

# **An Inefficient Truth**

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## **Executive Summary**

December 2007

## An Inefficient Truth

Global Action Plan has over 12 years of experience helping organisations to reduce their environmental impact. Through practical involvement, we have realised that Information and Communication Technology (ICT) has a significant and growing impact on carbon emissions and climate change.

In response to this Global Action Plan has established the Environmental IT Leadership Team (EILT) – a unique advisory group consisting of major ICT users seeking to make the use of ICT more efficient. The EILT defined the research scope of *An Inefficient Truth*.

*An Inefficient Truth* illustrates the environmental impact of ICT and the energy security and supply issues associated with the huge growth within the sector. It explores the current level of understanding that ICT managers have around environmental issues and the challenges that they face internally, from vendors and from Government in introducing more carbon efficient policies. The report provides some practical examples demonstrating how a wide range of organisations are starting to make a real difference in addressing this issue.

Finally, Global Action Plan sets out a 'Call for Action' that uses the findings of the report to encourage ICT users, vendors and Government to adopt more carbon efficient policies for the future.

## The Inconvenient Truth

There are more than one billion computers on the planet <sup>(1)</sup>, and the worldwide ICT sector is responsible for around 2% of man made CO<sub>2</sub> each year – a similar figure to the global airline industry <sup>(2)</sup>. In the UK, there are an estimated 10 million office PCs <sup>(3)</sup>; and ICT equipment accounts for roughly 10% of the UK's total electricity consumption <sup>(4)</sup>.

The ICT sector is growing at a faster rate than the aviation industry. In 2006, 48% more data storage capacity was sold than in the previous year <sup>(5)</sup>, compared to a 3% increase in UK air travel passengers in the same period <sup>(6)</sup>. The impact of the sector is starkly illustrated through the following statistics.

- A medium-sized server has a similar carbon footprint to an SUV achieving 15 miles to the gallon <sup>(7)</sup>. Servers also require as much energy to cool them as they directly consume <sup>(8)</sup>.
- 1,000 PCs left on 24/7 without any power save settings activated will consume up to £70,000 of electricity per year <sup>(9)</sup> and for every unit of electricity consumed, around another half unit is required to dissipate the heat generated <sup>(10)</sup>.
- If 20% of European business travel was replaced by teleconferencing, around 25 million tonnes of CO<sub>2</sub> could be saved each year <sup>(11)</sup>.
- In 1980 before the introduction of the PC, world office paper consumption averaged 70 million tonnes a year – by 1997 it had more than doubled to almost 150 million tonnes <sup>(12)</sup>.
- In the UK, 120 billion pieces of paper are printed every year <sup>(13)</sup>, the manufacture of which emits 1.5 million tonnes of CO<sub>2</sub> before taking into account the impact of the manufacture of printing equipment and ink and the energy consumed by printers <sup>(14)</sup>.
- Each year 125 million computers are taken out of circulation worldwide <sup>(15)</sup> and most of these end up in landfill sites (a problem addressed by the introduction of the European WEEE directive in 2007).
- Manufacturing one PC requires 1.7 tonnes of raw materials and water and consumes over 10 times its own weight in fossil fuels <sup>(16)</sup>.

Using energy costs money so tackling the carbon footprint of ICT is simply good business practice.

- (1) Richard Barrington, head of Public Policy for Sun UK and Ireland and UK government advisor
- (2) Gartner, 2007 Press Release
- (3) The PC Energy Report – A Report by the National Energy Foundation and 1E
- (4) Richard Barrington, head of Public Policy for Sun UK and Ireland and UK government advisor
- (5) IDC Worldwide Quarterly Disk Storage Tracker, March 2007
- (6) Civil Aviation Authority, News, March 2007
- (7) www.carbonneutral.com
- (8) Rakesh Kumar, Gartner Analyst, September 2006
- (9) Global Action Plan 2007
- (10) Roth et al 2002
- (11) European Telecommunications Network Operators Association (ETNO) and the World Wildlife Fund
- (12) UK Wastewatch
- (13) Research for Fujitsu Siemens Computers
- (14) Global Action Plan Calculation from DEFRA's waste strategy 2007
- (15) PC World November 2007
- (16) Professors Rudiger Kuerh and Eric Williams, United Nations University in Tokyo



# The Inescapable Truth

Having established this inconvenient truth, Global Action Plan conducted an on-line survey of ICT managers in conjunction with IDG's CIO and ComputerworldUK publications. This survey gauged ICT departments':

- awareness of the environmental impact of their systems and equipment;
- level of involvement in organisational sustainability initiatives;
- access to support to aid implementation of 'Green IT' solutions;
- data storage and capacity trends.

