

Green IT

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Why the need for Green IT?

We're all familiar with the need to be sustainable in the way we work and operate our businesses. Reducing energy, emissions and waste are concepts that have been around for many years, but one area that is often overlooked is information technology (IT).

With the world becoming ever more reliant on IT, from computers and laptops to smartphones, the issue of how you make it more sustainable, in terms of reducing energy requirements and electronic waste, becomes ever more pressing.

In 2010, it was estimated that 360 million computers were manufactured. A computer is one of the most resource-intensive pieces of equipment, requiring over 10 times its weight in fossil fuels to make. Compare that to a car or fridge, which need roughly an equal amount of fossil fuels to their own weight to produce.

The following statistics highlight the urgent need to do something now:

- The production of a computer requires 22kg of toxic chemicals, 240kg of fossil fuels and 1,500 kg of water. 80% of life-cycle energy use is accounted for before we even switch a PC on for the first time. *Computer Aid International*
- About 2% of the world's total energy is consumed by building and running computer equipment. *BBC*
- Office equipment is the fastest growing energy user in the business world, consuming 15% of the total electricity used in offices. This is expected to rise to 30% by 2020. In the UK, the cost of running this equipment is estimated to be around £300 million annually and rising each year. *Carbon Trust*
- 200 million computers and 550 million mobile phones reached the end of their life in 2008. *Computer Aid International*
- 50 million tons of e-waste was generated worldwide, but only 13% was recycled. *US Environmental Protection Agency*
- Reusing working computers is up to 20 times more energy-efficient than recycling them. *Computer Aid International*

Spotlight on Marriot

Marriott has developed a new underground data centre, which utilises the naturally cool environment below ground to reduce power consumption, and increase energy efficiency. The hotel group also makes extensive use of server virtualisation, desktop power management and recycling of IT assets. To date, more than 28,761 IT assets have been recycled (waiting for latest stats), which equates to 629,408lbs of e-waste diverted from landfill.

So what now?

Why has the environmental impact of IT been so ignored by the hospitality industry up to now? Carmen Ng, Environmental Manager at Langham Hotels International, offers this explanation: "The main reason is that the electricity consumption by a set of computers is not too high when run over a normal working day." But, she warns: "It becomes enormous when there are hundreds or thousands of computers that have been left on for 24 hours a day, seven days a week."

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And this is the key. Rising energy and material costs have forced operators — and by default manufacturers — to look at more energy-efficient equipment at all levels. Big hotel companies have wised up to the costs involved in operating inefficient hardware and are driving system changes to cut wasteful expenditure.

Data centres

A data centre is a facility used to house computer systems and their components, and it can be far and away the biggest contributor to an organisation's carbon footprint. A data centre's life expectancy is relatively long so it is imperative it is built to the highest standards in terms of efficiency as any excess energy use will lead to significant cost implications over the years.

The HSBC Group (see photo of its data centre above) has been leading the way in "green" IT since launching an ambitious strategy in 2007 to reduce energy consumption, business costs and CO2 emissions. Its Group Head of Technology Services Sustainability, William Thomas, says: "Data centres last 30-odd years and you can't go back in and fix them, so they need to be efficient. Over time, this saves money as they run efficiently. Servers have to be Energy Star-compliant or I won't even talk to vendors."

There are several key ways to increase efficiency:

1. Build the most energy-efficient data centre possible. This will save energy and costs over its lifespan.
2. Only get the data storage capacity that is currently required and forecast for the lifespan. Many data centres have excess capacity that burns energy (and therefore costs) unnecessarily. Don't have servers or equipment that will not be used.
3. Cooling data centres. Traditionally cooling has been done by air circulation, which is very inefficient. Larger data centres already use other technologies to cool more efficiently, such as water cooling.
4. Virtualisation technology. Improve your system's resource utilisation through virtualisation technology. Virtualisation is the creation of a virtual (rather than actual) version of something, such as an operating system, server, network, etc. and allows a single user to access several physical devices on one terminal. A computing device dedicated to an individual member of staff or allocated for one software application is highly inefficient and expensive. Virtualisation consolidates resources, requiring less power and cooling.
5. Consider cloud computing. This is a location-independent IT service, typically available over the internet, where shared servers provide resources, software and data to computers and other devices on demand, increasing IT capacity and capabilities without an organisation having to invest in new infrastructure. Keeping data virtually, or "in the clouds", means less information stored on IT systems and therefore less energy being used to run the systems. Systems such as BT's Virtual Data Centre, a hosted data centre that enables businesses to create, deploy, monitor and manage their own service through a self-service portal, claim to offer savings of up to 40% of the total cost of running one's own data centre as well as reducing the space required, the level of emissions produced and the power consumed.
6. Measure and monitor power usage. Once you know what's using the power, focus on why and whether it's possible to reduce consumption.

