



Ministry for the
Environment
Manatū Mō Te Taiao

Information and Communication Technology (ICT) Equipment Good Practice Guidelines for Environmental Sustainability

Review of current practice in Govt³ agencies

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Executive Summary

In January 2007 the Ministry for the Environment commissioned a survey of the 48 central government agencies. The survey focused on their existing practices for procuring and disposing of information and communication (ICT) equipment.

The aim of the survey was to establish a benchmark for current practices and to identify examples of good practice. The results revealed a strong willingness by government agencies to improve their current practice and a need for clearer guidance. In response, the Ministry for the Environment has created good practice guidelines on the environmentally sound management of ICT equipment, which should prove useful for all types of organisations, including business.

The survey highlighted many examples of good practice already occurring, such as desktop printers being replaced with more centralised multi-function devices. Multi-function devices have good power management tools, and duplex printing (double-sided) can be set as a default. This helps to reduce paper and energy consumption and wastage.

Currently, 99 per cent of computer equipment is being disposed of responsibly by government agencies. The first choice of an agency is to extend the life of the equipment through various reuse options, such as resale or auction, or donation to a community group. Mobile phone disposal appears to be presenting more of a challenge, which shows a need for clearer promotion and information on the take-back and recycling schemes operated by Telecom and Vodafone.

Despite the good progress made to date the survey also shows there is room for improvement, which is understandable given that adopting sustainable practices is a recent development. As with every organisation that implements sustainable principles, government agencies are “learning by doing”.

In this they are supported by a number of environmental initiatives that were outlined by the Prime Minister in February 2007 aimed at accelerating New Zealand’s sustainable development. In particular, the Ministry of Economic Development, with support from the Ministry for the Environment, will be producing a toolkit for the sustainable procurement of ICT equipment. Since the survey, government agencies have already acted to introduce environmental improvements to ICT purchase, use and disposal. The Ministry is expecting to see dramatic progress in this area.

1 Introduction

There is a growing concern, both within New Zealand and internationally, about the environmental and health problems associated with waste electronic and electrical equipment (WEEE). Computer monitors, components and circuit boards contain highly toxic substances such as lead, beryllium, mercury, cadmium and brominated-flame retardants. Redundant desktop computers and their peripherals, especially cathode ray tube (CRT) monitors and television sets (TVs), are of major concern due to the significant amounts of lead they contain.

There has been a rapid growth in the number of computers and other electronic equipment during the last 10 to 15 years. Much of this equipment is now reaching the end of its life and is being disposed of in landfills in the absence of any other more environmentally sound methods. Landfilling is not a sustainable solution, however, not just because of the potential risk from the hazardous substances, but also due to the loss of valuable resources. The prudent course of action is to reduce landfilling and increase reuse and recycling, even if it does not affect today's generation.

The Government, through the Ministry for the Environment, is working with electronic equipment suppliers to find a long-term sustainable solution. In the meantime, government agencies and other organisations can contribute to environmental sustainability by modifying their practices when buying, using and disposing of ICT equipment.

This survey summarises current practices in 48 Government public sector organisations in New Zealand. The results of this survey have been used, along with information from a number of overseas organisations (including major suppliers of ICT equipment and services), to develop good practice guidelines for New Zealand organisations. These guidelines have been published separately.

2 Methodology

All 48 agencies (see Appendix 1) were asked to complete a survey to ascertain the volumes of ICT equipment being acquired and disposed of. In addition, the person responsible for ICT procurement and disposal was interviewed to identify current practices. Forty-two agencies completed the survey, and all 48 agencies participated in the face-to-face interview. The results are summarised in this report. Individual detailed reports have also been prepared for each agency.

The survey questionnaire is reproduced in Appendix 2.

3 Equipment volume

3.1 Total quantity of ICT equipment

The survey revealed that there were approximately 65,000 computers (desktops, servers, laptops) in use in Govt³ agencies as at 31 December 2006. Of these, 5 per cent were leased and 95 per cent were owned. Aggregated details for the 42 agencies that responded to the survey are shown in Figure 1 and Table 1.

