Green Computing

The role of IT in the push towards environmental sustainability

David Tebbutt and Dale Vile, June 2008

Today's newspapers are awash with green initiatives. Where computers are discussed it is generally with reference to operational power management, rather than how IT can help a business achieve its environmental goals. The environmental damage caused by our love affair with computers and other electronic devices runs deep. This paper, based on an international survey of IT professionals, examines the broader picture and the part we can all play in resolving the issues.

EXECUTIVE SUMMARY

Drivers for environmental initiatives are regulatory pressure and cost
Regulation is the primary driver of environmental initiatives, closely followed by cost considerations. PR value is third while genuine concern for the environment ranked fifth out of six criteria.

Staff appear to be ahead of the organisation in environmental concerns
Over 60 percent of respondents are 'passionate' about the need to deal with environmental issues, but only a third of organisations take environmental issues 'seriously'. The highest levels of concern are detected in the very smallest and largest companies. It is not the first time that the mid-ground has proven hard to address but they stand to gain just as much as the other organisations.

IT can improve its own environmental performance
Energy is the big talking point at the moment with consolidation and virtualisation driving power savings. However, the majority of IT departments are not accountable for power usage. If this were changed, it would greatly affect IT decision-making in this area. IT also needs to take a clear look at the lifecycle environmental impact of its purchasing and disposal choices.

IT can help the company with its environmental objectives
Of the six main options offered, the top three ways in which IT can help the company improve its environmental performance all relate to travel. Moving bits instead of atoms can slash travel and accommodation expenses and reduce environmental impact. Home working and teleconferencing are the big winners here. These changes require collaboration between the board, HR and IT.

IT being green is a subset of IT helping the organisation get green and stay green
IT has a dual role, both in becoming greener itself and in supporting and enabling the business's environmental objectives. It is therefore important to think beyond IT's immediate jurisdiction such as power and cooling to the overall picture, where the use of technology as an enabler of more environmentally friendly practices can have a significantly greater impact.

Nail the obvious tasks and champion the more complex
Measures such as turning things off to save power and making power efficiency a standard selection criterion when buying new equipment are obvious, but ineffective unless they are actually implemented. Other areas, such as improving asset management and working environmental considerations into project assessments and infrastructure modernisation initiatives require more planning, funding and stakeholder buy-in, but may nevertheless still be championed by IT.

This report is based on the findings of an online research study conducted in February 2008 where feedback was gathered from 1,474 IT professionals on the topic of IT and the environment. The work was indirectly funded by VMware, Intel and Dell via one of Freeform Dynamic's media partners, though the study was designed, executed, analysed and interpreted on a completely independent basis by Freeform Dynamics.

About this report

This report is written primarily for IT professionals, although business people with an interest in how IT related considerations fit into the broader environmental picture may also find it useful.

One of the challenges we faced when putting together this report was the general problem of scoping any green related discussion. Single dimensional treatments, plans and actions run the risk of creating more problems than they are attempting to solve. Replacing a piece of equipment with a more power efficient equivalent, for example, might seem like an obvious way to help the environment. But will the energy savings over the lifetime of the kit outweigh the environmental cost of its manufacture and the disposal of the equipment being replaced?

This is a tough question and a simple illustration of how environmental practicalities are often not as straightforward as they appear at first glance. It also shows how important it is to understand the bigger picture, at least at a high level. Only then can specific ideas and actions be put into their proper perspective and options for moving forward be prioritised objectively. And this is particularly important in a commercial environment in which altruism is a nice idea, but is seldom a good enough driver for tangible commitment to making things happen.

The first part of the report focuses on this bigger picture, intentionally broadening the discussion beyond the simplistic view that 'Green IT' is about power management and recycling. Some may find elements of the discussion familiar but, even if you are a green guru, we encourage you to at least take note of the research charts we have included, which provide interesting insights into mainstream views, plans and activities.

For those who are struggling (as are many) with the question of how it all fits together, the initial discussion should provide some context and structure. Equally, if your organisation is thinking green across the business as a whole, tuning into the bigger picture will help IT professionals engage with senior management and their business equivalents in an informed and understanding manner. This is an important pre-requisite for formulating and executing an effective strategy.

The second part of this report, which begins at the section entitled 'IT: The broad view', is more action-oriented. Here we discuss some common imperatives for any organisation on the road to greener IT. Acknowledging that there is no universal formula and that to be of value, much activity is dependent on your situation, we then drill into considerations for specific scenarios and objectives. You may find that some of what is described will not apply directly to you, especially if you are a small business for example. But, as the adage goes, some points will apply all of the time, and all of them will apply some of the time.

Again, we make no apologies for keeping our treatment at a fairly high level. We are not trying to duplicate the mountain of information which is available from vendors, institutions and on the Web; rather, we are simply providing a 'steer', which is the most common type of request we get for advice and guidance in this area.

Much of the discussion is based on the results of an online survey completed in February 2008 via the Web. The respondents came from organisations of all sizes. Just over half were from organisations of fewer than 250 employees. The remainder were evenly split across medium and large organisations (Appendix A).

Given the nature of the research, it was bound to attract people with opinions about environmental issues. And not all of them were positive. Equally, given that the survey was hosted on a popular IT news and information site, the respondents were inevitably going to come, mainly, from the IT world or from those with a close interest in that world. While we don't think this information in any way invalidates our findings, it is important to bear this in mind as you read the report.

As always, we welcome your comments and feedback, so please feel free to contact the Freeform Dynamics analyst team at **analysts@freeformdynamics.com**.

Table of contents

Background: broadening the Green IT debate

Before we start the report in earnest, let's step back from IT and organisational issues and consider the broader picture. As you know, humans have been polluting the planet and consuming its natural resources as a consequence of their production, consumption and disposal of desirable goods and services. It's not a new problem, but governments, businesses and other institutions seem finally to have woken up to the realities of the situation. What's needed is a return to a more sustainable way of life in which we continue to enjoy nature's bounty but without depriving future generations of their inheritance.

