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Using IT to Go Green

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This briefing is for senior management team: heads of IT, estates, strategy and procurement.

The Context

Under the UK Climate Change Act 2008, the higher and further education sectors must meet carbon reduction targets of 34% by 2020 and 80% by 2050, compared with 1990 levels.

Most green initiatives in FE/HE involve ICT. They range from relatively simple ways to save power, to those needing high-level change, such as rethinking your institution's IT strategy.

The Rewards

- Meet and improve on required legal targets
- Improve your reputation
- Save money
- Increase efficiency
- Reduce your carbon footprint

What We Know Already

What can be done?

There are four main ways to use ICT to go green:

1) Change the way you use ICT, (eg power saving methods)
2) Change the type of IT you use (eg to more efficient or sustainable technology/hardware; virtualisation)
3) Manage things better with IT, eg energy use displays in buildings and working practices such as video conferencing.
4) Reduce the amount of IT equipment on site by sharing or outsourcing.

How easy is it?

Everyone wants to be green – you start with a lot of goodwill. But there can be barriers to change. Lack of staff time, lack of budget, lack of guidance and awareness, especially outside ICT departments, can mean that ideas do not get off the starting block. Green issues are not always a procurement priority, and procurement as a whole may not be that strategically embedded. However, many colleges and universities are trialling and implementing new ways to go green with help from JISC.

Personal computing and powerdown

Better management of PCs and printers can save power and reduce the use of other resources without serious re-investment. Examples include changing the approach to printing, and implementing automatic power up/power down procedures for desktop computers.

Data centres

Most colleges and universities have constantly-expanding data centres to run. They use a lot of energy and generate a lot of heat, which must be dispersed using more energy. Some institutions have found innovative ways to reduce cooling costs or are researching ways to capture and reuse heat energy.

How to 'green' legacy systems is a big issue for data centres and computer rooms; for example, retrofitting systems to make cooling more efficient presents complex engineering problems. JISC projects are pioneering techniques for improving energy use in existing data centres.

Power Usage Effectiveness (PUE) is a way to measure the energy efficiency of a data centre. It is the total energy consumption of a data centre, divided by that of the IT equipment itself. A low PUE reflects a limited 'overhead' of cooling load, power supply and other energy uses which are not contributing to computing activities. In many older data centres, this extra load can be around twice the amount used by computing (ie a PUE of 3.0), but state of the art

Worcester College of Technology are looking at greener ways to dispose of heat output, and also installing photovoltaic cells to create enough energy

Summary

Publication Date
18 November 2011

Publication Type
Briefing papers

Programmes
Greening ICT programme

Topic
Green ICT
Institutional ICT

facilities now have this figure down to 1.2 or less.

to run evaporative cooling units.

Increased awareness of this issue, partly through projects driven by JISC, means more colleges and universities are starting to achieve this figure. Investing in data centres is expensive, but it can immediately bring huge savings in energy use, which no amount of 'simple quick fix' measures elsewhere in your institution could equal.

Managing things using IT

Buildings. Innovations in IT are making it possible to present data about energy consumption in university and college buildings, allowing wider dissemination through web databases and display panels in buildings, so raising awareness of energy usage.

Changing working practices. Facilities like videoconferencing are a potential way to save energy and reduce your institution's carbon footprint, particularly where colleges or universities are relatively remote.

The Welsh Video Nework (WVN) and JISC are running a research project to look at how much energy is consumed by video conferencing equipment and studios, and how much energy is saved by replacing actual meetings with video-conferenced ones, in order to better assess the 'green credentials' of video conferencing. www.wvn.ac.uk/en/projects/greenict/

At Cardiff University, the Planet Filestore project has demonstrated energy saving of over 80% by managing file storage

Procurement

You can review procurement to take into account environmental impacts of all equipment you buy right across its lifecyle, from production, distribution and use through to disposal. Production and use are the stages which it is generally agreed have the most impact, so ensuring that you only buy equipment that is manufactured in a more sustainable way and is rated as more energy efficient will help.

Changing service models

Outsourcing or **sharing** some of your ICT-related services will allow you to use the equipment, data storage and associated processes within your institution more efficiently – or to remove some of it entirely.