Figure 1: Total quantity of ICT equipment in use as at 31 December 2006

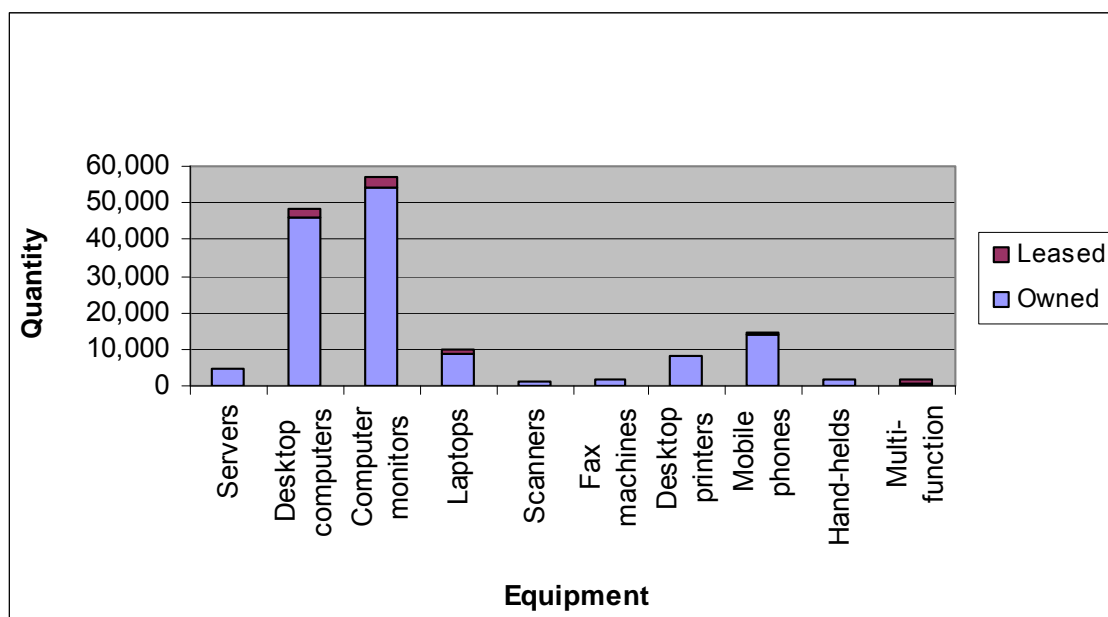


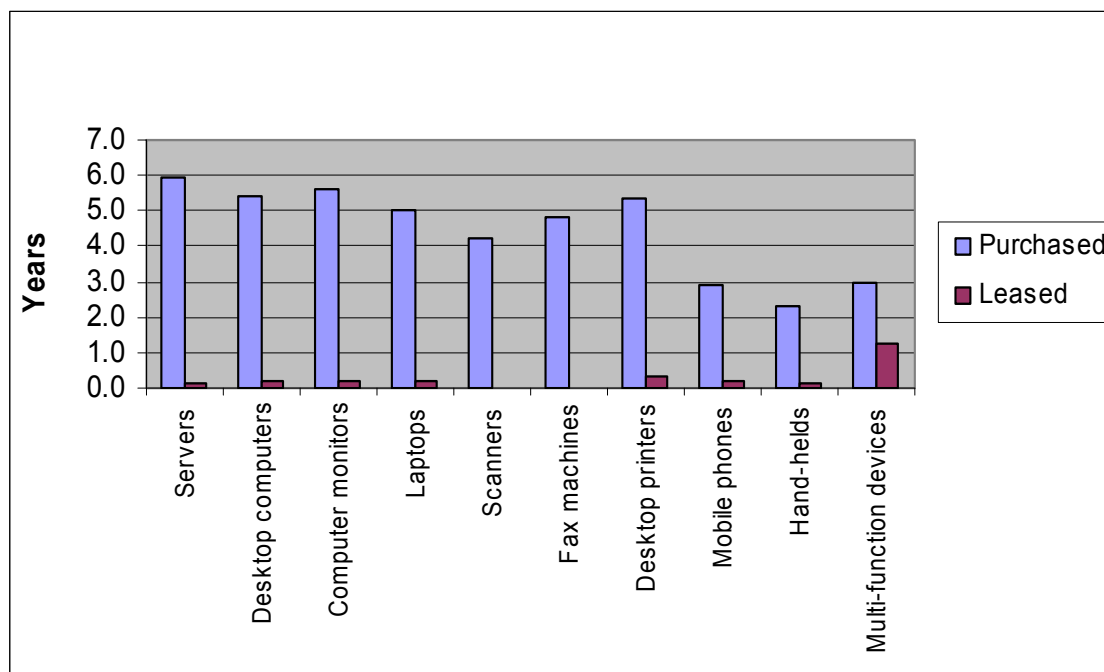
Table 1: Total quantity of ICT equipment in use as at 31 December 2006

