

*Opening the door to green IT would be easier if there was a standardised way of measuring and quantifying an organisation's carbon footprint*



# Who owns the carbon footprint?

**Prime Minister David Cameron says that he wants this government to be the “greenest ever”. But will cutbacks derail the process of the greening of government IT? It may depend on how network managers interpret their brief, says NICK BOOTH**

**N**etwork managers generally like to be in charge of their ship. But they're often held hostage by forces outside their control. Nobody can ever accurately predict the impact of the next management obsession, government legislation, or the vagaries of economics. All you can do is prepare for it and adapt as best you can.

The current economic conditions must seem like the perfect storm for governmental network managers. They are being buffeted on all sides, with pressure exerted by the environment, cutbacks, and staff shortages. Under such circumstances, it would be understandable if network managers decided to reign in their attempts to meet environmental targets. With

budgets under threat, the veracity of environmental data being increasingly challenged in the media, and the whole process of 'green IT' becoming confused by conflicting marketing messages from the industry, it would surely be a blessed relief to postpone any sustainability projects, at least until a clearer picture emerges.

However, none of that is an option. The government's *Carbon Reduction Commitment (CRC)* compels Britain's 10,000 largest enterprises (including most government organisations) to pay for their carbon emissions. It only became live in April 2010, but by 2011 it could become apparent that purchasing carbon allowances will likely put a large dent in any network manager's budget –

even if their equipment isn't directly responsible for the organisation's sky-rocketing electricity bills. Indeed, it's a moot point as to who takes responsibility for the various aspects that make up an organisation's carbon footprint. Data centres, with their all-consuming server racks, network equipment, cooling systems, etc, have a variety of owners, depending on the issue under consideration. Is a data centre the responsibility of the IT manager, the network manager, or the operations director? It varies from government department to council, and often depends upon whether blame (for high consumption) or credit (for being a strategic powerhouse) is being apportioned. Good ideas have many

fathers, but failures are always orphans, as they say in government.

Though nobody would admit it, the perception of the environmental agenda – and the impact that ICT departments can have on it – seems generally nebulous, if a survey of local council's and government departments is to be believed (see <http://tiny.cc/ygt20>). Using the *Freedom of Information Act*, PR firm Lewis obtained data from county councils in England which seems to indicate that the relationship between IT and the environment is a complete mystery. It asked the councils to provide simple information on gains that have been made over the last two years on reducing overall CO<sub>2</sub> emissions, and whether ICT has made any contribution.



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Only 19 councils replied, and none could provide any hard evidence of their own department's gains. In fact, none could even measure their IT department's consumption of electricity. Hampshire County Council gave the most effusive answer with a five paragraph response boasting about server virtualisation, LCD monitors, data centre heat recovery, virtual PCs, and a thin client strategy. But it gave no figures and like every other respondent, it was unable to quantify the amount of CO<sub>2</sub> generated by IT equipment. Thus, if network managers are to play their parts in reducing the organisation's carbon footprint, wouldn't it be a good idea to have an accurate yardstick to begin with?

### Embodied carbon versus operational carbon

Even when CO<sub>2</sub> figures are produced, they seem to be based on projections that have not been challenged. Best Foot Forward is an agency that helps large organisations to comply with the government's carbon reduction targets. It has carried out major consultancy projects with a variety of local government organisations, including the Greater London Authority, Welsh Assembly, and Ofcom. When quantifying carbon reduction, Best Foot Forward says that it measures two main elements: the "embodied" carbon and the "operational" carbon.

The embodied carbon in any IT system is the carbon emitted during the manufacturing process of, for example, a large server. By subsequently buying a server that is deemed to have a lower embodied carbon rating, an organisation can claim to have lowered its carbon footprint. But the carbon ratings are based largely on guesswork and the manufacturer's own claims.

Similarly, the calculations for operating carbon seem to be open to several types of interpretation. The running costs of a fleet of 1,000 laptops, for instance, are calculated on the power ratings provided by the manufacturer and assumptions about usage made by the person doing the calculations. That therefore gives anyone auditing the carbon footprint of a large organisation free license to produce whatever figures are convenient to them.

Best Foot Forward MD Paul Cooper says that even if the councils had taken the simple step of measuring their electricity usage, it would still be impossible to gain an accurate impression of the success of a CO<sub>2</sub> reduction programme. "If you measure anything to do with IT now and in 12 months time, you are never comparing like-for-like, because everything is so complex and holistic," he says. Networking and IT are a constantly moveable feast, and calculations on carbon emissions are made on arbitrary values which seem to be based on subjective judgements.

The clearest comparison that could be made seems to be between the two quantifying elements. "For a laptop, the operating carbon is around a quarter the size of the embedded carbon," says Cooper. In other words, this means that the power savings on a more efficient laptop can never compensate for the greenhouse gases that were released when it was being manufactured. Similarly, certain networking vendors, who claim that the minimal power savings they achieve on their switches qualify them as 'green' products, are pulling the wool over people's eyes. They could never compensate for the cloud of CO<sub>2</sub> generated during the manufacturing process. On the other hand, the efficiency savings on a

server, which uses twenty times the power of a laptop, could bring about a green return on investment.

### Little green lies

So the bad news for networking managers is that the whole subject of green ICT is incredibly confusing and vague. But the 'good' news is that you can work this to your advantage if you need to produce some creative carbon accounting for your network.