Spotlight on Fairmont Hotels & Resorts – The Savoy

The newly refurbished Savoy hotel in London is audited internally and by Fairmont to measure its carbon footprint. The hotel installed six large Xerox ColorQube copiers to replace the 100-plus printers previously used. These high efficiency printers are cartridge free, use solid ink technology and 90% less

packaging and waste over their life span. All the old desktop printers were recycled, and old computers and printers replaced during the refurb were sent to a vocational training school in central Ghana.

Purchasing

The key to any IT strategy these days is to have a purchasing strategy, which takes into account not only the initial outlay cost of hardware, but also the running costs. Some appliances may be cheaper to buy but may use up to 30% more energy, making it significantly more expensive when looking at the total cost of running that appliance during its lifespan.

Questions need to be asked of suppliers, but there are some easy criteria to use to sift out the non-runners. David Jerome, Senior Vice-President of Corporate Responsibility at InterContinental Hotels Group, says: "I won't touch a company unless it is Energy Star-rated. This can save us up to 30% on operating costs immediately."

ABOUT 2% OF THE WORLD'S TOTAL ENERGY IS CONSUMED BY BUILDING AND RUNNING COMPUTER EQUIPMENT

Purchasing tips

1. Upgrade. Before buying new, investigate options to upgrade with the latest energy-efficient components to extend appliances' working life and efficiency.
2. Green labels. Look out for the certification labels denoting more energy-efficient equipment, from Blue Angel in Germany to TCO in Sweden and Energy Star in the US (see below).
3. Screens. Opt for flat screen monitors, which reduce energy use by over two-thirds.
4. Get the right equipment. Consider your information technology needs against the tasks required. For example, laptops may be a better option in some circumstances because they have been developed to be energy-efficient and generally match the computer to the task required. Remember: not all staff have the same needs.
5. Consider running costs. Look at the life cycle costs, not just the purchase cost. Take note of running and standby costs of equipment. These can vary enormously.

Spotlight on InterContinental Hotels Group

IHG was the first hotel group to be awarded a LEED (Leadership in Energy and Environmental Design) by the US Green Building Council for its in-house sustainability system Green Engage. It can deliver over \$90,000 in annual energy savings to franchisees by making hotels 15% to 20% more energy efficient.

IHG manages several data centres and 12 contact centres and all of the IT systems that enable guests to book at its branded hotels. In 2008, its Enterprise Technology team started to simplify access to all its global distribution systems, online booking platforms, reporting applications and other management tools. The company is also changing its supply chain to purchase energy-efficient equipment and implementing internet-based voice and data networks across the enterprise. The goal is to reduce the number of IT servers by 80%.

Labels to look out for

Blue Angel

www.blauer-engel.de

This German label, launched in 1978, was the first environmental certification system to apply to electronic goods. It also studies the lifecycle and the disposal of the product.

Energy Star

www.eu-energystar.org

A US initiative that has now been adopted by Australia, the European Union, Japan and Korea for office

equipment. Certified equipment deliver substantial savings over conventional products, such as computers (up to 70% less energy consumed), monitors (up to 50% less), printers (up to 60% less), faxes (up to 40% less).

European Ecolabel Scheme

ec.europa.eu/ecolabel

Products are assessed on their lifecycle impact. Electrical equipment has to achieve very high energy efficiency targets to qualify.

