

The Hidden Drain – Reducing your power consumption – A White Paper from Kyocera Mita

Introduction

Concerns about Green IT have risen dramatically in the current economic and environmental climate. Rising energy costs and consumption in electrical devices is a hot topic in the workplace. As utility prices continue to rise, energy efficiency has moved to the forefront and manufacturers have to prioritise such features when developing new products.

In 2007, Analyst Group Gartner estimated that the ICT sector accounted for more than 2% of global CO² emissions. Gartner has warned businesses to conserve power or face rapidly rising IT expenditure.

The Carbon Trust also calculates that 15% of energy used by organisations is for IT, and predicts that this will increase to 30% by 2020.

Very few organisations know how much power is consumed by their computers, printers and other peripherals. This leaves a fundamental and significant drain unmonitored and uncontrolled. Power consumption is now a major TCO (Total Cost of Ownership) issue that cannot be ignored.

Beyond the dash for virtualisation and data centres, few organisations have a strategy for reducing the power consumed by their IT systems.

With output devices, there is a clear and simple way to improve your bottom line *and* reduce your carbon footprint: switch to Kyocera.

Savings

If we simply compared the Kyocera FS-C5300DN's power consumption with its nearest rivals, the data clearly shows that Kyocera's machine uses less energy than the other devices.

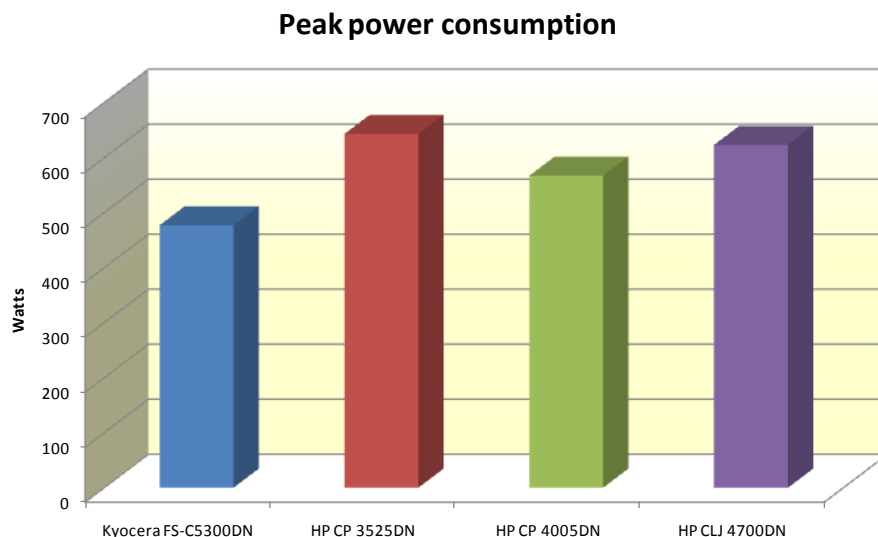


Figure 1: Peak power consumption during printing (W)



In the above calculation, Kyocera's FS-C5300DN came out most energy conscious using 477kWh. The most energy guzzling machine was the HP CP3525DN which uses 643 kWh, which is 35% more than Kyocera.

The equivalent saving in carbon dioxide (CO²) is 166 kWh, multiplied by 0.537kg of CO². This equals to nearly 90g of CO² per annum, based on the Carbon Trust's conversion factor of 0.537kg

Working this out financially, the below graph illustrates the energy consumption of one printer annually.

