory load. I used to talk about this with industry, which wanted regulators to step back. I agree but we need to make sure that there isn't a gap because, if the regulator steps back, the legitimate industry should step in so that there is no gap in performance.

**Many analysts argue that the Paris summit in December is the last chance to reach an agreement on emissions. How optimistic are you that we can reach an international consensus?**

There are huge challenges and many can be met by global agreements or individual countries agreeing to take action. I'm optimistic that ways can be found to address these. It's then for governments to take the necessary action.

**Given your experience over the past 17 years, would you advise doing any of it differently? Could the agency be a slightly different model from what it is at the moment?**

The agency is in a different place from where it was in 1998. A lot of its strengths are stronger now and I'd like to think that I've added something.

There are a couple of areas we need to think about, though. First, what does the regulator look like from a customer point of view or a recipient of services, or those being regulated? I would advise looking at the experiences of the different bodies and groups and see whether the approach being taken is the best way of doing it. The other issue for the agency is to find more ways of working in partnership with other organisations and other bodies, including local authorities: how it works with Public Health England and the NHS in England as well as with bodies like Natural England and the Marine Management Organisation, for example. Do they need to pool resources? They need to think about what it is that they're trying to achieve and what's the best way of deploying resources to deliver the best outcomes as well as how to involve local people in the discussion.

There's been quite a shift with partnership funding for flood risk management, and you know what you're going to get because there's a tariff system and local people also have to decide whether they're going to contribute to it. I think there will be much more of that sort of working.

**As a Fellow of IEMA and with your many years of experience at the frontline of environment management, how important is the institute and what advice would you give to the growing number of young professionals?**

I encourage people to become part of a professional institute. Certainly, when I was in the early stages of my career, I found it hugely beneficial because it was a network of people. You could learn from them. There were people from different industries and different organisations all coming together with a common purpose. If you happened to be the only professional in your organisation, you could get mentoring; you could ask people for advice and guidance. So professional institutes have a huge role to play. How we get them engaging with young professionals is the trick.

For me, the key bit is how do we get different professions working together to adopt integrated solutions and function in teams to deliver that? And the ultimate aim has to be, and I tried this in different jobs, to do yourself out of a job. If you can get general management to be thinking in a sustainable way, you don't need sustainability professionals, at least not in the same way. They'll be needed to educate, perform specialist functions and drive the agenda. But how do we get environment and sustainability into the core way of working? How do we get environment into business schools? How do we get environment and sustainability into core first degrees?

**The ultimate aim has to be to do yourself out of a job. If you can get management to be thinking in a sustainable way, you don't need sustainability professionals, at least not in the same way**

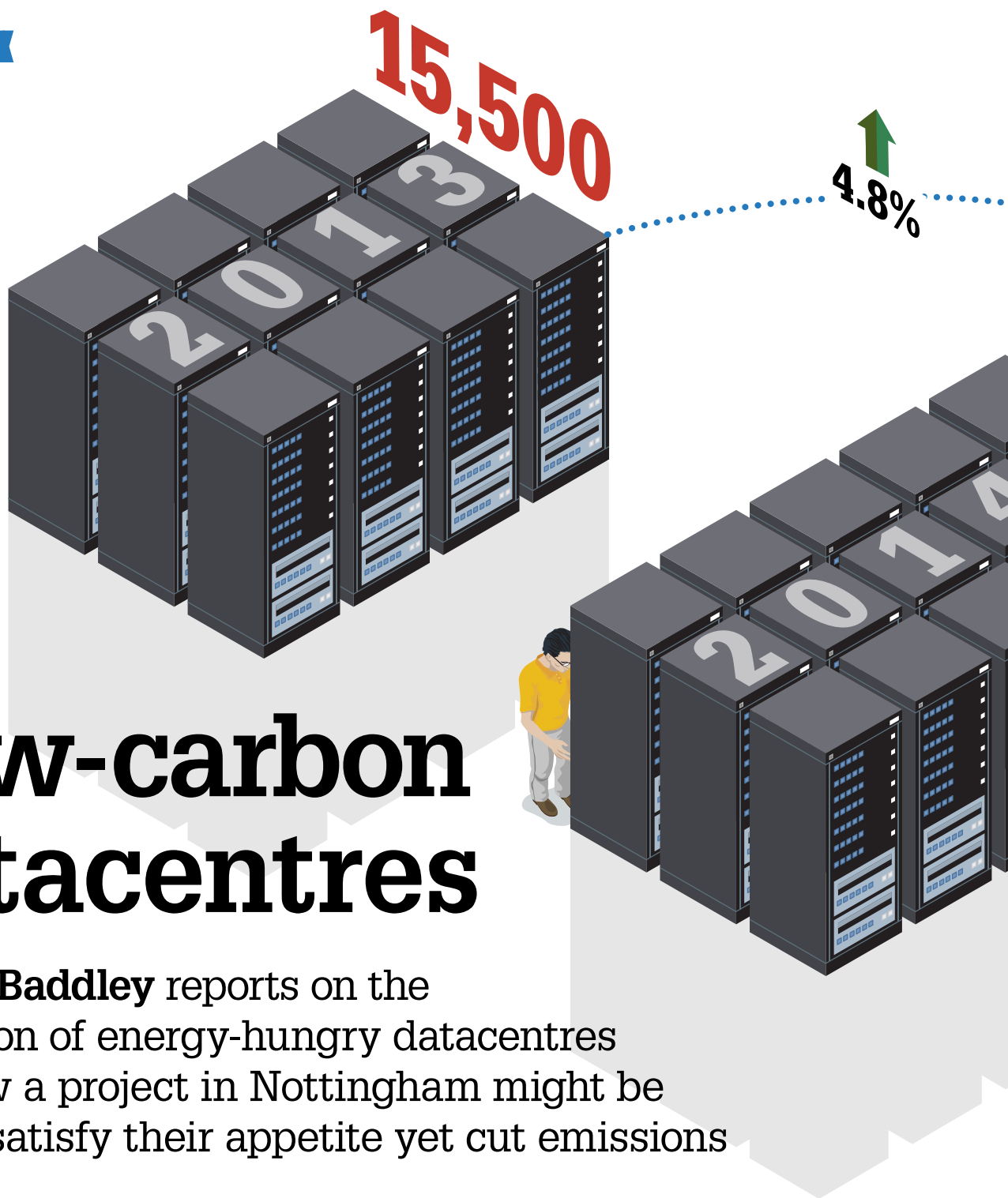
**You've left agency but not the environment profession and are going into academia. Why not just put your feet up now and enjoy a bit of quality time?**

I remain passionate. I still have questions in my mind and issues that still need to be addressed. There are still technical issues that need addressing. One thing I want to do is to help turn a good idea into a new way of doing something so we're not just doing things in the way that we used to do. People working in a specific area of research do not always know how to put it into practice. That is something I know how to do. Sometimes the legislation uses techniques and methods that are from years ago. How do we modernise that? And some of that might be hardwired into legislation or directives, so how do you go about it? I think I can help go about changing those into better ways of doing things.

The full interview with **Paul Leinster** is available to listen to at [environmentalisonline.com](http://environmentalisonline.com).

**John Barwise**, MIEMA, CEnv, is a director at QoL, an environmental management and communications consultancy.





# Low-carbon datacentres

**Jerome Baddley** reports on the expansion of energy-hungry datacentres and how a project in Nottingham might be able to satisfy their appetite yet cut emissions

**T**he world's information is doubling every two years and with that comes a huge demand for new datacentre infrastructure. More than 9% of global investment in datacentres is in the UK. Around \$16.95 billion is expected to be invested in new UK capacity in 2015 alone, up 4.3% on the 2014 levels of expenditure and 9.3 higher than in 2013.

The IT industry is under pressure to reduce its energy consumption. According to a report published by McKinsey in 2010, the sector consumes 2% of the world's energy and by 2020 will generate as much carbon as the airline industry.

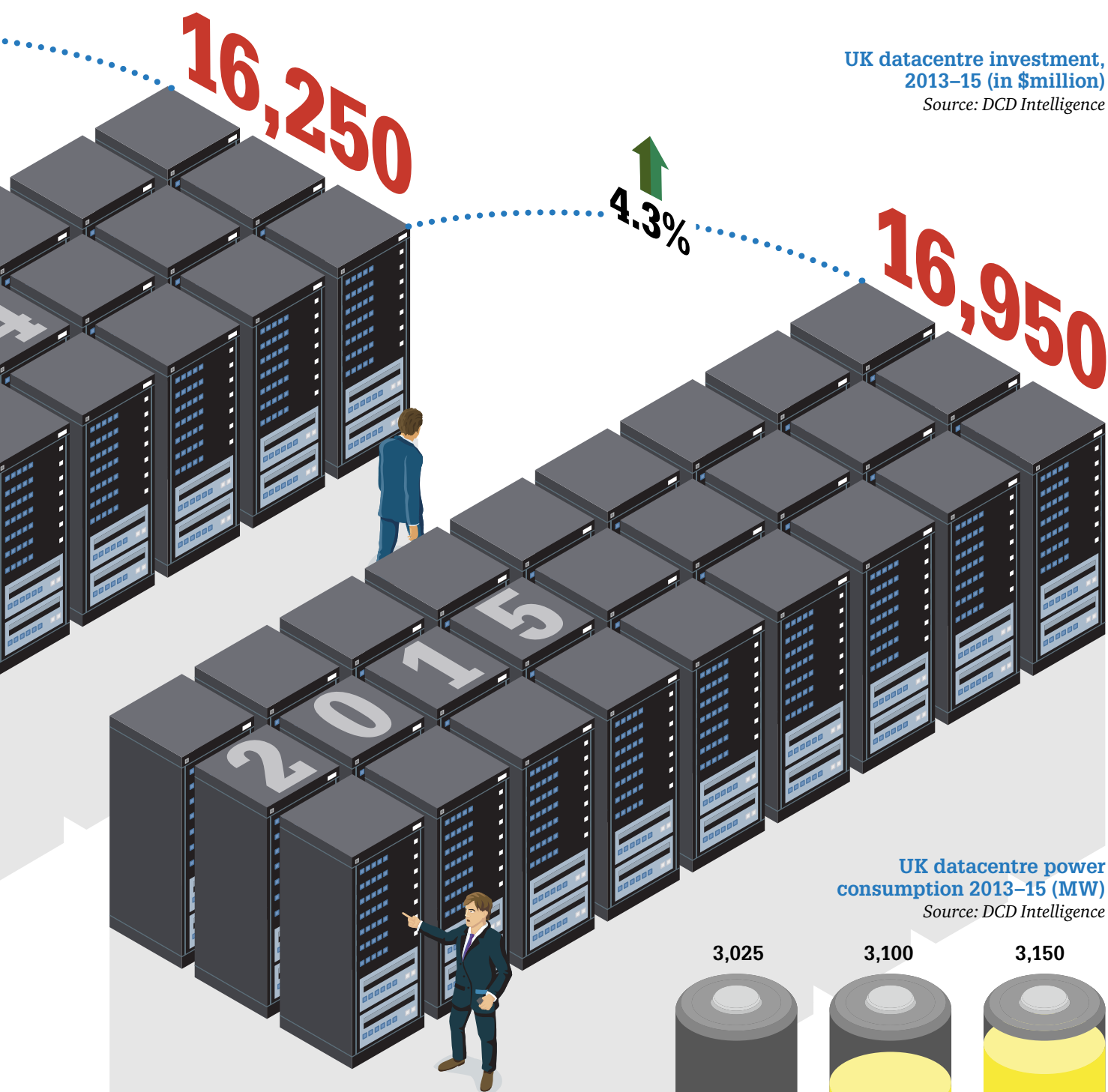
Datacentres operate around the clock and, in the UK, would consume 27.5TWh of electricity each year if fuelled by the national grid and be responsible for 15.2 million tonnes of CO<sub>2</sub> equivalent (mtCO<sub>2</sub>e) emissions. This is more than half the total footprint of the NHS and its entire supply chain (25 mtCO<sub>2</sub>e), and greater than that of Costa Rica. However, not all

datacentres are supplied by grid power; some off-grid centres may have diesel or fuel oil systems.

