



The Green CIO

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Introduction

What has struck us hard over the past 6 months or so is the extent to which Green thinking has suddenly become a core element of almost every conversation we have with CIOs. The CIO's motivation to talk about Green issues varies but the conclusions CIO Plus have reached through this dialogue and through exploring the vast pool of relevant collateral available are clear.

Firstly, CIOs must have a Green IT Strategy. There are a series of reasons for this, which are explored in more depth later in this paper and the good news is that a first cut Green IT strategy can be formulated relatively quickly given the existence of a clear, current, documented and well bought into IT Strategy.

Secondly, working through the vast array of potential Green IT initiatives open to the CIO, we conclude that the majority of these sit firmly within what can be described as best practice conventional IT strategy. This is also very good news in that it provides the handy corollary that portions of conventional IT strategy can be re-positioned as Green IT strategy by setting them out in terms that are recognisable in a Green context.

Thirdly, and most encouraging of all, we conclude that a proper, medium/long term Green IT strategy can have demonstrable commercial as well as environmental payback. So, in developing a Green IT strategy, the CIO need not worry about being labelled a Tree Hugger, a bleeding heart liberal or simply altruistic; there is genuine shareholder value to be derived from developing and delivering a formal Green IT strategy.

We have recognised **5 key challenges** to overcome.

Background

The story begins with Climate Change. There are a vast array of utterly compelling statistics everywhere you look supporting the link between carbon dioxide emissions and Climate Change but these, in themselves, are not sufficient to generate a bias for action in a CIO, since helping to save the planet doesn't intuitively map to enhancing shareholder value. CIO Plus is helping organisations to make the link.

For the last 20+ years, Global Warming has been a familiar topic across all media. It is generally accepted that the majority of global warming is due to carbon dioxide emissions from the burning of fossil fuels. When coal, oil and gas are burned to generate energy to run our transport, heat our homes and power our ICT, carbon dioxide builds up in the atmosphere trapping heat and causing the greenhouse effect.



The Kyoto Protocol, agreed in December 1997, came into force in February 2005. The objective of the Kyoto Protocol is to achieve "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." This protocol expires in 2012 and discussions are underway (e.g. in Bali, December 2007 continuing through to Denmark in 2009) regarding a replacement. It's worth noting that the US (for economic & competitive reasons – the US support the principles but insist they should apply to the developing countries as well) and Australia (through fear of job losses in an Asia/Pac competitive environment in which China and India have no emission reduction obligations) were amongst those not ratifying the Kyoto Protocol, though Australia recently announced it would.

But the UK did ratify and this means that carbon emissions are a key metric for businesses to track since the UK emissions cap will effectively be devolved to individual industry entities such as power plants, car factories, service organisations etc. There is now a trading market in emissions credits that allows organisations that will exceed their quotas to purchase credits (from those who have spare quota, from emissions credit brokers, from exchanges etc).

So, what started with Climate Change statistics has evolved into a world where businesses report on their Corporate Social Responsibility status and are becoming very sensitive to their carbon footprints. One only has to go to the Carbon Trust and other relevant sources to see all sorts of advice about a) measuring your carbon footprint, b) reducing it and c) offsetting it through payments or other mechanisms.

If organisations are reporting on their carbon footprints and trading in emissions credits to avoid exceeding quotas, it doesn't take a huge leap to realise that all significant sources of emissions within organisations are being scrutinised. ICT, being one of the least well understood areas in an organisation, may feel it has a little leeway in terms of taking corrective action and, after all, if people want to use ICT to support their daily routines, then the CIO can hardly take them away! Such complacency is misplaced.

Y2K

For those of us who lived through the Y2K issue in the IT profession, there are some interesting parallels and contrasts. Y2K had a relatively clear end point beyond which clear water was anticipated; adopting Green IT strategies doesn't – it appears to have a timeless horizon for all intents and purposes.

Y2K investment was looked upon as crisis avoidance but there were high levels of resentment afterwards based on the notion that it was potentially not money well spent and the potential problem had been blown up out of all proportion – 'no ticker-tape welcome for the homecoming CIO'.



Until recently, there appeared to be a feeling that planning investment in Green IT could be deferred until standard practices emerge and a 'follow the pack' strategy could then be adopted; this inertia was exacerbated by the fact that there is no real short-term deadline for action, nor is there a widely held perception that a Green IT strategy will deliver any sustainable competitive advantage let alone short term benefits.