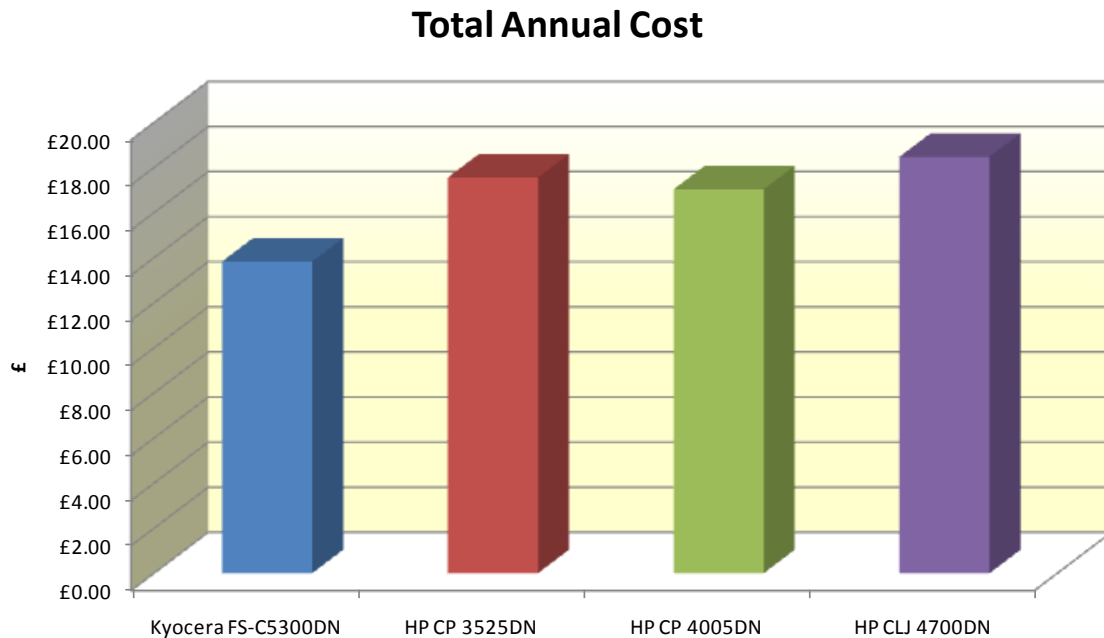


Figure 3: Total Annual Energy cost (1 printer)

One Kyocera machine will cost nearly £14 to run compared to the HPs which cost between £18 and £20 to run annually.

If you consider these prices for your entire printer fleet, using Kyocera will save a business a greater deal of money over a period of time.

If a company had 100 FS-C5300DNs in their fleet, this would cost approximately £600 cheaper annually than running 100 HPCJL4700DNs.

Environmental Concerns

The environmental impact of power consumption is always a hot topic, and in the current economic downturn, it has become an important factor for many companies.

Using The Carbon Trust's conversion factor for CO² produced by electricity generation in the UK, a Kyocera printer could reduce carbon emissions from printing by:

- Up to 34%
- 46kWH electricity **per printer per year** which is enough energy to power a lighthouse for nearly five days.
- 25kg CO² **per printer per year** which is enough to fill 33 four-drawer filing cabinets.