Equipment	Owned	Leased
Servers	4,875	7
Desktop computers	46,007	2,153
Computer monitors	54,068	3,005
Laptops	8,964	896
Scanners	927	1
Fax machines	1,609	8
Desktop printers	8,029	375
Mobile phones	13,716	700
Hand-helds	1,467	0
Multi-function devices	671	1,296

3.2 Equipment replacement

The average replacement rate of equipment is three to four years. This means that the Govt³ agencies are replacing at least 15,000 computers each year. The average age of ICT equipment when replaced, for each equipment type, is summarised in Figure 2.

Figure 2: Average age of equipment when replaced



3.3 Timeframes for equipment tenders

Table 2 indicates the timeframes within which agencies expect to be calling tenders for replacement equipment.

Table 2: Timings for equipment tenders

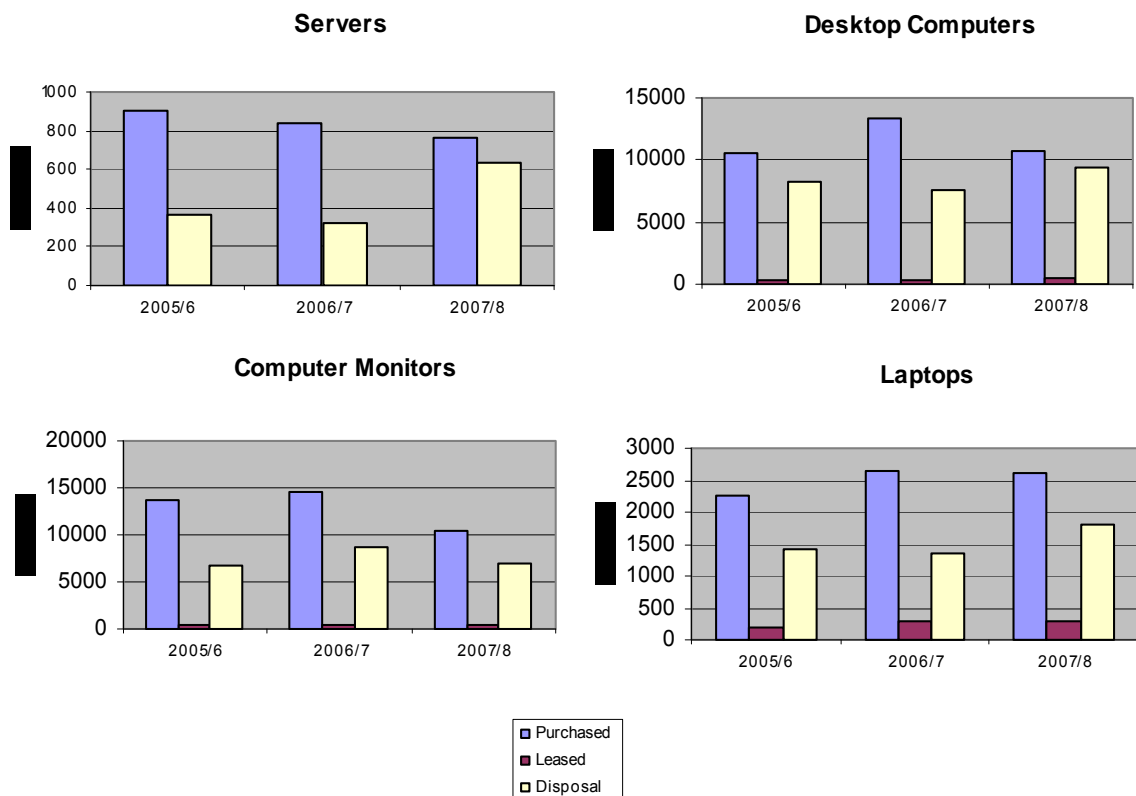
ICT item	No. of agencies calling for tenders		
	January–June 2007	July–December 2007	January–June 2008
Servers	20	20	19
Desktop computers	20	26	19
Computer monitors	22	24	17
Laptops	21	23	17
Scanners	11	8	8
Fax machines	8	8	6
Desktop printers	12	12	11
Mobile phones	21	20	18
Hand-helds	13	9	11
Multi-function devices	5	12	9