120 surveys were analysed, representing organisations employing over 0.5 million employees and with a combined ICT spend in excess of £475 million. The survey revealed the following key points.

## Awareness of how ICT links to the environment

Almost all ICT professionals were aware that their department has an impact on the environment, with more than half believing that the impact is significant. The majority also believe that environmental considerations will be important in their ICT purchasing decisions over the next two years.

Despite these beliefs, 86% of ICT professionals do not know the carbon footprint of their department's activities. More than half of the ICT departments surveyed do not see their organisation's energy bills and two-thirds do not pay their share of the energy bills.

Purchasing practices are not in line with the level of environmental awareness. Less than 10% of professionals have purchased products purely on the basis of their environmental benefits, and more than a third never consider environmental impacts when purchasing new products.

# Do ICT departments pay for the energy consumed by ICT equipment?



No and they don't see the bills	56%
No but they do see the bills	12%
Yes but only for specific functions such as the data centre	7%
Yes as the energy bill is shared out equally among departments	5%
Yes	20%





## ICT's involvement in sustainability strategies

Most ICT departments are not integral to their organisation's social responsibility strategy. Around half of respondents are involved in some way, but nearly a quarter are not involved at all. Furthermore, nearly half have never been asked to focus on energy efficiency as a part of an organisation-wide initiative and 94% of organisations do not incentivise the ICT department to act in an environmentally friendly way.

ICT departments showed a willingness to become involved in sustainability strategies, but they appear to be an under-used valuable asset when it comes to improving organisational energy efficiency.

## ICT capacity and 'Green IT' implementation

Data storage is confused and inefficient. Only 40% of ICT departments are using more than half of their available server storage space, and only a fifth of organisations have a good working policy on data retention.

Simultaneously, more than two thirds of the departments have already filled over 75% of the physical floor space of their data centre and 61% expect to reach storage capacity within 24 months.

ICT professionals cited time pressures and cost as the biggest obstacles to the implementation of new 'Green IT' technologies. Other significant barriers are the scarcity of information and a lack of knowledge within organisations. Only 1% of professionals considered vendor environmental information to be excellent whilst 60% said it was poor or confusing.

The introduction of recognised industry standards and targeted ICT tax allowances were rated as the most important incentives to encourage the take up of 'Green IT'.

## The Unavoidable Truth

The survey results illustrate that overall ICT managers and organisations have been slow to respond to the environmental impact of their activities. There are many areas where ICT departments can quickly and significantly reduce their carbon emissions. Some organisations are already leading by example.

### Case study 1:

Greater energy efficiency through server virtualisation

**Organisation:** John Lewis Partnership (JLP)

**Service / product provider:** Intel Server Virtualisation

After an initial pilot of 20 virtual servers, JLP has rapidly increased to an estate of nearly 150 virtual servers. In 2008 more than half of JLP's computing power will be virtualised. This project has saved over £100,000 in new server purchases, 120 units of rack space, 1.5 tonnes in weight of equipment, numerous network and SAN connections, £8,000 in consumed power over five months, additional air conditioning costs and 250 tonnes of CO<sub>2</sub> annually.

### Case study 2:

Thin client implementation and the virtual desktop

**Organisation:** Reed Managed Services

**Service / product provider:** Wyse Technology

Reed replaced all of its 4,500 PCs with thin clients. To maximise their investment, they also introduced blade servers and server virtualisation technology in the data centre, and decommissioned servers in remote offices.

In one year, Reed has reduced energy consumption by 5.4 million kWh, cut CO<sub>2</sub> emissions by 2,800 tonnes a year, halved the number of storage drives, reduced the number of servers by a factor of 20, and cut the annual IT budget by a fifth.