The most-quoted definition of sustainability is:

> *"Development which meets the needs of the present without compromising the ability of future generations to meet their own needs"*

This was contained in the Bruntland Report, 'Our Common Future', published in 1987. It's taken 21 years for the messages in that report to emerge into the mainstream. Even then, some of the essential principles weren't new. E.F.Schumacher made similar observations in his book, 'Small is Beautiful: Economics as if people mattered', in 1973. And, of course, the whole idea of sustainability borrows from the cycles of nature, in which growth, life and decay are intertwined and, fundamentally, fuelled by the sun.

Let's make things really simple: in a truly sustainable world, waste is food. This is explained in detail in ‘Cradle to Cradle’ by William McDonough and Michael Braungart. It means that, after use, materials are re-used at an equal or higher level in the production cycle. This requires careful thought at the design stage and in the choice of materials used. It also requires discipline at the end of life to ensure that materials are easily recovered in a reusable form. The end result is a virtuous cycle, more like nature than the earth-plundering, environment-polluting, mechanisms of our recent industrial age.

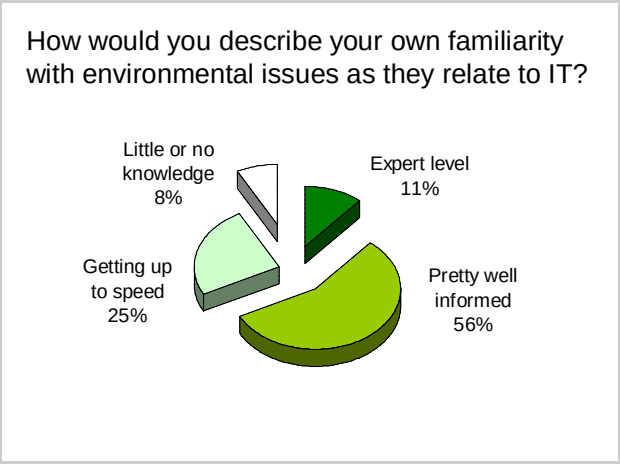
If we could hold these thoughts in our minds, they would change our attitudes to waste, seeing it more in terms of opportunity than as something to be ignored or sent to landfill. If we could reduce our use of resources in the first place then we would leave more for future generations. Or perhaps we will be able to change our approach so that the plundering can stop. To give you a clue: the average PC that is being discarded at the moment required 1.7 tonnes of raw materials in its manufacture.

Some would say that we're beyond the point of no return. It's already too late, we're hooked on a consumer lifestyle and globalisation has ensured its future spread to the massive populations of developing countries. If these people are childless or don't care about their grandchildren, then who's to say they're wrong? They will continue to plunder and to hell with the consequences. But they're probably a tiny minority. The rest of us can see the sense of doing what we can to slow, possibly halt, maybe even reverse our negative impact on our world.

Revealed: the gulf between personal and corporate attitudes

Probably the most important factor in moving in a green direction is the level of commitment within the organisation. Generally speaking, staff are happy when the board takes a positive lead because it makes them feel good about their workplace. If the board is ahead of the workforce, it's a relatively simple matter to bring everyone to the same understanding. If, however, staff have more environmental awareness and motivation than the board, then dissatisfaction can creep in. Having said this, it is important that everyone's attitudes are rooted in reality rather than woolly-minded idealism.

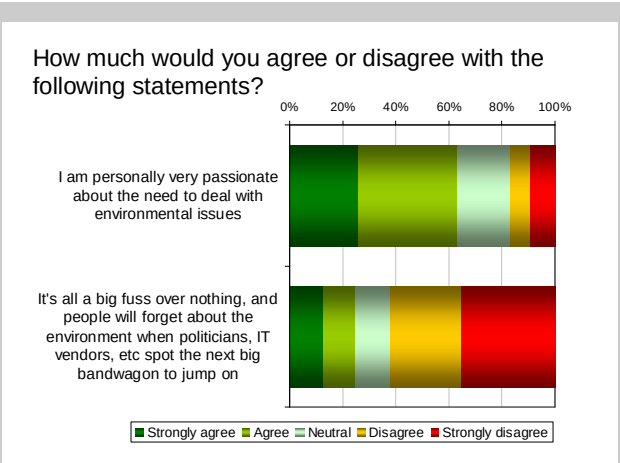
Within the research, apart from the usual questions about organisations and their geography which we'll address later, we also probed a little into the respondents' familiarity with green issues. Only eight percent of respondents admitted to little or no knowledge of the subject (Figure 1).



Most respondents were either already familiar with environmental issues as they relate to IT or told us they were in the process of getting up to speed.

Figure 1

Following on from this, it is also interesting to note that 63 percent of respondents agreed to being 'passionate about the need to deal with environmental issues', against 16 percent who were not. Taking a different tack, we also asked if it was 'all a fuss about nothing' and 25 percent agreed with this while 62 percent disagreed. This suggests that the respondents were largely opinionated on the subject with the believers considerably outnumbering the doubters (Figure 2).



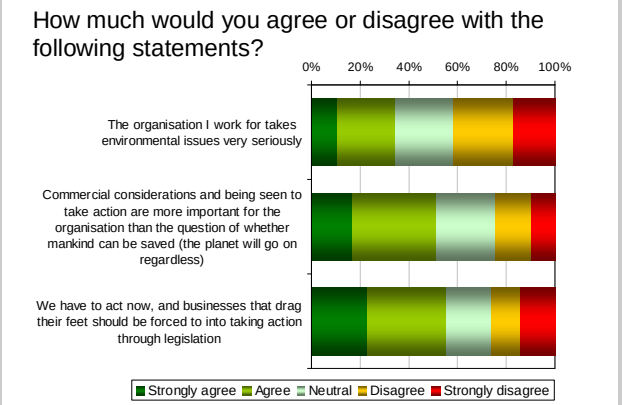
Whichever way around we look at personal sentiment, the majority take environmental issues seriously and care about taking some action.

Figure 2

While such personal views will colour personal responses, they shouldn't affect observations of the company and the IT department. It's easy for employees to talk of passion and beliefs when they don't have to manage the business. When investors, regulators, customers and business partners are watching the board's every move, then pragmatism has to take first place. Some companies have found that an overtly green policy has helped them. But this is not always the case. Not yet anyway. We expect regulations to help change attitudes and taxes to alter the business case. Other

pressures are likely to come from customers, business partners and employees. This is something we will look at a little more closely later.