4 Equipment acquisition and disposal

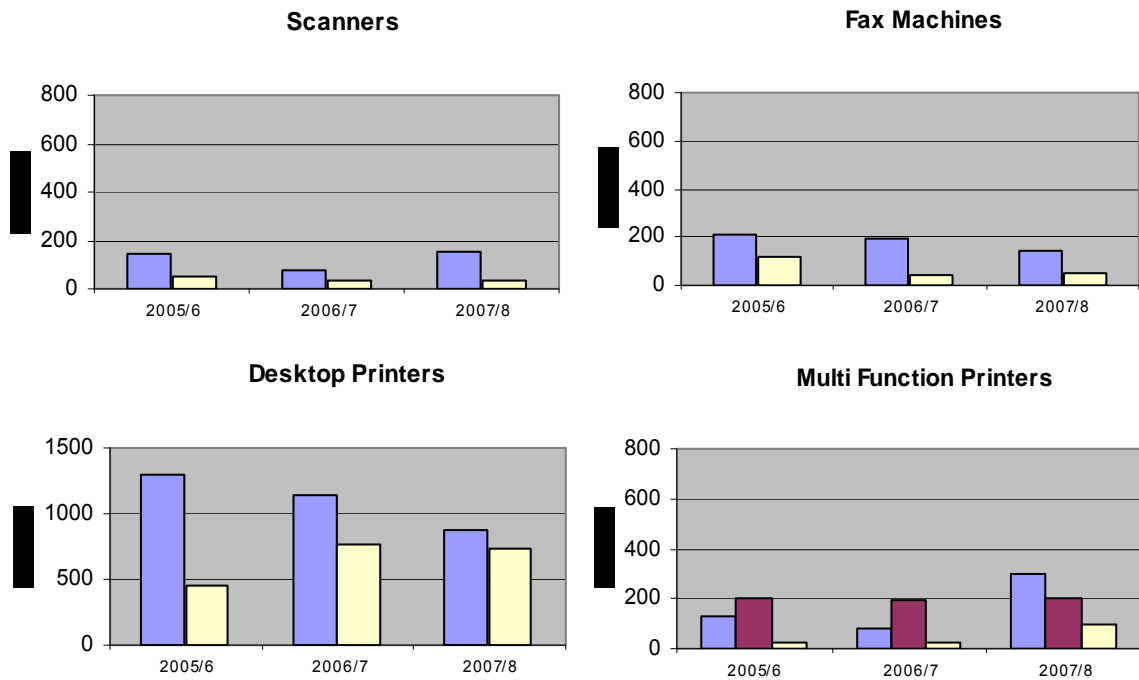
The survey asked agencies to provide the quantities of equipment recently acquired and disposed of. The aggregated results are summarised in Figure 3.

