Green economics?

Environmentally conscious IT policies can be good for both the planet and the bottom line.

Green IT policies for the sake of environmentalism are not high on the CIO's priority list. But there is a growing body of support for introducing these policies as an effective way to cut operating costs.

Environmentally conscious working practices are nothing new. Back in 1993, a poll by printer manufacturer Kyocera Mita found that while most organisations thought that being environmentally friendly was a laudable ambition, "most day-to-day support activities are carried out in the business world without paying any attention to the environmental consequences". In other words, while being green was a nice idea, putting it into practice was another matter.

But even the most environmentally mindful CIO faces a challenge. Activist groups such as Greenpeace have focused their efforts on getting manufacturers to change, rather than end users. In May 2005, the environment campaigner dumped a truckload of old computer equipment on the doorstep of Hewlett-Packard's European headquarters in Geneva. It wanted to raise awareness about the chemicals used in manufacturing IT parts. But advice for end users is thin on the ground. Even industry analysts offer only isolated pieces of research.

Nevertheless, anyone who wants to develop a green IT policy can start with the basic principles that apply to all green-thinking: use as few resources as possible and produce as little waste as possible. The cost implications are noticeable: fewer resources and less waste can equal lower expenditure.

SEIZING POWER

But any CIO proposing green policies will need the backing of some hard numbers to make their case, although, in some cases, it is relatively straight forward to make estimates
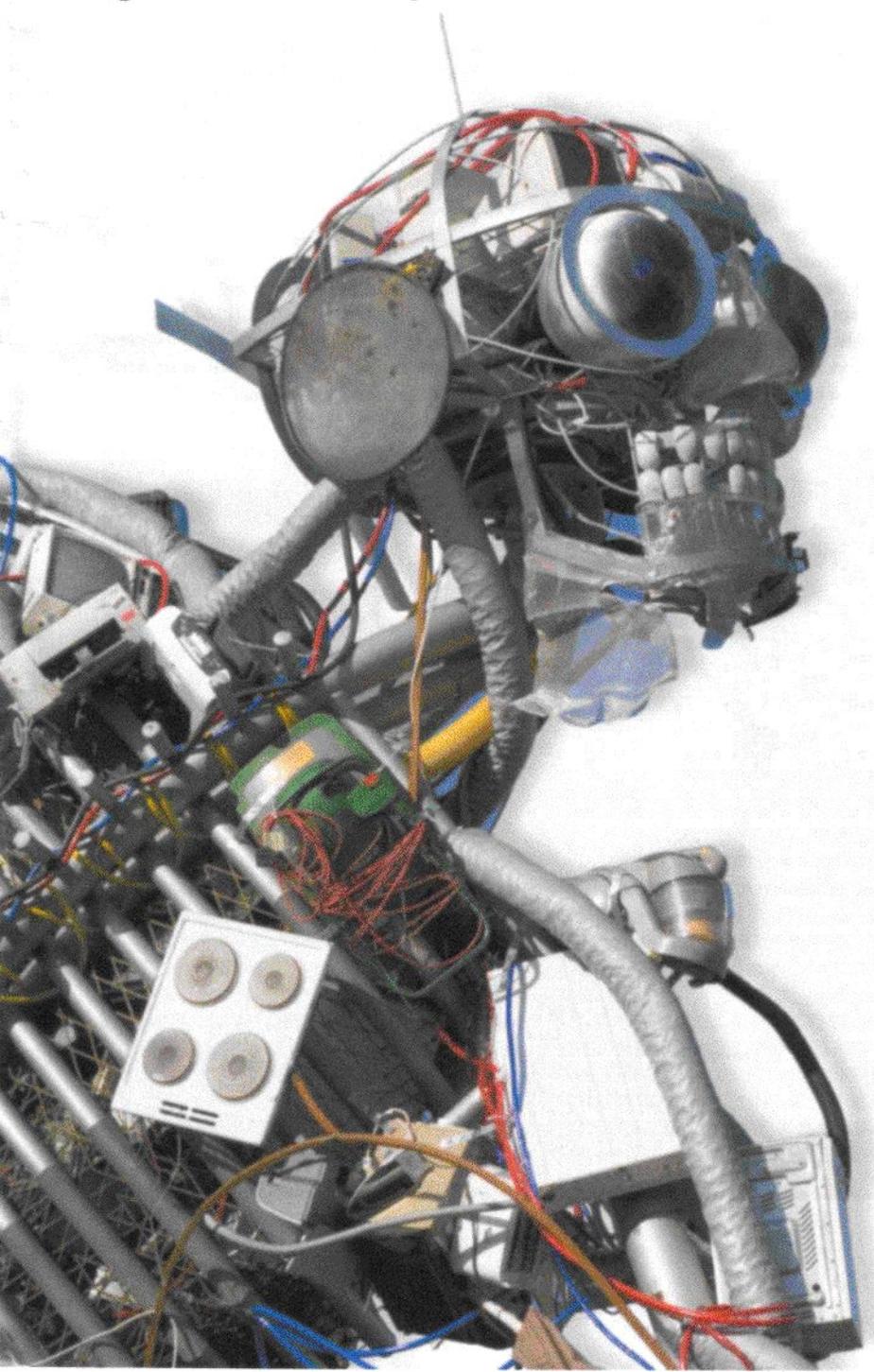
of potential savings. Take, for example, PC energy consumption. According to industry estimates booting up requires up to 100W; when relatively idle, but with the screen on, a PC consumes around 50W; in sleep mode, between 5W and 15W. A PC running flat out, using electricity costing 5p per kilowatt hour, would cost an organisation £43 a year.