At the high level, though, 35 percent thought their organisations took environmental issues seriously while a larger 41 percent thought the opposite. When asked how organisations choose between commercial considerations and saving mankind, 51 percent agreed that commercial considerations would come first, while 25 percent disagreed with this. Astonishingly, over half the respondents felt that businesses that drag their feet should be forced, by law, into taking action. A quarter disagreed with this (Figure 3).



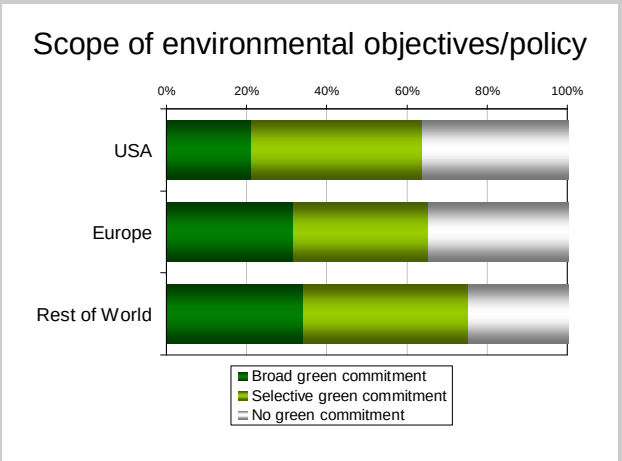
On balance, the sentiment is that businesses are not moving quickly enough and pressure should be put on them to do so.

Figure 3

Clearly, a gulf exists between many of the respondents and the organisations they work for. This will not be the case for all companies, because like will tend to attract like, but the survey suggests that a cultural gap exists which will need to be monitored. One group may need to move towards the other, either through taking action or through education.

If you look at the environmental track records of countries and organisations, you will know that a wide spread of attitudes and behaviours exist. The developed world has both contributed massively to the exploitation and pollution of our planet, yet it is also in the forefront of figuring out sustainable ways forward.

The research revealed that 21 percent of US organisations have a 'broad green commitment'* against an average of 33 percent for Europe and the rest of the world (Figure 4).



The variation in the overall number of organisations acting in this area isn't great, but the American organisations are either further behind or more selective/pragmatic, depending on how you look at it.

Figure 4

**Research note: The 'commitment' assessment shown in Figure 4 was derived from responses to multiple questions which probed company policy across a range of issues. The research was designed in this way, as to have asked the question point blank would have led to an unreliable response. It's also worth mentioning that those with 'no green commitment' may actually be taking green measures but simply not labelling them as such. Taking steps to cut energy costs, for example, might be seen as a green measure by some and a financial measure by others.*

The geographic differences we see in Figure 4 could mean that the US is actually less gullible than everyone else. However the picture we see shows that when 'broad' and 'selective' commitment are combined, the US and Europe figures are more or less the same with the rest of the world inching ahead. So perhaps the US is just more pragmatic or less constrained by regulations at the moment.

Other differences in levels of commitment by organisation type and size are provided in Appendix B.

Despite these differences, the inner truths of the 'green imperative' would seem at a higher level to be driving organisational behaviour. This is especially true when it can be coupled to business imperatives, such as saving money and securing good PR.

Drivers towards environmental action

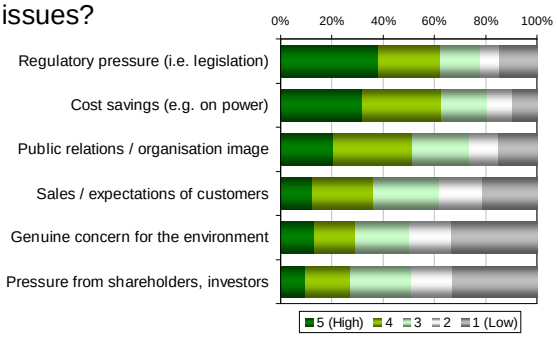
The environmental space is complicated because so many different, and frequently opposing, forces are at work. And attention needs to be paid at so many levels from airline travel down to the power consumption of a memory chip.

This tangle has to be unravelled before companies can formulate coherent strategies that are good for their businesses. In truth, a disconnect often exists between those with the knowledge and those with the power. An IT manager or a facilities manager can try to pressure the board into adopting one action or another, but communication often breaks down because they are driven by different values and speak almost different languages. If a company is to truly benefit from environmental initiatives, then the sooner this particular barrier is removed the better.

In the meantime, the pressure will come from other directions, principally from cost savings, regulation and customers. And, in the end, these things all link back to money. If a company is part of a supply chain then its customers may well start to place environmental demands on it. Marks and Spencer or IBM will, no doubt, already be applying pressure for its suppliers to certify that their supplies conform to whatever demands are being made. They, in turn, will be passing the buck down the line. If it's not happening in your business yet, it will.

We've already seen a number of companies gaining a green reputation, whether deserved or not, through their public relations activities. The non-authentic ones will be found out soon enough and this will set them back much further than the 'green' push moved them forward. In this ultra-connected and all-knowing world, pretence is not an option.

So against this background, let's look at the main drivers at the moment (Figure 5). Bear in mind that this is a snapshot and the elements will all be valid but the percentages will change over time.



Regulation, money and image are the top three drivers of environmental initiatives in business.

Figure 5

It's interesting to note that the 'genuine concern for the environment' is very low in the ranking and is unlikely to rise higher. When it comes to companies, it really does not figure as important. It only comes into play when other stakeholders decide that the company can turn in better results by adopting environmental measures. Other organisations, such as those in the public sector, may

take a more idealistic view although they, too, have financial targets to meet and still need to prioritise their actions.

We believe that energy will continue to rise in importance, not purely from the cost perspective as mentioned above, but also from the point of view of its availability and its renewability.