OFFICE EQUIPMENT IS THE FASTES GROWING ENERGY USER IN THE BUSINESS WORLD, CONSUMING 15% OF THE TOTAL ELECTRICITY USED IN OFFICE. THIS IS EXPECTED TO RISE TO 30% BY 2020. IN THE UK, THE COST OF RUNNING THIS EQUIPMENT IS ESTIMATED TO BE AROUND £300 MILLION ANNUALLY AND RISING EACH YEAR.

CARBON TRUST

EU Flower Label

ec.europa.eu/ecolabel

Applies to computers, notebooks and TVs. Compliant devices must be easy to dismantle to facilitate recycling, and the availability of electronic spare parts must be guaranteed for seven years after the date production ceases.

Electronic Product Environmental Assessment Tool

www.epeat.net

An online procurement tool offering a global register for green electronics.

TCO

www.tcodevelopment.com

Swedish label awarded to computers, monitors, keyboards and mobiles. Products must comply with criteria such as energy efficiency, the use of heavy metals, and sound and electromagnetic emission levels.

Optimising efficient operational practices

Of course, once your operation has acquired its IT systems there are still measures that can be taken to minimise the energy used. William Thomas, of HSBC, says: "Winning the energy game is about a lot of little wins over and over." The bank has introduced 16 sustainability-related measurable items for areas that include computers, data centre, laptops, etc. which top managers are scored against and bonuses are tied to those scores. "Now lots of people who weren't that interested are interested. Sustainability can't be a hobby. The scorecard helps as it ties risk and reward. It's been a game-changer for us," he adds.

200 MILLION COMPUTERS AND 550 MILLIO MOBILE PHONES REACHED THE END OF THEIR LIFE IN 2008

COMPUTER AID INTERNATIONAL

Top 10 Tips to reduce running costs of office equipment

(source: Carbon Trust)

1. Computers. Activate energy-saving features. In fact, most office equipment will have these features, so make sure they're activated.
2. Standby features. Introduce a policy to activate standby features, don't assume employees will do it.
3. Turn it off. Buy seven-day timers. These can save up to 70% on energy costs.

4. Monitor and manage the equipment that is peripheral to computers, such as speakers, printers, etc. and consider installing intelligent switch-off solutions. Printers can consume 30%-40% of their peak power demand when idling between printing and standby modes, so minimising this can produce cost savings, reduce heat output and increase its operating life.

5. Educate your staff. Consider a screen saver with an energy-saving message.

6. Rationalise your equipment via networking to reduce the number of printers (for example) in any office area.

7. Printers

- Use only black and white for internal documents and colour only when absolutely necessary.
- Consider the benefits of inkjet printers v laser printers. Inkjet energy use is much lower than that of a laser printer.
- Encourage staff to use print preview functions.
- Set default printing mode to double-sided.
- Use lower-specification printers, such as inkjets, for internal documents and encourage staff to use these for day-to-day use.

8. Photocopiers

- High volume copiers use more energy so should be used sparingly.
- Use low melting point inks (available from stationery suppliers).
- Encourage staff to copy in batches to increase standby time.
- Stick to black and white copiers and only use colour when absolutely necessary.
- Set default copying to double-sided.

9. Invest to save and purchase only what you need.

10. Don't forget to motivate staff. Keep repeating the message of the importance of energy saving in ways that they can understand (for example, a computer monitor switched off overnight saves enough energy to microwave six dinners).



Reducing e-waste

WEEE (Waste Electrical and Electronic Equipment), or e-waste, is the term used for old or disposed electronic equipment. It covers both the toxic and valuable materials found in appliances.

The most important lesson is to reuse, not recycle. With so much e-waste, and electrical devices such as computers and flat screens often being replaced well before the end of their shelf life and ending up in landfill, it's imperative that the most is made of these materials by reusing them productively.

Carmen Ng, of Langham Hotels International, says: “Electronic waste is an important issue. Simply think about how much equipment we have in our daily lives compared to 10 years ago. The golden rules for green could be applied again, ‘Reduce. Reuse. Recycle’”.

