

Elsave Silver & Gold solutions incorporate software developed by our technology partners at PC Power Down, and Office Electrics has exclusive access to PC Power Down technology for this purpose. Office Electrics and PC Power Down recently attended the Independent School's Bursar's Association (ISBA) annual conference, and this article is reproduced from their review.

Switch Off - and Save Money

Two major issues are confronting every organisation, including schools, that often result in conflicting priorities; climate change and the present economic reality. The common perception is that being 'Green' is expensive: many 'Green' initiatives have limited impact and unfeasibly long payback projections. There are, however, areas to focus on that will bring real environmental benefits and, far from being expensive, can deliver significant cost savings within just a few months.

Many are tempted to 'be seen to be doing the right thing' by installing micro-generation equipment such as wind turbines, solar panels or a biomass digester. All these technologies have their place but are probably not the place to start: installing a wind turbine in a school probably won't have too much impact in terms of climate change and the payback period may be longer than the projected life of the equipment but, it can act as a symbolic rallying point to raise awareness of the issues among the students, teachers and parents alike. The reality of micro-generation is a little like trying to fill a paper bag with water when it has a hole in it: rather than having precious resources running away, the first point of attack should be to identify and minimise waste.

The main energy consumers in any school are the heating and lighting systems and its ICT. Heat and light are obvious targets for waste and can easily be addressed: if the temperature is too high or too low, the heating or air conditioning can be adjusted and equally, it's obvious if lights have been left on and they can easily be switched off. ICT presents a slightly different challenge but how much of a problem is it?



ICT might not strike you as being responsible for much CO₂ and yet, according to the international research company Gartner in April 2007, "The global information and communications technology (ICT) industry accounts for approximately 2 percent of global carbon dioxide (CO₂) emissions, a figure equivalent to aviation ..." "Gartner's estimate of the 2 percent of global CO₂ emissions that ICT is responsible for includes the in-use phase of PCs,

servers, cooling, fixed and mobile telephony, local area network (LAN), office telecommunications and printers."

Since 2007, computers have increased in capacity and are using more energy: the number of computers in a typical school has increased dramatically and they are no longer confined to the 'ICT suite', they are everywhere. Just about every classroom now has an interactive whiteboard and a projector; there are network printers, photocopiers, scanners, telephones and all manner of other electrical devices throughout the school.

The legitimate use of ICT is pushing up energy bills and consequential CO₂ emissions. With equipment that is already installed, there is very little that can be done about its legitimate use: for future equipment procurement decisions, energy consumption can be put nearer the top of the agenda.



A simple example might be one of the latest IP telephone systems. Two of the market leaders, Cisco and Mitel have similarly featured systems, but the Mitel handsets on average consume between 1– 3.2 Watts, approximately less than half of the energy of the Cisco handsets which in normal operation consume 5–7 Watts. A typical desktop computer can consume more than its initial cost in electricity in under a three year period so its energy consumption should be high up the agenda in the decision making process. A network colour laser printer such as an HP5500 series uses about 600 watts when active; that's half an old-style electric fire.

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Choosing more energy efficient equipment for the future will clearly be of benefit by reducing consumption moving forward but it is the area of waste reduction that can have the most immediate and dramatic effect. The

problem is that ICT tends to be left on all the time even when it's not really needed: think about your own school. Research by the computer manufacturer Dell identified that 90% of company PCs are switched on 24/7: in discussion with the service provider to a large state PFI school, the ICT manager had insisted that all the PCs and servers were left switched on at all times including throughout the whole of the summer holiday.

So, why is equipment left switched on all the time? There are many reasons, one of the most common, is a misunderstanding of the consequences, cost being one. If you took a pretty standard desktop computer and a screen, plugged it in, switched it on and left it in a corner it would use anywhere between £30 to over £100 of electricity (dependent on its age, specification and peripheral equipment) and be responsible for between a quarter to over half a tonne of CO₂ emissions¹. But why are computers left switched on all of the time, and when is it they are really needed? If we assume that the computer is needed during the school day plus half an hour either end of the day, that would be about 45 hours a week which is less than a quarter of the total number of hours in a week.

Leaving a computer on all the time is simply wasting electricity for more than three-quarters of the time and if computers are left on during the holidays, the level of waste is even worse. In addition often additional air-conditioning is running out of hours to cool the heat generated by ICT equipment which is left on unnecessarily.

There are other non-financial potential consequences of leaving computers on all the time.