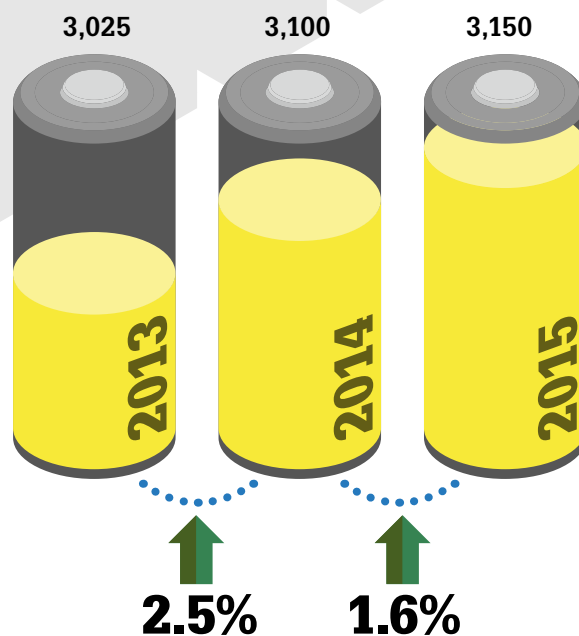
A promising approach to reducing the carbon impact of data-intensive industries is being explored in Nottingham by environmental consultancy NetPositive in partnership with 2BM, which installs datacentres. It comes as operator concern grows about the sector's environmental impact. An annual survey found "to be greener and more sustainable" ranked second after "to reduce operating costs" as the reason given for investment in datacentre facilities in 2014 and 2015. Indeed, in those years the proportion citing environmental concerns increased from 31% to 35%.

## Going local

The rise in the number of datacentres has sparked pressure from environmental groups and facilities managers to reduce power consumption at critical sites. With the UK consuming almost 7% of worldwide



**UK datacentre power consumption 2013–15 (MW)**  
Source: DCD Intelligence



## The rise of the powerful datacentres

The European commission's joint research centre estimates that, between 2007 and 2020, electricity consumption in western Europe's datacentres will increase from 56 Terawatt hours (TWh) to 104 TWh. In the UK, the power demand of datacentres is set to grow to 3.15GW by the end of the year. To put this figure in context, the capacity of Drax, the UK's largest power station, is 3.9GW.



## Datacentre efficiency



Two metrics have been adopted by the industry to measure the energy efficiency of datacentres: power usage effectiveness (PUE) and datacentre efficiency (DCE).

PUE is defined as total facility power divided by IT equipment power, which is the power consumed by equipment to manage, process and store data. Total facility power includes everything that supports the IT equipment load, such as cooling systems, including chillers, air conditioning and lighting.

The PUE is a quick way to compare energy allocation in a datacentre. If a PUE is determined to be 2.0, this suggests that demand is two times greater than the energy necessary to power the actual IT equipment. A PUE can range from 1.0 to infinity. A PUE value approaching 1.0 would indicate 100% efficiency.

Research suggests an average PUE in the EU of 1.78. In recent years, the density of processing power in datacentres has increased dramatically. To match this, the intensity of associated services, such as electricity demand and cooling demand per m<sup>2</sup>, have also had to increase. This high and climbing grid power demand is a primary reason behind the limits on datacentre capacity in some towns and cities.

In response to the projected rise in electricity consumption by datacentres in the EU, the European commission has developed a best practice code of conduct. The aim is to encourage datacentre owners and operators to have the energy efficiency of their operations measured and agree an action plan and annual progress report.

datacentre power, it is clear that measures must be taken to slow this ever-rising figure. At the same time, constrained power supply means that central London is reaching datacentre capacity and regional facilities are being considered for Slough, Birmingham, Manchester and Leeds. According to Tariff Consultancy, the European datacentre market monitor, these areas are likely to see clusters of service providers, each developing their own digital ecosystem. Datacentres outside London already account for 56% all "raised floor space" in the UK, and this is set to continue.

2BM, based in Nottingham, has recently built what is claimed to be the world's most efficient datacentre in

Cambridge for microprocessor design business ARM, using water-based rather than mechanical cooling. It is now looking at creating power-efficient, low-carbon datacentre facilities using district-heating systems in places like Nottingham. In summer, a district heating network is an ideal source of excess heat, which could be used for adsorption cooling at information communications and technology data storage centres.

Nottingham is already a UK leader for urban energy self-sufficiency, with around 15% of the city's consumption generated within its limits and the council operating the country's largest district heating network. Nottingham was also identified this year as having the fastest falling CO<sub>2</sub> emissions of any city in the UK, down 21% since 2005.

Initial modelling by sustainability partnership NetPositive looked at two types of datacentre: national grid-dependent (tiers 1 and 2) and national grid-independent (tiers 3 and 4). Costs, energy and emissions were estimated for datacentres supplied with electricity from the grid and those powered by diesel generators (grid-independent). For a grid-dependent datacentre connected to the Nottingham heating network, estimated annual running cost savings were £200,000, while potential carbon equivalent savings totalled 1,000 tonnes. The equivalent savings for grid-independent datacentres were £2 million and 3,500 tonnes CO<sub>2</sub>e.

The initial analysis suggests the running costs of a datacentre in Nottingham that uses CHP absorption chillers and is connected to the heating network would be more than 30% lower than one that was grid-dependent.

The UK heat strategy (*The future of heating: a strategic framework for low-carbon heat*) and *Carbon plan* include the development of low-carbon heat through district networks in towns and cities. The national strategies are reflected in the local plans and in Nottingham's 2020 energy strategy, written by the NetPositive team and published by the city council in April 2010, as well as the draft low-carbon plan from Local Enterprise Partnership, published in 2013.

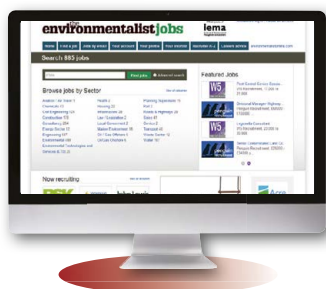
The support for companies such as 2BM to innovate in lower-carbon solutions forms part of the broad approach to low-carbon jobs and growth in Nottinghamshire and Derbyshire, primarily delivered through the region's new Low Carbon Hub. The aim of the hub, which launched in June, is to link businesses to appropriate sources of help and to foster collaborations across the low-carbon sector.

A 1.9MW datacentre would cost £26 million, but create between 100 and 300 skilled IT and facilities management jobs. Datacentres are only the physical embodiment of a digital services business that employs many more people than the onsite staff. If the UK can demonstrate expertise and a rapidly deployable solution to low-carbon datacentres, it should expect to generate a significant number of construction and operation jobs where these solutions are deployed. Further employment could be created as local companies export the expertise they develop.

**Jerome Baddley**, MIEMA and CEnv, is chief executive of NetPositive.

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# SAFE AND SECURE

**Rosa Richards** looks at managing cyber threats as part of environmental risk management





First came steam power, followed by electricity and then the digital revolution. Now use of smart technology and the Internet of Things (IoT) to control processes in real time is driving the fourth industrial revolution, or Industrie 4.0. But, with every introduction of a new smart device or system the threat of a cyber-attack grows.

Cyber security incidents are often in the news and there is evidence that the frequency of attacks is increasing, although few have led to hazardous events. Nonetheless, environment managers may want to review the risk to their organisation's operations from cyber threats. At the same time those responsible for critical national infrastructure (CNI) and sites regulated under COMAH – control of major accident hazards – are advised to ensure procedures are in place and staff trained to deal any threat.

### Growing problem

Uptake of smart technology is increasing year on year. Deloitte predicts that in 2015 one billion wireless IoT devices will be bought worldwide, 60% more than in 2014. ABI Research predicts that by 2020 more than 30 billion devices globally will be connected wirelessly to the internet. The increasing use by enterprises and industry of smart systems is accompanied by the responsibility for managing and protecting them.

Global cyber-attacks against supervisory control and data acquisition (SCADA) systems quadrupled in 2014 compared with 2013, according to Dell's annual threat report. The technology firm recorded 675,186 attacks in 2014, with Finland facing the largest proportion (202,322), followed by those in the UK (69,656) and the US (51,258). The high figures are likely to be due to increased awareness and detection, as well as the fact that SCADA systems are more common in these countries and more likely to be connected to the internet. Many attacks target operational capabilities in power plants, factories and refineries. These are political in nature rather than those that are financially-driven, such as credit card fraud or identity theft, but which receive more publicity.

The Health and Safety Executive (HSE) recognises the implications of cyber-attack on CNI, which includes energy, food, health, transport and water. It says: "Accidental failure or malicious attack on process control systems could result in loss of system-critical safety functions such as interlocking and emergency shutdown systems and disruption of control of the process, potentially resulting in serious risks to operators and possibly the public."

The Centre for the Protection of National Infrastructure (CPNI) advises large companies and organisations operating CNI to "take all necessary measures to prevent major accidents involving dangerous substances. Limit the consequences to people and the environment of any major accidents that do occur."