Figure 3: Equipment acquisition and disposal

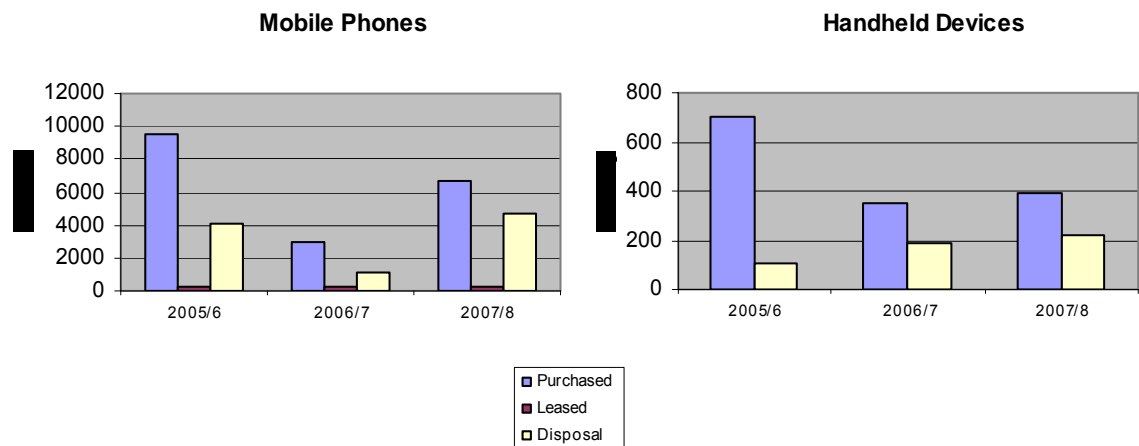
(a) Computer equipment



(b) Peripheral equipment



(c) Mobile phones and hand-helds



5 Procurement

The survey revealed that little or no consideration has been given to sustainability issues in government ICT procurement contracts. Some agencies have started to specify energy efficiency, such as compliance with the Energy Star label, but many simply trust their suppliers to be environmentally responsible. Few specify equipment “take-back” in procurement contracts, although many expect this service when new equipment is installed. In recent years most agencies have adopted an aggressive replacement programme for CRT monitors, with some already having fully migrated to liquid crystal displays (LCDs).¹ Within the next 12–24 months it is expected that the remaining CRTs will have been replaced.

Desktop printers are steadily being replaced with more centralised multi-function devices (MFDs), typically one per floor in the larger offices. Although there is some resistance from users in terms of reduced printing convenience, the benefits of reduced costs for printing, maintenance and management mean this trend is likely to continue. In addition, most MFDs are effectively leased from suppliers, who charge a per-page price that covers all printing and maintenance costs (as well as equipment replacement when necessary).

Despite the general absence of sustainability issues in current ICT contracts, all agencies are willing to incorporate clauses into future tender documents and supply contracts, and are seeking guidance on what is most appropriate.

Under the Government’s sustainability work programme, it is expected that government agencies will give more weighting to sustainability issues when evaluating competitive bids, given the “total cost of ownership” and “value for money” requirements of the procurement statement of good practice issued by the Office of the Controller and Auditor-General.² The good practice statement makes it clear that “total cost of ownership” and “value for money” do not necessarily mean selecting the lowest price.

¹ LCD: liquid crystal display – the technology currently used in most flat-screen monitors and laptop computers.

² Office of the Controller and Auditor-General, *Procurement: A Statement of Good Practice*, June 2001, pp. 12–13.

6 Sustainable use

The survey revealed a number of good-practice sustainable-use policies, although few appeared to be well documented or rigorously monitored. Practices included:

- printer defaults set for duplex black-and-white printing
- printing directed to centralised MFDs
- migration to LCD monitors with reduced power consumption
- server virtualisation and outsourcing of servers to a data centre
- activation of desktop inactivity defaults for power-saving options – screen and/or hard drive
- powering off desktop computers and monitors at night (and periodic rewards for staff who remember to do this)
- replacing desktop computers with more energy-efficient laptops.

Practices such as powering down desktop equipment at night varied widely. Some agencies instructed staff to leave equipment on at all times to facilitate overnight software updates, while others arranged for software updates whenever a computer logs on the network. Some were concerned about reducing the life of equipment with frequent shut downs. One agency with a mobile workforce has migrated to a laptop-only environment.

7 Security cleansing

Practices for security-wiping computer hard drives and portable communications equipment – mobile phones and personal data assistant (PDAs) – varied widely among the Govt³ agencies. All accepted the need for deleting data from hard drives and mobile phone memories before disposing of equipment, but most relied on others to do this. Many referred to the US Department of Defense standard³ for security wiping hard drives, but most had no formal procedures to ensure this was implemented. Other security-cleansing software used included Norton's Diskwipe, Darik's Boot and Nuke (DBAN), Scan Wipe, BC Wipe and Killdisk.