Payback on Y2K investment was difficult to measure before or after the event (how much disaster did we actually avoid in dollar terms?). However, it is becoming increasingly straightforward to apply cash value to Green IT strategy elements.

Politics & Culture

It stretches credulity to think that there is a board of directors anywhere on the planet who haven't discussed their organisational carbon footprint and what, if anything, should be done about it.

From the CIO's perspective, this is where the savvy politician comes in – CIOs are recognising the need to be seen to have solid Green IT strategies that genuinely (and cost effectively) reduce the organisation's carbon footprint, provide direct financial benefits as a result and are aligned to the business strategies in the same way that conventional IT strategies need to be.

It's crucial for the CIO to be ahead of the game in this context because the Carbon Trust estimates that IT can in extreme cases account for up to 70% of an organisation's power usage. So, although the solutions to IT power consumption are perceived as relatively complex by the business, once discussions on business travel, home working, commuting without cars etc have been aired, the ICT carbon footprint is likely to be a large proportion of what remains.

Additionally, the CIO needs to recognise that there are ICT components to other board members' carbon reduction strategies. These include supporting remote/home working, data security associated with workers using laptops which are only infrequently (or never) attached to corporate networks, video-conferencing, tele-conferencing and, crucially, providing the systems and process support for the organisation's overall programme of carbon footprint reduction projects – this means vendor management, project portfolio & pipeline management and financial (including carbon accounting) management.

The CIO has to judge whether or not to play a leading, championing role within the board in respect of carbon footprint reduction or a supporting (yet pro-active) one. Often an organisation will identify a senior manager/director as the Green Champion. So **Challenge No.1** for the CIO is positioning himself on the 'Green advocacy spectrum' – one end is passive, thinking in a purely ICT-centric way about areas for carbon footprint reduction; the other end is driving the organisation towards Green and being the Green Champion himself. And of course there are intermediate stances between these two extremes.



As will become clear later in this paper, a key contributor to the IT carbon footprint is the data centre; and within the data centre, the lowest hanging fruit is switching kit off – kit most usually associated with legacy applications. This is obviously a delicate one for the CIO, but cross charging departments with their share of IT support costs and carbon units is one way of moving this debate forwards, though formal internal carbon accounting is still very immature.

What are the components of the Green IT Strategy?

Each of the following areas warrants a fuller exploration than given it here and there is a plethora of supporting data and papers on the internet.

- Data centres contributed 1.5% of the overall energy consumption of the US in 2006 and a similar proportion in UK. The trend is for this consumption to rise – note conventional energy sources are finite, so as well as mitigating against increasing costs, organisations also have to deal with the risk of continued supplied (look at California, Gaza). The areas to look at are fairly intuitive –
 - More efficient servers – IBM, HP and Dell are reducing server energy usage by 30-40% and this will improve further still; more power efficient storage devices – Plasmon look to be ahead of EMC here with their AA638 Ultra Density Optical Archive Appliance
 - Virtualisation – VMWare and other solutions allow data centres to crunch today's server landscape into vastly reduced footprints through these technologies and the latest blade servers
 - Virtualisation solutions have also emerged that support thin client access to virtual desktops inside a data centre – there are myriad benefits from this in respect of carbon and cost reduction
 - Kill legacy applications and switch off the associated boxes
 - Cooling systems & UPS. If the amount of power being consumed by servers reduces, then the amount of cooling required reduces and the power consumed in providing this reduced cooling also reduces (a virtuous circle). Consider deploying more efficient cooling and airflow systems, and uninterruptible power supplies
 - The above steps lead to a reduced need for space, power and cooling in existing data centres and correspondingly a reduced demand for new data centres
 - In an environment where Green data centres will become the norm, the CIOs need to re-look at their sourcing strategy for data centre services – an on-site computer room or out-dated data centre will offer even greater scope for outsourcing than previously. Look to outsource to a service provider who can distribute computing resources among customers on an as-needed, resource-efficient basis; a provider who is pro-actively looking to reduce the footprint of its entire data centre offering
 - Centralise and consolidate storage capacity on a storage area network