Operations using an instrumented control system that is electrical, electronic or programmable are bound by international standard IEC61508. This requires a hazard analysis to be undertaken but also a security threat analysis if malevolent or unauthorised action constituting a security threat is identified as reasonably foreseeable. The HSE says: "While it is good practice to

## Cyber-security risk assessment

A cyber-security risk assessment is the first step in securing process controls and SCADA. These steps are recommended by the CPNI:

1. Undertake a cyber-security risk assessment to understand the business risk – a combination of credible threats, impacts and vulnerabilities. Questions to ask include: What information is at risk? From whom? How likely is this? How might attackers try to access the information? What impacts would there be? Who is responsible for this risk at board level? What security measures do you have and are they working? Is there an incident response plan? Can any improvements be made to improve security?
2. Implement secure architecture according to the business risk. This should not rely on one single security measure, such as firewalls, for its defence.
3. Establish response capabilities.
4. Improve awareness and skills.
5. Manage third-party risk from use of mobile devices, such as laptops and USB sticks, by implementing the Cyber essentials scheme, a government-backed initiative to help organisations protect themselves against common cyber attacks ([bit.ly/1hkkmdz](http://bit.ly/1hkkmdz)).
6. Engage with all new process-control, system-related projects.
7. Establish ongoing governance.

Your information risk management regime should comprise all of these components:

- Ongoing staff training and awareness-raising.
- A mobile working policy with training.
- Security patches.
- A policy for all removable media controls – for example, USB sticks.
- Account management processes – limit user privileges and monitor user activity.
- Incident management plans and reporting – see CiSP in useful resources below.
- A continuous monitoring strategy.
- Malware protection across the organisation.
- Network security measures.

Further advice is available at [cpni.gov.uk](http://cpni.gov.uk). Other useful resources include: CPNI training in ICS security, which is free for CNI assets owners; *Companies like yours* video ([bit.ly/1YLMJJS](http://bit.ly/1YLMJJS)); *Secure the breach* – two-part video ([bit.ly/1ODU7mU](http://bit.ly/1ODU7mU)); *The critical security controls for effective cyber defense*, version 5.1, Council on Cyber Security ([bit.ly/1o0RG1q](http://bit.ly/1o0RG1q)); and the Cyber-security Information Sharing Partnership (CiSP) – a UK "community watch" scheme for cyber threats and vulnerabilities so that UK businesses are aware of current issues and can take steps to reduce their impact ([bit.ly/1P3urzz](http://bit.ly/1P3urzz)).

isolate safety-critical control or protection systems from any connectivity to the 'outside world' this approach is being challenged by the changing nature of plant electronic control and management systems. This is leading to increased vulnerability of plant to electronic attack, while at the same time the threat level is increasing. The possibility of such electronic attack of control systems is recognised as a threat to the CNI."

A security breach can be caused internally simply due to human error – which accounts for about half, according to the UK 2015 information breaches survey, published by the government in June – or an intentional cyber-attack by a disgruntled staff member. Alternatively



## Spear phishing attack at German steel mill

The German Federal Office for Information Security (BSI) reported in 2014 that a cyber attack on a German steel mill caused extensive damage to a blast furnace.

The attackers used spear phishing and clever social engineering to target key staff and trick them into opening emails.

The messages contained code that captured login details for the office network. This gave the hackers access to the plant's production systems. The attack led to parts of the control system failing, which resulted in the uncontrolled shutdown of a blast furnace and caused extensive damage.

The security services rated the attackers' technical skills as very advanced. To be capable of mounting the assault, the hackers would have had in-depth knowledge of IT security and technical knowledge of industrial control systems as well as production processes.

Attacks like this are reported to the national security services so that other operators of industrial installations are aware of the risks and threat level. In the UK, incidents are reported to the Cyber-security Information Sharing Partnership (CiSP).

attacks can originate from malicious external third parties, including organised criminals, malware authors, activists and non-professional hackers. Poor IT security or a lack of control of vendors or third parties can present weaknesses. Breaches of technology were the third most common type of security breach after government and "other" in the first half of 2015, according to data from the Global Breach Level index.

In 2011, Stuxnet was the first-known virus designed to target critical infrastructure, such as power stations. It was transferred by USB to equipment physically isolated (air-gapped) from unsecured networks. Dragonfly was a less publicised virus, designed to sabotage energy supplies. It simply sent emails with information that the recipient opened. According to cyber security business Symantec, more than a 1,000 organisations in 84 countries were affected over an 18-month period.

Other cyber-attacks aimed at industrial control systems in 2014 include the Havex RAT – a cyber espionage malware campaign – and BlackEnergy malware attacks, which exploited vulnerabilities in products from GE, Advantech/Broadwin and Siemens.

### Combating the threats

All employees need to be aware of cyber threats and how to avoid them; it is not just the responsibility of the IT department. They should understand the risks of spear phishing (a fraudulent email) across organisations and whale phishing (attacks on wealthier and senior people), which targets executives. Both make organisations vulnerable to cyber espionage by releasing sensitive information in response to cleverly worded emails (see panel, above).

Security control measures, such as firewalls, antivirus and vulnerability management can be put in place to prevent breaches, and threats can be monitored but these measures will not prevent all cyber-attacks. In the past, an organisation's internal network may have been "fenced off" from the web, but smart technology interacts with the internet. Previously the standards

of security may have been higher for IT than for operational technology (OT), such as SCADA systems, due to the systems and knowledge bases being separate. This situation is changing with IT and OT working more closely together, such as in the utilities sector.

There is growing acceptance that breaches are inevitable so the emphasis in many companies is switching to securing sensitive data. Security experts recommend that firms take a data-centric view of digital threats. This includes setting long and strong passwords and installing multi-factor authentication and encryption so that if data is stolen it is useless. Data "tunnels" can be used so information being transferred is secure. Companies can hire ethical hackers, known as "white hat" hackers, to test the strength of their infrastructure. In addition, IT teams are recommended to establish roles and responsibilities, and to draw up plans for regular testing in scenarios that cover all possible outcomes.

Nick McLauchlan, business manager at the engineering business, Z-Tech Control Systems, warns: "There can sometimes be an assumption that smart devices are secure. If the original equipment manufacturer [OEM] is selling the device they must make it secure – right? Wrong, your data system is only as secure as the weakest link in the chain, and the OEM will generally assume that you are responsible for the security of your system." He recommends performing a full cyber-security risk assessment (see panel, p.21) at the design stage of any project. This should be followed by regular reviews throughout the life of the system, and staff should receive regular training on simple behavioural controls that will maintain security. These include instructions not to open attachments in emails from unknown sources and controlling the use of USB dongles. McLauchlan also advises organisations to refer to the guidance provided by the CPNI.

Severn Trent Water recently undertook a cyber-security review and improved its data security with guidance from the CPNI. John Skelton, chief technology officer at the utility company, said: "We took proportionate and appropriate action across people, process and technology to manage the risks. It was hard work at times, but we gained useful insights. There has been sweat, but no blood or tears – yet! We feel more confident that we are now more proactive to cyber threats rather than just reactive, and better prepared for the challenges ahead with increasing use of machine-to-machine [M2M] technologies." M2M refers to technologies that allow wireless and wired systems to communicate with other devices.

Organisations that have assessed their cyber-security agree that it has been a worthwhile exercise. Moreover, guidance is easily available on how to take proportionate and appropriate pre-emptive action. We are already living in the digital age and the system "surface" potentially vulnerable to cyber-attack will continue to grow with the types of threat likely to become more sophisticated.

**Rosa Richards** is an independent environmental consultant specialising in water policy. She is a freelance science writer, programme manager of the Sensors for Water Interest Group (SWIG), and distance learning tutor of integrated environmental management at the University of Bath.





# And then there was one

North West Bicester is the sole survivor of the visionary ecotown programme. With the first homes being sold, **Catherine Early** pays a visit

**E**cotowns should have been a no-brainer. Designed as pioneering settlements with visionary environmental and social standards, they aimed to tackle both the housing and environmental crises, while improving inhabitants' health and wellbeing. Instead they were panned by critics who accused them of subverting the planning system and being expensive white elephants. Of the 10 originally championed by then Labour chancellor Gordon Brown, four were approved (see p.25). Of these, only one – North West Bicester in Oxfordshire – is still being developed under the core ecotown principles set out in the now defunct planning policy.

NW Bicester has been designed to meet Bioregional's One Planet Living principles and has an extensive list of environmental and sustainability targets (p.24). All homes will run on electricity only and have rainwater harvesting and other water-saving features to constrict daily use to 80 litres a person. The development as a whole will include 17,500m<sup>2</sup> of solar panels across its rooftops and a district heating network powered by a gas-fuelled combined heat and power (CHP) plant. To reduce conventional car use there will be a bus stop within 400 metres of each home, segregated cycle lanes

and an electric car club. More than 40% of 400 hectares of land being developed will be allocated to green space, with wildlife corridors running around homes. The development will boast a communal orchard, fruit bushes, herb boxes and allotments. Each household will be able to choose an apple, pear or plum tree for their garden.

## A residential development

The first 91 homes of the development's exemplar phase, which will eventually total 393 dwellings, are due to be completed by the end of the year. Twenty-seven have been sold since June, with buyers varying between those with a strong desire to live more sustainably to those who just like the houses, says Steve Hornblow, project director at A2Dominion, the housing association acting as lead developer. The homes have been designed to look traditional without the "eco-bling" of other developments, such as Bioregional's BedZed development in south London, with its distinctive wind cowls that provide passive ventilation.

NW Bicester's first residents will be key to how the rest of the 6,000-home scheme is developed over the next 20 years, as they will be pioneers of using the technology. Their energy use will be monitored on a neighbourhood





## Future proofing

NW Bicester homes have been designed to adapt to a changing climate, with the temperature by 2050 predicted to have risen by 2°C on average, with a chance of a 10°C peak, according to site-specific research by Oxford Brookes University. Dwellings all have south-facing roofs to enable solar power generation, but this has left some with west-facing windows that could cause overheating in the summer. To manage this, all windows will open fully and external blinds can be retrofitted to shade the inside of the house. Trees have been placed to provide shade where overheating could occur.

## NW Bicester's ecotown targets

In construction:

	Target	Achieved
Airtightness	3.0m <sup>3</sup> /hr/m <sup>2</sup>	2.35m <sup>3</sup> /hr/m <sup>2</sup>
Waste	Zero waste to landfill	Zero waste to landfill
Embodied carbon	40% reduction compared with typical new build	29% reduction
Carbon emitted by construction	30% reduction compared with typical new build	29% reduction
In use:		
Energy	No net CO <sub>2</sub>	
Water	80 litres a person a day	
Biodiversity	40% of land to be devoted to wildlife and biodiversity; net gain in biodiversity	
Travel	cut the number of car journeys by 50%	
Car ownership	10% of cars to be electric by 2017	

level and the data will be crucial to determining whether the development will meet its target of being "true zero-carbon" – that is, whether all energy consumption, including the extra used by householders to power TVs and gadgets, will be zero-carbon.