IT: The broad view

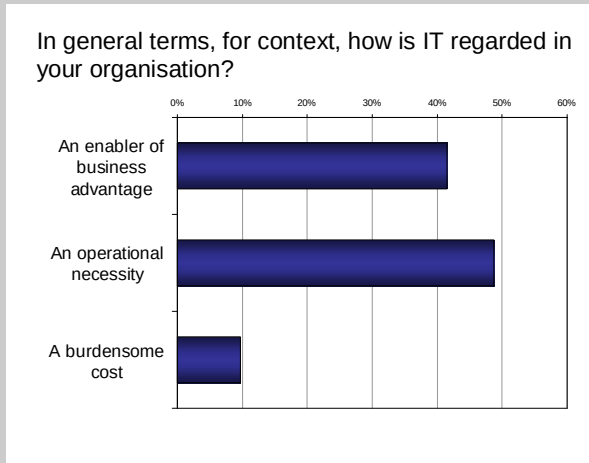
While IT is the cause of some environmental problems it can also be the cure for others. Often the benefits can be reaped quite naturally. Consolidation and virtualisation initiatives, for example, have generated advantages in terms of cost and operational efficiency and also led to a reduced impact on the environment as utilisation rates reduce energy consumption. Beyond virtualisation, as new equipment is brought in as part of the move to denser blade configurations and 64-bit architectures, or simply to provide additional capacity, organisations will also benefit from advances in processor efficiency.

Given the synergy between environmental and other agendas in this context, it is not surprising that attention has been focused on what can be done to reduce or at least manage data centre energy consumption. While this centralised approach is critical, however, it is necessary to look more broadly across the organisation too. How many machines are left on following an upgrade, through laziness, or an unwillingness to wait for ages for a reboot in the morning? How many laptop and mobile phone chargers are permanently powered? Addressing such issues can look like a daunting prospect, but it needn't be that hard. Simple behavioural changes multiplied across a workforce can deliver very large savings.

But the really big wins probably come from the major behavioural changes at an overall business level, supported by IT. What about teleworking and teleconferencing? Both have a wider impact on the environment and a massive impact on costs and efficiency. Of course, calculations get complicated when comparing the use of space, heat/cooling and light in the home against that which is shared in the office. And maybe a degree of guesswork is required. But there's no denying the saving in fuel, time, airfares and accommodation costs brought about by the modern telecommunications infrastructure and the enabling software. And, of course, flexible working enables companies to close whole buildings with all the associated cost savings.

Any company that doesn't work closely with IT needs its metaphorical head examined. In fact IT, facilities and HR should all be working in harmony with the board to bring about changes which will result in business benefit and, as a bonus side issue, address environmental challenges.

But when we look at how IT is perceived by the organisation (Figure 6), we have to ask ourselves how easy this will be.



The perception of IT could be an impediment to progressing the green agenda in almost 60% of organisations.

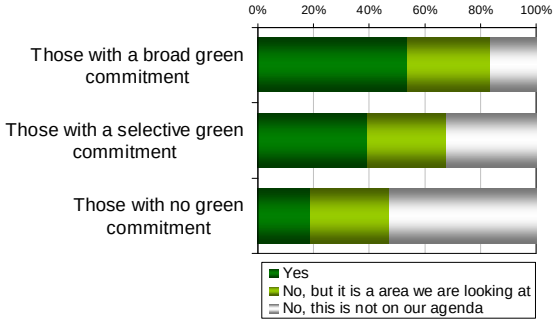
Figure 6

It's good news that over forty percent regard IT as an enabler of business advantage, but what about the rest? Almost sixty percent mark it down as an operational necessity or a burdensome cost. If your organisation is in one of the latter two groups, you either accept it and do nothing, or

step forward and show how IT can be of positive benefit. One thing is certain: once the company starts making strategic noises about environmental improvements, it will have to engage with IT, so let's drill into the specifics in a bit more detail.

IT: The operational view

First of all, let's quickly take a look at what's going on inside the IT department. Given that power is a significant source of expense and environmental damage, IT bears a responsibility to do something about it. According to the research, about a third of organisations overall have initiatives to reduce power consumption in relation to IT, with a strong correlation between commitment to green and both actions and plans (Figure 7).

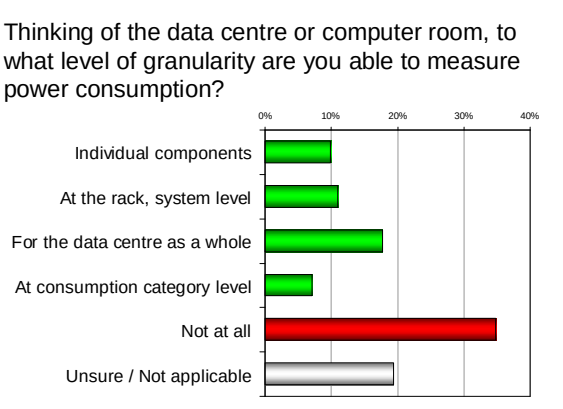


Those with a broader commitment to green are more likely to be looking at reducing power consumption in IT.

Figure 7

The picture we see here is interesting when we consider the often heard view that power management is just 'business as usual' for IT. While this may be the case at one level in that most IT people would opt for more power efficient servers, for example, there is a pretty clear link, between proactive initiatives to reduce power consumption and the presence of a broader green agenda. But what are the practicalities of making such initiatives successful?

Astonishingly, we found that a minority of IT departments are actually accountable for their power consumption. This is clearly one potential impediment to progress right away. Then we have the pretty fundamental issue that the majority of IT departments have an inadequate view, if any, of their power usage so they can't even begin to formulate coherent strategies for its management. If an IT department is to truly manage its environmental impact, it has to be able to measure its energy consumption to a reasonable level of granularity. At the moment, this is far from the case (Figure 8).



Three out of four organisations do not have enough visibility to seriously optimise their use of power.

Figure 8

The danger is that all IT professionals can do is listen to the blandishments of vendors who say "if you buy my product, then you'll save energy." Software is good in this respect, it carries little carbon footprint. Having said this, a case could be made that bloatware and inefficient file formats cause environmental damage. This is a good illustration of how hard it is to make an assessment when considering the components of the IT landscape in isolation. It's therefore not surprising that total system optimisation is regarded as having the most impact on energy use in the data centre. See Appendix C (Figure 20) for an illustration of this, along with other findings relating to power management.

