

# GREEN-MY-TECH TIPS 3

## Did you know:

### That there are many tools to help you calculate your organisation's emissions?

About 2% of carbon emissions are caused by computer and phone equipment, and this number is on the rise. People around the world are talking about climate change and how they can be more environmentally friendly, or "greener". There are many ways to reduce our ecological footprint, but one that is often overlooked is how we as consumers can use technology in a sustainable way. These fact sheets offer practical information and suggestions on what you can do to "green your tech".

## GETTING YOUR ORGANISATION TO GREENIT

### What does "green IT" or "greening IT" mean?

"Greening IT" means to reduce the energy use, carbon emissions and pollution caused by information technology (IT) and telecommunications. For many organisations, the majority of electricity usage is related to office equipment, and IT may be the single largest source of greenhouse gases (GHGs). In many countries there are already legal requirements governing use and disposal of electronics, but a "Green IT" policy should go beyond those.

### Who should be involved in developing and reviewing a "Green IT" policy and action plan?

If you are a large, formal business or institution, generally the person with the most authority on issues of corporate social responsibility (CSR). The head of IT, chief information officer (CIO), or sponsoring board member responsible for IT should also be involved as this person has the ability to assess environmental criteria alongside demands on IT services. Specialist expertise on infrastructure, applications management, resilience and risk assessment may also be necessary. The procurement and finance managers should be involved, as greening IT will influence contracts, invitations to tender and service level agreements with suppliers. "Green IT champions", who are enthusiastic about communicating the need to green IT, and are given authority to raise awareness and initiate a change of culture in a given area and inform and empower others to act should also be involved. If you are a smaller NGO, you will need to work out who should be responsible for greening your tech. This will obviously involve people who perform similar roles to those listed above. "Green IT" is a relative term rather than a product or a fixed standard, and continual gains need to be made to make best use of changing technology. For this reason, the term "Greening IT" allows for a sense of continuity and evolution for continuing a programme of projects to improve environmental performance. The green IT team should demonstrate the importance and urgency of greening IT, define workable, relevant metrics or indicators, get guidance from national government, regulatory or funding bodies, and work environmental considerations into ICT strategy. It should also have a realistic expectation of obstacles and challenges, and consider critical success factors, including "buy-in" and working relationships, roles and responsibilities, other green issues (such as waste disposal), and skill requirements.

### What accounting tools are available?

Measuring carbon emissions and environmental impacts over the whole organisation is an accounting activity, and using full-cost accounting such as the Triple Bottom Line (people, profit and planet) or Global Footprint Network standards help rigorous reporting and forecasting. The GHG Protocol has a set of spreadsheets to help organisations calculate their emissions and includes necessary background statistics such as carbon intensity.

Embodied carbon in products bought or sold can be assessed using life-cycle analysis (LCA) according to international standard ISO 14044 and UK guidance PAS 2050. Other useful figures are included in the tools at [www.ccalc.org.uk](http://www.ccalc.org.uk) or available through private companies such as AMEE. Some countries have their own regulations for monitoring large emitters, such as the Carbon Reduction Commitment (CRC) in the UK. The CRC has encouraged data centre efficiency, but the simplified measurements required are not necessarily a good substitute for the GHG Protocol (or ISO 14064-1 which is very similar).

### What kind of changes can I expect?

Projects may do one of the following:

- Provide a "quick fix" with negligible costs and some financial benefits. This would include policies related to auto shut off when computers are idle, setting printer defaults to draft quality and double-sided (duplex) printing, finding a third-party to return toner or inkjet cartridges, and more. These changes often also requires a cultural change within the organisation.
- Require investment in time or kit, with calculable returns on investment. For example, service asset and configuration management, including staff time to audit and decommission or virtualise underutilised legacy systems, or consolidating printer hardware by only using networked "secure printing".
- Involve enhanced environmental criteria from suppliers, such as stipulating new office equipment is EPEAT® Gold-certified (see sheet 2), or renewable electricity supply contracts. Although these solutions may not be a quick fix and can be more expensive, they are necessary for both internal and external credibility of the green IT project.