As part of this, all homes will come with appliances installed to avoid residents bringing in inefficient ones that might add to the energy load needed for the properties. This is more ambitious than the government's now abandoned zero-carbon homes target, which covered only regulated energy, meaning what is used for heating, lighting and hot water. This will make the development about 30% more ambitious than the zero-carbon target, says Hornblow. For now, A2Dominion is using historical data from existing housing stock in its calculations for energy consumption. This will be reassessed once energy use in the exemplar homes has been monitored for 10 years post occupation, with the "actual" unregulated energy use taken into account for onsite production in future phases of the scheme.

The development is receiving funding from the government body, Innovate UK, for a four-year research project aimed at monitoring the gap between the performance the homes are designed to achieve and what they do achieve. The project, called the Bicester ecotown process implementation toolkit (BEPIT) and involves A2Dominion, Willmott Dixon, Bioregional, architects PRP and Loughborough University, will test different solutions to bridge any gap. Two researchers are based on site. Hornblow says they have highlighted some simple issues such as the airtightness of pipes entering the homes and ensuring tradespeople do not accidentally drill through airtight membranes.

## Meeting the challenges

A2Dominion admits that the transport targets are its biggest challenge. It is aiming to reduce the rate of trips by petrol and diesel cars from the Bicester average of 67.5% to 50%. It is aiming for 10% of residents to have electric cars by 2017. To help meet this, A2Dominion is subsidising electric cars for residents and holding events where they can tell others about their experience. All residents will be given an electric vehicle for a two-week trial, and manufacturers will attend promotional events to arrange test drives. All homes will have infrastructure for electric charging points, which will be installed free if the resident buys an electric car within two years of moving in. The presence of an onsite electric car club will also help to meet the target.

The segregated cycle lanes include a direct route into Bicester for commuters as well as more scenic routes for leisure cyclists. In a further move to encourage cycling, the developer is applying for permission to replace a 50mph road that cuts the ecotown off from the rest of Bicester with one of 30mph with segregated cycle lanes and crossing points for pedestrians.

Another major challenge the developer has faced is how to deal with the surplus energy generated onsite by the solar panels and a CHP plant. It has cost A2Dominion around £1 million to upgrade the energy network for the first phase of the scheme, according to Hornblow. "In the UK, the grid is not very good at taking energy in," he says. "We've had to pay substantial money to upgrade the network to get energy from the site into the grid. We've ended up with four substations, purely to cope with the energy we're generating, not what we're using. It's not something you normally think of when you're a housebuilder; it's been quite a learning curve for us. You can't just put loads of solar PV on every roof because that energy has to go somewhere."

Hornblow is already negotiating with energy storage manufacturers to install equipment in future phases of the scheme. Batteries the size of a small suitcase could fit inside roofs or garages to store what the PV panels produce instead of feeding it into the grid, for example. The technology will be trialled on some of the homes next year.



The ecotown aims to reduce the embedded carbon of each home by 40% compared with a typical new build. Data from manufacturers is used to compare the carbon emitted through the manufacture of all the materials in the homes and their surrounds, such as kerbstones. It has worked on this with experts at consultancy Sustain. They calculated that the design of the homes would result in an almost 29% reduction in embodied carbon. The report has been used to inform design of future phases of the development, such as increased use of timber cladding, which has a lower carbon footprint.

So far, the project is progressing well towards its targets (see p.24). “There were challenges to achieve all the targets since they are very demanding,” says Nick Schoon, policy and communications manager at Bioregional. “We and A2Dominion knew that, which is why we were open to the idea of reviewing the plan in the light of experience.”

One thing no developer can guarantee is the behaviour of residents once they move in. But rather than tell people what they are not allowed to do, A2Dominion’s tactic is to encourage behaviour change by making sustainable living as easy as possible by giving residents the information and tools to make this possible. Each home will have a tablet information system, known as the “shimmy”. Residents will be able to use this to find out how much energy and water they are using, when the next bus is due and to book electric vehicles from the car club. The shimmy will inform residents about efficient use of the technology in their homes, such as reminders to switch ventilation systems to summer mode. “Over time we can bring to them the benefits of living here so that they will slowly adapt their lifestyle over time. We’re not telling people that they have to be green to live here or it would never sell,” Hornblow says.

Schoon also acknowledges that generating behaviour change may be hard: “Against a background in which people live increasingly individualistic lives, how are we going to create that ethos where people will go the extra mile for sustainability? A lot of that is to do with creating a strong community, taking up the opportunities around local food growing and using the car less.”

It will also be a challenge to ensure that future phases of the development remain in line with the original high ambitions of the first phase, Schoon adds. The government’s cancellation of both ecotown planning policy in March and the zero-carbon homes target in July should not directly affect NW Bicester, since the ecotown is now enshrined in Cherwell District Council’s local plan. However, significant research and development in the housebuilding sector was geared towards meeting the zero-carbon homes target and it remains to be seen whether the supply chain will maintain that to meet the requirements of developments such as NW Bicester.

## Ecotowns – where are they now?

The three other developments designated as ecotowns alongside NW Bicester are:

- **St Austell and China Clay, Cornwall.** Being developed as an “eco-community” by Cornwall Council and government regeneration body the Homes and Communities Agency on the site of a former clayworks. A planning application is now being assessed by the council. An earlier planning application for 2,000 homes in 2011 was withdrawn due to concerns over economic viability and uncertainties about planning policy.
- **Whitehall and Bordon, Hampshire.** Located on former Ministry of Defence land, this scheme by Taylor Wimpey will include 3,350 homes, schools and 150 hectares of natural environment. It is aiming to follow Bioregional’s One Planet Living principles. It received outline planning permission in April 2015 and construction is due to start early next year.
- **Northstowe, Cambridge.** Up to 10,000 homes, as well as schools, employment areas, a town centre and other community services, are being developed by Gallagher Estates and the Homes and Communities Agency on the former RAF Oakington Barracks site. Environmental targets include solar PV on 26% of the roof space, which will provide at least 12% of regulated energy use.

Louise Sunderland, senior policy adviser at the Green Building Council, says that, in the short term, projects like NW Bicester should not have a problem because the target was due to come into effect next year and suppliers had worked to that deadline. However, she says: “The issue is how we manage to sustain some of the big developments that have been made in improving products, practices, design and construction approaches that were made on the back of zero carbon. Now that is gone, what will drive that research?”

Willmott Dixon is continuing with its work regardless, says Alasdair Donn, the construction firm’s principal consultant for NW Bicester. “While that’s the political direction the government is taking, we’re nevertheless aiming to set very high standards and the zero-carbon objectives that NW Bicester set out to achieve, albeit if those haven’t been translated into standard practice for housing, which was the original plan.”

But a source close to the project warned: “These aren’t good times and the foot has definitely come off the accelerator. The supply chain may not develop in the way it needs to; the impetus is lacking.” It will be more difficult for developers to undertake projects like NW Bicester in the future, he says. They will have to work much harder to prove that big sustainability gains can be made without housing costing a lot more. “If it’s substantially more, then you’ve got a problem. With the emphasis so much on affordability, the sustainability premium must be modest. You also have to be brilliant at showing that it’s a better life, that people are happier in the homes and that there’s a better sense of community, and that bills are lower.”



# The scope for onsite renewables

**Victor Parrilla** on how to account for onsite renewables in carbon reporting

**E**arly this year, new guidance was published on how organisations should measure scope 2 emissions, from purchased or acquired electricity, steam, heat and cooling, for example. It also clarified the reporting of emissions associated with the consumption of renewable energy.

## Two figures

Under the new guidance, issued by the World Resources Institute (WRI), companies that consume low-carbon electricity can now reflect the emissions savings through their greenhouse-gas reporting. The approach requires companies to report two carbon emission figures for their electricity use: a location figure using standard grid factors; and a market figure of the GHG emissions based on their choice of supply. WRI says the market-based method shows emissions from electricity that firms have purposefully chosen.

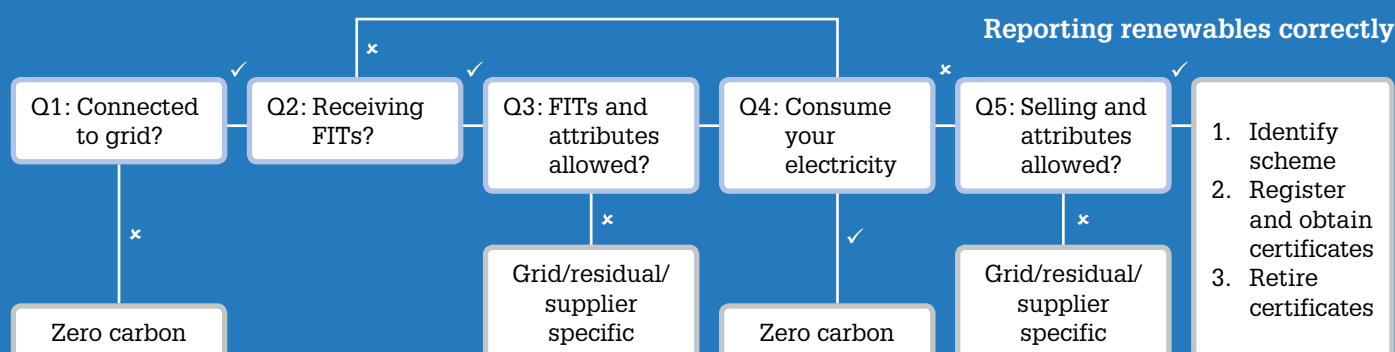
The market-based figure depends on “ownership” of energy attributes. These represent the environmental (and sometimes other non-power) qualities of renewable electricity, such as zero-carbon generation. When a renewables installation produces electricity, energy attributes are generated too. Both attributes can then be sold or used together or separately.

## Onsite renewables

There are five questions organisations must answer to report renewable energy correctly under the guidance (see also panel, above):

1. Is your onsite renewable installation connected to the grid? If the answer is no, the electricity generated can be regarded as either low or zero carbon in the organisation’s scope 1 emissions. However, most installations will be connected, so the organisation should move to the next question.
2. Do you benefit from feed-in tariffs (FITs) paid by the government? Most companies receive FITs. Those that do must answer the next question; those that do not should go straight to question four.
3. Does national regulation enable the organisation to receive both FITs and energy attributes for its renewable energy or does the regulation prohibit it from receiving energy attributes if it receives FITs?