In the meantime, all indications are that the focus of energy management today is primarily on cost and, in an increasing number of countries, availability. And once again the by-product is an environmental benefit.

Unfortunately, any short term savings are likely to be overtaken by growth in demand for IT and communications functions so, in terms of data centre energy use, we will probably end up back where we started in a few years. However, if IT is used to business advantage, it can support substantial environmental savings elsewhere. A tough question for all is whether to seek renewable energy sources. They tend to be a) more expensive and b) in short supply.

Linking IT and sustainability

IT buys, uses and disposes of equipment and supplies. It also delivers value into the organisation, as part of its own lifecycle of acquisition, exploitation and disposal. We've seen that IT sometimes has to take an environmental hit in order to deliver bigger savings to the organisation. Teleworking is the obvious example. We've also considered renewable energy sources, but this is an organisational choice, unless the data centre is separate.

The areas where IT can address sustainability issues directly are through its acquisition, usage and disposal policies.

Before we go into more detail, let's see how much environmental issues currently figure in the IT strategies of survey respondents (Figure 9).

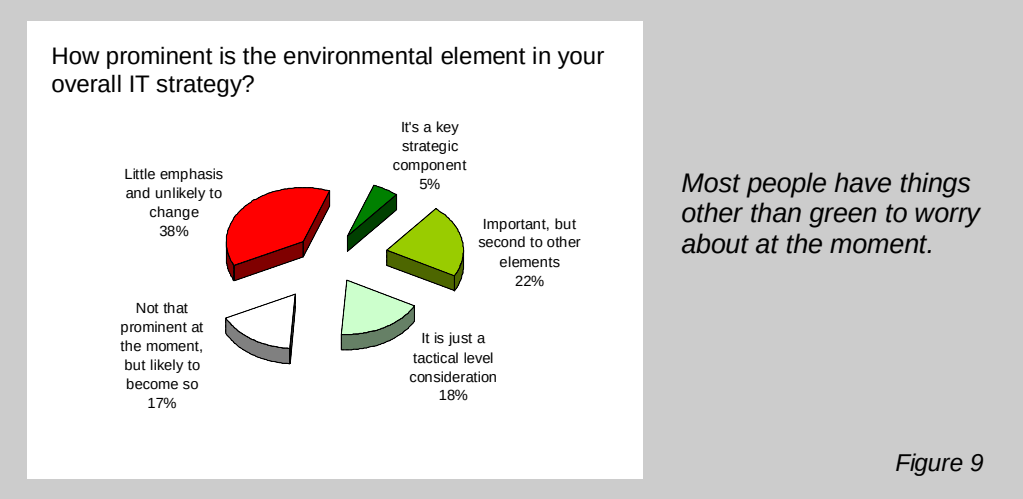


Figure 9

Almost forty percent don't see it becoming important. And only five percent see it as a key strategic component. It seems as if most IT people have other things to worry about. Yet hardware changes carry huge environmental implications, both in terms of what is bought and what is disposed of.

Ideally, you want to extract the maximum economic value out of your existing equipment and you would like to buy new equipment that has the smallest lifecycle environmental footprint. If you're offered a server that can do four times the work of the previous server in the same amount of rack space and use the same amount of energy, you are faced with a conundrum. The environment takes two hits as a result of your decision, one for the equipment being purchased and the other for the equipment being retired.

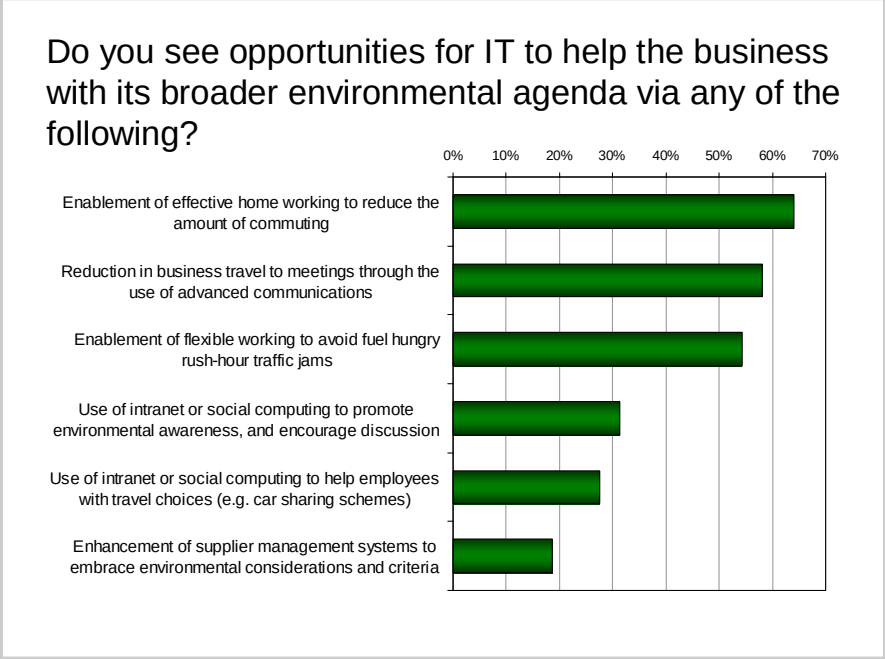
You are not helped by the fact that, at the time of writing, we have no ways of measuring the equipment we buy in terms of its lifecycle impact on the environment. All manner of people are labouring on the calculations and the labelling but its unlikely anything coherent will see the light of day before the third quarter of 2008 (see Appendix D for some relevant links in the meantime).

Some computer manufacturers will take equipment back and recycle as much as possible. Sun is reverting to metal cases for just this reason. A UN University report suggests that re-use is twenty times better than recycling. You may want to investigate schemes like Computer Aid International, which extends PC's lives by refurbishing them and making them available to charities in developing countries.