Similarly, there are overheads in running screens. A CRT monitor will draw 100W or more of power when switched on. LCD displays use less electricity, typically between 30-60W. However, both will use electricity overnight if not properly switched off. And while costs for a single machine are low, the potential for cost savings over an entire PC estate is significant.

Instead of running PCs, a 'greener' option may be to use thin clients. These run most applications on a server, with the client simply used to provide a window onto the server's activities. As such, they do not usually require powerful processors, hard drives, large amounts of memory, PCI cards or other standard PC components. David Angwin, senior regional marketing manager at Wyse Technology, explains the advantages as he sees them: "From a green perspective, there are really three areas where thin clients excel. Because they have no moving parts, they have

lower power consumption. They produce less heat as a result, which means you can have many thin clients in a room without needing air conditioning. They also last longer."

A typical thin client will only draw about 5.6W, even when used all day, at a cost of roughly £2 per year in electricity charges. Its usual lifespan is five years, instead of two years for a PC, with a mean time to failure of over 175,000 hours compared to 25,000 hours for a PC. It is also usually cheaper than a PC, costing about £140. Since all the applications run on the server, a thin-client environment is also far easier to manage and provides a lower total cost of ownership than even the most well-managed PC environment, according to analyst group Gartner.

But thin clients are impractical in some situations, particularly in organisations with many power users. By adopting certain policies, the cost of PCs to the environment – and the IT budget – can be reduced.

Switching monitors and PCs off at night can save companies considerable money in electricity costs. Some businesses are already ensuring cleaning staff do just that on their nightly rounds. Enabling power management settings will also save considerable power, and turning off screensavers will do likewise – a monitor displaying a screensaver

will use potentially 25 times as much power as one in standby mode.

Moreover, shifting PC processing power to the server will obviously require either more servers or more powerful servers. But power and cooling issues are already threatening to destabilise many existing data centres. "Power consumption in data centres is an important issue," says Damian Reeves, CTO of infrastructure management provider Zeus. "The expense of running extra air-conditioning to keep computers within operating temperature, the extra back-up generators needed to keep power-draining computers alive during electricity outages and the sheer space taken up by large hungry computers place a heavy financial burden on the data centre."

