AUSTRALIAN COMPUTER SOCIETY

POLICY STATEMENT

on

Green ICT

ICT Professionals Shaping Our Future

www.acs.org.au

August 2007

Table of Contents

SUMMARY OF ACS POSITION

The ACS has undertaken an emissions audit on the amount of carbon dioxide being generated by ICT usage by Australian Businesses. The results of the audit indicate that ICT use by Australian Businesses generated 7.94Mt of carbon dioxide in 2005, **equivalent to 1.52% of total national carbon dioxide emissions**.

To put this figure in perspective road transport accounts for 12.6%, industrial processes 5.3%, metal production (mostly iron and steel) around 2.3%, the cement industry around 1% and civil aviation just under 1% of total national carbon emissions.

The ACS believes that leveraging technological solutions will be the key to reducing our domestic and commercial carbon dioxide emissions. To gain maximum benefits from this Australian ICT professionals and businesses must be part of the vanguard – we must be leaders and not followers.

As well as designing ICT equipment and technologies that are more resource efficient, the innovative development of power and other resource use algorithms and programs for commercial and domestic application is a key area where ICT professionals can constructively contribute to reducing energy use and achieve significant cost savings for commercial operations and domestic consumers.

To help ICT professionals in this area, the ACS has implemented a **Green ICT Special Interest Group** for its members and other ICT professionals interested in discussing and being part of the solution to the climate change issue. It will provide a forum for sharing information and keeping up to date on this vital matter.

In addition, the ACS is calling on the Government to extend the Energy Rating System, run as a joint initiative by the Federal, State and Territory Governments, to cover domestic and commercial ICT equipment to assist ICT professionals and consumers in making more energy efficient choices.

The ACS recommends the following initiatives to help ICT professionals reduce carbon dioxide emissions from ICT equipment:

- Develop a green ICT policy outlining initiatives to reduce the organisations carbon footprint and guidelines on the safe disposal of old technology;

- Leverage innovative technologies to reduce power consumption and lower carbon dioxide emissions;

- Disable screen savers and implement ‘sleep mode’ for periods of inactivity for ICT equipment;

- Purchase emissions offset programs to help offset the emissions being produced by ICT equipment used in the office. For a typical Australian ICT SME comprising 5 to 20 employees, this would cost between $144 to $576 per annum.

- Look at replacing PBX or KTS equipment with soft phone clients on computer workstations. Look at combining the communications server onto existing servers using virtualisation technology;

- Examine the feasibility of using virtualisation technology to significant reduce the number of servers in use;

- Implement desktop virtualisation using ultra-small, secure clients on the desktop and linking the thin clients to their own virtual desktop machines residing on servers. With desktop environment consolidated within the data centre, firms can deliver secure, isolated desktops that consume less energy.

INTRODUCTION

Climate change associated with green house gas emissions is one of the most pressing public policy issues in Australia today. Individuals and companies are looking for ways in which they can contribute to the debate and initiatives they can put into place to make a positive contribution to reducing carbon dioxide emissions.

The ICT sector and ICT professionals are becoming increasingly concerned about energy consumption and subsequent carbon dioxide emissions from commercial ICT equipment.

This policy looks at quantifying the extent of emissions from business ICT applications in Australia and recommends practical initiatives for ICT professionals and government to help reduce the emissions impact form ICTs.

BACKGROUND

ICT is becoming increasingly ubiquitous in our work and home lives and as our reliance on technology grows, so too does our demand for energy and consequent level of carbon dioxide emissions.

While there has been considerable speculation on the extent of carbon dioxide emissions from our increasing use and reliance on ICT, there is little hard evidence quantifying the actual level of carbon dioxide emissions generated from ICT use in Australia.

Quantification of the level of carbon dioxide emissions from commercial ICT usage is necessary if we are going to create an effective program to address this issue. Aside from providing an indication of the extent of any problem, it will also provide a base line against which specific measures can be monitored and reviewed.

The Australian National Green House Office measures and monitors Australia's total carbon dioxide and other green house gas emissions and provides a breakdown by industry sector. The ubiquity of ICT use across all of Australia's industry sectors means that measurement of ICT related emissions is captured as part of this sectoral data, although it is not specifically reported.

To remedy this situation the ACS commissioned the Ethan Group to develop a model to estimate the total carbon dioxide emissions attributable to ICT usage by Australian businesses.

ICT EMISSIONS AUDIT

The Ethan Group conducted an emissions audit using a model based on the demographics of Australian businesses across all business sectors, use of ICT within those business sectors and the level of power consumption resulting from that ICT usage.