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In some countries, including the UK, renewable projects that benefit from FITs have their environmental attributes retired on behalf of all consumers. Public taxation funds the attributes so the government believes it owns them. In such cases, the electricity generated needs to be reported as non-zero carbon (see top panel, right). In other countries, including Hungary, ownership of energy attributes is allowed in some circumstances in addition to national subsidies. If this applies, move to the next question.

4. Does the organisation consume the electricity produced onsite? If yes, it can report this as either low or zero carbon in the organisation's scope 1 emissions; if the electricity is sold, question five applies. It may be that the organisation consumes some of the electricity produced onsite and sells the remainder. In this case, the organisation should report the electricity it uses as zero carbon and answer question five for the electricity it sells.
5. Does national regulation allow organisations to sell electricity generated from onsite renewables and retain its energy attributes? In many countries, when the electricity is sold, its environmental attributes are transferred at the same time. If this is the case, the electricity generated is classed as not zero carbon for reporting purposes and the appropriate emission factor applies. If national regulation allows the organisation to retain the attributes after the electricity is sold, these steps must be taken:
  - identify what scheme operates in the country for carbon-related energy certificates to be issued;
  - register the renewables installation and obtain the certificates; and
  - retire them in order to reduce the carbon footprint of the electricity purchased and consumed. This enables the organisation to claim zero carbon for the electricity – typically one certificate equals 1MWh.

The new guidance should result in companies applying them to reduce their GHG emissions. WRI says nearly 40% of global emissions can be traced to electricity generation, and half of that is consumed by businesses. The new guidance seeks to improve

### Appropriate factors

	Location-based	Market-based
Organisation has contractual agreements	Grid-mix	Supplier specific emissions factor
Organisation does not have contractual agreements	emission factor	Residual mix

### Reporting examples: UK and Italy

Company A based in UK	Company B based in Italy
Renewable energy generation: <ul style="list-style-type: none"> <li>■ two solar panels connected to the grid;</li> <li>■ generated 1MWh, of which 14 MWh was consumed onsite and 4MWh was sold to the grid;</li> <li>■ receives FITs for the 18MWh</li> </ul>	Renewable energy generation: <ul style="list-style-type: none"> <li>■ one solar panel not connected to the grid;</li> <li>■ generated 6MWh, all consumed onsite</li> </ul>
Total electricity consumption: 500MWh	Total electricity consumption: 300MWh
Electricity consumed from the grid: 486MWh Opted for a green tariff on electricity bought	Electricity consumed from the grid: 294MWh ■ 294MWh x residual mix emissions factor
Market-based footprint: <ul style="list-style-type: none"> <li>■ 486MWh x green tariff emissions factor</li> <li>■ plus 14MWh x residual mix emissions factor</li> </ul>	
Location-based footprint: <ul style="list-style-type: none"> <li>■ 500MWh x grid-mix emissions factor</li> </ul>	Location-based footprint: <ul style="list-style-type: none"> <li>■ 294MWh x grid-mix emissions factor</li> </ul>

footprint accuracy and provides a further incentive to use renewable electricity, whether it is produced onsite or bought through a supplier.

**Victor Parrilla** is a consultant at WSP|Parsons Brinckerhoff. This article is his understanding of how to account for onsite renewables under the revised guidance, which is available from the World Resources Institute at [bit.ly/1KZQjsV](http://bit.ly/1KZQjsV). Defra has yet to revise its scope 2 reporting guidance.





# Powering Scotland's future

Maxine Perella reports on the development and trial of hydrogen and fuel cell technologies

Scotland has access to some of the richest and most diverse renewable resources in Europe, but harnessing them has always been problematic. Developing the means to manage intermittent electricity generation, especially from wind turbines, has been a key challenge for grid operators, but the country is now making great strides – notably through the use of hydrogen and fuel cell technologies.

The potential of hydrogen has long been recognised by the Scottish government. In its *Hydrogen and fuel cell opportunities for Scotland* report, published in 2006, the government noted that leveraging both technologies to balance and integrate diverse and intermittent sources of energy could net the economy £500 million a year and sustain 10,000 jobs.

## Essential mechanism

The 2020 routemap for renewable energy in Scotland, published in 2011, sets a target for the country's electricity demand to be supplied from renewable sources by the end of the decade. The government considers hydrogen an essential mechanism to help achieve this, while recognising that it can also support the development of community-based renewable

energy projects, such as those on the islands. Figures from Decc show that, in 2014, Scotland's renewable power generation was equivalent to almost half (49.8%) of all electricity used in the country. But, as Nigel Holmes, chief executive at the Scottish Hydrogen & Fuel Cell Association (SHFCA), points out, as the amount of intermittent renewable energy rises there can be local constraints in the power distribution and transmission networks.

"This is already affecting areas such as Western Isles and the Orkney Islands, and leads to renewable energy production being curtailed," he says. "During 2014, the Orkney Islands produced more electricity from renewables than the islands consumed and it was a net exporter. This could have been even higher if the Orkney grid connections had sufficient capacity."

To try to resolve this challenge, hydrogen demonstrator projects are now emerging. Hydrogen's gift lies in its flexibility: it can be compressed, stored and converted back to electricity when needed. When electricity generated from intermittent renewables is used to produce hydrogen, it "top slices" the energy that cannot be fed into the grid and stores it for future use. This type of production carries a low-carbon footprint





and is known as green hydrogen. When produced from the electrolysis of water, it can be generated with zero-carbon emissions, making it an ideal sustainable transport fuel.

“Fuel cells using hydrogen have essentially zero emissions of carbon dioxide and other forms of air pollution such as fine particulate matter [PM] or nitrogen oxides [NOx],” says Holmes. “This is particularly relevant for cities and urban areas where PM and NOx are currently responsible for regular breaches of air quality limits, along with the associated health concerns.”

### The granite city

One city exploiting this is Aberdeen, which is home to one of Europe's largest hydrogen projects. H2 Aberdeen is a far-reaching programme that aims to strategically position north-east Scotland as a world-class, low-carbon energy hub by building a hydrogen economy that will eventually cascade down to Edinburgh, Dundee, Glasgow, Stirling, Inverness and Perth.

Attention so far has centred on Aberdeen's £20 million hydrogen fuel cell bus project, under which the council has already deployed a fleet of 10 vehicles in the city. They give a quieter, smoother ride compared with the diesel models, according to Fiona Goodenough, Scottish cities alliance hydrogen project officer at Aberdeen City Council, one of the key H2 facilitators.

“The bus fleet emits only water from the tailpipe and operates with circa 95% reduced noise level,” says Goodenough, adding that the public's response has been positive. “Part of the project is to complete public perception surveys before, during and after the project.

The surveys carried out before found that more than 80% of people would be happy to use the hydrogen buses. From a health and wellbeing perspective, this is key to our communities.”

However, reports of the buses breaking down suggest some teething problems. Goodenough acknowledges this, but emphasises that it is a demonstration project. “We are currently in the six-month testing phase and expect that there will be technology issues,” she says. “As issues arise, they are addressed by a team of engineers from the manufacturer. Reliability has improved considerably since their deployment.”

A hydrogen production and bus refuelling station and maintenance depot has been installed at one of the council's depots. Goodenough says the council is now trialling other vehicle types, such as hybrid hydrogen diesel vans. “The vans emit 59g/km carbon dioxide under test, which equates to a 70% reduction in CO<sub>2</sub> and 40% reduction in nitrogen oxides compared with a diesel equivalent.”

### Going further

Dundee City Council is keeping a watchful eye on developments. “We want to follow on with the lead Aberdeen has taken,” says Neil Gellatly, head of transport. The council considers itself a pioneer in the electrification of transport and claims to operate the largest local authority fleet of electric vehicles in the UK, totalling more than 60 cars and vans.

Gellatly now wants to introduce hydrogen buses into the city. “We've identified through our air quality action plan where our hotspots are and these are where our major public transport corridors are. Because we've got a pedestrianised city with controlled entry, the buses work in the heart of the city all day. They run on clean-diesel engines. But the only way you can go zero emissions is by using something like a hydrogen fuel cell.”

On the other side of the River Tay from Dundee, Fife Council is set to become one of the first local authorities to run hydrogen-powered refuse collection vehicles (RCVs). The council recently awarded a contract worth £1.5 million to Dunfermline-based Heil Farid European Company to supply nine RCVs, two of which will be converted to run on dual-fuel hydrogen and diesel.

The hydrogen vehicles, which are expected to be on the streets in early 2016, will be fitted with an ECOpto drive system so that a much larger hydraulic pump can be used. This means that, when the vehicle is operating the packer and bin lifts, the engine does not need to rev so high, resulting in less fuel consumption.

“Due to the innovative nature of the refuse vehicle design, it is not possible to quantify the expected carbon savings until the design is completed,” says Tom Henderson, the council's service manager for fleet operations. “But the saving is expected to be significant, and will apply to both the motive and the compactive energy used on the vehicle.”

Significantly, the RCVs form part of a wider hydrogen drive in the region. The council is a member of the Levenmouth Community Energy Project (LCEP),





Hydrogen refuelling station in Aberdeen

HyTransit



HIGHVLOCITY

which houses the Hydrogen Office in Methil – a leading demonstrator site of hydrogen applications. The LCEP is led by Bright Green Hydrogen and involves a consortium of partners including Toshiba, the SHFCA, BOC and Community Energy Scotland.

According to Bright Green Hydrogen's technical manager, David Hogg, Levenmouth will eventually become home to one of Europe's largest fleets of hydrogen dual-fuel vehicles – up to 25. "Hydrogen refuelling has been installed in London, Swindon and Aberdeen, but the Levenmouth project involves developing one of the largest concentration of vehicles in the UK," he says. "As a result, it is pivotal to putting the region on the global clean-energy map."

The office is also helping to broaden Levenmouth's ambition. The building's energy system includes a 750kW wind turbine, 30kW electrolyser, 10kW hydrogen fuel cell and a geothermal source heat pump. It also houses a 5kW hydrogen boiler, which provides space heating in the nearby Fife Renewables Innovation Centre.

Hogg says this will improve the business park's capacity to be energy self-sufficient. "Such an approach will also demonstrate how more renewable energy can be connected to the grid nationally by alleviating the network export constraints that are becoming all too common in areas such as Scotland in times of peak renewable generation. This ability to guarantee an energy supply enables renewably generated hydrogen to be used for higher value applications."

LCEP started in earnest in March, when it was awarded a £4 million grant from the Scottish government. It has plans to lease out dual-fuel powered vans next year to local businesses in Fife. These will include 10 electric-powered Renault Kangoo vans with hydrogen fuel cell range extenders, enabling each to travel up to 200 miles between recharging. Businesses will be able to refuel at the Hydrogen Office and the council's Bankhead depot in Glenrothes.