### Case study 3:

Power Management Software

**Organisations:** Peterborough City Council and Irwin Mitchell

**Service / product provider:** NightWatchman® by 1E and Surveyor® by Verdiem.

Power management software automatically reduces energy being wasted by equipment when switched on but left idle.

By introducing NightWatchman® software, Peterborough City Council has saved £50,000 per annum on electricity and 250 tonnes of CO<sub>2</sub> – making a return on investment in under three months.

By introducing Surveyor® software, Irwin Mitchell reduced PC energy consumption by 34%, which equates to around 107 tonnes of CO<sub>2</sub> per year.

### Case study 4:

Communications without travel

**Organisation:** Pearson plc

**Service / product provider:** Teliris VirtuaLive®

Through the utilisation of telepresence technology, Pearson has reduced time wasted by senior executives when travelling, improved the speed and flexibility of their decision-making and enhanced the work/life balance for employees through reduced travel.

Pearson has also significantly reduced transport costs and avoided 800 tonnes of CO<sub>2</sub> emissions worth of air travel.

### Case study 5:

Energy efficiency through behaviour change

**Organisations:** Construction Skills and Britannia Building Society

**Service / product provider:** Global Action Plan

Behaviour change achieved through empowering staff and using innovative and fun communications helped Construction Skills reduce PC and monitor energy waste by 58%.

Britannia Building Society has a complex ICT system, reflecting the 250+ branches in the UK. Through branch staff manually switching off printers and photocopiers an estimated 222 tonnes of CO<sub>2</sub> and £34,000 will be saved annually.





## The Future Truth

The illustrated case studies are a welcome step in the right direction towards a more efficient ICT sector. More profound and rapid change is required to achieve the cuts in carbon dioxide scientists tell us are necessary to avoid runaway climate change.

Practical action is required from all stakeholders to achieve the level of change required. Based upon the findings of *An Inefficient Truth*, Global Action Plan has issued the following call for action.

### Central Government

Central Government must create a scenario in which ICT departments are incentivised and guided to implement 'Green IT'. New legislation will be required to encourage ICT vendors and users to be more energy efficient. Equally, the government must be careful not to introduce legislation that will unnecessarily increase the data storage burden. As stated by the Corporate Leaders Group on Climate Change:

“ We need a strong policy framework that creates a long-term value for carbon-emission reductions and consistently supports the development of new technologies.”<sup>(17)</sup>

Central Government must create a more robust response to the energy supply and security challenges facing the UK. The growth of organisations is being restricted by lack of energy supply and some organisations are starting to move their data centres overseas to address supply problems in the UK. These energy demands must be met by lower carbon energy supplies.

<sup>(17)</sup> <http://management.silicon.com>, Climate change is costing us money, says BT

## Vendors

Vendors must improve the transparency, accuracy and quality of the environmental information that they are providing to users. The wave of green froth coming from vendors must be replaced by recognised industry standards. This was rated by users as one of the two most important incentives to encourage the take up of 'Green IT'.

## User Organisations

Organisations must ensure that ICT departments are integral to their sustainability strategies. Used creatively and efficiently, ICT could significantly help organisations to reduce their environmental impact, for example through the increased use of technology to reduce the need to travel.

Structures should be set up to make ICT departments more accountable for their energy costs. This will encourage ICT managers to place greater emphasis on energy efficiency, better cooling systems, increased server utilisation and environmentally conscious purchasing decisions.

ICT departments need to up their game regarding the quality of their environmental communication to employees. Significant savings can be achieved through simple changes of behaviour within the workplace and ICT departments are well placed to encourage these changes.

**The full report is available at:**  
**[www.globalactionplan.org.uk](http://www.globalactionplan.org.uk)**

**This report has been created by**



## The Practical Environmental Charity

Supported by



Global Action Plan is thankful to the Environmental IT Leadership Team for supporting and providing their expert opinion in the research of this report.

We are grateful to the following organisations for releasing information on their environmental improvement work:

Britannia Building Society, Construction Skills, Irwin Mitchell, John Lewis Partnership, Pearson plc, Peterborough City Council, Reed Managed Services.

We are also thankful to the following organisations for their input:

1E, Broad Group, Panduit, United Access, Very PC, VSR2, Wyse Technology,





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Charity Number - 1026148

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