Modeling business use of ICT requires assumptions based on the type and size of businesses and clearly, the level of ICT use varies substantially across differing types of business and industry sector.

Industry divisions based on the current ANZSIC classification were used for the audit and within each industry division, business were classified into micro, small, medium, large or corporate based on the number of employees.

Data from ABS8165.0 was used to determine the total number of Australian businesses, including entries and exits between June 2003 to June 2006, their distribution and size.

Since the use of ICT will vary significantly with the type of business, the model also captures the level of ICT penetration based on industry sector and business size.

Power consumption estimates for each business were based on the size and type of business and estimate of indicative type of ICT equipment – desktop/workstation, servers, LAN configuration, telephone handset numbers etc.

The total estimated power consumption from ICT use by Australian businesses was then calculated from the estimated total power use and the estimated amount of carbon dioxide produced in the generation of that power, adjusted for losses in the power transmission and distribution networks (approx 6%) based on the NSW Government Emissions Coefficient of 0.941.

Details of the ICT emissions audit model can be found in the “Audit of Carbon Emissions resulting from ICT Usage by Australian Businesses” prepared by the Ethan Group and available from the ACS web site www.acs.org.au.

The audit found use of ICT by Australian Businesses generated 7.94 Mt of carbon dioxide in 2005, equivalent to 1.52% of total national carbon dioxide emissions, a small but significant amount.

COMPARISON OF EMISSIONS

There is very little publicly available data available of similar granularity to the ACS ICT emissions audit. Most Federal Government data is prepared by economic sector or high level energy sectors. However, for comparison road transport produces 12.6%, industrial processes 5.3%, metal production (mostly iron and steel) around 2.3%, the cement industry around 1% and civil aviation at around 0.97% of total national carbon emissions.

WHAT CAN BE DONE

ICT professionals and the ICT sector have an important role to play in improving energy efficiency to reduce carbon dioxide emissions through the deployment of new and innovative ICT developments.

ICT based innovations are going to be a key factor in reducing emissions and increasing Australia's international competitiveness. Australia's innovative ICT solutions development capability positions our ICT sector to be at the vanguard in developing solutions to this problem.

Finding solutions to improving energy efficiency and reducing emissions will generate global opportunities for Australian ICT professionals and ICT businesses. It also represents a challenge for our governments to ensure we have the necessary infrastructure and regulatory regime in place to allow our ICT sector to take advantage of these opportunities.

What's more, the ACS believes that demonstrating 'green credentials' will provide businesses with a competitive advantage in attracting and retaining staff as the impacts of climate change become more apparent and the people make informed choices on the basis on their employers commitment to reducing carbon dioxide production.

As a start, businesses can develop their own ICT emissions policies to demonstrate a commitment to reducing their carbon footprints. Issues to consider in developing a green policy are listed below.

Green ICT Group

To assist ICT professionals in being part of the solution of reducing emissions associated with ICT use, the ACS has established a Green ICT Special Interest Group (SIG) for its members and others interested in being part of the solution to the climate change issue.

The ACS Green ICT SIG will provide an online forum for ICT professionals to seek information, exchange views and share experiences on projects and

innovations they have put into place to improve efficiency and reduce power consumption.

Optimisation of Resource Use

An area where ICT professionals can have a significant impact is in developing solutions to optimise resource use for both commercial and domestic application.

For example, developing optimisation and automation programs that will allow commercial and domestic users to see the power being consumed by each appliance and that will allow non essential functions to be performed outside of peak power consumptions periods. This will not only help reduce the loading on the power grid during peak periods but will achieve considerable power savings by performing tasks during off peak periods.

Similar programs could also be developed to help optimise other resource usage in commercial and domestic situations; for example optimisation of water use which aside from saving water, also saves on energy use.

The ACS believes that innovation in developing automated programs to optimise the use of valuable resources is an important area where Australian ICT professionals can make a real difference and achieve global recognition and success whilst doing so.

Workstations

Desktop workstations contribute a significant proportion of the overall ICT associated carbon dioxide emissions. Upgrading is usually the driver for new equipment, however power use reduction usually doesn't occur with the deployment of newer equipment.

However, new operating systems do allow for computers to be put into hibernation either on a schedule or after periods of inactivity. Ensuring workstations are put into sleep mode during periods of inactivity, even for relatively brief periods, is a means by which CIOs and others in charge of company desktops can drastically reduce power consumption.

Disabling screen savers and using activation of sleep mode should also be considered as part of the emissions reduction program.