Total Annual CO₂ Emissions

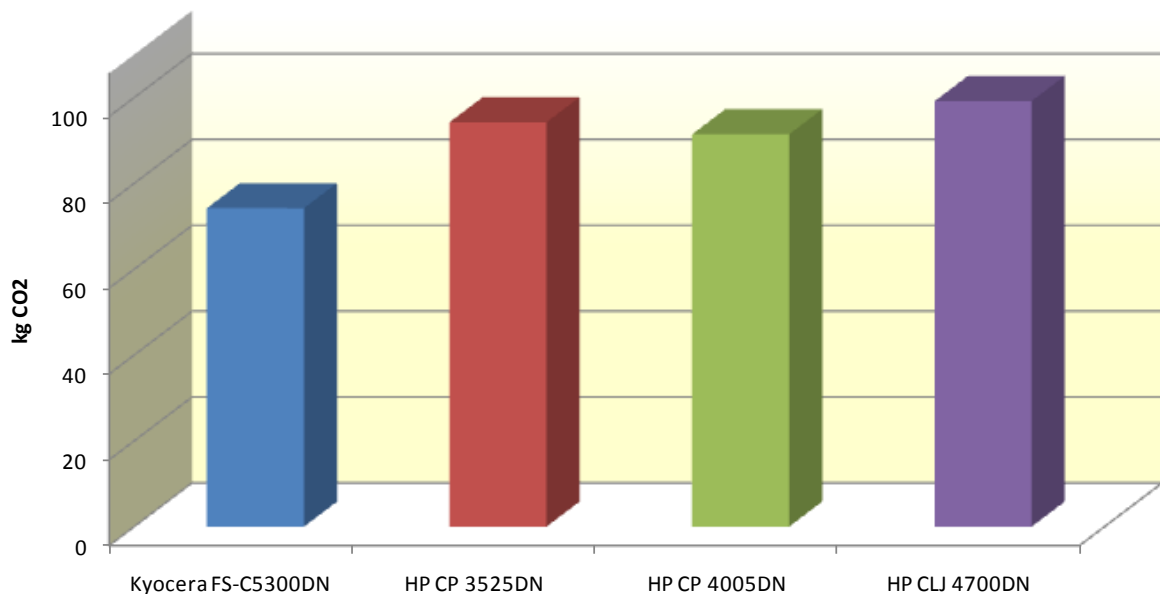


Figure 2: Total Annual CO₂ Emissions (1 printer)

Energy Star

All of Kyocera's business products are Energy Star compliant. The Energy Star products have a feature that sends them into sleep mode after a period of inactivity.

All of Kyocera's machines enter into a standby mode when not used for a pre-set period of time selected by the user. This mode can save a considerable amount of energy and reduce costs, and it is good practice to ensure it operates optimally. Manufacturers can advise on the energy use of their machines in different modes and the most energy efficient settings to use.

This standby feature can reduce a copier's annual electricity costs by over 60 percent. In addition, high speed copiers can be set to duplex as standard.

Just having one Energy Star copier can reduce an organisation's paper costs and the volume of paper sent into the waste stream. In fact, a larger machine uses less energy than many small ones and therefore staff should be encouraged to use departmental or workgroup multifunctional devices for copying, printing, faxing, scanning to e-mail or PC and for long print runs, rather than desktop devices.

It takes 10 times more energy to manufacture a piece of paper than it does to copy an image onto it. Therefore, using less paper also means decreased energy consumption. If everyone used ENERGY STAR copiers, the amount of paper used would amount to a savings of 1 million tons of paper, enough to go around the world 1400 times.

It is estimated that each UK office worker wastes, or fails to optimise the use of two thirds (67%) of the material printed out each week according to Kyocera's "Engagement with the Environment" survey carried out in 2008.

A Sleeping Machine

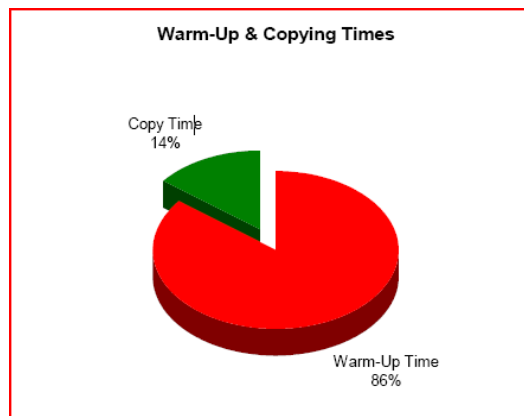
When purchasing a machine choose the most energy efficient model that meets your output requirements. Compare the printing, idle and standby electrical consumption levels.

Printers only need to be switched on in order to print. Therefore it is particularly interesting to determine how much energy a printer consumes when it is in "stand-by" mode.

Once a copier has been idle for a while it shuts down to standby mode to conserve power. Components that need to be hot to operate are allowed to cool. When the copier is turned on for use again, it takes time for these components to warm up. This takes time, sometimes up to 15 minutes, time during which the user could be standing by the copier, frustrated.

This factor has been taken into consideration more and more as businesses become more energy-conscious. Copiers will be configured to sleep sooner and sooner after copying finishes, meaning they will have to warm-up more and more frequently.

Warm-up time will assume an ever-increasing importance mainly because copiers spend most of their time in sleep mode. The following graph is taken from a recent study by Kyocera and shows how the total time required to copy a four page document is divided. The graph is based on the speed of the Oce CS180, the slowest copier to warm-up in a recent comparison.





Of the 115 seconds taken for the whole copy process, less than 17 seconds are taken actually copying; 99 seconds are taken warming the Océ up.