Dell, for example, will provide any networking manager with impressive sounding achievements for its new laptop, desktop, and server products. "We work with Greenpeace and make hard commitments to address green policies," says Renzo Taal, the MD for Dell Netherlands and its director for healthcare and life sciences. Dell claims it is taking out the heavy chemicals (such as PCBs) that it previously used to make screens and plastic cases. It is also looking to lower its carbon footprint by cutting the amount of travel and haulage involved in sourcing components and assembling them. Taal says that components will no longer be made in Japan and then shipped to California, before being hauled off somewhere else. Instead, assembly will take place much nearer the point of distribution. "We're working towards producing a carbon neutral PC. We've been involved in green IT for many years," says Taal.

But Saverio Romeo, senior industry analyst at Frost and Sullivan, challenges the claim that green strategies have long been part of the agenda at companies like Dell, or even in government departments. "It's only in the last two or three years that we've seen a serious commitment towards green strategies. Investments in green data centres and networking infrastructures are a recent obsession. We are at the beginning of the green agenda where local authorities, transportation agencies, hospitals, and other public organisations, are realising that they can dramatically improve their carbon footprints using ICT technologies."

Romeo does not envisage public sector cuts having any effect on the green agenda. Firstly, he says that

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## If Ikea sold data centres?

Data centres are voracious consumers of resources. However, the model for creating them seems to be evolving fast.

Old style data halls, which were built on the premises and kept teams of engineers from an eclectic range of disciplines busy for up to 18 months, are falling out of favour. The two biggest criticisms levelled at them is that they take too long to build and are not particularly efficient.

"Air cooling a data hall is an incredibly inefficient way to manage the temperature," explains David Galton-Firenzi, marketing manager at Zycko, which distributes data centre components. A new generation of pre-fabricated containerised data centres, packs the servers far more tightly, and creates a much smaller area in which air needs to be cooled. SGI recently delivered a containerised data centre for BT that is said to have occupied a space of just 20m<sup>2</sup>, but delivered the output of a 3,000ft<sup>2</sup> traditional centre.

The densely packed equipment also makes it a lot easier to cool, says Galton-Firenzi: "You could almost pop it into a big freezer!"

Colt recently launched what it describes as the next generation of data centre which, it claims, makes for even greater efficiency savings. These modular data centres are said to be cheaper to make, more flexible, and can be aggregated together to make a scalable 'network' of data centres, akin to a stackable hub. The role of the networking manager, in this case, is to outsource the manufacture of the data halls, and choose the components that go into it.

According to Colt's figures, a typical government department could save hundreds of thousands of pounds on power bills, by deploying such a data centre. "We've taken all the waste out of the process," says Guy Ruddock, Colt's data centre infrastructure service director. ■

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green networks



**“We work with Greenpeace and make hard commitments to address green policies”**

*Renzo Taal,  
Managing director,  
Dell Netherlands*

budget cuts are about rationalising public services, reducing costs, and optimising delivery. That does not obviate investing in better or greener technologies which are designed to reduce energy consumption, and ensure good quality and performance. “This perfectly fits in the budget’s philosophies,” says Romeo. Secondly, there are some international commitments that cannot be ignored. These include the EU’s 20-20-20 targets which, over the next ten years, aim to: reduce EU greenhouse gas emissions to at least 20 per cent below 1990 levels; use renewable sources to provide 20 per cent of EU energy consumption; and reduce primary energy use by 20 per cent compared with projected levels by improving energy efficiency. Can such initiatives help quantify carbon footprint? Romeo says it’s hard enough to benchmark one organisation against itself one year later, so it will be difficult to benchmark Britain’s performance against the EU accurately. “I believe that it is too early to run systematic benchmarking. Certainly, the UK has shown an immediate reaction to the issue, but the same intensity can be found in the other European countries.”

**Looking after your green patch**

Tempting as it might be to just ‘fiddle the figures’, it’s certainly better for the network manager to actually make a real attempt at lowering carbon footprint. But the problem here is that many of the worst areas of consumption are outside the network team’s remit. These could include the servers, their cooling systems, and even the virtualisation platform (where used) which is generally thought to be the responsibility of the IT director. However, there is some low hanging fruit in the network manager’s patch. One obvious area for he or she to make a visible impact on power savings is on the management of the PC estate. Even if the network manager does not have

direct responsibility for everything on the network, they are likely to be the only person with the tools at their disposal to curtail the power consumption excesses.

John Lunt, MD of asset management service provider Certero, says the odds are stacked against anyone who tries to control the way staff look after their PCs. “Users often don’t like to switch off their PCs at night, because it takes them an age to close down all their applications. And they resent having to restart them all in the morning. On the other hand, PCs often need to be left on so that maintenance and patches can be carried out. And, if [staff] work from home, they often leave the work PC on so they can get access to files. Certero claims its asset and power management software bypasses these problems by

allowing network managers to manage all PCs on their patch from their desktops. For example, the company says that automating the shut down (and wake up when necessary) of 5,000 PCs enabled Hull City Council to save 390 tons of CO<sub>2</sub> and £40,000 in energy bills. Richard Clark, head of public sector for software company 1E, makes similar claims. His company has just won a pan-government framework contract to offer power management services until May 2012. Clearly, this is an active area and will mean that network managers are going to enjoy a choice of such service providers.

Another area within the manager’s control is the UPS system. Rob Tanzer, technical support manager at Chloride, says these are generally recognised as a networking product, and the good thing

about these boxes is that there’s always plenty of room for improvement.

Tanzer says that a UPS will lose up to ten per cent of the power that goes into it during the process of converting that power into a more controlled throughput that doesn’t burn out the circuits of every piece of IT equipment on the network. Given that a data centre can run on 200kW loads, that’s a substantial amount of power leakage every year. Chloride claims it has recently cut UPS leakage rates from 10 per cent to two per cent. On a 200kW load, that would represent a reduction of leakage of around £7,500 a year, according to Tanzer. “We’re constantly working to reduce the leakage, and we have the potential to help other government departments to make real savings,” he says. ■



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