Hogg says: "The vans will be leased to the public and private sectors. The leases will very flexible – based on periods of months or years – so that businesses can try them out. The project also includes five Transit dual-fuel, diesel-hydrogen vehicles which are to be owned and operated by Fife Council."

### On the islands

Meanwhile, several Scottish islands are exploring hydrogen energy conversion. The Orkney Surf 'n' Turf project recently received £1.35 million from the Scottish government's local energy challenge fund to combine electricity from two tidal turbines and a wind turbine on the island of Eday. These small islands often produce more power than they need so excess electricity will be used to produce compressed hydrogen, which will be exported to the main town, Kirkwall, and converted into electrical power for buildings and berthed ferries at the harbour. This will reduce harbour costs and create jobs for the local community.

Ian Garman, innovation development officer at Community Energy Scotland, which is leading the project, believes energy generation for the area is being reshaped. "It is first a clear demonstration of how we can get around local restrictions and provide a workable alternative to the current model – grid export only – for local electricity generation. It also lays the foundations for a more ambitious indigenous alternative to brought-in fossil fuels for marine transport and other onshore power requirements," he says.

Garman points out that there are some technical challenges to overcome before hydrogen can become a mainstream transport fuel. "Our main focus is on the crew training and installation approvals needed before any seagoing public passenger vessel can rely on hydrogen power," he says. "This is a major block to any use of hydrogen on vessels. This project aims to provide both the training facilities and approved courses and certification necessary as an integral part of its operation."

Garman says overcoming these hurdles will open the door for Orkney's next generation of inter-island ferries to consider hydrogen as a viable energy source: "The amount of energy needed to run an inter-island ferry for an operational day is broadly equivalent to the energy harnessed in 24 hours by a 900kW wind turbine, such as the type that many of the local communities served by the ferries host."

Holmes believes this type of project has the potential to be "disrupt" the status quo through its "bottom up" approach to energy production and local use. "Remote and island communities where conventional fuel access is limited will be an early opportunity area for hydrogen," he says. "These same remote areas often have the best renewable energy resources, in the form of wind, hydropower and even solar." Despite such progress, commercial viability remains key if there is to be greater uptake of such technologies. "The main challenges at this stage are the embedded nature of the existing incumbent energy and transport technologies," says Holmes.

"Early stage deployment of innovative technologies will struggle to compete with the incumbent technologies on cost, and the commercial benefits to businesses from carbon and pollution reduction are not yet compelling. For this reason, public sector support for early stage deployments will be essential if we are to scale up and bring down costs."

Maxine Perella is a freelance journalist.

# IEMA members visit new anaerobic digestion plant

Members of IEMA's eastern region attended the opening of a £5.4 million anaerobic digestion plant at the Stowmarket head office of malted ingredients company Muntons.

The plant anaerobically digests the liquid waste produced from extracting malt from barley. It will provide up to 25% of the site's base-load electricity each year and produce 3,000 tonnes of bio-fertiliser for sale to local farms to enrich fields to grow more of Muntons' prime raw material.

Manufacturing and sustainability director Nigel Davies described the generation of the fertiliser as a genuine cradle-to-cradle process.

"All of the sludge comes from processing locally grown barley. The AD plant will convert this into highly nutrient-rich fertiliser used to cultivate more locally grown barley – a really perfect example of local recycling," he said. The company says it will save £750,000 each



year and reduce annual carbon emissions from lorries by about 340 tonnes.

John Hill (pictured, second left), chair of the eastern region, welcomed the fact that feedstock for the new plant is manufacturing agricultural residue, rather than purposely grown maize. This is often the fuel of choice for industrial scale, farm AD plants, and is creating a "maize monoculture" in East Anglia, with the loss of high grade, productive food growing land, less biodiversity and local transport disruption, he said.



## Training at IEMA

From January 2016, IEMA's training arm, iemaSTS, will be integrated into the main business to provide a single and consistent brand identity.

The centralised approach is intended to ensure a stronger, smoother and more effective service for learners. There are more than 80 IEMA approved training partners delivering courses to suit individuals with different levels of knowledge.

To see all of IEMA's training courses, members should visit [iemasts.com](http://iemasts.com) until January, after which the address will become [iema.net/training](http://iema.net/training). You can also find details of the courses running in the first half of 2016 in the training supplement with the December issue of *the environmentalist*.





## CONFERENCES 2015

## EMS FORUM

Enhancing performance through the revised  
ISO 14001: Strategy, Risk, Resilience and Improvement

Date: 1<sup>st</sup> December 2015 Venue: Manchester Central

BOOK NOW!

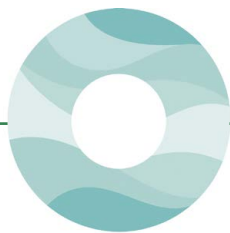
http://newmembers.iema.net/ems-forum.html




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ROAD TO PARIS

## #NoCopOut campaign continues

IEMA's climate change network is continuing its campaign of webinars to support the learning of other members on climate issues in the lead up to the UN climate change summit in Paris, at the end of November.

Since September, members of the network have offered their expertise on several topics:

- Our profession taking action on climate risk: No "COP out" by IEMA members – Jae Mather.
- Climate science: risk, reality and the change imperative – Anna-Lisa Mills
- Sustainable finance: environmental and social risk – Oliver Warner and Aditi Joshi.
- Addressing climate change through ISO14001 – Lucy Candlin.
- Making the business case for climate change – Jonathan Foot and Colin Robertson.
- Behaviour change and climate action – Chris Large and Rebecca Vowles.
- Planning a strategy on energy and carbon reduction – Bekir Andrews and Anna-Lisa Mills.

If you have missed any in the series, the webinars have been posted online to view at [iema.net/event-reports](http://iema.net/event-reports). The next webinar – A new climate economy: the economic case for international action – Paris and beyond – is on 24 November and will be presented by Russell Bishop, senior economist at New Climate Economy. Visit [iema.net/events](http://iema.net/events) to book your place.

To add your support to Live Earth's campaign to get "one billion voices to deliver a single message to global leaders this November" go to [goo.gl/jSkqFi](http://goo.gl/jSkqFi) to sign up.

## Take part in corporate sustainability survey

IEMA is running a research project to better understand how sustainability, particularly corporate sustainability, is viewed. An online survey was launched in October, and all members with an interest in corporate sustainability are invited to participate.

The survey is part of IEMA's wider work on corporate sustainability and developing the GACSO network, and aims to help the institute find out about overall development and direction as well as various approaches and levels of commitment to sustainability. It will also help the institute better understand the motivations, key issues, barriers and challenges that organisations and professionals face, as well as information on skills and associated gaps.

Questions include asking participants to choose which of five statements best represent their understanding of corporate sustainability. They are:

- a reporting process concerning the organisation's environmental, social, financial and ethical performance;
- an initiative by the organisation to protect and improve its reputation;
- how well the organisation is addressing its negative impacts;
- the organisation's resilience and ability to endure over time; or
- a change process that seeks to understand material issues, impacts and dependencies to improve and transform towards sustainability.

Member views are important, so please complete the survey at [bit.ly/1LRs65X](http://bit.ly/1LRs65X). IEMA is also seeking case studies from members that span the three pillars of sustainability, going beyond trade-offs and single-issue outcomes. If you are interested in discussing how you could get involved, please contact policy and engagement lead Nick Blyth at [n.blyth@iema.net](mailto:n.blyth@iema.net).

## Hundreds of members sign up for direct debit

On a scale of 1-5 stars (1 being very difficult, 5 being extremely easy) how simple did you find the online set-up of your Direct Debit?

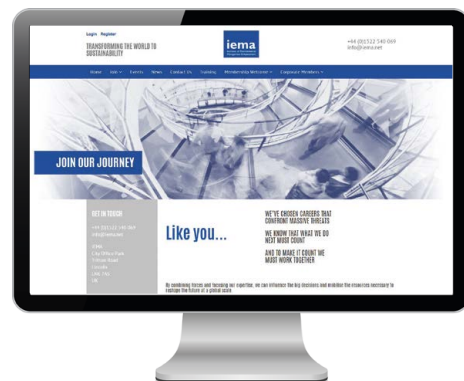


**4.59**  
Average rating

Maintaining your IEMA membership is important to your career. Being a member of the world's largest environment and sustainability body speaks volumes to employers, colleagues and clients about your professional standing.

But, with the demands of work and home life, your membership is one more thing to sort out. Why not switch to pay by direct debit and permanently take all the stress out of renewing?

During the summer, IEMA made renewing easier with the launch of its direct debit portal. Since then, hundreds of members have made the change, with 68% saying the reason they switched is because direct debit is easier and saves them the hassle of having to remember to make a manual payment. They have rated the online set-up highly too, giving it a score of 4.59 out of 5 for ease and convenience.



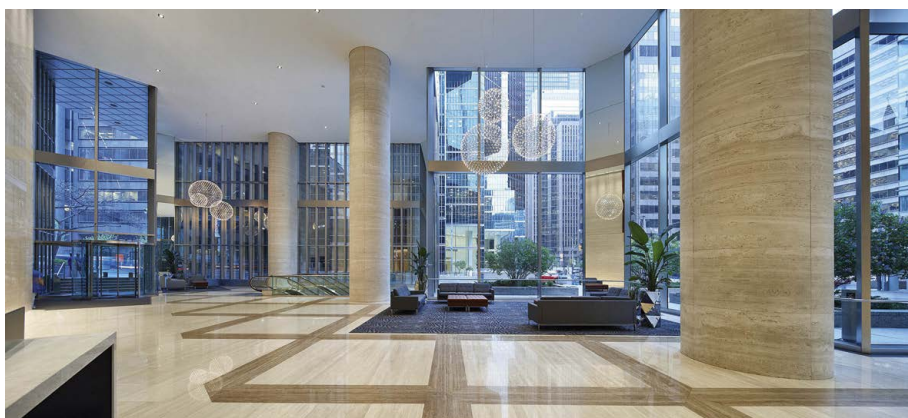
If you want to benefit from regaining some time and the reassurance that your membership will never lapse, not to mention £5 off your next renewal, set up your own direct debit today at [bit.ly/1O2UZBV](http://bit.ly/1O2UZBV).

# GACSO

empowering  
the corporate  
sustainability  
professional

## briefing

### Value of green buildings significantly greater than their additional costs, finds **Jae Mather**



**A**s sustainable construction and green building certification become more prevalent and the industry matures, there is increasing evidence of what many in the construction sector have felt for a long time: sustainable construction delivers significant added value.