Enabling the sustainable business

Stepping back to the broader organisational requirements, it is clear that IT has an important role to play, if it is allowed to. The major benefits to the organisation are lower capital and operational costs as a result of teleworking and teleconferencing. Hot desking certainly means fewer offices and car parking spaces, even if the heat and light savings are spread among the staff that are home-working. Travel budgets can be slashed and staff time freed up by eliminating all but essential long distance travel.

Let's take a look at how organisations see these opportunities (Figure 10).



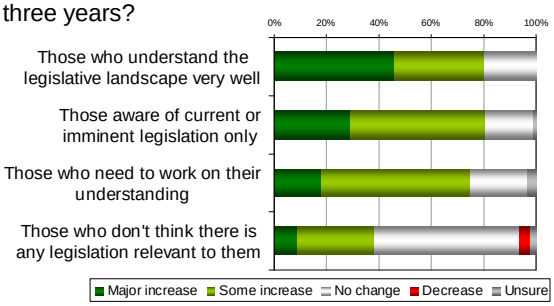
Some obvious opportunities exist for IT to support the organisation's broader environmental agenda. *Figure 10*

As expected, the top three are directly travel related. A long way behind are a couple of social computing measures to facilitate debate and to make transport arrangements. Finally, the supplier management aspect is quite low at the moment. Once again, this is likely to change as regulations bite.

Pulling it all together

It really is early days for mainstream environmental concerns. The issues will become ever more evident as time passes. It is easy to become cynical and think that this is just a bandwagon that suppliers are jumping on to boost their own profits. In some cases this will be true but it will soon become obvious which ones have a genuine story to tell and which ones are just slapping on the greenwash.

We asked respondents how they think the environmental emphasis within IT will pan out over the next three years. Their views differ according to whether they're up to speed on the current and future legislative landscape but, nevertheless, some trends are clear (Figure 11).



Ready or not, green legislation is coming.

Figure 11

Most are expecting an increase in environmental emphasis within IT. Anyone with even a glimmer of knowledge about legislation is predicting some increase. Only those who are currently ignorant of legislation are predicting a decrease, and even then it's an extremely tiny minority.

It's interesting to note that those with the most legislative knowledge are the ones who are expecting a major, as opposed to some, increase in emphasis over the next three years.

But this isn't about regulation really, it's about how IT and the company can work together to take measures which will save the company money, improve its image and help the environment. Whatever the relationships in the past and regardless of the attitudes to IT at the moment, it is clear that the best way forward is for the company and IT to formulate a harmonious strategy.

In short, environmental values and goals are best set at board level and IT empowered to act. But, even if this doesn't happen, IT can take plenty of actions which benefit the company and prepare it better for the new environmentally-aware world in which it will soon be operating.

So, what to do? Plan some things, just get on with others

Having read the report, you will know that environmental concerns will form part of your decision-making processes in addition to the usual issues such as business benefits, risk and cost. It's a case of weaving 'environment' into your actions wherever appropriate. There are also some rather obvious activities that some organisations have been doing for several years. Turning things off to save electricity is hardly the revelation of the century, so just get on with it. Other areas will, of course, require more thought.

Before you start, consider that IT has a dual role to play, both in becoming greener itself and supporting and enabling the business's environmental objectives. It's easy to be carried along with the prevailing assumption that power and cooling are the only areas in which IT has any jurisdiction. In practice, however, 'green IT' and 'IT helping the business to sustain its green strategy' will likely be indistinguishable. If you've read this far, you will already have realised this.

The key sentiment is 'sustainability'. By default this means making green the norm, which puts the emphasis on what the organisation is already doing as a business. The following sections describe areas in which a sustainable green strategy can be instigated. Some of the steps are obvious, but they only count if you actually do them. Discard the 'no-brainers' only if they are already underway.

Weaving Green IT into the organisation

All companies have countless proposals for new projects and initiatives. Most stay below the waterline simply because there's a limit to how many can be taken on. Some green initiatives are so obviously good for the organisation that they are taken up with enthusiasm. Others may struggle to

be noticed. A more sensible and sustainable approach is to institutionalise environmental considerations by threading them through existing business processes and projects.

The Register Tech Barometer (Appendix D) provides a very good indication of what's top of mind at any given time among IT professionals. This provides a useful framework within which to describe the possible environmental measures which can be taken.

In the survey, published in December 2007, 'General Infrastructure Optimisation' and 'Mobile or Remote Access' imperatives ranked highly among all respondents. Among enterprises, 'Governance, Compliance and Risk Management' also ranked highly. In the mid-market, 'Desktop upgrade/modernisation' earned third place. All of these issues are front of mind for IT professionals right now. With these and some known board level considerations, we offer some practical steps which can introduce green into the organisational agenda in a realistic, practical and beneficial way:

Governance, Risk and Compliance

Someone, whether it's IT or legal, needs to monitor present and upcoming environmental regulations in order to prepare for change in an orderly way. Start your search with the local equivalent of America's EPA or the UK's Defra.

Assuming that environmental compliance is part of the board's stated policy then this needs to be shared with employees as a prelude to securing their commitment and involvement. If the board is not yet committed to a green agenda, then this can be an opportunity for IT to explain how it fits into the bigger picture and provide the business case for change.

Best practices

Staff like to work for environmentally committed companies. Employees are more ready to support green measures in organisations such as these rather than companies where a more ad hoc approach is taken. Apart from improvements in the data centre, the collective actions of the individuals in an organisation are likely to lead to the greatest energy and environmental savings.

Brief staff on the measures they need to adopt. In particular, switching off power to devices when they're not in use and avoiding paper waste. While an individual might not consider leaving a phone charger plugged in or a monitor on standby as a major oversight, it is the collective impact of correcting such oversights that alters the electricity bills and, as a by product, diminishes the environmental impact.

Procurement

Build consideration of environmental friendliness into the procurement process, but keep it practical. Certification from EPEAT (Electronic Product Environmental Assessment Tool) and Energy Star are good starting points. It can be difficult to assess the carbon footprint of equipment over its entire lifetime, but you can at least look at the efficiency of the processor, the amount of heat it generates, and its operational and power management characteristics. Other criteria such as the environmental cost of manufacture and disposal may be added over time. The principle holds true for all types of equipment under IT jurisdiction: from desktops and printers through to network equipment.