Processes that can be shared or outsourced, by way of ICT systems, include services such as student records, timetabling, finance, estates, human resources, library management, virtual learning environments (VLEs) and customer relations management.

A particular form of outsourcing, **cloud computing**, is still relatively new for universities and colleges. It is basically 'computing capability that is delivered as a service over the internet', and can include email, data storage, and software services for things like remote collaboration and virtual learning environments. Still in its early days, the cloud's green credentials are yet to be established, but the potential benefits are large.

Using the cloud you can move computing effort out of what are, in many cases, inefficient local data centres in universities to facilities where you can take advantage of economies of scale. The ability to shift computing load dynamically to take advantage of free cooling, means the institution doesn't have to use mechanical chilling.

For more examples of pioneering JISC projects, visit JISC's Greening ICT programme: http://bit.ly/rri7SM

Financing Green IT Investment

The Responsible Energy Costs in Higher Education and Further Education – Stage One (RECSO) study led by Forum for the Future has found that the financial/accounting incentives to 'go green' in the education sector are generally weakly developed. The study identified five techniques which could help:

1) Devolved budgeting: an individual becomes the responsible budget-holder for their area
2) Shared savings: a department keeps a portion of any savings it makes
3) Grants and soft loans: from either an institution's internal resources or external funds such as the Salix Trust
4) Awareness and competition: no direct incentives, but provides relevant information to encourage behavioural change
5) Whole life costing: techniques to identify and take into account the full costs of assets over their entire lifecycle

The next stage of the RECSO project will be to develop guidance, strategic advice and support pilot projects in interested institutions in order to introduce the use of these mechanisms.

The Revolving Green Fund (RGF)

The RGF provides interest-free support for capital investment in energy efficient and low carbon technologies in English Higher Education Institutions, with funds supplied by a partnership established between HEFCE and Salix Finance Ltd. Similar Salix-managed recycling funds also operate in Scotland and in Northern Ireland.

The University of St Andrews has financed almost £2 million of energy efficiency expenditure through Salix

A Note of Caution

Balance upstream environmental impacts – related to production – against the purchase of potentially more efficient new equipment.

Do not underestimate the potential of 'rebound effects' to cancel out

savings. If an organisation can cut energy usage and run equipment more
cheaply, it may be tempted to run more of it.

Getting Started

- Use our ICT energy and carbon footprinting tool. Knowing your current footprint will enable you to set achievable targets and monitor progress.
- Read 'Low Carbon Computing: a view to 2050 and beyond' to help you plan. Also contains a draft model of a 'low carbon ICT roadmap'.
- Consider where you can change things/make savings, and at what scale you want or need to make changes. The scale of what you can achieve may depend on the buy-in of other SMT members and relevant stakeholders – present a case to stakeholders and decision-makers.
- Review procurement. Look at the whole ICT lifecycle to see where you can change the type of equipment you use: materials and energy used in making ICT and its components; transport of hardware; energy consumption of equipment when in use; financial and environmental costs of disposal, versus costs of recycling.
  Review business, academic and day-to-day processes and procedures: can you make any of them 'remote' or electronic?
- Streamline the services you provide: can any be shared or outsourced?
- Sign up to the EU Code of Conduct for Datacentres. The Code is a voluntary initiative which promotes best practice. It aims to reduce the environmental impact and energy use of data centres. The Code is a useful framework which focuses on two key areas: the IT load (IT capacity available for the power used) and facilities load (equipment and systems that support the IT load, such as cooling systems).

More information, including examples of good practice and links to JISC's resources on Green ICT can be found in the PDF version available for download - link below.

Documents & Multimedia

Using IT to go green
Portable Document Format (pdf) File [387 Kb]

Links

Internal Links

Business and Community Engagement: Maximising the Impact of Your Partnerships

Managing Your Customers

Business intelligence: Monitoring performance and planning improvement

Efficiency and flexibility: Getting fit for a changing funding environment

Strategic Management: Making IT Work for You

Supporting staff through technological change

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Last updated on 19/04/12 by Rob Bristow