- Consider installing sensors and software to track and regulate cooling, airflow and power
- Consolidation, Centralisation, Standardisation, Simplification, Rationalisation – these are good, solid under-pinning words associated with historic, core corporate IT strategy. Applied across the following areas (list courtesy of HP), they have a knock on effect on power consumption and are therefore core Green IT strategies
 - Application consolidation - Reduce maintenance costs and improve energy performance by consolidating multiple applications and application instances
 - Database consolidation - Achieve business information optimisation by reducing the number of redundant or maintenance-intensive databases; power usage reduction follows
 - Data centre consolidation - Overcome server, storage and application sprawl by consolidating data centres; power usage reduction follows
 - Network consolidation - Improve security and simplify network management by implementing enterprise-wide solutions
 - Storage consolidation - Improve operational efficiencies by simplifying and standardizing on networked storage
- PCs, Monitors, Printers
 - Adopt flat screen monitors to replace more power hungry CRT products
 - Configure printers to default to double sided printing where this is possible
 - Optimise number and type of printers/copiers
 - Use re-cycled paper
 - Cross charge departments for printing
 - Invoke auto-switch off for PCs – a PC left on solidly for its 3 year life contributes a tonne of carbon dioxide
 - Utilise PC's for longer (elapsed time, e.g. 4 years instead of 3) – dispose of them ecologically, re-cycling where possible
- Look at the power reduction effect of other Intelligent Building Systems – heating, cooling, lighting, access and security. Until recently, the benefits advertised from such systems rarely focused on the positive Green impact. If such systems are considered, they need to integrate with the ICT landscape
- Carbon Accounting – this is as yet an immature field with no clear standards on how to score and report. But in principle, it offers a useful way of linking individual financial budget holders to their corresponding carbon budgets. In due course and with some consistency in treatment, this is a way in which the CIO can additionally justify Green IT projects e.g. legacy application retirement would result in a support cost reduction and an associated power usage reduction, both of which could potentially be passed on to the user department budget holders.



Challenge No. 2 is to ensure that development of the Green IT Strategy doesn't fly in the face of the existing IT Strategy so the next step is to revisit and refresh as required the IT Strategy.

Validating and updating the existing IT strategy represents a valuable opportunity for taking 'Green soundings' amongst the senior organisational stakeholders as it's key to know where the organisation believes it needs to be in terms of its commercial and marketing response to Climate Change. If the organisation is looking to reduce business travel and encourage home working, the implementation of the Green IT strategy will represent a fairly significant enterprise change programme. Communication will (as always) be key.

A Green IT Strategy can now be developed that is appropriate for the business. Much will depend upon Challenge 1 and whether the Green IT Strategy is being developed on the back of an initial enterprise carbon footprint assessment or solely within the bounds of the ICT function. **Challenge No. 3** is thus to develop the Green IT Strategy.

Challenge No. 4 is implementation. An organisation knowing its carbon footprint has made a start. But what's an appropriate set of initiatives to take on; how much how soon; where will the biggest reductions come from? Implementation begins with scoping, planning, understanding the timing and size of benefits (footprint and cost reduction) and the costs of the various mooted initiatives. As discussed earlier, there is no comparable Y2K deadline here. The key thing is to have started, not to have finished – particularly true from a CSR perspective.

In order to properly manage the reduction programme, CIO Plus utilises an enterprise-wide toolkit that allows an organisation to manage the reduction of its original carbon footprint through a series of measurable, improved states. This begins by setting up all the organisation's Vendors, Assets and Services (including IT services, right down to individual applications) as 'measurable Vendors' in the toolkit. Each item on the resultant Vendor Services Portfolio is populated with its key characteristics in terms of running costs and power consumed. The series of initiatives comprising the programme then cause a reduction in the services portfolio in number, cost and carbon footprint. The toolkit also facilitates reporting on other carbon footprint information that an organisation would typically be looking at e.g. personnel travel.

This overall programme of projects is managed and monitored via the toolkit giving clear visibility of the key parameters of the overall Green IT programme – change costs, running cost savings, energy savings etc. This also allows the CIO to project change over a longer period, driving down costs and improving efficiencies further. Specific reporting views are available for key stakeholders, e.g. 'the CSR officer view'

Whilst this works well for individual organisations, the approach is also particularly suited to outsourcing organisations who are able to measure and report the carbon footprints of the services they provide for their customers (and which therefore count towards the customer carbon footprint) and make recommendations for [potentially shared between customers]



consolidation, rationalisation and virtualisation projects that will result in carbon and cost savings for their customers.