Although not a big deal yet, if your organisation is asked to proffer its green credentials, the nature of its supplier base becomes an implicit part of how it will be judged. Better to work such considerations into procurement and supplier management now, rather than having to rush processes into place in a reactive way when you are forced to do so in the future.

Business proposals

Introduce an 'environmental impact' element to all significant projects that require a sign-off. This forces people to consider the issue when making proposals and generating business cases.

Asset management

As a prelude to many activities, you need an accurate inventory of all IT equipment and software. This provides a solid base for progress measurement, as well as helping identify redundancy and, indeed, leakage. A Configuration Management Database (CMDB) may allow for the addition of environmental notes such as power usage.

IT infrastructure optimisation

Most focus to date has been on improving data centre performance through virtualisation and consolidation. Fewer centres that are better utilised, means less space and less demand for cooling.

The same goes for the office. Printers have a habit of proliferating. Can one be networked per floor? It would act as a deterrent as well as keeping energy costs and paper waste to a minimum.

Remove unused equipment and see if it can be reused elsewhere. This is the most environmentally agreeable way to proceed. If it really cannot be reused within the organisation, see if a charity is able to make use of it. Recycling should be a last resort. And landfill should never be considered.

While it's good to think that users will adopt power saving measures themselves, it is always a good idea to ensure that their standby, hibernate and power-down settings are optimised. The same goes for printers and photocopiers.

Mobile and remote access

Introduce teleconferencing as an alternative to face-to-face meetings. Anything that cuts vehicle use and, probably, office space is likely to deliver a nett environmental benefit. A balance needs to be struck though because the home worker will need space, equipment and warmth. Whether the economic and environmental benefits will be realised will depend on individual circumstances.

Video conferencing can be a good substitute for long distance travel to meetings, especially when the participants are known to each other. It removes the cost and expense of airline travel and accommodation from budgets as well as collapsing the environmental cost.

Desktop upgrades/modernisation

As in 'IT Infrastructure optimisation' above, try to extend the working life of equipment. If you can extend it by a year, on a four year refresh, that's 25 percent fewer machines being bought. Perhaps the question to ask is "do we need this?" Even adding memory or a disk drive is better than buying a new replacement. Figures are still hard to nail down at the moment but a common statistic is that 75 to 80 percent of a PC's lifetime carbon impact occurs before it is switched on.

We know that people like the latest laptop, citing weight and battery life as primary reasons. If that's the case, cascade the outgoing machine to someone else in the organisation.

Finally, when you are buying new desktop and notebook PCs, take particular notice of their power management characteristics. Much of this will manifest itself at the operating system level, but some modern chipsets which enable more effective remote control, can minimise powered up idle time, so are worth considering, particularly for larger centrally managed estates.

Corporate infrastructure

Introduce intelligent power (light, air conditioning, other equipment) into the premises. Because it is likely to be IP-based, it falls under the remit of IT as well as facilities management.

Last word

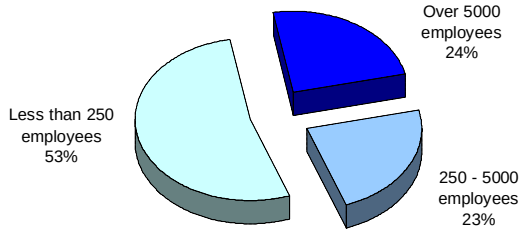
We hope that, as you explore the areas outlined above, new ideas and possibilities will be triggered which will apply to your organisation. You will, no doubt, be aware that many of the things that can be done are somewhat obvious. This is, after all, a checklist for people at all levels of awareness. But just being aware isn't enough, the benefits will only accrue if you take action.

No blueprint, or one-size-fits-all master plan, exists. But one thing, above all others, is clear: the best results will come to organisations which include ICT as an integral supporting element of its environmental initiatives.

Appendix A

RESEARCH SAMPLE

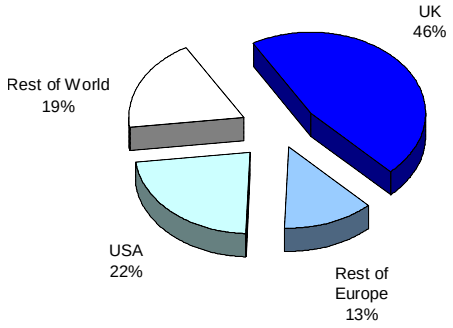
Participants by organisation size



All size bands are properly represented, from enterprise, through mid-sized organisations, to SMB.

Figure 12

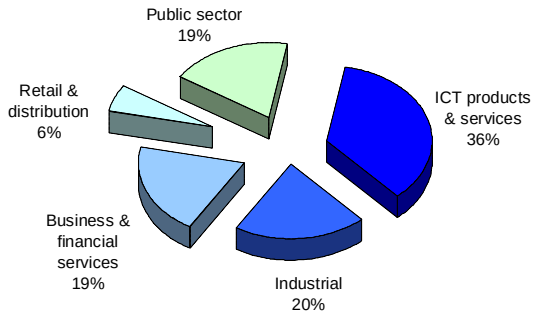
Participants by geography



A skew towards the UK and USA reflects the nature of the research, which was conducted online, in English, via a UK headquartered news and information site.

Figure 13

Participants by type of organisation

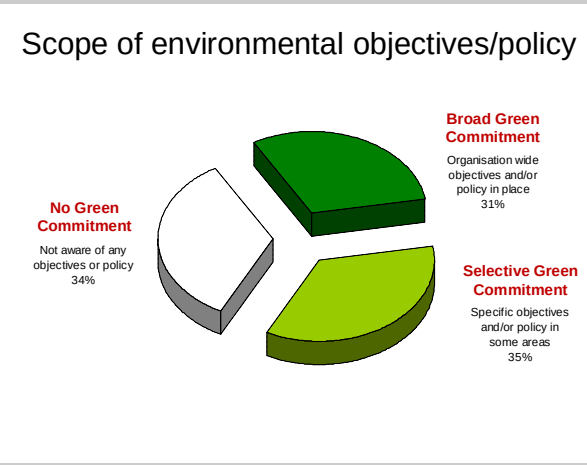


The skew towards ICT products and services reflects the nature of the host website, but this is unlikely to have made a significant difference to the findings (please see Appendix B for variation in commitment to green by industry sector).