Value should include financial benefits, such as decreased running and maintenance costs and increased rents, as well as other, less tangible elements. These include higher levels of occupier satisfaction and retention; less sickness absence among occupants; measurable improvements in productivity – often due to improved ventilation and internal air quality, and lighting that moves beyond simple LUX levels into virtual day lighting and varying light colour, for example.

A 10-year study of Canadian property management company Bentall Kennedy, published in *The Journal of Portfolio Management* ([bit.ly/1LNCIYX](http://bit.ly/1LNCIYX)), which examined financial performance data from across the firm's portfolio of 5.4 million m<sup>2</sup> of assets, further demonstrates that green buildings deliver much greater value than the additional costs sometimes associated with their development and construction.

Some highlights of the study include:

- **Energy consumption** was 14% lower per m<sup>2</sup> in US commercial properties certified to the LEED (Leadership in energy and environmental design) green building standard than in buildings without certification.

- **Net effective rents** were, on average, 3.7% higher in LEED-certified properties in the US than in similar non-certified buildings.
- **Rent concessions** for LEED and BOMA BEST (Canada's green building certification programme) buildings are on average 4% lower than in similar non-certified buildings.
- **Occupancy rates** over the 10-year period were 18.7% higher in Canadian buildings with both LEED and BOMA BEST certification, and 9.5% higher in US buildings with ENERGY STAR certification, than in buildings without certifications.
- **Tenant renewal rates** were 5.6% higher in commercial buildings in Canada with BOMA BEST level-3 certification than in buildings that did not meet the standard.
- **Tenant satisfaction scores** were 7% higher in Canadian buildings with BOMA BEST level 3 and 4 certification than in non-certified buildings.

Over the typical lifespan of a building these added values contribute to significant environmental and financial benefits. As time passes it becomes ever more obvious that sustainability equals business common sense.



**Jae Mather** is director of sustainability at the Carbon Free Group, an IEMA Fellow and a member of the GACSO steering group; @JaeMather.

## Policy update



### Review of carbon and energy policy

After the chancellor's budget announcement to hold a review into the business energy efficiency tax landscape, the government has been seeking evidence from businesses and stakeholders through a cross-departmental consultation (p.10). The consultation document sets out what are described as "policy proposals to simplify and improve the effectiveness of the landscape in supporting the government's objectives around simplicity, productivity, security of energy supplies and decarbonisation".

The review is significant and could, for example, lead to the closure of the CRC scheme and wider changes affecting a range of policies, including mandatory GHG reporting, climate change agreements, the climate change levy and ESOS.

In August, a group of IEMA members met officials from Decc and the Treasury to discuss the review and the need for a lasting and effective policy landscape – one that will be durable and less prone to frequent review and change. IEMA input highlighted the important role of policy drivers such as mandatory GHG reporting, the contribution made by the CRC and the imperative for fiscal drivers that provide certainty and medium-term confidence for businesses – so that members can more effectively and confidently plan for business case investments in energy and carbon reduction.

IEMA has run workshops with members in London, Edinburgh and Lincoln to review the consultation document and to inform the institute's response. IEMA also hosted a webinar about the review on 30 October, which included a presentation by Decc on the proposals. This is an important consultation for IEMA members and a high response from businesses to support effective and lasting policies could be particularly influential. The consultation runs until 11.45am on 9 November and the document can be accessed at [bit.ly/1LiP9vw](http://bit.ly/1LiP9vw).

**Nick Blyth** is policy and engagement lead at IEMA. [n.blyth@iema.net](mailto:n.blyth@iema.net); @NBlythIEMA.



## More successful IEMA members

IEMA would like to congratulate the following individuals on successfully upgrading their IEMA membership.

### Associate

**Kim Amos**, Carillion  
**Shelley Anderson**  
**Tally Anderson**, CH2M UK  
**Matthew Beacon**  
**Begum Bidik Nash**, Sustainable Homes  
**Mirela Blagojevic**, Fidelta  
**Harrison Bowers**, AECOM  
**Suzanne Brooks**, AECOM  
**Craig Buchanan**, Royal Marines  
**Thomas Chapple**  
**Emma Clarke**  
**Joseph Coles**, Leeds City Council  
**Boris Eremin**  
**Tom Errett**, Argyll Environmental  
**Nicola Erskine**, Muller UK & Ireland Group  
**Rachel Fairfax**  
**Christian Galanis**, URS Infrastructure and Environment UK  
**Stuart Gascoigne**, DAS Legal Expenses Insurance Company  
**James Geraghty**, Kier Strategic Highways

**Tom Gibbs**, Brookfield Multiplex Construction Europe  
**Tracy Gibbins**, Civil Service  
**David Gibson**, Bradford District Care Trust  
**Thomas Gold**  
**David Graham**, KnowledgePool Group  
**Jim Hartley**, Tetra Consulting  
**Michael Holding**, Bakkavor  
**Claire Howard**, Carillion  
**Joseph Hudson**, Eunomia Research and Consulting  
**Lewis Jenkins**, AECOM  
**Kayleigh Jenkyns**  
**Daniel Jimenez**  
**Craig Johnson**, JLL  
**Laura Kearns**, AECOM  
**Nikita Kelly**, Essar Oil UK  
**Charles Krolik-Root**, Argyll Environmental  
**Lusine Manucharyan**, Zangezur Copper Molybdenum Combine CJSC  
**Christopher McFadden**, PHH Environmental UK  
**Sandra Moore**, SITA UK  
**Gary O'Brien**  
**Thomas Parrott**, AECOM  
**Mike Raine**, CEVA Logistics  
**Andy Ralston**, Howden Construction and Maintenance  
**James Rushton**, Openview

Security Solutions  
**Olivier Sauvage**, O-I Europe Sarl  
**Robin Simon**, Wayland Farms  
**Stuart Smedley**, WSP|Parsons Brinckerhoff  
**Gordon Smith**, South Tyneside NHS Foundation Trust  
**Kevin Smith**, Sainsburys  
**Leighton Smith**  
**Peter Standish**, BAE Systems  
**Laura Stone**, Laing O'Rourke  
**Jorge Tunon Mendez**  
**Marie Udale**, British Gypsum  
**Andrew Walton**, CAV Aerospace  
**Chris Webb**  
**Richard Whitehurst**, ERIKS Industrial Services  
**Colin Whittingham**, RSK Group  
**Matthew Wilby**, Dar Al-Handasah  
**Hannah Williams**, Newground CIC  
**Ffion Wilson**, GroundSure  
**Farah Yassine**, WSP|Parsons Brinckerhoff  
**Estera Zak**, Shell UK

**Full with Chartered environmentalist**  
**Philip Charles**, CIRIA  
**Jennifer Craig**, Amey

**Janet Gascoigne**, UKAS  
**Kathleen Hankins**, RSK Environmental  
**Carol Hardingham**, Skanska UK  
**Naomi Harvey**, Nicholas Pearson Associates  
**Duncan Healey**, Skanska UK  
**Elizabeth Howarth**, Network Rail  
**Charles Joly**, Isle of Wight NHS Trust  
**Robert Macdiarmid**, Atkins  
**James Macmillan**, Skanska UK  
**Robert McAuliffe**, R J McAuliffe  
**Olena Samsonenko**, Harsco Metals and Minerals  
**Rachel Sharp**, Aberdeen City Council  
**Benjamin Shaw**  
**Geraldine Simak**, Costain  
**Lisa Stuart**, Morgan Sindall  
**Graham Waddell**, Bicton College  
**Jim Wilkinson**, Environment Agency  
**Craig Wood**, Petrochina  
**Martyn Youell**

**Chartered environmentalist**  
**Charmaine Morrell**, Morgan Sindall

## IEMA events

Date	Region/time (BST)	Topic
11 Nov	Wales	Full member and CEnv mentor forum; Wales IEMA network meeting and social
11 Nov	Yorkshire and Humber	Networking (Leeds)
26 Nov	South West	Nuclear power at Hinkley Point – site visit
3 Dec	South East	Christmas Social (London)
<b>Conferences</b>		
1 Dec	Manchester	EMS national forum
<b>Webinars</b>		
12 Nov	12:30–13:30	Sustainable offices: different approaches to bring sustainability into the workspace
18 Nov	12:30–13:30	Legal update: 2015 review and 2016 preview
19 Nov	12:30–13:30	Full membership
20 Nov	12:30–13:30	Full membership application guidance with an assessor
26 Nov	12:30–13:30	The growing role of ecosystems services assessment in global IA practice
24 Nov	12:30–13:45	A new climate economy: the economic case for international action – Paris and beyond

# EIA update

## Scoping opinion on stadium plans

The London Borough of Hammersmith and Fulham has sent consultancy AECOM its scoping opinion ([bit.ly/1OnS1q4](http://bit.ly/1OnS1q4)) for the demolition and redevelopment of Stamford Bridge, home of Premier League champions Chelsea.

The club wants to demolish the existing stadium in west London, which can hold just under 42,000 spectators, and replace it with one for 60,000. AECOM submitted its environmental statement scoping report in August and the council's 17-page reply includes consultation responses from the Environment Agency, Natural England and Transport for London.

Although the council describes the report as "generally sound and clear", it makes a number of recommendations, including that all potential environmental risks to part 2A receptors are examined, even if they are quickly discounted.

In its submission, the agency asks for surface water issues to be included in the EIA, and that the developers consult the lead local flood authorities, which in April



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took over responsibility from the agency for advising on surface water flood risk for major planning applications. Natural England, meanwhile, points out in its response that Stamford Bridge is next to two designated nature conservation sites. These are rail-side habitats for protected species and planned structures would lead to their loss, it says. The nature body wants surveys undertaken to establish the presence or absence of protected species.

The demolition and construction phases are expected to last four years. Stamford Bridge has been the home of Chelsea Football Club since 1905.

## EIA research

### EIA and climate change

Climate change in environmental impact assessment is the focus of the latest issue of *Climate change business journal* ([bit.ly/1WQPbWH](http://bit.ly/1WQPbWH)). It finds that the number of climate assessments in EIAs is growing, albeit slowly. The journal estimates that the overall revenue associated with GHGs and climate risk in EIAs is between \$30 million and \$40 million in the US and about twice that globally.

In Europe, the revised EU EIA Directive (2014/52/EU) requires greater scrutiny in assessments of climate change, among other issues.

Practitioners quoted in the journal believe the directive will help embed climate change in EIAs. Richard Halsey, associate director for sustainability at UK planning consultancy Turley, believes the directive will create the need for a service that is now generally optional. "It will be a requirement that people have to think about, as opposed to being something that some people address because of their project's location or public profile," he said.