- Equipment life can be significantly reduced. Although computers are electronic devices, they contain electro-mechanical elements such as hard disks and fans. All hard disks have 'mean time between failure' so leaving them working when not required brings forward the likelihood of failure;
- Risk of fire also needs to be considered: unattended computers left powered up can present a fire risk;
- Computer security, it is impossible for a computer to become compromised through the attentions of a hacker or a virus when it is switched-off;
- A further reason for ICT equipment being left on is the lack of one-to-one accountability in a school. ICT equipment is often shared and, as such, it's not an individual's computer; the consequence is that at the end of the day no-one has 'ownership' and responsibility to switch off. Even if someone such as a caretaker comes across a computer that has been left switched on, they may not sure what to do: if there are open applications and documents will they be lost if the computers is shut down? Should they therefore take the risk of switching off the computer? What is the safe way to switch the computer off? The result is that computers are just

left or the screen may be switched off; this helps but the majority of power is used by the computer itself.



- Other equipment is left switched on because it is difficult to access; often overhead projectors and ceiling mounted making them difficult to switch off. Photocopiers and large network printers tend to be in public shared areas or in a print room; in either event, they are remote from general users. The equipment that provides power to IP telephones tends to be locked away in a server room as a result all of this type of equipment tends to be left on;
- Many teachers want computers, projectors and whiteboards left on overnight to make sure that when they arrive in a classroom for a lesson, they don't spend the first ten or fifteen minutes waiting for the ICT to switch on and become ready;
- Finally, computers may be left on at the insistence of an IT manger. This is usually 'just-in-case'; just in case the IT department wants to apply patches or upgrades to the computer, just in case they want to update virus definitions, just in case they want to carry out routine maintenance tasks. In a large school or with a remote IT support team, it would be impracticable to walk around school switching computers on to perform these tasks.

There are reasons why equipment is left on out-of-hours but how can those reasons be overcome? In part it is cultural; today's teenagers live in an always-available society, 'instant' this and 'always-on' that, they have a load of gizmos and gadgets at home and at school and seem to have forgotten how to use the off button. In part, it's practical; if the IT department need computers to be left on what can you do? And it's in part education; most people don't realise that leaving three computers on out of hours is responsible for up to or over a tonne of CO₂ a year.

Help is at Hand

Today, there are technological solutions that can overcome all the issues and realise the potential CO₂ reductions and financial savings. There are now computer-based systems that control the power supply to ICT and other electrical equipment against a simple central schedule. People don't need to remember to switch equipment off, it is done automatically for them, and similarly equipment can be power up again in time for first lesson.

At the heart of these systems is the scheduling software that sits on a server. A selection of modules can then

be added to the core software to manage whichever groups of equipment you need to control. The types of equipment you can control fall into three main groups; computers, groups of equipment and isolated equipment.

- Computers are directly controlled over the network. Computers are assigned to groups such as; 'ICT Suite 2', 'Admin Office', 'Science Block' etcetera and each group can then have a schedule attached to it. The schedule will switch on the group of computers at a predetermined time on each day and off again; the on and off times can be different for each day to match the timetable. Usually, equipment will be switched on half an hour before it is needed to make sure it is ready in time. Any connected peripherals such as monitors, printers or scanners can also be powered down by an intelligent power block;
- When powering computers down you can choose between the hibernation and shut down functions. If hibernate is chosen, all open applications and documents are save to disk before powering down so that when the computer is powered up all the applications are restarted and the documents opened so the computer is in exactly the same state. Using shut down completely switches off the computer and all documents need to be re-opened manually once the computer has been restarted and the user has logged in;
- Automatic switch on and off overcomes the problems of people forgetting to switch equipment off but what about the requirements of the IT department? The scheduling software allows the IT department to wakeup computers when it needs them; this can be a regular event such as every Friday from 03:00 to 04:15 or they can be set up as an ad hoc one-off event.

Groups of equipment might include for example, an IP telephone system, or a group of equipment could also be, for example, an entire class room. These groups are controlled by a device that is added to the network that directly controls the power to the room or in the case of telephones, the main switch.

Finally, isolated equipment such as projectors, network printers or photocopiers have a special socket that is controlled by the software using a Wi-Fi signal to switch the socket on and off.

These readily available systems help overcome the main reasons for ICT and other electrical equipment being left on and significantly reduce waste. In a typical school, of around 1,000 students, the saving per annum can be around £30,000 and around 200 tonnes of CO2 just on PC equipment alone. If applied to other electrical devices throughout the school the savings may be at least doubled. The return on investment therefore can be counted in weeks and months not years.

Gary Shepherd and David Watson

Gary Shepherd and David Watson are two of the three inventors of PC Power Down. The original design was simply to shut down PCs when not in use but this has since been extended to other electrical devices ranging from water coolers and photocopiers to VOIP telephones. In addition the latest version of PC Power Down provides the ability to measure and monitor consumption which is becoming increasingly important given the current and future implications of CRC (Carbon Reduction Commitment) which came into law earlier this year. See: www.pcpowerdown.com. Contact them on 0845 148 9118 or by email at: sales@pcpowerdown.com.