### Where are the main savings to be found?

A typical organisation may find that improving efficiency of servers and data centres reduces emissions by a similar amount to office and desktop policies. Additional to office policies, other ideas include sophisticated power monitoring and management software such as Verdiem or 1E Nightwatchman, which can have a payback of about six months, or using physical timer switches on other devices, and use of thin clients. Depending on mains characteristics and equipment tolerances, one of the cheapest building-management savings in both office and data centres (beyond environmental temperature settings) may be voltage optimisation, meaning regulators in IT equipment dissipate less energy. Replacing air conditioning with evaporative cooling systems, for example, may also have IT implications. Switching to renewable energy can be a great way to cut carbon emissions. National regulations may not always recognise a green electricity supply as zero-carbon, although investing in on-site renewable generation almost always is. Less demanding software choices on servers and clients can also benefit accessibility and security; and



encourage software developers to look at software efficiency and scalability (see sheet 4 in this series). Lengthening equipment lifetimes, including in mobile/cell phone contracts, also significantly reduces embodied emissions, environmental cost of mineral extraction and e-waste (see sheet 2), which should be a vital part of any greener IT policy.

### What about savings in the data centres?

These involve action on both hardware and software (see sheet 4). Data centre Power Usage Effectiveness (PUE) measures the building overhead, principally for cooling, but PUE figures from a data centre operator should be investigated carefully, and checked against other appropriate guidance such as ITU L.1300, the EU Code of Conduct on Data Centres and certification like the UK's CEEDA. Think about carbon intensity of the electricity supply if national regulations are robust enough to assure this is measured in a meaningful way. The ITU's L.1310 will cover auxiliary telecoms equipment and switches. Services and server resources should not be over-provisioned, whether by IT departments or suppliers. The Fixed to Variable Energy Ratio (FVER) metric indicates the energy wasted when servers are idle. Underused servers can be removed to achieve a utilisation of 50%. Security concerns with virtual private servers (VPS) shared with other departments or organisations are negligible since the systems are designed to isolate the virtual machine; and if data needs to be that secure, it should be physically under your control. Increasingly, web hosts should steer clients towards shared hosting, as this has a much smaller footprint than a VPS or dedicated server.

### What's "the cloud" and is it green?

"The cloud" is a poorly defined concept, usually implying access to data via the internet, but also sometimes dynamic scaling of server resources. Unrestrained growth (currently around 19% per year) of remote server capacity in the "cloud" is seen by Greenpeace as a potential environmental threat, depending partly on whether the power supply is renewable. It has been argued that Software as a Service (SaaS) suppliers (such as Google Docs) encourage efficient coding so as to require minimum hardware investment, but that argument applies less to the efficiency of client software.

### Can't we just offset our carbon emissions?

Carbon offsetting is controversial and should be a last resort as it does not in itself reduce emissions, but rather moves them from one place to another. At its best, it pays developing countries to counter GHG emissions; however, 1 tCO<sub>2</sub>e from fossil fuel burning is not the same as 1 tCO<sub>2</sub>e from "additional" renewable energy generation or from burning HFCs, and some projects actually

encourage the production of pollutants such as HFCs. Privately bought offsets are often Voluntary Emission Reductions (VERs) which failed to qualify for Clean Development Mechanism regulation. Any offsets should be "Gold Standard" Certified Emissions Reductions (CERs), and if offsetting is used in a green claim, the type and size of the offset should be stated, along with the size of actual emission or energy savings.

### How can we extend the benefits of Green IT?

You can do this by:

- Sharing and publishing Green IT achievements may encourage others, if it involves honesty, transparency and reusable solutions, but avoid "greenwash" or selective claims (check out ISO 14021 or the EC Guidance for Making and Assessing Environmental Claims). Greenwash and vague green PR threaten real progress and morale.
- When you have established collection facilities for waste electrical and electronic goods or batteries, extend them to domestically produced e-waste for employees' convenience. Consider other side-benefits and facilities that are free or cheap to offer to the local community.
- One obstacle to ecologically aware decision-making is a lack of reliable independent data, for example over embodied energy of ICT equipment. Working with researchers and academics to produce and publish empirical data and standards would be of great benefit.
- Consider how to best learn from, maintain and communicate the process and how obstacles were overcome. Frameworks like PACT ([www.pact.co](http://www.pact.co)), based on the five A's – Awareness, Agency, Association, Action and replicating Architecture – can identify pathways to help both climate mitigation and adaptation in an organisation. You might like to use some mnemonic for a change cycle, like Consider, Learn, Involve, Map, Act, Take stock, Educate = CLIMATE. Encourage people to demand transparency on ecological issues, and consider ISO 26000 recommendations on corporate responsibility.
- Get creative!

### Does all this really make a difference?

Yes! We all make a difference together. It may be an effort to do the work and convince other people now, but it pays off in the long run. Consider how you can make small changes in your life and encourage friends, colleagues or decision-makers to do the same, perhaps using the information in these sheets. Remember, don't break the biosphere -- someone else might want it!