The Government Communications Security Bureau recommends a product called Blancco.⁴ However, most agencies rely on the company responsible for disposing of the hardware to ensure that all data are appropriately removed. There are exceptions. Agencies with classified information ensure hard drives are security wiped before leaving their premises and then physically destroyed with acid baths or by drilling holes through the drives.

At the time of the survey little consideration was given to security cleansing of mobile phones, and as hand-held PDAs are a new technology no agency has yet had to face the issue of their disposal. Agencies with GSM mobile phones typically removed the SIM cards, where any sensitive information such as phone directories is stored. Some agencies were physically destroying mobile phones as a security measure and landfilling the waste. However, physical destruction is not necessary, it precludes any possible further use and has a negative environmental impact when landfilled. It is expected that agencies will expand their security cleansing practices to mobile phones and hand-held devices and adopt more environmentally friendly disposal methods.

³ US Department of Defense Standard 5220.22-M specifies a minimum overwrite of three times, but depending on the level of sensitivity of the information up to seven times is recommended.

⁴ Blancco, <http://www.blancco.com>, distributed in New Zealand by ComSec New Zealand, <http://www.comsecent.co.nz>.

8 Hardware disposal

Current methods of equipment disposal are summarised in Figure 4.

Figure 4: Methods of disposal of ICT equipment, 2005/06

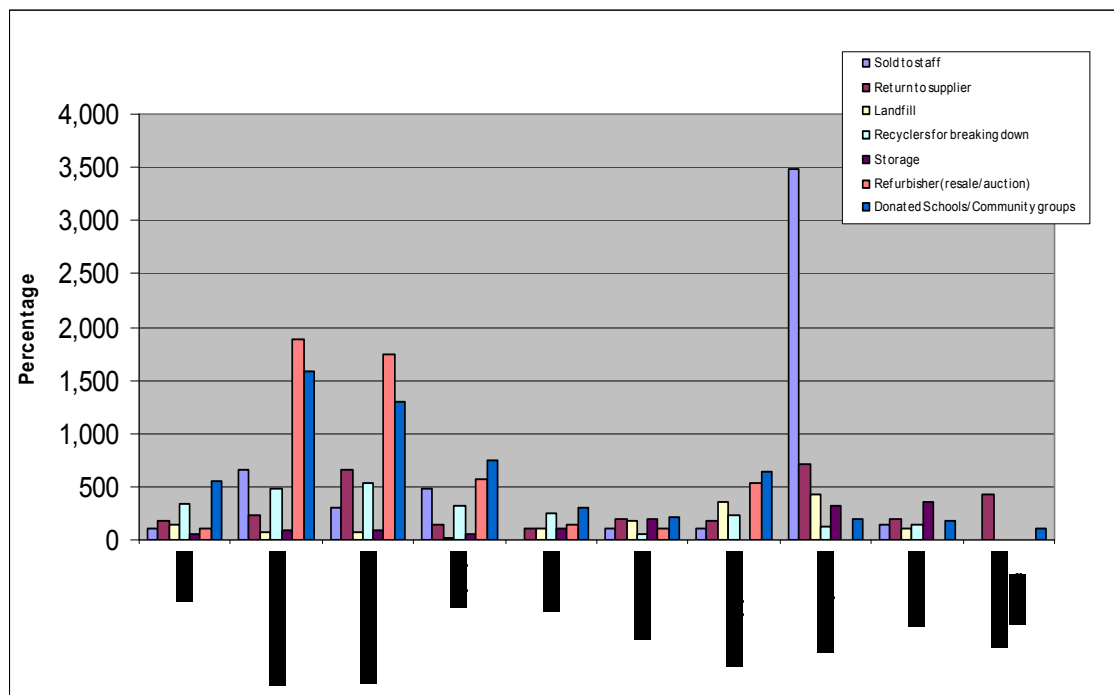


Figure 4 indicates that the two most common methods for disposing of unwanted computer equipment are through a refurbisher (for resale or auction) or by donation to a school or community group. Relatively small quantities of equipment are sold to staff or returned to suppliers under “take-back” schemes. Less than one per cent of computer equipment is being sent directly to landfills, although larger volumes of peripheral equipment such as printers (nearly 500 in 2005/06) and fax machines (around 250 in 2005/06) are being landfilled. There are also significant quantities of equipment being held in storage, pending the development of environmentally friendly disposal solutions.