The introduction of blade servers and high-density racks has also made it possible to vastly exceed the power supply built into existing data centres – with most racks usually served with 15kW of power rather than the 20-30kW now typically needed. These racks generate a large quantity of heat that is difficult if not impossible to dissipate even with additional air conditioning.

Again, reducing the amount of hardware required is the greenest route. Many servers often run at only 10-20% of capacity, compared to mainframes, which often run at

Lex Vehicle Leasing

BASED in Slough, Lex Vehicle Leasing is a joint venture between the RAC and Halifax that provides contract hire for company car and van fleets. In 1996, the company decided it wanted to reduce the environmental impact of its business – and save money – by redesigning its operations around the environmental ISO14001 certification.

One of the aims was to reduce the company's carbon dioxide output by one-third. Helen Counsell, quality environmental manager at Lex, says a number of IT policies were introduced to do this and achieve other green aims. "We replaced all of our CRT monitors with LCD monitors: they use less power and emit less radiation. We donated all our old PCs to charity for re-use elsewhere. We implemented faxing from PCs to reduce the amount of paper we used, and implemented double-sided printing wherever possible. We monitored which departments used more paper and found out how to manage the peaks and troughs of printing." In its more remote offices, the company also chose to use thin clients run-

Lex: Greener fleet management

ning Citrix to connect them to the main business systems in Manchester.

Alongside these visible IT policies, the company has implemented remote working for employees, installing comms lines at their homes and giving them broadband connections. This saves many employees the difficulty of the morning commute, or offsets it outside peak hours so the time spent in traffic jams and at lower speeds is reduced, which also has a positive effect on greenhouse gas output. Alongside environmental issues, this has also increased staff morale.

The biggest benefit Lex's green IT policies

have brought to the company's bottom line relate to video conferencing. Introduced at the end of 2003, video conferencing is used wherever possible between the company's sites in Manchester, Marlow and Stirling, and internationally with the Lex IT Centre in India and suppliers in the US. "We found it amazing the amount of savings in terms of money, time, carbon dioxide and even the stress levels of people on the road," says Counsell. In 2004 the company saved £217,500 through video conferencing, reduced the organisation's carbon dioxide output by 140 tonnes, saved 9,051 hours of employee time and 63,600 litres of fuel.

The links to overseas partners have also paid dividends. Bi-monthly visits to the Lex IT Centre by ten specialists and managers are now unnecessary, as are trips to the US. With research from the University of York now suggesting that the rise in demand for air travel is one of the most serious environmental threats facing the world, the benefits to Lex's balance sheet are also benefits to the environment.

near to 100% of capacity. So using utility computing and virtualisation approaches (in which a single server can run more than one operating system and associated storage and applications) to consolidate several servers' applications onto a single server can quickly reduce both the number of servers and the amount of power required.

Cooling technologies, such as Fujitsu's Primecenter LC water-cooling system and IBM's calibrated vectored cooling (CVC), can reduce the overall power consumption of the combined systems. "The savings made in terms of extending equipment life and uptime, reduced system power consumption due to them running cooler, and higher equipment density due to cooler running, outweigh the additional power used to run the [water-cooled] rack," says Garry Owen, head of enterprise at Fujitsu Siemens.

Another option for tackling power and cooling issues is to look at a radical overhaul of the data centre itself, by switching to DC current. Currently PCs and servers use DC current internally, but require inefficient, heat-generating converters to take mains electricity. By switching to a supply of DC current, companies could strip out power converters, saving costs, reducing heat output and potentially increasing power supply reliability by as much as 70 times.

The idea was first floated by Compaq in the late 1990s, but has recently enjoyed a renaissance in the US. Early indications suggest that data centres wired for DC current have 20% lower running costs than the equivalent systems running with AC power.

GREEN INK

The costs, to both the environment and the business, of unnecessary printing are well known, but can be tackled using some relatively easy procedures. Ensuring that printers are turned off overnight cuts electricity costs; ensuring that duplexing options are switched on can reduce the amount of paper used. There may also be benefits to switching to laser rather than inkjet printers, by reducing the consumables required.