50 MILLION TONS OF E-WASTE WAS GENERATED WORLDWIDE, BUT ONLY 13% WAS RECYCLED

US ENVIRONMENTAL PROTECTION AGENCY

Her point is confirmed by the EU WEEE Directive, which prioritises reuse and puts the responsibility for the disposal of e-waste on the manufacturers of such equipment.

Dumping e-waste on developing countries was until recently commonplace, and it has caused huge environmental problems and harm to human health in countries such as Ghana and China. But new legislation, including the EU WEEE Directive and the 2010 US Responsible Electronics Recycling Act, has stopped countries from being able to export e-waste.

In Canada, several states have adopted a scheme where the cost of recycling an electronic item is included in the purchase price. In Switzerland, they’ve been able to return all electronic waste to their place of purchase since 2005, and in the European Union, Taiwan, South Korea and Japan manufacturers must by law recycle 75% of the e-waste they produce.

The International Business Leaders Forum’s (IBLF) Digital Partnership initiative is a great example of how recycling can benefit developing countries and disadvantaged communities worldwide. Pioneering a unique model for affordable information communications technology (ICT) access through technology re-use, business engagement and innovative cross-sector partnerships, Digital Partnership has introduced sustainable strategies so that technology can be used to help alleviate poverty and promote socio-economic development.

Launched in South Africa in 2001, the Digital Partnership has become a global model, recently assisting the Ethiopian Government to establish a computer refurbishment and training centre and de-manufacturing facility, the first of its kind in East Africa (see photo above of a pupil at Jegnoch School with computer access thanks to the Digital Partnership programme in Ethiopia).

The worldwide demand for donated ICT equipment continues to exceed the supply. IBLF’s Digital Partnership can offer a sustainable solution to this problem – and a mutually beneficial partnership opportunity for companies seeking a socially responsible, economically competitive solution for the disposal of their ICT equipment.

There are many other such organisations, including Computer Aid International and Bank Drugiej Reki (BDR), which collect second-hand and refurbished hardware to give to NGOs in Poland.

Options to investigate when trying to reduce e-waste are:

1. Can you upgrade your equipment with new energy efficient components?
2. Can it be used by someone else in the company?
3. Can it be given to a charity? (Note: charities must be registered to take WEEE.)
4. Will the manufacturer take back the old equipment and reuse parts in new products?

What’s new

Looking to the future, efficient energy consumption (ie, the cost of running the equipment) will be the driving force behind innovations in the IT field. Already a priority, the rising cost of energy, which IT analysts Gartner predict will be double in 2011 from 2005 levels, will make this even more imperative and will only serve to increase the necessity for green/energy efficient credentials.

REUSING WORKING COMPUTERS IS UP TO 20 TIMES MORE ENERGY-EFFICIENT THAN RECYCLING THEM

COMPUTER AID INTERNATIONAL

Developments on the horizon include:

1. Smaller, more efficient processors. The continuing development of microprocessors means a mobile phone can have around the same computational power as the average desktop computer back in 2000.
2. Memristors. Electronics giant HP is in the process of developing “memristors” (see photo above), which have greater memory storage capacity while requiring less energy and space. They are due to be on the shelf in about three years.
3. Specialist data centre design. Siemens recently launched its transformational Data Centre Solution, a groundbreaking strategy in data centre energy-efficient design and operation. It claims the system, which uses virtualization and efficient power and cooling, offers many benefits for businesses, including up to 50% energy savings through ground water cooling and IT costs reduced by 30%.
4. Outsourcing. Hotels of all sizes are starting to view IT outsourcing as a viable option to gain flexibility and reduce short-term costs and increase transparency of cost structures and processes.
5. Optimisation of resources. This will become a necessity either through virtualisation, networking or cloud computing.
6. Water cooling. IBM is currently working on a supercomputer that is cooled by water (a given volume of water can hold 4,000 times more waste than air), which claims to be 50% more energy efficient than the world’s leading systems. The Aquasar stacks many computer processors on top of each other with cooling water flowing between each one. IBM’s Dr Bruno Michel told the BBC in November 2010: “We plan that 10 to 15 years from now, we can collapse such a system into one sugar cube — we’re going to have a supercomputer in a sugar cube.”