Figure 14

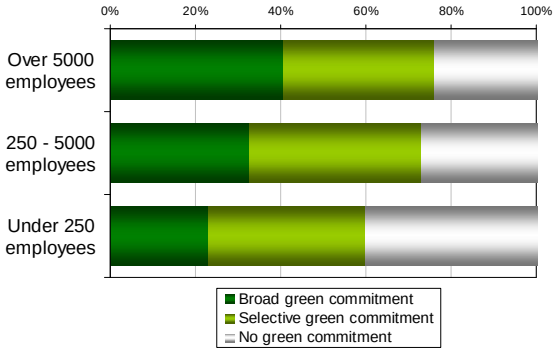
Appendix B

COMMITMENT TO GREEN



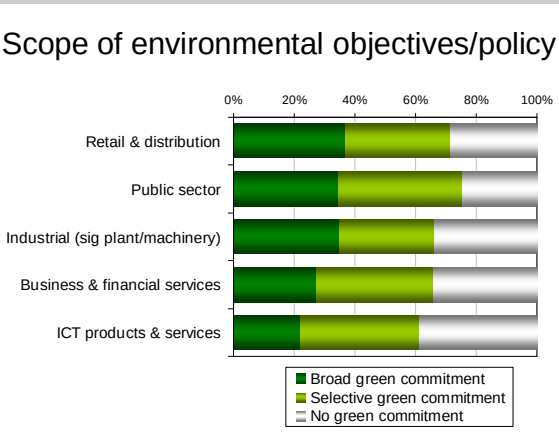
Levels of commitment were derived by combining responses to a range of more detailed questions on policy and objectives, a questioning technique which provides a more accurate view than asking such questions directly.

Figure 15



Larger organisations are more committed on average reflecting greater sensitivity to legal pressure and significantly more focus on brand image.

Figure 16



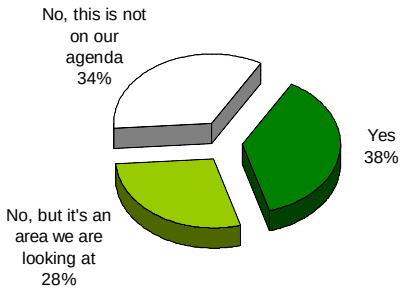
No industry stands out as being wildly ahead or behind, confirming that the environmental imperative is horizontal in nature.

Figure 17

Appendix C

POWER MANAGEMENT

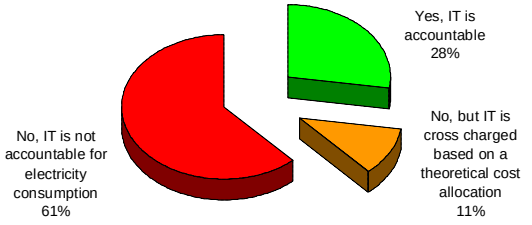
Do you have initiatives in place to reduce power consumption in relation to IT?



Roughly evenly split between those acting, those planning and those not yet thinking about it.

Figure 18

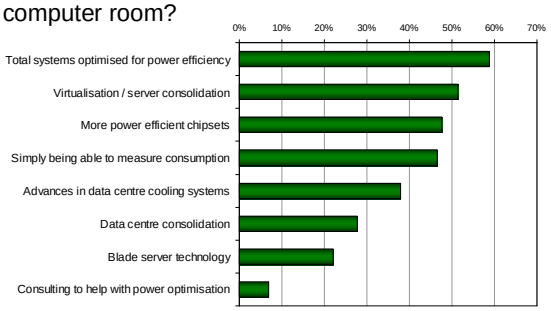
Is the amount you spend on electricity to run IT a known quantity, i.e. is it tracked or measured at the moment?



Accountability is often an important prerequisite for getting things done, so this picture highlights a potential impediment to making progress.

Figure 19

Which of the following would you regard as having a potentially significant impact when looking to minimise power consumption in the data centre or computer room?



Virtualisation and consolidation are highlighted as expected, as is the importance of power efficient processors. Optimisation at a total systems level is seen as the most important.

Figure 20

Appendix D

SOURCES OF HELP

British Computer Society
http://www.bcs.org/

Bruntland 'Our Common Future' report
http://en.wikipedia.org/wiki/Our_Common_Future

Carbon Disclosure
http://www.cdproject.net/

Carbon Trust
http://www.carbontrust.co.uk/

Cradle to Cradle (the book)
http://www.amazon.com/Cradle-Remaking-Way-Make-Things/dp/0865475873

Cradle to Cradle (the company)
http://www.mcdonough.com/cradle_to_cradle.htm

CTO Council (UK)
http://www.cio.gov.uk/chief_technology_officer/index.asp

Current legislation
http://www.netregs.gov.uk/netregs/legislation/287972/

Energy Star
http://www.energystar.gov/

Environment Agency
http://www.environment-agency.gov.uk/

EPEAT
http://www.epeat.net/

Future legislation
http://www.netregs.gov.uk/netregs/legislation/380525/389384/

Green Grid
http://www.thegreengrid.org/

Greenpeace Barometer
http://www.greenpeace.org/international/campaigns/toxics/electronics/how-the-companies-line-up

High Tech: Low Carbon - The role of technology in tackling climate change
http://www.intellectuk.org/content/view/52/11/

Intergovernmental panel on climate change
http://www.ipcc.ch/

Market Transformation Programme
http://www.mtprog.com/

Measuring environmental impact
http://www.trucost.com/

Stern review - economics of climate change
http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

Tech barometer
http://www.freeformdynamics.com/fullarticle.asp?aid=131

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Freeform Dynamics is a research and analysis firm. We track and report on the business impact of developments in the IT and communications sectors.

As part of this, we use an innovative research methodology to gather feedback directly from those involved in ITC strategy, planning, procurement and implementation. Our output is therefore grounded in real-world practicality for use by mainstream IT and business professionals.

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