Xerox's solid-ink technology and Kyocera Mita's separate drum technology offer more environmentally friendly – and cheaper – alternatives to standard laser toner cartridges. Paul Birkett, Xerox UK business solutions manager, says: "Due to the simplicity of the consumables, you don't have to pull drum units out. You just drop in an ink block, which has the consistency of a wax crayon. It produces zero ozone and zero waste. Xerox is already beginning to exploit the technol-

ogy and it will go right through the product range over time."

Xerox claims that printers that use solid ink can print 30,000 pages before they need attention, compared to 1,200 pages with laser printers. Furthermore, for every 100,000 pages printed, solid-ink printers will generate 4.4 pounds of landfill waste, compared to 198.4 pounds for a typical colour laser printer.

Kyocera Mita's separate drum system takes the drum usually contained in standard laser toner cartridges and makes it an integral part of the printer. "When the toner runs out on a conventional printer, you normally dispose of the drum as well," says

Tracey Rawling Church, Kyocera Mita: "The cost per page in consumables is 0.3p compared to 1p or more for other laser printers."

Tracey Rawling Church, head of marketing, Kyocera Mita. "With our devices, the only thing replaced is toner." This means the cost per page in consumables is 0.3p with Kyocera Mita printers, says Rawling Church. Other laser printers normally print at 1p per page or more. With no included drum, the amount of wastage is reduced as well.

Green IT savings last all the way through to the end of the hardware lifecycle. The ungreen option of disposing of a PC – throwing it in a landfill – can cost between £50 and £80, according to Gartner Research, with British landfills typically charging by weight of disposed material. However, a pilot programme by Maxitech.biz run over the past two years has found that a typical organisation can recover 5% of the initial cost of redundant IT equipment, and one in three can generate a positive return from recycling.

Services company Morse goes further and claims that its 'asset retirement programme' can, at the very least, not cost money – which given the cost of storing obsolete equipment is one step up – and will usually produce a revenue of £10,000 to £100,000 a year in large organisations .

"It can be done a number of ways," says Steve Mellings, a specialist in the decommissioning of IT equipment at Morse. "The traditional way is the trade-in where a customer would purchase new hardware, return the old equipment to the vendor for re-use, and they would receive an amount of money in return for that."

Vendors, such as Dell, Sun, IBM and HP are creating extensive buy-back programmes for their own equipment, offering between 4% and 20% of the list value of new equipment. This is partly to reduce the amount of second-hand hardware available within channels and to increase customer loyalty. But it is also a response to the EU's Waste Electrical and Electronic Equipment (WEEE) directive, which will require equipment manufacturers to assume responsibility for the disposal of the hardware they manufacture. Since it also limits how much can be put into a landfill, many parts of computers will be recycled and manufacturers are already changing their hardware's construction and raw materials to make them easier to recycle.

Mellings says that most organisations are unaware of WEEE and should discuss it with their suppliers when negotiating contracts: many, for instance, do not know that if a company sells the organisation a monitor, for example, it now has to take back one of its own old monitors as part of the deal.

The second option is a buy-back. "We can effectively buy back the equipment and then broker it on their behalf or dispose of it." Mellings says there is a significant market in Eastern Europe and Asia for Pentium III desktops, for example; the cost of shipping the PC is usually more than equalled by the sales cost, and at the very least is less of a cost than disposing of the PC in a landfill.

'Green IT' may seem quirky at the moment, but most vendors and analysts agree that it will become more and more important over the next few years. EU legislation such as WEEE will provide considerable opportunities for revenue returns from old IT equipment. As organisations start to look more at ongoing costs of hardware as well as initial acquisition costs, the products that use the least power and the least consumables will quickly stand out as having the lowest TCO. And in the data centre, only those technologies that run the coolest will be economically viable as rack densities increase. Green IT's time is coming – disguised as common-sense economics. ⓘ