Recent media reports indicate that many of Australia's large companies, which can have tens of thousands of desktop personal computers or notebooks, are actively saving substantial electricity costs by decommissioning screen savers and implementing sleep mode for periods of inactivity.

Offset Programs

Carbon offset programs provide an excellent means by which companies can act to offset their ICT carbon emissions.

The ICT carbon footprint per small business employee is approximately 1.74 t of carbon dioxide per annum. The retail cost to offset this equates to:

- $144 per annum for a 5 employee business;
- $288 per annum for a 10 employee business; and
- $576 per annum for a 20 employee business.

Server Virtualisation

Recent software developments in virtualization technology present an opportunity to significantly reduce the number of servers. It is not uncommon for organisations to operate individual applications on separate servers. This is often driven by the need for operational isolation or because of different operating systems being required for different applications.

Using high performance computers running virtualization software, different applications (each with their own operating system) can be run on one or two servers, significantly reducing power consumption. While a typical server in the year 2000 consumed around 100W of power, the average server today consumes at least 4 times as much.

Combined with rising energy costs and increasing server density, the growth of data centre energy consumption and subsequent costs can outpace the rate of growth of the ICT budget for many firms, leaving less for vital ICT initiatives and projects.

Each server removed represents a saving of around 3.35t on carbon dioxide emissions per annum.

Desktop Virtualisation

Taking the server virtualisation further by using ultra-small, secure thin clients on the desktop, linking the thin clients to their own virtual desktop machines residing on servers. With desktop environments consolidated within the data centre, firms can deliver secure, isolated desktops that consume less energy. Each thin client is centrally managed and accessible form anywhere on the network. This allows firms to:

- reduce PC maintenance costs;
- increase security;
- deploy full PC desktops on centralised servers;
- set up workgroups and entire department quickly;
- reduce energy requirements of running desktop environments.

Integrated Telephony

Innovation in IP based telephony solutions is going to present opportunities to replace traditional telephone equipment that will generate savings in power usage and call costs.

It is important to note however that replacement of PBX or KTS equipment with VoIP can actually increase power consumption because stand alone IP phones draw between 5 to 7W of power whereas traditional digital or analog handsets use only 1 to 2W when in use.

The major opportunity for reductions through the use of IP telephony is when the stand alone handset is replaced by a soft phone client on the computer workstation. Indeed, if the communications server is combined onto existing servers using virtualisation technology, then the power consumption of the entire phone system can be effectively reduced to zero.

Automated Power Control

Power saving functions for equipment in offices are not always used by staff because of inconvenience in waiting for equipment to return to an operational state.

Advanced control systems are now available to remotely ensure equipment is put into sleep function and then woken up to ensure it is available when required can minimise power usage and reduce emissions.

ENERGY RATING SYSTEM

The energy rating system is a joint initiative of the federal, state and territory governments and incorporates the familiar energy rating label system that allows consumers to compare the energy consumption of domestic appliances.

The energy rating system has proved very successful and is an instantly recognised label that is mandatory for fridges, washing machines, air conditioners, dryers and dish washers.

The ACS believes the energy rating system should be extended to cover all domestic and commercial ICT equipment.

This would greatly assist ICT professionals in making energy efficient choices for their firms resulting in considerable cost savings and emissions reduction. It would also assist those setting up home offices and people buying ICT appliances for the home in making better energy saving choices, providing a practical and effective way for people to have an impact on reducing carbon dioxide emissions.

It also represents a practical means by which manufacturers of ICT products and components can assist their clients and purchasers of their products in going green.

CONCLUSION

ICT and ICT professionals are shaping the future of Australian business, underpinning the productivity gains of all sectors of our economy. There is virtually no product or service that does not depend on ICT in some way for its development, production, commercialisation or distribution.

Our reliance on ICT comes with a price – an increasing demand for power and its consequent generation of carbon dioxide emissions.

However, while our reliance on ICT is generating green house gases, technology is also very much part of the solution – the tool to help reduce emissions, not only within the ICT sector, but for all other sectors of the economy that rely on it and for domestic consumers as well.

Innovation in ICT and advances in technology are streamlining processes, creating more energy efficient equipment, facilitating consolidation and sharing of networks and improving business models. It can also help domestic consumers reduce their energy consumption and costs.

Environmental considerations are set to become an integral part of the professional conduct, practice and ethical considerations that ICT professionals will bring to their organisations.

The ACS encourages ICT professionals to adopt the measures outlined in this policy and for the Australian ICT sector to capitalise on the rapidly expanding global market for ICT based solutions to the climate change issues.