The article also profiles UK-based consultancy Golder Associates, reporting that climate change is slowly becoming a more important aspect in its assessment work. The firm employs about 100 staff full-time on EIAs, supported by around 800 specialists.

Simon Aldrich, Golder's lead on infrastructure, predicts that assessing climate risks will become a more important feature of EIAs in areas where there is coastal strain, such as regions where conditions may change dramatically over the lifecycle of a project. Meanwhile, James Montgomery, director at Mott MacDonald, believes long-term climate change impacts on projects will have to be assessed. "The whole concept of the lifetime of a project is going to be more and more important in the EIA guidance," he says.

Montgomery is the lead author of IEMA's free EIA guide to climate change resilience and adaptation, which was launched at the institute's EIA and ESIA masterclass conference on 3 November.

### EIA practice update with IEMA's Josh Fothergill

**30 years of the EIA Directive** – IEMA and several members are attending a conference on 12–13 November hosted by the European Investment Bank, European commission and government of Luxembourg to celebrate 30 years of the EIA Directive. Ian Roach, from QMark registrant AECOM, will present on the role of environmental design and mitigation in screening.

**DMRB review** – IEMA and its members are helping to reshape the *Design manual for roads and bridges* for Highways England. QMark registrant WSP|Parsons Brinkerhoff is assisting with the review. Members, through the IA Network, have provided early input to volume 11, which relates to the environmental assessment process applied to major road schemes.

**EIA and ESIA masterclass** – On 3 November, nearly 150 practitioners attended IEMA's impact assessment

conference, which included keynote speeches from representatives of the World Bank and Crossrail 2. IEMA thanks its conference partner Royal HaskoningDHV and all the day's sponsors and speakers. Next month's *environmentalist* will include a report.

**Health in IA** – The University of Liverpool, an IEMA for education member, staged a conference on the role of health in impact assessment practice on 8 October. The event was hosted by IEMA Fellow professor Thomas Fischer and helped to establish the new Health IA sub-group in the IEMA IA Network.

**IAIA16** – Members considering presenting at IAIA16 in Japan next year are reminded that papers must be submitted by 30 November. I will be leading a session on collaboration and capacity building to drive quality in IA.





# Rachel Quinn

Senior environmental adviser, Skanska Construction



**Why did you become an environment/sustainability professional?** I started working in the construction industry as a site secretary in 2005. I had an interest in environmental and sustainability issues and quickly realised that, although a construction project could cause big impacts on the environment, it also provided lots of opportunities to improve sustainability. This really interested me.

**What was your first environment/sustainability job?** Compiling evidence for BREEAM assessments. This was a useful role as it gave me a really broad brush of understanding of all the elements that go into assessing how sustainable a project is.

**How did you get your first role?** It was a matter of right place, right time. Site administration included some environmental work, such as waste recording and collecting data for carbon footprinting. Doing this work meant managers noticed I was organised and efficient; these are good transferable skills relevant to all aspects of construction.

**How did you progress your environment/sustainability career?** In 2009, after a year of BREEAM work and environmental support work, I took the course for IEMA Affiliate membership. I followed this up in 2011 by doing the Associate course. I have worked in different areas of construction – buildings, civil engineering and utilities – and this has given me a lot of experiences, including in water and contaminated land management, materials, carbon footprinting, and ecology.

**What does your current role involve?** Project environmental/sustainability management, which includes pre-construction work, such as commissioning surveys and working with the design team to interpret findings and eliminate or mitigate potential impacts; and, during construction, auditing projects regularly to ensure the teams are

complying with legal, client and company requirements. I am a Construction Industry Training Board-qualified trainer and also act as the regional corporate social responsibility (CSR) representative, organising volunteering opportunities for staff.

**How has your role changed over the past few years?** It has developed from mainly being about onsite environmental compliance to including pre-construction work to improve sustainability and eliminate or mitigate impacts. The training and CSR aspects have also come to play a much larger part.

**What's the best part of your work?** The variation. Every day is different and you are constantly learning new things, whether it is researching the latest debates in the potential human health impacts from use of pesticides or learning about techniques for remediation of contaminated land. My favourite days involve site visits. I love seeing how projects are taking shape and how my early interventions have preserved trees and wildlife that may otherwise have been damaged.

**What's the hardest part of your job?** With multiple projects and multiple tasks, it can sometimes be difficult to prioritise and keep everyone happy!

**What was the last development/training course/event you attended?** I have just started a CIRIA advanced course on contaminated land. I am also taking an online course on sustainable cities run by the University of the West of England.

**What did you bring back to your job?** These courses will increase my technical competence and understanding of emerging trends.

**What is/are the most important skill(s) for your role and why?** You can learn technical skills but you can't learn how to get on with people. In our field, we are often trying to win

## Career file

### Qualifications:

BSc, AIEEMA, Certificate in ecological consultancy

### Career history:

**2006 to now** senior environmental adviser, Skanska Construction  
**2004 to 2006** site secretary, Robert Half International (for Kier Western)  
**2002 to 2004** project worker, Gloucestershire County Council,  
**2000 to 2002** project worker, Matson Neighbourhood Project  
**1998 to 1999** administrator, Manpower UK  
**1996 to 1998** careworker, Social-face Recruitment/Cotswold Chine Home School  
**1988 to 1990** claims processor, Sun Alliance Insurance

hearts and minds and convince people about the benefits of going green, so the communication skills are essential.

**Where would you like to be in five years' time?** At Skanska, we have a "Deep Green" vision for our projects, where the construction process and our product performance has a near-zero environmental impact and thereby future-proofs our projects. I want to be part of this development.

**What advice would you give to someone entering the profession?** Seek out opportunities, even if they do not seem directly relevant to what you want to do as you never know where it will lead you.

**How do you use IEMA's environmental skills map?** Earlier this year, IEMA ran a tutorial day for Skanska environment staff seeking full membership and introduced the skills map to us. It is in a simple-to-use format and is very useful to identify the competences that I need to build into my professional development plan.



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## Climate negotiations and taking action

Everyone is talking about COP21 and the expectations for finally agreeing a global deal to tackle climate change. There will most likely be a deal agreed by the end of the negotiations through a process that has seen a good number of countries already publicly announce the post-2020 climate actions they intend to take under the international agreement. These are known as Intended Nationally Determined Contributions (INDCs). The current question is whether the INDCs are going to be sufficient in putting us onto a path that will avoid dangerous climate change?

Whilst negotiators and science communities are trying to address this question, action can also be taken in other forms. Through the Young Global Leaders of the World Economic Forum, a group of world-leading experts have come together – including ENGIE, the Centre for Carbon Measurement of the National Physical Laboratory, Climate-KIC and the National Institute of Industrial Property (INPI) – to launch the “Decarbonathon”, which aims to develop innovations that reduce CO2 emissions from cities in order to fight global warming.

Cities, as many will know, represent more than 70 percent of global energy-related CO2 emissions, and means that action at city-level is a fantastic opportunity for taking

action on climate change. The Decarbonathon looks for solutions in several areas that have a high climate impact: sustainable mobility, energy efficient buildings, sustainable energy production and consumption.

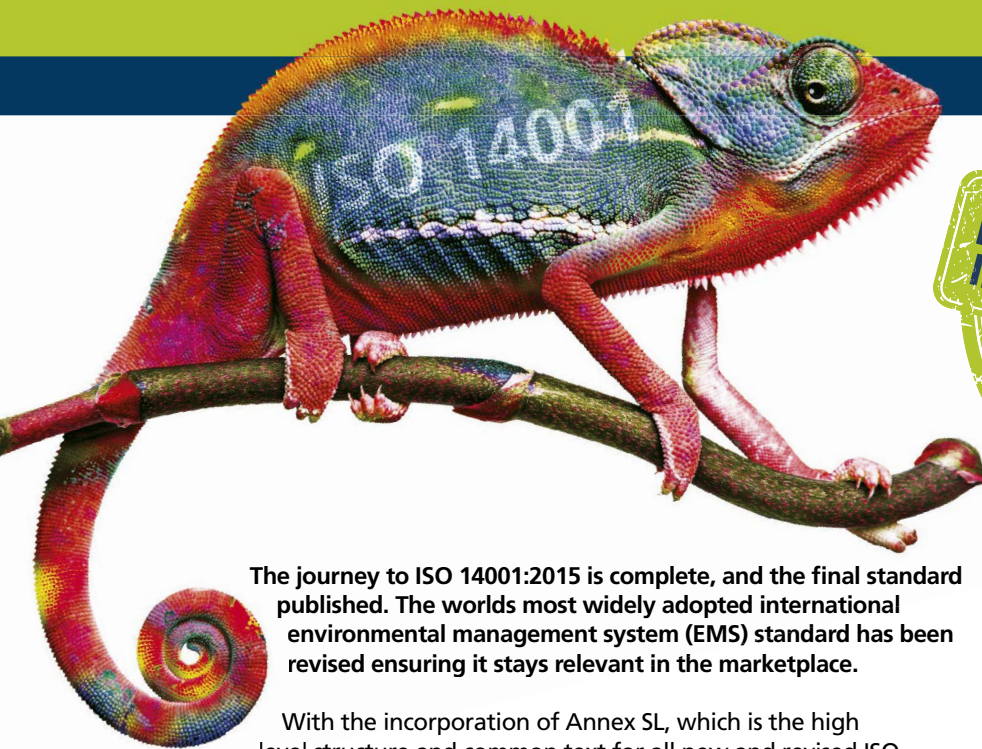
Unlike the more common difficult path startups go through without the support of such a challenge competition, the selected teams will receive coaching from experts on a technical level but also on how best to go about their business planning. This will in part happen online as teams may sit across different continents, but also in form of a hackathon in Paris on 14th and 15th January 2016. The winners will benefit from publicity around the project and have the potential to get in touch directly with potential investors. They will be eligible for a start-up acceleration programme of two to six months with the support of several partners of the event, to get these new technologies on the market quickly, in addition to a range of prizes.

To the entrepreneurs or individuals who have novel ideas, investors in new technologies, city leaders who could benefit from these ideas – please go to [www.decarbonathon.org](http://www.decarbonathon.org) to find out more and either submit your idea or get in touch with the Decarbonathon team.



# Are you ready for the changes?

## ISO 14001:2015 NOW PUBLISHED



The journey to ISO 14001:2015 is complete, and the final standard published. The world's most widely adopted international environmental management system (EMS) standard has been revised ensuring it stays relevant in the marketplace.

With the incorporation of Annex SL, which is the high level structure and common text for all new and revised ISO management system standards, some of the main new requirements include organisational context, knowledge and risk-based thinking. Other areas of the standard that have been revised include the importance of top management engagement, as well as policy and the need for processes.

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