Of course, if organisation A is executing an enterprise wide vendor assessment specifically with the intention of reducing its carbon footprint, it stands to reason that organisations to whom Organisation A is a vendor, may be doing the same thing. The fact that you are showing yourself to be steeped in Green initiatives may be a significant factor positively affecting your own opportunities as a vendor. A recent Ipsos Mori poll found that 53 per cent of respondents said they were more likely to purchase services from a company with a good environmental reputation.

So **Challenge No. 5** is making the most out of what the programme is delivering. Internal and external communications covering achievements to date and those planned to come; what messages to give to customers, suppliers, employees and shareholders. If actual footprint figures are to be quoted, it would be sensible to understand how the organisation stands relative to competitors in the same sector, so repeating (perhaps in a lighter manner) an overall carbon footprint snapshot from time to time and comparing with competitors, would provide strong guidance as to what should be ultimately published in the Corporate Social Responsibility section of the Annual Report.

CIO Plus has a growing database of overall organisational carbon footprints, by sector, and split into categories such as Commuting, Utilities, Data Centre, Business Travel, 3rd Party Capital Purchases. So not only is an organisation able to plot its own carbon footprint reduction journey, but it will also be able to compare its performance within its sector.

Conclusions

The debate on Climate Change from the CIO perspective is over. Kyoto, Carbon Caps, Emission Trading Systems, the recent (August 07) US Environmental Protection Agency report on data centres, Legislation and Regulation in the pipeline, CSR reporting requirements, pressure from customers and potential customers, pressure from staff – all these factors mean that ICT carbon footprint assessment, reduction and potentially offsetting are now on the CIO radar whether the CIO is looking at it or not.

But unlike Y2K, where there was a level of fear of the unknown, these power usage challenges are very describable and very measurable and the reduction solutions are able to be woven into an organisation's IT strategy. So is the CIO is going to take a Green IT strategy to the board, given that ICT in many businesses is contributing the bulk of the carbon footprint, or have the board demand it from the CIO?

Just as with the housing market in the UK, it will not be long before it's second nature for the annual audit to cover an organisation's carbon footprint (past, present and future). Whereas with Y2K, there was always a time to look forward to when it would all be over, the carbon



footprint management and reduction demand is going to be with the CIO for the rest of their career, and their successor's and the several successors' after that.

The entry level Green IT strategy, as explained earlier, comprises a range of conventional IT strategy components re-assessed from a Green perspective. Of course there is a need for innovation in terms of new thinking and new approaches, but the starting point for putting a Green IT strategy together is not the awesome challenge it might appear at first glance. And many of the fundamental strands within such a strategy are by their nature, relatively long timescale projects.

So, whilst there are clearly some visible short term steps that can be taken to kick-start the programme (printing, purchasing lower power kit going forward), a large proportion of the Green IT strategy is a) medium to long term and b) something that can evolve as the journey progresses and CIOs can 'steal with pride' from their peer network.

The main thing is to start and to be seen to be starting and the barriers to entry for this are almost non-existent.

Note on CIO Plus

Formed in 2004 by John Berney (ex Scottish & Southern Energy) and Chris Billimore (ex Invensys), CIO Plus offers a range of high value strategic IT services to CIOs and, in cases where the CIO role is vacant, to CEOs/CFOs.

These services are focused on -

- M&A (including Cost Reduction, Change, Programme Management, IT Strategy, Sourcing Strategy, Benchmarking)
- Value Generation (underpinned by our Integrated Operational Planning & Budgeting methodology)
- Green IT Strategy development and delivery.

We also provide, via our broad associate base and a series of formal partnerships, deep expertise in IT infrastructure, Telecoms Strategy, HR, Legal, Website Repair, CIO dashboard implementation, Document Management and Laptop Data Security.

Our customers include Egg, Ofcom, Wates Construction, Brakes Food Group, Dixons Stores Group, Hungarian Telcos (HTCC, Invitel), HP, Invensys, DHL, De La Rue, AT Communications, the C of E, Meridian Business Support, Energy Savings Trust, Richmond Events.