Most agencies currently dispose of surplus computer equipment through a CANZ⁵ accredited recycler (RemarkIT⁶ in Wellington or The Ark⁷ in Auckland) in response to a Cabinet directive some years ago that encouraged government agencies to donate surplus equipment through the CANZ scheme to support the expansion of ICT infrastructure in schools.

⁵ CANZ (Computer Access New Zealand Trust) is a not-for-profit trust established and operated with support from the Ministry of Education to promote the use of refurbished computer equipment in schools.

⁶ Remarkit Solutions Limited, <http://www.remarkit.co.nz/>.

⁷ The Ark, <http://www.the-ark.co.nz/>.

However, since this scheme commenced over five years ago, the cost of a new computer has fallen from over \$3,000 to under \$1,000, while the price of a refurbished computer has stayed about the same at \$250–\$400. At the same time, schools have progressively become much better equipped with computers, and teachers have upskilled in the use of ICT. The net result is that there is a reducing demand from schools for refurbished computers, with most preferring to pay slightly more and get much higher-spec equipment. Nevertheless, there is still a strong demand for refurbished equipment for school-related programmes such as the 2020 Communications Trust’s Computers in Homes⁸ programme. This programme aims to ensure all families with school-aged children in low-income areas have access to a computer and the Internet in their homes – an estimated 100,000 families.

The Dell e-Day,⁹ held in Wellington in 2006, in partnership with the Ministry for the Environment, CANZ, RemarkIT and the Wellington City Council, was referred to by many agencies as one attempt to assist households, which, along with schools and community groups, often find themselves at the end of the “reuse” chain and have to bear the cost of disposal. Planning is underway for further e-Days in other centres, and while these can clearly help in reducing the amount of e-waste sent to landfills, they are not a complete or long-term solution.

Mobile phones appear to be presenting more of a challenge in terms of disposal, with most agencies unsure about good practice. This is despite take-back schemes being operated by the two major providers, Telecom and Vodafone. This year the Ministry for the Environment, in partnership with Telecom and Vodafone, is increasing awareness of the schemes and promoting the recycling of mobile phones.

⁸ Computers in Homes, <http://www.computersinhomes.org.nz/>.

⁹ Dell e-Day, <http://www.beehive.govt.nz/ViewDocument.aspx?DocumentID=26973>. A drop-off event for households to deposit unwanted IT equipment for free recycling.

Appendix 1: Govt³ agencies

Accident Compensation Corporation
Archives New Zealand Te Rua Mahara o te Kāwanatanga
Crown Law Office
Department of Building and Housing
Department of Conservation
Department of Corrections
Department of Internal Affairs
Department of Labour
Department of the Prime Minister and Cabinet
Education Review Office
Energy Efficiency and Conservation Authority
Environmental Risk Management Authority
Government Communications Security Bureau
Housing New Zealand Corporation
Inland Revenue Department
Land Information New Zealand
Landcare Research
Ministry for Culture and Heritage
Ministry for the Environment
Ministry of Agriculture and Forestry
Ministry of Defence
Ministry of Economic Development
Ministry of Education
Ministry of Fisheries
Ministry of Foreign Affairs and Trade
Ministry of Health
Ministry of Justice
Ministry of Pacific Island Affairs
Ministry of Research, Science, and Technology
Ministry of Social Development
Ministry of Transport
Ministry of Women's Affairs
National Library of New Zealand Te Puna Mātauranga o Aotearoa
New Zealand Antarctic Institute
New Zealand Customs Service
New Zealand Defence Force
New Zealand Police
New Zealand Post
Office of the Auditor General and Audit New Zealand
Office of the Clerk of the House of Representatives
Office of the Parliamentary Commissioner for the Environment
Parliamentary Service
Serious Fraud Office
State Services Commission
Statistics New Zealand
Te Puni Kōkiri
The Treasury
Transit New Zealand

Appendix 2: Survey questionnaire

Govt³ ICT equipment procurement and disposal survey

The purpose of this survey is to establish a benchmark in terms of current practice by Govt³ agencies for the procurement and disposal of ICT equipment.