Copiers – like printers – are configured by their manufacturer to shutdown to sleep mode after a number of minutes of inactivity. Users can change this on Kyocera devices. The power required when a device is in ‘sleep’ mode is typically over 40 per cent lower than in ‘standby’ mode

A copier does not just consume power before it shuts down to sleep mode, it wastes it, meaning the power is not used at all.

This unused energy is costing companies money and wastes global resources that could be more profitably used elsewhere. As companies become more aware of their carbon footprint, increasing numbers of them will be looking for ways to reduce their energy bills.

Let’s take into account some typical printing scenarios where:

1. The time the printer spends printing
2. The time it takes in ‘idle mode, ready to print another document
3. The time it spends in ‘sleep’ mode, conserving energy

Projected power consumption

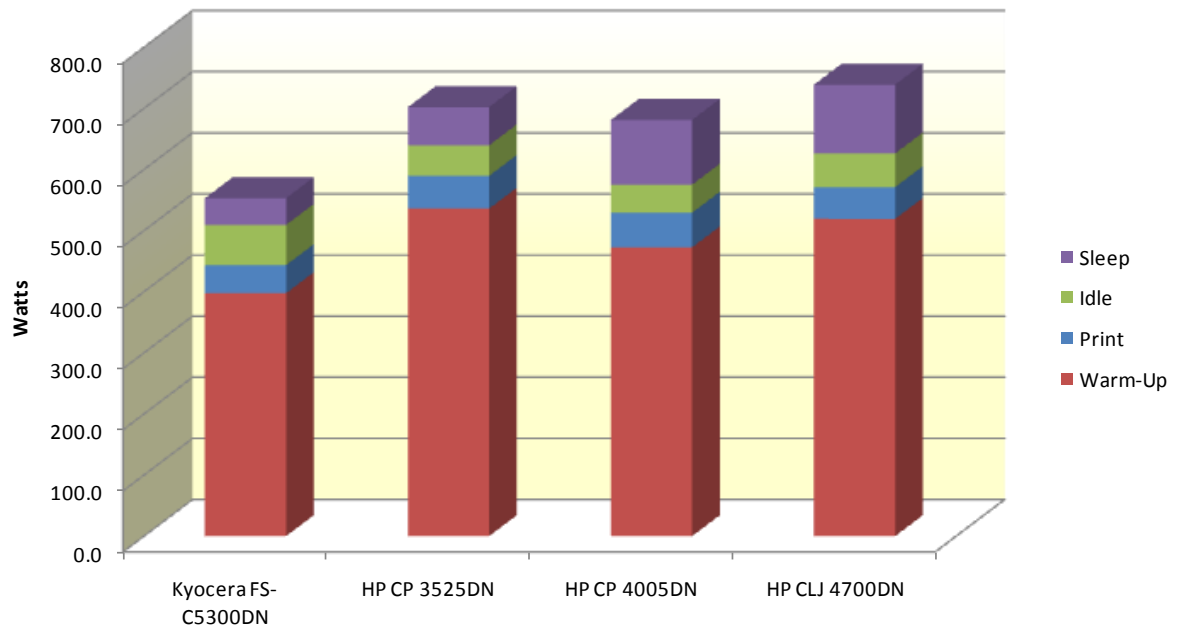
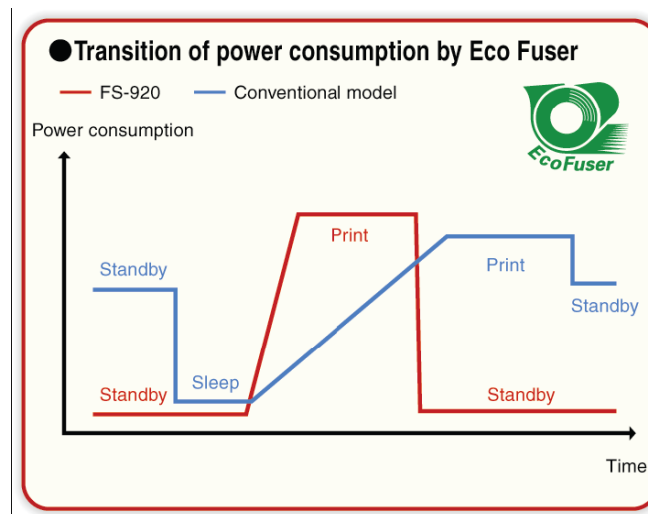


Figure 2: Total power consumption (50 3-page documents a day)

The graph above clearly shows that the Kyocera device consumes up to 34% less power than its HP rivals. The red bar shows how much power is used simply to warm up the machine, compared to the power used when it is actually printing, indicated by the blue bar.

EcoFuser

Kyocera's EcoFuser is a smaller, thinner fuser roller that heats up and cools down rapidly using less power and reducing energy consumption. The EcoFuser, developed with Kyocera's own temperature control technology, enables the machine to be ready for printing after 12 seconds from standby or 16 seconds after power on. This reduces power consumption during standby to 6W or by 45% compared with a conventional machine. Kyocera has reduced the power consumption in standby mode by 98% between 1995 and 2007.



Sustainable Design

Reducing power consumption helps reduce your organisation's carbon footprint. The cartridge-free design of Kyocera printers also makes them more environmentally sustainable than other printers on the market.

Kyocera's ECOSYS concept-based manufacturing has created 15 years of drastic reduction in both new resources and industrial waste. The revolutionary amorphous silicon drum has incredible long-life properties - typically lasting 10 times longer life than a conventional organic photoconductor (OPC) drum, because the manufacturing process requires only a single coating process of the photoconductor layer it reduces CO₂ emissions by one third.

When a Kyocera printer runs out of toner, you replace the toner cassette: just five pieces of readily-recyclable plastic. The other elements of the print engine last for up to 500,000 pages. Most competitors' printers use all-in-one print cartridges. When the toner runs out you replace

most of the print engine: over 60 parts made from numerous materials.



Considerations

Ensure the machine is set up and operated according to the manufacturer's recommendations on energy efficiency and ensure the correct settings are communicated to all users.

GENERAL

Technology: Kyocera ECOSYS, Laser

Engine speed: Max. 51/26 pages per minute A4/A3 simplex,
max. 37/17 pages (18/8 sheets) per minute A4/A3 duplex

Resolution: 1,200 dpi quality (1,800 x 600)

Time to first page: 3.5 seconds

Warm-up time: 60 seconds from power on

Duty cycle: Max. 300,000 pages per month,
max. average 30,000 pages per month

Power source: AC 220 ~ 240 V, 50/60 Hz

Power consumption: Printing: 900 W, Stand-by: 180 W,
Power-Saving (ECOpower): 4.5 W

Noise (ISO 7779): Printing: 70dB(A), Stand-by: 51dB(A),
Power-Saving (ECOpower): Immeasurably low

Dimensions (W x D x H): 599 x 646 x 615 mm

Weight: Main unit: Approx. 68 kg

Certifications: TÜV/GS, CE, PTS

This product is manufactured according to ISO 9001 quality standard and ISO 14001 environmental standard.

Information about a machine's energy consumption can be found on the datasheets supplied by vendors. These will tell you the energy consumption of the device in operation, standby and sleep modes. There has always been a tendency to focus on the energy consumption of devices when printing, but most printers tend to spend 80% of their time in either standby or sleep mode so their energy consumption in this mode is a key factor.

CONCLUSION

While the amount of energy consumed by a printer when it is operating is an important factor, printers tend to spend the majority of their time in sleep or standby mode so it's also important to establish how much energy they consume when idle to give a complete figure for energy efficiency. Printers with fast warm up times are also more efficient and convenient as less energy



is used in the powering up phase. User resistance is also reduced if the machine springs back to life quickly from sleep mode.

The IT sector has been chastened by accusations that its emissions are comparable with those of the airline sector, so manufacturers have had to work hard to reduce the impact of its products and promote them to the end user.

The Carbon Trust has stated that office equipment accounts for 15% of energy use and is expected to reach 30% by 2020.

Offices are open for only around 25% of the time. Turning these devices right off outside working hours will also save energy and money.

Customers now want to know what impact their hardware will have and what the energy costs will be. Offering products with proven sustainability gives manufacturers the edge in this environmentally conscious purchasing climate.