Government agency:

Number of employees:

Number of physical locations:

1. **Thinking about the total quantities of ICT equipment currently used by your agency as at 31 December 2006. How much equipment does your agency own (listed in your asset register) compared to the quantity of equipment that is leased?**

Product	Total equipment (units)	Quantity <u>owned</u> (total quantity or %)	Quantity <u>leased</u> (total quantity or %)
Servers			
Desktop computers			
Computer monitors			
Laptops			
Scanners			
Fax machines			
Desktop printers			
Mobile phones			
Hand-held devices (eg, PDAs)			
Multi-function printers			

2. **Now thinking about the total quantities of ICT equipment you have recently acquired (purchased or leased), or plan to acquire.**

Enter the total quantity purchased or leased in the 2005/06 financial year and expected quantities for the current financial year (2006/07) and the next financial year (2007/08).

Product	2005/06		2006/07		2007/08	
	Purchase	Lease	Purchase	Lease	Purchase	Lease
Servers						
Desktop computers						
Computer monitors						
Laptops						
Scanners						
Fax machines						
Desktop printers						
Mobile phones						
Hand-held devices (eg, PDAs)						
Multi-function printers						

3. **Thinking about future purchases or leases of ICT equipment, please indicate when you expect to be calling tenders or placing orders for equipment.**

Please tick (✓) the boxes in the table below to indicate the particular time period(s) when you expect to be placing orders. This will help identify agencies that could take a lead in implementing any new practices.

Product	January–June 2007	July–December 2007	January–June 2008
Servers			
Desktop computers			
Computer monitors			
Laptops			
Scanners			
Fax machines			
Desktop printers			
Mobile phones			
Hand-held devices (eg, PDAs)			
Multi-function printers			

4. Now thinking about the quantities of ICT equipment you have recently disposed of, or plan to dispose of. Please record only equipment that you own; we assume that leased equipment is returned to the supplier. By “disposed of” we mean, removed from your organisation, irrespective of whether the equipment is to be reused or dumped.

Enter the total quantity disposed of in the 2005/06 financial year and expected quantities for the current financial year (2006/07) and the next financial year (2007/08).

Product	2005/06 Actual quantity of disposals	2006/07 Expected quantity of disposals	2007/08 Projected quantity of disposals
Servers			
Desktop computers			
Computer monitors			
Laptops			
Scanners			
Fax machines			
Desktop printers			
Mobile phones			
Handheld devices (eg, PDAs)			
Multi-function printers			

5. Now thinking about how often you replace ICT equipment. What is the average age (in years) of your ICT equipment when replaced?

Product	Average age of purchased equipment when replaced (years)	Average age of leased equipment when replaced (years)
Servers		
Desktop computers		
Computer monitors		
Laptops		
Scanners		
Fax machines		
Desktop printers		
Mobile phones		
Hand-held devices (eg, PDAs)		
Multi-function printers		

6. And finally, thinking about the ICT equipment that you disposed of during the last financial year (2005/06), excluding leased equipment. What methods of disposal did you use?

Product	Total quantity* of ICT equipment disposed of in 2005/06	Enter actual quantity or estimate % of total						
		Sold to staff	Returned to supplier (take-back)	Sent to landfill	Sent to recycler (for breaking down)	Sent to storage	Sent to refurbisher (for resale or auction)	Equipment donated for schools or community groups
Servers								
Desktop computers								
Computer monitors								
Laptops								
Scanners								
Fax machines								
Desktop printers								
Mobile phones								
Hand-held devices (eg, PDAs)								
Multi-function printers								

* As in Question 4.

Thank you for your assistance.

You may return this questionnaire when completed to zcl@xtra.co.nz or fax to 04-472 9796. Alternatively, an interviewer will collect the questionnaire during their visit to discuss current practices in your agency.

ZCL Use

Interviewer:

Date: