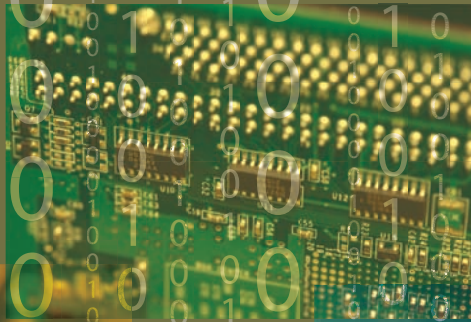




Australian Government

Australian Government ICT Sustainability Plan 2010-2015



NEXT

ISBN: 978-1-921733-15-4

© Commonwealth of Australia 2010

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without prior written permission from the Commonwealth. Requests and inquiries concerning reproduction and rights should be addressed to:

**Chief Information Officer
Department of Sustainability, Environment, Water, Population and Communities
GPO Box 787
Canberra ACT 2601**

TABLE OF CONTENTS

OVERVIEW	1
SUMMARY OF OUTCOMES, STRATEGIES AND ACTIONS	5
ABOUT THIS PLAN	7
1 INTRODUCTION	8
2 IMPROVING SUSTAINABLE ICT PROCUREMENT	9
2.1 MANDATORY ENVIRONMENTAL STANDARDS	10
2.2 OTHER ICT PROCUREMENT CONSIDERATIONS	14
2.3 AGENCY TARGETS	15
3 IMPROVING ICT ENERGY AND CARBON MANAGEMENT	17
3.1 SETTING A WHOLE-OF-GOVERNMENT ICT ENERGY CONSUMPTION TARGET	17
3.2 ICT ENERGY INTENSITY MEASURES AND TARGETS	18
3.3 AGENCY ICT ENERGY MANAGEMENT PLANS	20
3.4 ICT ENERGY AND CARBON REPORTING ARRANGEMENTS	20
3.5 AGENCY TARGETS	21
4 ICT: PROMOTING MORE SUSTAINABLE SOLUTIONS	22
4.1 WITHIN GOVERNMENT OPERATIONS	22
4.2 PROMOTION OF BROADER SUSTAINABILITY	23
5 STRENGTHENING AGENCY MANAGEMENT SYSTEMS	24
5.1 IMPROVING ENVIRONMENTAL MANAGEMENT PROCESSES	24
5.2 INSTILLING BEHAVIOURAL AND CULTURAL CHANGE	25
5.3 REPORTING ENVIRONMENTAL PERFORMANCE (GREEN ICT SCORECARD)	25
6 IMPLEMENTATION	26
6.1 CENTRAL GOVERNMENT COORDINATION	26
6.2 IMPLEMENTATION ACTIVITIES	26
6.3 MID-TERM REVIEW	27
6.4 EXEMPTIONS (OPT-OUTS)	27
ABBREVIATIONS	28
GLOSSARY	29
APPENDIX 1 EPEAT AND EQUIVALENT ECO-LABELS	31
APPENDIX 2 ICT SUSTAINABILITY INITIATIVES	34

OVERVIEW

Background

In response to the 2008 *Review of the Australian Government's use of information and communication technology* (Gershon Review)¹, the Australian Government has initiated a comprehensive ICT reform program which includes the development of this whole-of-government ICT sustainability plan.

Among other things, the Gershon Review recommended that the Australian Government align its ICT operations with the Government's overall sustainability agenda and improve its ability to understand its energy costs and the carbon footprint of its ICT estate. Consistent with this view, the Government decided that the ICT sustainability plan should:

- identify which of the available environmental standards should be adopted as mandatory for relevant ICT acquisitions;
- identify the steps to develop a whole-of-government ICT energy consumption target and associated reporting arrangements;
- establish ICT energy intensity measures and/or targets; and
- take into account potential implications of the Carbon Pollution Reduction Scheme (CPRS) and other ICT sustainability initiatives.

The Government also decided that Australian Government agencies with an annual ICT spend over \$20 million would develop an ICT energy management plan,² and that agencies would undertake periodic independent ICT energy assessments of their data centres and server rooms.

In addition, the plan should consider the contribution that ICT can make more broadly to achieving more sustainable practices in the community.

Context

This *Australian Government ICT Sustainability Plan 2010 - 2015* complements the Government's current policies, guidelines and infrastructure in relation to climate change and improved environmental performance.³ It reinforces agency obligations under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*, *Energy Efficiency in Government Operations (EEGO)* policy, *e Government* strategy and other greening of government initiatives. It also takes into account other relevant Government and industry initiatives relating to product stewardship, in particular the *National Packaging Covenant* (NPC) and the *National Waste Policy* (NWP).⁴

The plan outlines strategies and actions that will assist Australian Government agencies to introduce low carbon emission initiatives to improve the sustainability of their ICT operations. This aligns with the Australian Government's carbon emissions mitigation strategy (including the proposed CPRS) and its commitment to reduce greenhouse emissions by 60 per cent of 2000 levels by 2050. The plan also serves to inform industry of the Government's ICT sustainability agenda.

Environmental standards in ICT procurement

Australian Government agencies currently manage significant quantities of ICT equipment, estimated at 350 000 PCs and laptops, 14 000 servers, and 37 500 imaging devices, as well as the consumables used in this equipment such as toner cartridges and copy paper. This volume of activity raises significant environmental management concerns over the life cycle of products, mainly relating to energy use, carbon emissions, e-waste and hazardous materials, packaging and the sustainable use of precious and scarce metals.

In this context, the *Australian Government ICT Sustainability Plan 2010 - 2015* involves the implementation of sustainable procurement principles and practices in relation to ICT. Sustainable procurement aims to promote more environmentally responsible products and services, improve product stewardship, avoid unnecessary demand and consumption, and assess ICT products on a life cycle impact basis. These principles are introduced into Australian Government ICT procurement processes through the use of mandatory environmental standards which sets a minimum level of environmental performance for relevant ICT acquisitions.

Australian Government agencies are required to adopt the following mandatory environmental standards in ICT procurement processes:⁵

- compliance with ISO 14024 or ISO 14021 at the level of EPEAT Silver or equivalent as a minimum standard for relevant ICT equipment;
- compliance with the current ENERGY STAR[®] version for relevant ICT equipment;
- product take-back and appropriate resource recovery, reuse or recycling for (a) mobile devices, such as mobile phones, PDAs and Blackberry devices; (b) toner cartridges; and (c) ICT equipment covered by the National Television and Computer Recycling Scheme under the *National Waste Policy*;⁶
- general use office copy paper to have a minimum post-consumer recycled content of 50 per cent by July 2011, with progression to 100 per cent post-consumer recycled content;
- participation by ICT suppliers in the *National Packaging Covenant* by July 2011 or compliance with the *National Environment Protection (Used Packaging Material) Measure* (UPM NEPM); and
- adoption by suppliers of an environmental management system aligned to ISO 14001.

There will be transitional arrangements for suppliers to reach some mandatory standards, for example suppliers will be given six months from the date of contract signing to align business processes to the EMS ISO 14001 standard (Note: this is not EMS ISO certification).

Energy and carbon emission management

The Australian Government is committed to improving energy efficiency, carbon emission management and environmental performance in Australian Government ICT operations. To this end, large agencies are required to implement an ICT energy management plan that will facilitate improvements in technology, infrastructure and practice.⁷ These plans will include improvements from the *Green ICT Quick Wins* and the *Australian Government Data Centre Strategy 2010-2025*, which will have a considerable impact on energy efficiency and carbon emission performance across government.⁸

A whole-of-government ICT energy consumption target will be developed using various sources, including data gathered from the ICT energy management plans of large agencies, with subsequent progress and performance being monitored through the existing online system for comprehensive activity reporting (OSCAR). Changes will be made to the OSCAR database to support ICT energy and carbon emission reporting in Australian Government operations.

Preliminary analysis indicates that Australian Government ICT operations can expect to improve energy performance by up to 20 per cent on current consumption levels by July 2015 due to

improvements to desktop and data centre energy efficiencies. This equates to around 325 000 tonnes of carbon emissions mitigated over the five-year term of the plan. A more accurate calculation will be determined through detailed analysis arising from the whole-of-government ICT energy consumption target process as outlined above.

Agency targets

To ensure the primary objective of improved environmental performance is achieved, the plan sets targets for agencies across their ICT operations (see summary table below). The targets are set at a level to achieve real change. Agencies will implement ICT sustainability initiatives⁹ to improve performance equal to or beyond the targets indicated.¹⁰

When measuring agency compliance with targets, regional and remote offices with less than 20 staff are excluded.

Using ICT to enable broader sustainability

ICT can be an enabler of more environmentally sustainable practices within Australian Government operations and it can also promote sustainability in industry and the broader community. The plan requires agencies to incorporate in their decision-making processes consideration of the effective use of technologies to promote sustainability across its economic, social and environmental dimensions.

Transformational change

The plan is designed to promote transformational change at both organisation level and system level. Its initiatives are, therefore, linked to an agency's non-ICT operations as well as the policies and programs of the Australian Government overall.

-
1. *Review of the Australian Government's use of information and communication technology*, Commonwealth of Australia, August 2008, <http://www.finance.gov.au/publications/ICT-Review/docs/Review-of-the-Australian-Governments-Use-of-Information-and-Communication-Technology.pdf>
 2. The Government used the term *energy efficiency plan*, this is synonymous with *energy management plan* which is used in the *Energy Efficiency in Government Operations (EEGO)* policy and taken up in this plan. See Section 3 for further details on agency energy management plans.
 3. DEWHA, September 2009, *Whole-of-Government ICT Sustainability Plan Discussion Paper*, Appendix 4 <http://www.environment.gov.au/sustainability/government/ictplan/discussion-paper.html>
 4. Refer to Section 2.1 for information relating to the NPC and the NWP.
 5. Refer to Section 2 for supporting notes on these targets.
 6. The National Television and Computer Recycling Scheme is also referred to as the 'national e-waste recycling scheme' in this document.
 7. Agencies may elect to integrate ICT elements into an existing corporate energy management plan or environmental management plan.
 8. ICT Reform Program, 2009, <http://www.finance.gov.au/e-government/strategy-and-governance/ict-reform-program.html>
 9. Examples of ICT sustainability initiatives are outlined in Appendix 2.
 10. Refer to Sections 2 and 3 for details and supporting notes on agency targets.

Summary of measures

	Government Baseline	July 2010	July 2011	July 2012	July 2013	July 2014	July 2015
Sustainable procurement (section 2.1) Relevant ICT equipment meets ISO14024 or ISO14021 standards at a level of EPEAT Silver or equivalent as a minimum standard ICT equipment complies with current ENERGY STAR® version Product take-back and appropriate resource recovery or reuse for mobiles; toner cartridges; and ICT equipment covered by the national e-waste recycling scheme under the NWP General use office copy paper (post consumer recycled content) Suppliers participate in <i>National Packaging Covenant</i> (NPC) (July 2011) or comply with Used Packaging Materials NEPM Suppliers EMS aligned to ISO14001		Implemented in procurement process from July 2010 or from announcement of plan but allowing transitional arrangements for suppliers					
			50% recycled				100% recycled
Managing resource consumption and demand (section 2.2) Internal copy paper per end user (reams per annum) Desktop computers to printer ratio Desktop devices (inc. laptops) per end user	18.6 8:1 1.6:1			13 14:1 1.4:1			9 20:1 1.2:1
Managing waste (section 2.2) e-waste reused or recycled ICT packaging recycled (targets as per NPC timeframes)							75%
Managing energy consumption (section 3.5) Desktop energy per end user (kWh per annum and averaged across agency) Power usage effectiveness (PUE) in data centres and server rooms Desktop computers off after hours	630 2.5			400			250 1.9
		90%					

Notes:

1. When measuring agency compliance with targets, regional and remote offices with less than 20 staff are excluded.
2. Targets to be reviewed mid-term of the plan ie 2012-13.
3. Where no baseline is indicated no data exists at this point.
4. *General use copy paper* target – flexibility will be considered for special circumstances.
5. *Desktop computers to printer ratio* target – flexibility will be considered for special circumstances.
6. Energy intensity baselines are preliminary estimates and will be reviewed after the first energy reporting cycle of the plan's implementation.
7. *Desktop computers off target* – applies from July 2010 or within 6 months of the plan's announcement.

SUMMARY OF OUTCOMES, STRATEGIES AND ACTIONS

The main aim of the *Australian Government ICT Sustainability Plan 2010 - 2015* is to improve environmental performance and reduce carbon emissions across government and the ICT industry. This aim will be achieved through a framework of outcomes, strategies and actions. The stated outcomes are aligned with Australian Government policies and programs which directly and indirectly impact on sustainability.

Outcome	Strategy	Action
<ol style="list-style-type: none"> 1. Improved energy efficiency 2. Reduced carbon emissions 3. Reduced waste 4. Improved overall environmental performance 	<p>Improve sustainable ICT procurement processes [Section 2]</p> <p><i>Key outcomes: 1, 2, 3</i></p>	<p>Agencies will apply mandatory environmental standards in ICT procurements, including:</p> <ul style="list-style-type: none"> • compliance with ISO 14024 or ISO 14021 at the level of EPEAT Silver or equivalent as a minimum standard for relevant ICT equipment. • ENERGY STAR® as the minimum energy standard for relevant ICT equipment. • general use office copy paper to have a minimum post-consumer recycled content of 50 per cent by July 2011, with progression to 100 per cent post-consumer recycled content by July 2015. • end-of-use product take-back and appropriate resource recovery or reuse for mobile devices; toner cartridges; and ICT equipment covered by the National Television and Computer Recycling Scheme under the <i>National Waste Policy</i> (NWP). • participation by ICT suppliers in the <i>National Packaging Covenant</i> (NPC) by July 2011 or compliance with the <i>National Environment Protection (Used Packaging Material) Measure</i> (UPM NEPM). • ICT suppliers to have an environmental management system aligned to the ISO 14001 standard. <p>Agencies will apply the provisions of the <i>Green ICT Procurement Kit</i>.</p> <p>Agencies will apply sustainability principles and practices and implement strategies to effectively manage ICT resource consumption, resource demand and waste.</p> <p>Agencies will include an appropriate measure or weighting for environmental criteria within ICT procurement evaluations.</p>

Outcome	Strategy	Action
	<p>Improve ICT energy and carbon management [Section 3]</p> <p><i>Key outcomes: 1, 2</i></p>	<p>An Australian Government ICT energy consumption target will be set.</p> <p>Agencies will implement <i>Green ICT Quick Wins</i> initiatives and improvements listed in the <i>Data Centre Strategy 2010-2025</i>.</p> <p>Large agencies will implement an ICT energy management plan (EMP), which can be part of a wider agency EMP that includes implementation of improvements from <i>Green ICT Quick Wins</i> initiatives, <i>Data Centre Strategy 2010-2025</i>, internal energy intensity measures and targets, and periodic independent ICT energy assessments for data centres and server rooms.</p> <p>Agencies will report ICT energy and carbon emissions through the online system for comprehensive activity report (OSCAR) and in Annual Reports.</p> <p>The OSCAR database will be modified to allow ICT reporting.</p>
	<p>Using ICT to improve sustainability [Section 4]</p> <p><i>Key outcomes: 1, 2, 3</i></p>	<p>Agencies will actively pursue the use of ICT to improve environmental performance within government operations and in the delivery of government programs and services to achieve more sustainable economic, social and environmental outcomes.</p> <p>Online information and better practice case studies will be developed and issued indicating where ICT can be used as an enabler of sustainability in government operations.</p>
	<p>Strengthen agency management systems [Section 5]</p> <p><i>Key outcome: 4</i></p>	<p>Agencies will conduct an environmental risk assessment and integrate significant ICT aspects into their EMS.</p> <p>Agencies will review their internal governance arrangements and integrate ICT sustainability into internal documentation.</p> <p>Agencies will implement strategies to raise awareness, provide training programs, and monitors and reports performance through a GreenICT Scorecard.</p>
	<p>Leadership, governance and management [Section 6]</p> <p><i>Key outcome: 4</i></p>	<p>A nominated agency will provide central coordination, guidance and support for agencies when implementing the plan.</p>

ABOUT THIS PLAN

Scope

The *Australian Government ICT Sustainability Plan 2010 - 2015* is a five year plan applicable to *Financial Management and Accountability Act 1997* (FMA Act) agencies. Other government agencies are also encouraged to implement the plan.

ICT Sustainability definition

Giving consideration to the principles of *ecologically sustainable development* (ESD), outlined in Section 3A of the EPBC Act, the following definition of ICT sustainability has been developed for the plan.

ICT sustainability in government is the responsible acquisition, installation, use and disposal of information and communications technologies and services so as to utilise resources more effectively, improve efficiency and increase productivity, and reduce the environmental impact of operations. It also includes the effective use of information and communications technology to promote more sustainable practices in industry and the community.

Plan development

The plan has been developed by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC), in consultation with the Australian Government Information Management Office (AGIMO) within the Department of Finance and Deregulation. It is based on extensive research and consultation with key stakeholders, including Australian Government agencies, international governments, industry and other interested parties.

A public discussion paper was released in September 2009 to seek input from industry and other interested parties.¹¹ There were 21 submissions received and these helped to inform the development of the plan.

An Interdepartmental Committee (IDC) provided valuable direction in the plan's development and was an important conduit for Australian Government agency consultation. The IDC comprised representatives from small, medium and large Australian Government agencies.

Following additional consultation with agencies, the *Australian Government ICT Sustainability Plan 2010-2015* was endorsed by the Secretaries' ICT Governance Board (SIGB) in February 2010 and approved by the Australian Government in July 2010.

Mid-term review

A comprehensive mid-term review will be initiated to determine agency progress against targets and objectives. The mid-term review activities are outlined in Section 6.

11. DEWHA, September 2009, *Whole-of-Government ICT Sustainability Plan Discussion Paper*, <http://www.environment.gov.au/sustainability/government/ictplan/discussion-paper.html>

1. INTRODUCTION

In response to the 2008 *Review of the Australian Government's use of Information and Communications Technology* (Gershon Review),¹² the Government initiated a comprehensive ICT Reform Program including the development of a whole-of-government ICT Sustainability Plan.

Among other things, the Gershon Review recommended that the Australian Government align its ICT operations with the Government's overall sustainability agenda and improve its ability to understand its energy costs and the carbon footprint of its ICT estate. Consistent with this view, the Government decided that the plan should:

- identify which of the available environmental standards should be adopted as mandatory for relevant ICT acquisitions;
- identify the steps to develop a whole-of-government ICT energy consumption target and associated reporting arrangements;
- establish ICT energy intensity measures and/or targets; and
- take into account potential implications of the Carbon Pollution Reduction Scheme.

The Government also decided that Australian Government agencies with an annual ICT spend over \$20 million would develop an ICT energy management plan, and that agencies would undertake periodic independent ICT energy assessments of their data centres and server rooms.

In addition, the plan considers the contribution that ICT can make more broadly to achieving more sustainable practices in the community.

12. *Review of the Australian Government's use of information and communication technology*, Commonwealth of Australia, August 2008, <http://www.finance.gov.au/publications/ICT-Review/docs/Review-of-the-Australian-Governments-Use-of-Information-and-Communication-Technology.pdf>

2. IMPROVING SUSTAINABLE ICT PROCUREMENT

Australian Government agencies currently manage significant quantities of ICT equipment, estimated at 350 000 PCs and laptops, 14 000 servers, and 37 500 imaging devices, as well as the consumables used in this equipment such as toner cartridges and copy paper. This volume of activity raises significant environmental management concerns over the life of products, mainly relating to energy use, carbon emissions, e-waste and hazardous materials, packaging and the sustainable use of precious and scarce metals.

It is estimated that ICT currently produces around two per cent of the world's greenhouse gas emissions.¹³ The high rate of growth in ICT penetration and increases in processing power mean that, without mitigation, the harmful contributions of ICT are likely to grow quickly.¹⁴ This issue is not dissimilar for Australian Government operations with ICT accounting for around 13 per cent of total government emissions.¹⁵ Reducing these emissions needs to be tackled on a number of fronts, including ICT procurement.

One of the primary drivers of ICT procurement is the high rate of product turnover due to rapid innovations in technology. This means that ICT products usually become technically redundant before being physically redundant. The materials comprising ICT products are resource intensive. Components consist of hazardous, precious and rare metals, and contain large volumes of plastics, glasses and other materials. Without reuse, or resource recovery through recycling, the high level of product turnover contributes to a significant waste and pollution issue, as well as generating emissions in the production, transport and recovery phases of the product life cycle.

The operation of ICT equipment in Australian Government agencies consumes considerable energy. The most energy consumed is in the operation of mainframe, midrange, data and telecommunications, and desktop systems.

In addition, the Australian Government procures large quantities of consumables necessary for ICT equipment. Products such as printer toner cartridges and office copy paper have the potential to contribute to significant waste and pollution.

Responsible suppliers and manufacturers are already addressing these issues. To support these efforts, to further encourage industry adoption, and to minimise and/or mitigate the impact of ICT on the environment, the Australian Government through this plan is introducing mandatory environmental standards into ICT procurement processes.

Mandatory environmental standards for relevant ICT acquisitions will also provide a catalyst for improving the environmental performance of supply chains through large scale government demand for sustainable ICT products and services driving resource efficiency and innovation. Similarly, the demand will support suppliers and manufacturers to invest, develop and produce more environmentally sustainable goods and services.

2.1 Mandatory environmental standards

Mandatory environmental standards will be applied to the purchase of ICT equipment and consumables posing significant environmental risk or impact. The standards are a minimum level of environmental performance and therefore will be a necessary condition of participation for any supplier to respond to an ICT request for tender (RFT).

ACTION: The mandatory environmental standards used in Australian Government agencies for ICT procurement are:

- ES1 Compliance with ISO 14024 or ISO 14021 at the level of EPEAT Silver or equivalent as a minimum standard for relevant ICT equipment;¹⁶
- ES2 Compliance with the current ENERGY STAR[®] version for relevant ICT equipment;
- ES3 Product take-back and appropriate reuse or resource recovery (a) mobile devices, such as mobile phones, PDAs and Blackberry devices; (b) toner cartridges; and (c) ICT equipment covered by the National Television and Computer Recycling Scheme under the *National Waste Policy (NWP)*;
- ES4 General use office copy paper to have a minimum post-consumer recycled content of 50 per cent by July 2011, with progression to 100 per cent post-consumer recycled content by July 2015;
- ES5 ICT suppliers are signatories to the *National Packaging Covenant (NPC)* by July 2011 or comply with the requirements of the *National Environment Protection (Used Packaging Materials) Measure (UPM NEPM)*; and
- ES6 Adoption by suppliers of an environmental management system (EMS) aligned to the ISO 14001 standard.

A brief explanation of these mandatory environmental standards is provided on the following pages.

Criteria for selecting environmental standards to address current and emerging risks

Over the duration of the plan new environmental risks may emerge from, for instance, the deployment of new technologies which have a potential to cause significant impacts. In such cases, additional mandatory environmental standards may be required to address these impacts. These impacts may arise from carbon emissions, energy use, materials use, water use, ozone depleting substances, hazardous substances and product disposal.

In addition, new standards that promote environmental benefits and support the CPRS will also be considered for use in Australian Government ICT procurements, such as the use of accredited renewable energies and verifiable carbon offsets in product production, distribution, use and resource recovery processes.

The assessment process to select minimum environmental performance standards for ICT procurement (current standards and any future standards to address new risks) is based on the following criteria:

The standard

- uses a reputable standard accepted by industry and government;¹⁷
- has widespread geographic coverage (eco-labels);
- is appropriate for use in Australian Government ICT procurement processes;
- can be easily applied by agency staff and evaluated during procurement processes;
- contributes to demonstrated improvement in environmental performance over time;
- is subject to continuous improvement through research and investment in further standards development (eco-labels); and
- can be applied with minimal or no cost to agencies.

ES1 Compliance with ISO 14024 or ISO 14021 at the level of EPEAT Silver or equivalent as a minimum standard for relevant ICT equipment

Life cycle assessment is an internationally recognised approach to evaluating the potential environmental impacts of products and services.¹⁸ It evaluates environmental impacts covering whole-of-life processes from raw materials extraction to end-of-life. The standards and environmental performance criteria that underpin eco-labelling programs which take a life cycle approach are generally developed to comply with accepted international standards such as ISO 14024 Type I Independent Third-Party Certified (IC) eco-labels or ISO 14021 Type II Self Declared (SD) Product eco-labels.

In this plan the Electronic Product Environmental Assessment Tool (EPEAT) Silver rating, or equivalent, is selected as a minimum standard of environmental performance for relevant ICT equipment. As with EPEAT, the ‘equivalences’ must meet the environmental life cycle impact requirements contained within ISO 14024 or ISO 14021.

EPEAT is a self declared eco-label that assesses the environmental attributes and life cycle impacts of electronic products. Product manufacturers self-assess and declare the conformance of their products against EPEAT criteria grouped under eight environmental performance categories. These include:

- reduction/elimination of environmentally sensitive materials;
- materials selection;
- design for end-of-life;
- product longevity or life cycle extension;
- energy conservation and renewable energies;
- packaging;
- end of life management, including product take-back; and
- corporate performance.

Compliance with the EPEAT standard is a requirement in a number of other countries – notably the USA in relation to government operations – and has been accepted by the Australian ICT industry as a viable approach.¹⁹

The Australian Government uses and consumes significant quantities of ICT products to which the EPEAT eco-label, or equivalent, applies. Under this plan agencies are required to apply EPEAT Silver, or equivalent, to new procurements for the following ICT equipment categories:

Equipment categories	Effective date
Personal computers	2010
Monitors	2010
Laptops, notebooks, netbooks or similar	2010
Integrated workstations	2010
THIN Clients	2010
Imaging equipment (such as MFDs, copiers and printers)	2011
Mobile devices	2013
Servers	2013

Standards or criteria for mobile devices, servers, imaging equipment²⁰ and other ICT equipment categories will be progressively applied as relevant EPEAT Silver, or equivalent, criteria become available. Other equipment categories posing significant environmental risk may also be included for standards or criteria treatment over the duration of the plan.

New imaging equipment supplied must be able to print with 100 per cent post consumer recycled content paper.

Appendix 1 provides a brief overview of EPEAT and equivalent eco-labels.

ES2 Compliance with the current ENERGY STAR[®] version for ICT equipment

ENERGY STAR[®] is a widely recognised international standard for energy efficient electronic equipment and is utilised in the US, Canada, Europe, Asia and Australia. ENERGY STAR[®] compliant ICT products aim to reduce the energy use and carbon emissions of ICT equipment during operation. Eco-labelling programs, such as EPEAT, often incorporate ENERGY STAR[®] within their required criteria.

Under this plan agencies and suppliers are required to ensure that all relevant ICT equipment being procured comply with the current ENERGY STAR[®] version.

ES3 Product take-back and appropriate reuse or resource recovery for:

- (a) mobile devices, such as mobile phones, PDA's and Blackberry's;**
- (b) toner cartridges; and**
- (c) ICT equipment covered by the National Television and Computer Recycling Scheme under the *NWP***

There are significant waste impacts arising from the high rate of product turnover of mobile devices. There are also opportunities to recover rare high-tech metals from mobile devices.

The Australian Government currently operates an estimated 37 500 office printers and multi-function devices (MFDs). The use of toner cartridges in such devices represents a significant consumable item and waste issue in Australian Government operations.

Agencies are required to include resource recovery and take-back provisions in relevant ICT procurement and service contracts for toner cartridges and mobile devices, and for ICT equipment such as televisions and personal computers (laptops, desktops and peripherals) covered by the National Television and Computer Recycling Scheme under the *National Waste Policy* (NWP).²¹

ES4 General use office copy paper to have a minimum post-consumer recycled content of 50 per cent by July 2011, with progression to 100 per cent post-consumer recycled content by July 2015

Office copy paper

Office copy paper is a significant consumable item in Australian Government operations, with an estimated 6 500 tonnes consumed per annum.²² The use of recycled content paper reduces carbon emissions, energy use, water use, hazardous substances and other environmental loads compared to virgin fibre paper²³ and also reduces competition for land use and the loss of biodiversity and habitat.

Agencies are required to source office copy paper for general purpose use with a minimum of 50 per cent post-consumer recycled content by July 2011 with progression to 100 per cent by July 2015.²⁴ Remaining virgin fibre content is to originate from chain-of-custody sources, such as Forest Stewardship Council (FSC) certified sources/forests, Program for the Endorsement of Forest Certification (PEFC) schemes or from sustainably managed forests.

These requirements support the agroforestry and recycling industries, as well as Government policies, including the *Plantations for Australia – the 2020 Vision* policy and *National Packaging Covenant*. This initiative also supports international agreements, such as the 2008 Australia-Indonesia Forest Carbon Partnership, which has programs that reduce carbon emissions from deforestation and forest degradation.

External printing and design

Agencies are required to introduce similar paper content standards for external printing and design contracts, where possible.

ES5 Participation of ICT suppliers in the *National Packaging Covenant* or compliance with the *National Environment Protection (Used Packaging Materials) Measure*

Packaging relating to ICT equipment and consumables delivery represents a significant waste component of Australian Government operations. The *National Packaging Covenant* (NPC) is a voluntary initiative by government and industry with the key objective being to reduce the environmental impacts of consumer packaging and office paper in Australia. The covenant aims to minimise these environmental impacts through better design and production processes and to facilitate the reuse and recycling of used packaging materials.

The NPC also has an associated regulatory instrument, the National Environment Protection (Used Packaging Materials) Measure (UPM NEPM). Relevant companies that are not to signatories to the NPC are legally required to comply with the UPM NEPM.

For the purpose of this plan, agencies will require suppliers of ICT equipment to be current signatories to the NPC or to commit to participation in the NPC, or its replacement, by July 2011.²⁵ Suppliers who choose not to participate in the NPC must comply with the UPM NEPM (unless exempt by legislation). Guidance will be provided on this requirement in relation to the NPC, its replacement (the Australian Packaging Covenant or APC) and transition arrangements, and the UPM NEPM.

In general, suppliers are required to minimise packaging while allowing for appropriate packaging to prevent damage; reduce the amount of non-recyclable packaging; and improve used packaging materials reuse and recycling.

ES6 An environmental management system (EMS) aligned to the ISO 14001 standard

To ensure that suppliers are committed to managing their impacts on the environment, they will be required to have in place an EMS aligned to ISO 14001. This includes processes to ensure compliance with environmental legislation, regulations and related policies and guidelines, as well as internal environmental policies, procedures and processes.

Agencies must ensure that suppliers have an EMS aligned to the ISO 14001 standard or ensure that suppliers will have business processes aligned to the EMS ISO 14001 standard within six months of contract signing. (Note: this requirement does not require ISO certification).

Guidance will be provided to agencies in order to evaluate this criterion.

2.2 Other ICT procurement considerations

There are other considerations during ICT procurement processes that will ensure better sustainability outcomes. These include the adoption of environmental sustainability principles and practices; management of consumption and demand; and inclusion of an appropriate evaluation measure or weighting for environmental criteria within ICT procurement evaluations.

Environmental sustainability principles and practices

In addition to the mandatory environmental standards outlined in Section 2.1 above, agencies are required to apply the environmental sustainability principles and practices that are embedded within the *Commonwealth Procurement Guidelines* (CPGs) when procuring ICT equipment, software applications and consumables.²⁶

Of particular importance are the principles of whole of life value for money assessments, corporate social responsibility, ethical behaviour and sound governance structures.²⁷

Additionally, the AGIMO *Green ICT Procurement Kit* provides guidance and tools to help agencies when procuring ICT products and services, and to manage environmental issues relating to manufacture, distribution, packaging, energy efficiency and disposal.

ACTION: Agencies will apply the provisions of the *Green ICT Procurement Kit* and environmental sustainability principles and practices to ICT procurement.

Managing resource consumption, resource demand and waste

Managing demand and avoiding unnecessary consumption is an opportunity for agencies to control and reduce costs and improve environmental performance without compromising overall business objectives. For instance, strategies to reduce paper and toner cartridge consumption are easily implemented and can deliver considerable savings.

Additionally, consolidation and integration strategies can optimise equipment utilisation and total cost of ownership – such as server virtualisation and deploying multi-function devices. Other strategies include centralised laptop pooling, laptop docking stations and hot desking, which assists to minimise demand, consumption and cost. These strategies are most effective where supporting policies and procedures underpin the initiative.

While mandatory environmental standards for e-waste will be relevant for new ICT procurement processes, there will also be a requirement to manage waste arising from pre existing ICT equipment and consumables. These include:

- e-waste;
- packaging (eg. pallets, paper, cardboard, plastic wrapping, polystyrene and other forms of packaging);
- toner cartridges; and
- office copy paper.

Agencies are required to manage waste through strategies to responsibly reuse and recycle waste and minimise resource consumption. These strategies are promoted through the *National Waste Policy* and *National Packaging Covenant*.

ACTION: Agencies are required to implement strategies to effectively manage resource consumption, resource demand and waste – where practical.

Evaluation in procurement processes

Agencies will apply the mandatory environmental standards identified in this plan as part of the evaluation criteria used in procurement processes, in addition to the various criteria normally used in the comparative assessment of tender responses – such as technical worth and capability, product quality, corporate experience, service levels, pricing and ultimately value for money. To ensure the Government’s objectives in relation to ICT sustainability are achieved, an appropriate priority needs to be given to the environmental criteria. For instance, a minimum weighting of 20 per cent could be applied to these procurement criteria as part of the evaluation process.

ACTION: Agencies will include an appropriate evaluation measure or weighting for environmental criteria within ICT procurement evaluations.

2.3 Agency targets

The targets below are set at a level to achieve real change in an agency’s ICT operations.

	Government Baseline	July 2010	July 2011	July 2012	July 2013	July 2014	July 2015
Sustainable procurement (section 2.1) Relevant ICT equipment meets ISO14024 or ISO14021 standards at a level of EPEAT Silver or equivalent as a minimum standard ICT equipment complies with current ENERGY STAR® version Product take-back and appropriate resource recovery or reuse for mobiles; toner cartridges; and ICT equipment covered by the national e-waste recycling scheme under the NWP General use office copy paper (post consumer recycled content) Suppliers participate in <i>National Packaging Covenant</i> (July 2011) or comply with Used Packaging Materials NEPM Suppliers EMS aligned to ISO14001		Implemented in procurement process from July 2010 or from announcement of plan but allowing transitional arrangements for suppliers					
Managing resource consumption and demand (section 2.2) Internal copy paper per end user (reams per annum) Desktop computers to printer ratio Desktop devices (inc. laptops) per end user	18.6			13			9
	8:1			14:1			20:1
	1.6:1			1.4:1			1.2:1
Managing waste (section 2.2) e-waste reused or recycled ICT packaging recycled (targets as per NPC timeframes)	48% (2003)	65%					75%

Supporting notes to the above table

General

When measuring agency compliance with targets, regional and remote offices with less than 20 staff are excluded. Targets are to be reviewed mid-term of the plan ie 2012-13. Where no baseline is indicated no data exists at this point.

Sustainable procurement

General use copy paper target – flexibility will be considered for special circumstances.

Resource consumption and demand

*Internal copy paper per end user*²⁸ – target based on printer rationalisation, deploying follow-me print solutions, electronic document management systems and training programs. The baseline is 18.6 reams per person.²⁹

Desktop computers to printer ratio – target based on printers rationalised through movement to high-speed MFDs, follow-me print and training programs. The government baseline has been derived from total desktop PCs, printers and MFDs. Flexibility will be considered for special circumstances.

Desktop devices per end user – target based on rationalisation of devices through improvements to resource and demand management, and technology innovation. The baseline is 1.6 desktop devices including laptops per APS employee.³⁰

Waste

e-waste reused and/or recycled – 75 per cent by July 2015 is a target for Australian Government agencies to demonstrate leadership. This supports the overall aims of the Government's *National Waste Policy* and the e-waste recycling scheme target of 80 per cent by 2021 for general consumers.

ICT packaging recycled– 65 per cent post consumer packaging recycled by July 2010 is included to reinforce the Australian Government's commitment as a signatory of the NPC.³¹

-
13. *Smart 2020: Enabling the Low Carbon Economy in the Information Age*, The Climate Group and GeSI (2008), <http://www.theclimategroup.org/publications/2008/6/19/smart2020-enabling-the-low-carbon-economy-in-the-information-age/>
 14. Organisation for Economic Co-operation and Development, *Measuring the Relationship Between ICT and the Environment*, 30 July 2009. [http://www.oilis.oecd.org/olis/2008doc.nsf/LinkTo/NT0000B1F6/\\$FILE/JT03268374.PDF](http://www.oilis.oecd.org/olis/2008doc.nsf/LinkTo/NT0000B1F6/$FILE/JT03268374.PDF)
 15. Australian Government ICT carbon emissions are based on a high-level estimate by DSEWPC.
 16. Information will be provided on eco-labels that provide an equivalent or better environmental standard for relevant ICT products.
 17. Reputable implies the use of an eco-label compliant to national and/or international standards; or an established level of performance that has been widely accepted within the Australian Government.
 18. Refer to ISO 14040:2006 http://www.iso.org/iso/catalogue_detail?csnumber=37456 ; also RMIT University, Centre for Design, October 2009, http://www.cfd.rmit.edu.au/programs/life_cycle_assessment
 19. Based on formal industry submissions received 30 September 2009.
 20. The 'effective dates' shown in the table for these 3 equipment categories are approximates only and are dependent on the successful development of new standards by working groups of the IEEE Standards Association.
 21. The National Television and Computer Recycling Scheme will commence in 2011 and be progressively implemented over a five year period. Further guidance will be provided in regard to the ICT equipment recycling, the product stewardship (e-waste) scheme and the NWP.
 22. ANAO, Audit Report No 25 2008-09, *Green Office Procurement and Sustainable Office Management*. p58.
 23. Department of Environment and Climate Change NSW, 2009, *Know your paper – a guide for purchasing recycled content office paper*, <http://www.environment.nsw.gov.au/resources/sustainbus/0992OfficePaperFacts.pdf>
 24. There may be circumstances where the use of recycled paper is not appropriate for an agency (eg special reports, awards, regional areas, etc). Guidance will be provided and consideration given in regard to this requirement.
 25. The NPC is due to expire on 30 June 2010. It will be replaced by the Australian Packaging Covenant (APC) in 2011. Transition arrangements will apply for a period of up to 12 months until the APC is operational.
 26. The CPGs establish the core procurement policy framework and articulate the Government's expectations for agencies in relation to procurement. The CPG is No 1 of the "Financial Management Guidance series" of publications of which a number relate to procurement and may be relevant (eg FMG series No 10 and No 13).
 27. Refer *Commonwealth Procurement Guidelines* (2008) Division 1, in particular paragraphs 4 and 6.
 28. The term 'end user' will be aligned to an appropriate definition, such as (1) APS employee staff, or (2) occupied workpoint, or (3) Full Time Equivalent (FTE)
 29. ANAO, Audit Report No 25 2008-09, *Green Office Procurement and Sustainable Office Management*, p58
 30. *Review of the Australian Government's Use of Information and Communication Technology*, Commonwealth of Australian, August 2008, <http://www.finance.gov.au/publications/ICT-Review/index.html>, p50
 31. Refer to the *Australian Government National Packaging Covenant Draft Action Plan 2008-2010* for details of Australian Government agencies' NPC commitments. This plan will be reviewed to account for the introduction of the *Australian Packaging Covenant* (see footnote 25).

3. IMPROVING ICT ENERGY AND CARBON MANAGEMENT

The 2008 *Review of the Australian Government's use of Information and Communication Technology* reported a significant disconnect between the Australian Government's overall sustainability agenda and its ability to understand and manage energy costs and the carbon footprint of its ICT estate.³² The review also found that most agencies surveyed were unable to provide meaningful data in regard to energy use and costs.

This section addresses these issues and seeks to improve ICT energy and carbon performance in Australian Government operations by:

- setting an ICT energy consumption target for Australian Government operations, which is supported by performance reporting arrangements;
- identifying energy intensity measures and targets for use in Australian Government agencies; and
- establishing ICT energy management plans in agencies that have an annual ICT spend of more than \$20 million.³³

These initiatives complement the mandatory environmental standards of EPEAT Silver (or equivalent) and ENERGY STAR® (see Section 2), which have energy performance requirements for ICT equipment purchases.

The energy and carbon initiatives cited in this section complement the Carbon Pollution Reduction Scheme (CPRS), a key driver of Australia's greenhouse gas emissions mitigation policy. The initiatives also assist in the conservation of Australia's natural energy resources through containing or reducing ICT energy use.

3.1 Setting a whole-of-government ICT energy consumption target

The objective of setting an energy consumption target for Australian Government ICT operations is to provide an incentive to manage, monitor and report ICT energy performance.

A target will drive Australian Government agencies to seek continual energy efficiency improvement through the use of appropriate technologies, infrastructure and practices. These benefits can be examined on a whole-of-government and/or whole-of-business approach, as ICT may provide enabling opportunities to drive energy efficiency in other areas of operation. The ICT energy consumption target will include energy consumed by ICT equipment and energy consumed to operate server room and data centre facilities.

There are three primary steps to setting a whole-of-government ICT energy consumption target. These are:

1. establishing a baseline for ICT energy consumption;
2. forecasting the effect of agency energy efficiency; and
3. forecasting the effect of external energy demand (eg. business growth).

The energy consumption target for Australian Government ICT operations will depend on the accuracy of information provided by agencies, alignment to sustainability initiatives, an agency's capacity to move to greater energy efficiency, and budgetary constraints on agencies.

While a whole-of-government ICT energy consumption target will be developed based on the above steps, subsequent progress and performance will be monitored using the existing online system for comprehensive activity reporting (OSCAR). Changes will be made to the OSCAR database to support ICT energy and carbon emission reporting in Australian Government operations.

Preliminary analysis indicates that Australian Government ICT operations can expect to improve energy performance by up to 20 per cent on current consumption levels by July 2015 due to improvements to desktop and data centre energy efficiencies. This equates to around 325 000 tonnes of carbon emissions mitigated over the term of the plan. A more accurate calculation will be determined through detailed analysis arising from the whole-of-government ICT energy consumption target process as outlined above.

ACTION: A whole-of-government ICT energy consumption target will be developed with performance being monitored through the OSCAR system.

3.2 ICT energy intensity measures and targets

As described above, an energy consumption target will be derived for Australian Government ICT operations. There is also a need to compare ICT energy performance across agencies and to assist agencies to improve their performance. Energy intensity measures are tools to deliver this outcome.

In some agencies there is a business need for high numbers of energy intensive ICT equipment which will distort cross-agency benchmarking and performance analysis. This issue will be analysed and addressed through whole-of-government reporting in the early stages of the plan and may result in these agencies being grouped separately.

Energy intensity measures

Energy intensity measures have been identified for (1) desktop energy consumption including PCs, laptops, thin clients, printers and other desktop peripherals, and (2) data centre and server room energy consumption.

ACTION: Agencies are required to adopt energy intensity measures to manage ICT energy consumption. These are:

(1) Desktop energy

- *Desktop energy per end user* – measures the desktop energy efficiency, which includes desktop equipment and peripherals, and can be benchmarked across government.³⁴

(2) Data centre and server room energy

- *Power usage effectiveness (PUE)* – measures the efficiency of ICT equipment and facilities energy in data centres and server rooms, and can be benchmarked across government.
- *NABERS Energy data centre rating(s)* (available 2011) – measures ICT equipment and facilities energy efficiency and can be benchmarked across government. The NABERS energy rating philosophy measures total energy consumption compared with business drivers (eg. office buildings m²) to rate performance on a 0 to 5 star scale.

The PUE measurement is calculated by dividing the total data centre energy use by the data centre ICT energy use. All ICT equipment contained within the data centre or server room will be part of the PUE calculation, such as midrange, mainframe, and data and telecommunications.

Energy intensity targets

While an overall Australian Government ICT energy target will be developed, early improvements in energy efficiency and consumption by individual agencies will be encouraged by setting targets for specific aspects of an agency's ICT operations. Energy intensity targets for desktop energy per end user and PUE have been derived based on expected improvements in desktop and data centre energy performance.

TARGET: Agencies are to achieve energy intensity targets by July 2015 of:

- 250 kWh or less per annum in desktop energy per end user; and
- 1.9 or less power usage effectiveness (PUE) in data centres and server rooms.

Desktop energy efficiency improvements

The desktop energy per end user improvement will be driven by agencies implementing the *Green ICT Quick Wins*.³⁵ Some examples of improving desktop energy efficiency are power management solutions, printer rationalisation and desktop virtualisation. A target of 90 per cent of all desktop computers is to be shut down after hours by July 2010 (or within six months from announcement of this plan), which supports the 250 kWh per annum energy intensity target. Refer to Appendix 2 for *Green ICT Quick Wins* and other sustainability initiatives.

Data centre energy efficiency improvements

The initiatives to improve data centre and server room performance are outlined in the *Australian Government Data Centre Strategy 2010-2025*. The strategy considers energy efficient technologies, consolidation strategies and improvements to data centre facilities infrastructure and design. Some of the technology improvements to gain energy efficiency benefits include the use of server virtualisation, cloud computing, storage de-duplication, thin provisioning, and disk spin-down.

The data centre PUE target recognises that facilities infrastructure and accommodation space requires an extended lead time to allow for a re-fit or to move to a more efficient premises.

ACTION: Agencies are required to adopt the initiatives listed in the *Green ICT Quick Wins* and the *Australian Government Data Centre Strategy 2010-2025* to enable energy and carbon management improvements to desktop and data centre performance over the duration of the plan.

3.3 Agency ICT energy management plans

During March 2010, each agency with an ICT spend of more than \$20 million developed an ICT energy management plan based on a standard template provided by DSEWPC. The development of an ICT energy management plan is an important initiative for agencies to improve energy efficiency and carbon emission performance. An ICT energy management plan will also facilitate the use of ICT as an enabler of sustainability in other areas of an agency's operations.

ACTION: An agency's ICT energy management plan will be progressively enhanced to include the following key components:

- ICT energy consumption baselines for ICT equipment categories;
- provision for independent ICT energy assessments for agency data centres and server rooms to determine baseline energy measurements, including a calculation of PUE and NABERS energy data centre rating (available 2011);
- ICT energy intensity measures and targets, and other energy performance indicators;
- strategies for achieving targets, including implementing improvements under the *Green ICT Quick Wins* and the *Australian Government Data Centre Strategy 2010-2025*;³⁶
- opportunities to deploy ICT technologies to enable sustainability benefits in business and policy decision making processes;
- opportunities to use or procure:
 - accredited renewable energies, particularly in data centre and server room operations; and
 - verifiable carbon offsets;
- reporting arrangements for ICT energy consumption and intensities.

Agencies that have an organisational environmental management plan or energy management plan may elect to integrate the ICT components into either of these documents.

3.4 ICT energy and carbon reporting arrangements

The *Energy Efficiency in Government's Operations* (EEGO) policy outlines the requirements for annual energy performance reporting for Australian Government agencies. Agencies are required to submit annual energy and business data to the OSCAR database. The information is consolidated and tabled in Parliament as the report, *Energy Use in the Australian Government's Operations*. The report contains information on energy and carbon emission performance.

ACTION: The OSCAR database will be modified to allow ICT energy and carbon emission reporting.

The *Environment Protection and Biodiversity Conservation Act 1999* section 516A requires Australian Government agencies to report their environmental performance and contribution to ecologically sustainable development in their Annual Report. The agency is required to report historical and forecast consumption of greenhouse gas emissions, energy, water and waste.³⁷ Minimising the ICT impact on the environment is also a component of this reporting cycle.

ACTION: Agencies are required to include in their Annual Report those policies, programs or initiatives that contribute to ecologically sustainable development, including managing energy and carbon emissions, e-waste and other impacts of ICT on the environment. This includes reporting of where ICT is used as an enabler of sustainability.

3.5 Agency targets

The targets below are set at a level to achieve real change in an agency's ICT operations.

Agencies will implement ICT sustainability initiatives to improve performance equal to or beyond the following targets. Examples of ICT sustainability initiatives are outlined in Appendix 2.

	Government Baseline	July 2010	July 2011	July 2012	July 2013	July 2014	July 2015
Desktop energy per end user (kWh per annum and averaged across agency)	630			400			250
Power usage effectiveness (PUE) in data centres and server rooms	2.5						1.9
Desktop computers off after hours		90%					

Supporting notes to the above table

General

When measuring agency compliance with targets, regional and remote offices with less than 20 staff are excluded. Targets are to be reviewed mid-term of the plan ie 2012-13. Where no baseline is indicated no data exists at this point.

Managing energy consumption

Desktop energy per end user – target based on PCs shut down after hours and power management activated, printers rationalised and reduced desktop equipment from 1.6 to 1.2 per end user. Desktop energy includes desktop computers, laptops, thin clients, printers, scanners, MFDs and other desktop peripherals.

Power usage effectiveness (PUE) – target based on *Data Centre Strategy 2010-2025* improvements and consolidation and other data centre energy improvement initiatives.

PCs and monitors off after hours (where operationally practical) – target based on agency rapid take-up of GreenICT Quick Wins. The target includes all PCs, laptops and monitors other than those that can not be turned off due to their operational importance.

Desktop computers off target – applies from July 2010 or within 6 months from the plan's announcement.

32. *Review of Australian Government's use of information and communication technology*, Commonwealth of Australia, August 2008, Chapter 3, pp53-54 <http://www.finance.gov.au/publications/ICT-Review/docs/Review-of-the-Australian-Governments-Use-of-Information-and-Communication-Technology.pdf>

33. An energy management plan is synonymous with an energy efficiency plan. The *Energy Efficiency in Government Operations (EEGO)* policy uses the term 'energy management plan'. An agency may elect to integrate the ICT energy management components into their broader agency environmental or energy management plans.

34. The term 'end user' will be aligned to an appropriate definition, such as (1) Full Time Equivalent staff, or (2) occupied workpoint, or (3) APS employee

35. Green ICT Quick Wins, Australian Government Information Management Office, July 2009, <http://www.finance.gov.au/e-government/strategy-and-governance/sustainable-ict/quick-wins.html>

36. Green ICT Quick Wins, Australian Government Information Management Office, July 2009, <http://www.finance.gov.au/e-government/strategy-and-governance/sustainable-ict/quick-wins.html>; *Australian Government Data Centre Strategy 2010-2025*, Australian Government Information Management Office, March 2010, http://www.finance.gov.au/e-government/infrastructure/docs/AGDC_Strategy.pdf

37. Senate Committee on Finance and Public Administration, Annual Reports (No.1 of 2008), March 2008, p.28

4. ICT: PROMOTING MORE SUSTAINABLE SOLUTIONS

4.1 Within government operations

Whilst ICT has adverse impacts on the environment, it can also be a powerful enabler of improved environmental performance within government agency operations. Transformational change leading to significant rather than marginal improvement is unlikely to be achieved unless a whole-organisation approach covering both ICT and non-ICT operations is adopted.

Some examples of ICT enabling improved environmental performance in government operations include flexible work practices and teleworking, e-learning, remote collaboration and video conferencing, which all have the potential to significantly reduce energy and associated carbon emissions in the transport sector. There is also evidence to suggest that agencies that use electronic records management systems consume significantly less paper per person than agencies without these systems.³⁸ Similarly, the use of follow-me print technologies can further reduce paper and energy consumption and carbon emissions.³⁹

Over 70 per cent of the Australian Government's energy consumption is on buildings (excluding Defence operations).⁴⁰ Commercial buildings contain building management systems (BMS) to automatically monitor and control building services. These services include heating, air conditioning, ventilation, boilers and lighting. There is evidence to suggest that agencies can derive up to 25 per cent in energy savings using BMS software systems compared to non-BMS systems.⁴¹

Government 2.0 is an Australian Government initiative that makes government information more accessible and useable, and promotes online collaboration across agencies. The technology also provides an online medium for citizens and other stakeholders to interact and collaborate with government and with each other in order to stimulate discussion around policy planning and design. Agencies receive rapid feedback assisting with improvements to government services and programs.⁴² Government 2.0 is designed to lower costs and produce more efficient communications, and the technology can also lead to better social outcomes and reduce environmental impacts within government operations and the broader community.

There are other opportunities for agencies to improve sustainability through the effective use of ICT. To facilitate these opportunities, online information and better practice case studies will be developed and issued indicating where ICT can be used as an enabler of sustainability in government operations.

ACTION: Agencies are required to actively pursue the use of ICT to improve environmental performance within government operations.

ACTION: Online information and better practice case studies will be developed and issued indicating where ICT can be used as an enabler of sustainability in government operations.

4.2 Promotion of broader sustainability

In addition to improving the environmental performance of Australian Government ICT operations, ICT can also be a major facilitator of more sustainable practices in the Australian community. At one level ICT can be used to assist in identifying the complex and integrated connections between the various economic, social and environmental dimensions of sustainability. In the environment sphere, ICT has been estimated to enable carbon emission reductions at a global level of up to 15 per cent in other industry sectors.⁴³ Similar reductions should be possible in the Australian context.

Considerable economic, social and environmental benefits can be derived from the effective use of ICT in the delivery of government programs and services. The proposed investment by the Australian Government in a *national broadband network* will provide significant opportunity for governments, industries and communities to innovate and introduce enabling technologies to assist in achieving long term sustainability goals.

Some examples of how ICT technologies can be used to produce wider sustainability benefits include e-Government and Web 2.0 for online business transactions and communication, smart energy grids, smarter traffic control systems, health service delivery to remote areas, land and crop monitoring systems, citizen-focused information exchange, and digital education initiatives.⁴⁴ The use of ICT through these initiatives will have long term intergenerational sustainability benefits and help to transform various industries into low carbon sectors of the economy.

These initiatives and resulting benefits can foster further investment and innovation, and open new profitable markets and trade.

ACTION: Agencies are required to pursue the use of ICT in the delivery of government programs and services to achieve more sustainable economic, social and environmental outcomes.

38. ANAO, Audit Report No 25 2008-09, *Green Office Procurement and Sustainable Office Management*. p58

39. Green ICT Quick Wins, <http://www.finance.gov.au/e-government/strategy-and-governance/sustainable-ict/quick-wins.html>

40. Energy Use in the Australian Government's Operations 2007-08, Table 2

41. Adapted from *Good Practice Case Study: BMS Linked Heating Controls and Gas Conversion, at the University of Ulster, Belfast Campus* http://www.dfpni.gov.uk/good_practice_case_study_no.4.pdf

42. Adapted from *Towards Government 2.0: an Issues Paper* <http://gov2.net.au/files/2009/07/Towards-Government-2.0-An-Issues-Paper.pdf>

43. *Smart 2020: Enabling the Low Carbon Economy in the Information Age*, The Climate Group and GeSI (2008), <http://www.theclimategroup.org/publications/2008/6/19/smart2020-enabling-the-low-carbon-economy-in-the-information-age/>

44. Department of Broadband, Communications and the Digital Economy, *Australia's Digital Economy: Future Directions*, 2009 http://www.dbcde.gov.au/digital_economy/future_directions_of_the_digital_economy/australias_digital_economy_future_directions

5. STRENGTHENING AGENCY MANAGEMENT SYSTEMS

5.1 Improving environmental management processes

The objectives of the plan are more likely to be achieved if agencies are able to integrate ICT sustainability activities into core business operations. Strengthening agency environmental management systems is a means to enable this outcome, which will also drive continuous environmental improvement and performance. This requirement is consistent with greening of government initiatives for agencies to develop their own environmental management system (EMS).

The processes underpinning an EMS will also consider those environmental aspects outside of energy and carbon management. These aspects include the disposal of ICT equipment, non-hazardous solid waste, water use, materials, noise, ozone depleting substances, volatile organic compounds and hazardous substances.

An EMS will also highlight issues relating to e-waste requirements under the *National Waste Policy*, and legal obligations relating to data centre air conditioning cooling towers, refrigerants, fire suppression systems and fuel tank containment.⁴⁵

More broadly, an agency's internal governance arrangements and policies should be aligned with and reinforce the Government's objectives in relation to this plan and other greening of government initiatives.

ACTION: Agencies are required to conduct an environmental risk assessment to determine significant aspects of their ICT operations to be managed and integrated into the agency's environmental management system.

ACTION: Agencies are required to review their internal governance arrangements and integrate ICT sustainability into internal documentation. This includes documentation for:

- Chief Executive Instructions (CEIs);
- internal policies, procedures and guidelines;
- business plans and decision related documents;
- tender and sourcing documents;
- management reporting frameworks, including balanced scorecards;
- duty statements and performance agreements for staff and contractors; and
- awareness and education programs.

5.2 Instilling behavioural and cultural change

Raising the level of ICT sustainability awareness and knowledge in government agencies is fundamental to achieving the outcomes of the ICT Sustainability Plan.

To encourage behavioural and cultural change that supports ICT sustainability, agencies will need to develop strategies that raise the general awareness of staff in relation to their use of ICT equipment and consumables. It is important to highlight that various positive daily practices and procedures reduce environmental impacts, improve energy efficiency and help realise the benefits and capability of ICT as an enabler of sustainability. While orientation and induction programs will be used to promote these outcomes, a wider ongoing reinforcement program will also be necessary.

In addition to raising general awareness and positive practices, formal staff training will be required to ensure agency sustainability outcomes. For example, targeted learning and development programs in ICT sustainability (or 'Green ICT') will assist in raising the skills and knowledge of staff responsible for the purchase, deployment and disposal of ICT equipment and consumables.

ACTION: Agencies are required to implement strategies to:

- raise awareness and promote behavioural change amongst staff and contractors in regard to sustainable ICT, and
- provide specific training for individuals, in particular procurement and ICT staff.

5.3 Reporting environmental performance (Green ICT Scorecard)

Agencies are required to maintain a Green ICT Scorecard as a management reporting tool to monitor and review ICT environmental performance against key objectives and to assess progress of ICT sustainability initiatives. The scorecard will include performance measures, metrics and targets.

ACTION: Agencies are required to maintain a Green ICT Scorecard to monitor and manage progress against key ICT sustainability strategies and actions.

45. Processes and procedures to establish and maintain an EMS are outlined on the DSEWPC website under EMS tools.
<http://www.environment.gov.au/sustainability/government/ems/tool.html>

6. IMPLEMENTATION

6.1 Central government coordination

One of the objectives of this ICT Sustainability Plan is to demonstrate Australian Government leadership in the sustainable management of ICT operations. This will only occur if the overall approach and actions contained in the plan lead to improved outcomes. To ensure these outcomes are achieved appropriate coordination and oversight of agency activities, and the implementation of systems to underpin the plan, are required.

Central coordination will be provided by a nominated agency to ensure that whole-of-government outcomes are realised and that agencies receive appropriate support and guidance during the implementation of the plan.

6.2 Implementation activities

The nominated central coordination agency will develop an *ICT Sustainability Implementation Plan* to schedule and cost activities. Some of the key transitional arrangements and agency support activities are listed below.

- | | |
|------------------------------|--|
| Sustainable ICT procurement | <ul style="list-style-type: none"> • Modify central government ICT procurement contracts and requests for tender templates to include ICT sustainability requirements (<i>prospective activity</i>) • Provide sustainable ICT procurement guidance for agencies, such as information on eco-labels and environmental standards; the NPC and NWP. • Provide information and training for agencies on the <i>Green ICT Procurement Kit</i>, particularly the mandatory environmental standards • Provide guidance on appropriate evaluation measures or weighting for environmental criteria within ICT procurement evaluations • Provide guidance on responsible ICT suppliers |
| Energy and carbon management | <ul style="list-style-type: none"> • Enhance the OSCAR database to enable separate ICT energy and carbon emission reporting • Develop an energy management plan (EMP) template for agencies • Develop a whole-of-government ICT energy consumption target • Develop guidance on ICT energy intensity measures and other performance measures • Develop and manage Green Lease Schedules for data centre leases (<i>prospective activity</i>) |

Leadership, governance and management

- Establish an ICT Sustainability unit to provide central coordination and support
- Establish a dedicated ICT Sustainability website to deploy information such as better practice case studies, guidelines and templates
- Develop, promote and facilitate ICT sustainability awareness, learning and development programs
- Provide guidance on a Green ICT Scorecard, including performance measures
- Provide general ICT sustainability guidance materials, including information on using ICT as an enabler of sustainability

6.3 Mid-term review

A mid-term review of the *Australian Government ICT Sustainability Plan 2010 – 2015* will be undertaken to determine the plan's effectiveness, including an assessment and progress report on the following areas:

- relevance of mandatory environmental criteria for ICT acquisitions and energy intensity measures and targets;
- analysis of whole-of-government ICT energy consumption targets and agency targets;
- agency progress towards implementing initiatives outlined in Appendix 2;
- success of implementation activities; and
- environmental, social and financial analysis of benefits realised.

The review will also consider any significant changes in Australian Government policy and international ICT sustainability initiatives and technology.

ACTION: Central coordination, guidance and support for agencies will be provided in the following areas:

- supporting agencies with implementation;
- policy advice and standardisation of practice;
- integration of plan into agency management systems;
- online ICT sustainability knowledge centre, helpdesk, training and communication;
- measurement, monitoring, evaluation and reporting; and
- mid-term review of the plan.

6.4 Exemptions (Opt-outs)

There may be requirements outlined in the plan that are not suitable for agency operations to meet service levels or special purpose needs. In such cases, agencies that have special operational circumstances or business needs can apply for exemption (opt-out) from requirements in the plan by submitting a business case for consideration by the Secretaries' ICT Governance Board (SIGB).⁴⁶

46. Agencies should refer to the *Process for Administration of Opt-outs from Whole-of-Government ICT Arrangements* at http://www.finance.gov.au/e-government/strategy-and-governance/docs/Process_for_administration_of_opt.pdf

ABBREVIATIONS

AGIMO	Australian Government Information Management Office
APC	Australian Packaging Covenant (replacing the NPC in 2011)
APS	Australian Public Service
CPRS	Carbon Pollution Reduction Scheme
DSEWPC	The Department of Sustainability, Environment, Water, Population and Communities
EEGO	<i>Energy Efficiency in Government Operations policy</i>
EMP	Energy Management Plan
EMS	Environmental Management System
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPEAT	Electronic Product Environmental Assessment Tool
ESD	Ecologically Sustainable Development
FMA Act	<i>Financial Management and Accountabilities Act 1997</i>
GeSI	Global e-Sustainability Initiative
GLS	Green Lease Schedule
GRI	Global Reporting Initiative
ICT	Information and Communications Technology
ISO	International Standards Organisation
NABERS	National Australian Built Environment Rating Scheme
NPC	<i>National Packaging Covenant</i>
NEPM	<i>National Environment Protection Measure</i>
UPM NEPM	<i>National Environment Protection (Used Packaging Materials) Measure</i>
NWP	<i>National Waste Policy</i>
OSCAR	Online System for Comprehensive Activity Reporting
PVC	Polyvinyl chloride
RoHS	Restriction of Hazardous Substances
SCCP	short chain chlorinated paraffins

GLOSSARY

Cloud computing	Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. ⁴⁷
Corporate social responsibility	Corporate social responsibility is a term used to express an organisation taking responsibility for the impact of its activities upon employees, customers, citizens, communities and the environment.
Desktop virtualisation	Desktop virtualisation is a server centric computing model that borrows from the traditional thin client model but is designed to give system administrators the ability to host and centrally manage desktop virtual machines in the data centre while giving end users a full PC desktop experience. Some advantages include instant provisioning of new desktops, significant reduction in the cost of new application deployment, robust desktop image management capabilities, and normal 2-3 year PC refresh cycle extended to 5–6 years or more. ⁴⁸
Ecologically sustainable development	Ecologically sustainable development (ESD) involves decision-making processes that integrate both short term and long term economic, environmental and equitable considerations. ESD incorporates the principles of intergenerational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
Energy intensity measure	An energy intensity measure is a calculation to analyse energy performance using an appropriate business driver. The areas that impact on ICT energy consumption include business drivers such as, volume of transactions, number and type of database queries, software applications, and number of end users or staff.
Environmental aspect	An environmental aspect is an element of an organisation's activities or products or services that can interact with the environment. ⁴⁹
Environmental impact	An environmental impact is any change to the environment, whether adverse or beneficial, wholly or partially resulting from organisational impacts. ⁵⁰
Environmental performance	Environmental performance is measurable results of an organisation's management of its environmental aspects. ⁵¹

Environmental management system	An Environmental Management System (EMS) is a structured system or management tool designed to help an organisation to reduce its negative impacts on the environment and improve its environmental performance. The system can also provide a methodical approach to planning, implementing and reviewing an organisation's environmental management.
ICT Sustainability	ICT sustainability in Government is the responsible acquisition, installation, use and disposal of information and communications technologies and services so as to utilise resources more effectively, increase productivity and improve efficiency, and reduce the environmental impact of operations.
Mandatory environmental standard	A mandatory environmental standard refers to the application of an eco-label or criteria in agency procurement processes to achieve a minimum level of environmental performance.
Server virtualisation	Server virtualisation is the concealing of server resources, including the number and identity of individual physical servers, processors, and operating systems, from server users. The server administrator uses a software application to divide one physical server into multiple isolated virtual environments.
Storage de duplication	Storage de-duplication is a method of reducing storage needs by eliminating redundant data. Only one unique instance of the data is actually retained on storage media, such as disk or tape. Redundant data is replaced with a pointer to the unique data copy. ⁵²
Sustainability	Sustainability is the quest for a sustainable society; one that can persist over generations without destroying the social and life supporting systems that current and future generations of humans (and all other species on earth) depend on.
Sustainable procurement	Sustainable procurement is a process whereby organisations meet their needs for goods, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment.
Thin client	A thin client is a client computer or client software in client-server architecture networks which depends primarily on the central server for processing activities, and mainly focuses on conveying input and output between the user and the remote server. In contrast, a thick or fat-client does as much processing as possible and passes only data for communications and storage to the server. ⁵³
Thin provisioning	Thin provisioning is a mechanism that applies to large-scale centralized computer disk storage systems, storage access networks (SANs), and storage virtualisation systems. Thin provisioning allows space to be easily allocated to servers, on a just-enough and just-in-time basis. ⁵⁴

47. <http://en.wikipedia.org/wiki/>

48. *ibid*

49. Environmental Management Systems (EMS) ISO 14001:2004

50. *ibid*

51. *ibid*

52. http://searchstorage.techtarget.com/sDefinition/0,,sid5_gci1248105,00.html

53. <http://en.wikipedia.org/wiki/>

54. *ibid*

APPENDIX 1

EPEAT AND EQUIVALENT ECO-LABELS

While the Australian Government has selected EPEAT Silver as the minimum environmental standard to be applied to ICT equipment (outlined in Section 2) it recognises the presence of other established regional and international eco-labels that meet the ISO standards which are relevant to the ICT industry and can be considered at least equivalent to EPEAT. These include independently certified (IC) eco-labelling programs that are members of the Global Ecolabelling Network (GEN).⁵⁵

GEN members are voluntary, third party certified, life cycle based eco-labelling programs which comply with the international standard ISO 14024. Some examples of GEN members include *Blue Angel* (Germany), *TCO Certified* (Sweden), the *EU Ecolabel* (Europe), *Eco Mark Program* (Japan), *Good Environmental Choice Australia* (GECA), and *Environmental Choice* (New Zealand).

ICT related eco-labels will be periodically reviewed over the duration of the ICT Sustainability Plan to determine 'equivalences' to EPEAT.

EPEAT criteria

The Electronic Product Environmental Assessment Tool (EPEAT) is a self declared eco labelling program that aligns to the self declared ISO 14021 eco-label standard. The environmental criteria and operational details of the EPEAT program are contained in a public standard, *IEEE 1680*, developed by the Institute of Electrical and Electronic Engineers (IEEE), while the program is managed by the Green Electronics Council (GEC), an American not-for-profit organisation. The GEC carries out product declaration verifications to ensure that the products meet the stated criteria.

There are three levels of environmental performance in the EPEAT eco-labelling program:

- *EPEAT Bronze* – product meets all 23 mandatory criteria;
- *EPEAT Silver* – product meets all required criteria plus 50 per cent of the 28 optional criteria; and
- *EPEAT Gold* – product meets all required criteria plus 75 per cent of the optional criteria.

Currently the IEEE 1680 standard covers notebooks, desktops, thin clients, integrated systems and monitors – refer to EPEAT criteria below. Standards are also being developed for imaging equipment and televisions (due 2011) and servers and mobile devices (due 2012/2013).

Agencies will be advised as new standards/criteria for ICT equipment become available.

EPEAT criteria

Criteria Category	Required criteria	Optional criteria
1. Reduction/elimination of environmentally sensitive materials	<p>Compliance with provisions of European RoHS Directive upon its effective date</p> <p>Reporting on amount of mercury used in light sources (mg)</p> <p>Elimination of intentionally added SCCP flame retardants and plasticisers in certain applications</p>	<p>Low threshold for amount of mercury used in light sources</p> <p>Elimination of intentionally added mercury used in light sources</p> <p>Elimination of intentionally added lead in certain applications</p> <p>Elimination of intentionally added hexavalent chromium</p> <p>Large plastic parts free of certain flame retardants classified under European Council Directive 67/548/EEC</p> <p>Batteries free of lead, cadmium and mercury</p> <p>Large plastic parts free of PVC</p> <p>Elimination of intentionally added cadmium</p>
2. Materials selection	<p>Declaration of post-consumer recycled plastic content (%)</p> <p>Declaration of renewable/bio-based plastic materials content (%)</p> <p>Declaration of product weight (kgs)</p>	<p>Minimum content of post-consumer recycled plastic</p> <p>Higher content of post-consumer recycled plastic</p> <p>Minimum content of renewable/bio-based plastic material</p>
3. Design for end of life	<p>Identification of materials with special handling need</p> <p>Elimination of paints or coatings that are not compatible with recycling or reuse</p> <p>Easy disassembly of external enclosure</p> <p>Marking of plastic components</p> <p>Identification and removal of components containing hazardous materials</p> <p>Minimum 65 per cent reusable/recyclable</p>	<p>Reduced number of plastic material types</p> <p>Moulded/glued in metal eliminated or removable</p> <p>Minimum 90 per cent reusable/recyclable</p> <p>Manual separation of plastics</p> <p>Marking of plastics</p>
4. Product longevity/life cycle extension	<p>Availability of additional three year warranty or service agreement</p> <p>Upgradeable with common tools</p>	<p>Modular design</p> <p>Availability of replacement parts</p>
5. Energy conservation	ENERGY STAR®	<p>Early adoption of new ENERGY STAR® specification</p> <p>Renewable energy accessory available</p> <p>Renewable energy accessory standard</p>
6. End of life management	<p>Provision of product take-back service</p> <p>Provision of rechargeable battery take-back service</p>	Auditing of recycling vendors

7. Corporate performance	<p>Demonstration of corporate environmental policy consistent with ISO 14001</p> <p>Self-certified environmental management system for design and manufacturing organisations</p> <p>Corporate report consistent with Performance Track or GRI</p>	<p>Third-party certified environmental management system for design and manufacturing organisations</p> <p>Corporate report based on GRI</p>
8. Packaging	<p>Reduction/elimination of intentionally added toxics in packaging</p> <p>Separable packing materials</p> <p>Declaration of recycled content in packaging</p>	<p>Packaging 90% recyclable and plastics labelled</p> <p>Minimum post-consumer content guidelines</p> <p>Provision of take-back program for packaging</p> <p>Documentation of reusable packaging</p>

Source: EPEAT, <http://www.epeat.net/Criteria.aspx>

55. GEN <http://www.globalecolabelling.net/index.html>

APPENDIX 2

ICT SUSTAINABILITY INITIATIVES

The Australian Government Information Management Office (AGIMO) released *Green ICT Quick Wins* in July 2009. The Quick Wins are a set of immediate measures to address ICT energy performance and management in Australian Government operations.⁵⁶ The table below lists the Green ICT Quick Wins and other sustainability initiatives. It is intended to serve as a planning guide to assist agencies schedule initiatives in the context of reaching environmental performance targets.

To maximise cost saving opportunities, agencies should schedule ICT infrastructure changes around refresh cycles and contract renewals.

This list will be expanded over the duration of the plan as new technologies and practices develop.

		Planned	In progress	Completed	Not actioned
Sustainable ICT procurement					
1. Improved ICT sustainability requirements in tenders	<ul style="list-style-type: none"> • apply mandatory environmental criteria <ul style="list-style-type: none"> - minimum EPEAT Silver or equivalent (based on ISO14021/ISO14024) - ENERGY STAR® - product take-back for toner cartridges, mobile devices, and ICT equipment covered under the <i>National Waste Policy</i> - minimum 50 per cent post-consumer recycled content paper - participation by ICT suppliers in the NPC/ compliance with the NEPM - ICT suppliers EMS aligned to ISO 14001 • apply <i>Green ICT Procurement Kit</i> provisions • apply relative weighting (or other model) to environmental criteria 				
2. Zero e-waste and packaging waste to landfill	<ul style="list-style-type: none"> • recycling infrastructure for batteries, mobile devices, cables and ICT equipment • re-use or recycling of packaging waste • <i>National Packaging Covenant</i> requirements or NEPM compliance • <i>National Waste Policy</i> requirements • responsible gifting of usable ICT equipment 				

		Planned	In progress	Completed	Not actioned
Energy and carbon management					
3. Zero active screensavers	<ul style="list-style-type: none"> black screens static screens 				
4. Zero PCs left 'on' after office hours	<ul style="list-style-type: none"> staff shutdown PCs at the end of the day PC fleet power management solution (auto shutdown) set monitors to standby after 10 minutes of inactivity 				
5. Optimise paper and toner cartridge use	<ul style="list-style-type: none"> printers set to default duplex printing follow-me print solutions printing multiple pages per sheet online reading and editing effective use of the print preview function eco-font and fast draft printer density settings default grey scale for colour printers e-forms, e-claiming and e-payments 				
6. Increase energy efficiency for desktop fleet	<ul style="list-style-type: none"> energy efficient PC, laptop and monitor desktop virtualisation thin client technology activate power management settings on all desktop computers and peripherals (where operationally practical) 				
7. Optimise total number of desktop PCs and laptops	<ul style="list-style-type: none"> minimise PC and laptop duplication conduct a comprehensive analysis of desktop fleet numbers and rationalise where necessary laptop pooling and/or docking stations hot desking 				
8. Optimise telephone handsets	<ul style="list-style-type: none"> minimise handset duplication integrate telephony soft phone technology 				
9. Optimise printer utilisation	<ul style="list-style-type: none"> centralised MFDs Follow-me print solutions 				
10. Optimise ICT equipment and facilities energy efficiency in data centres and server rooms	<ul style="list-style-type: none"> conduct independent energy assessment for PUE or NABERS energy rating server virtualisation (where suitable) cloud computing storage de-duplication thin provisioning disk spin-down location of data centre or server room optimise air conditioner coefficient of performance mitigate air blocks and leaks, and maximise air flow mitigate cold/hot air short circuiting optimise hot air collection and return air locations optimise server rack selection and use hot aisle and cold aisle containment and layout free cooling or liquid cooling Power distribution efficiency and other <i>Australian Government Data Centre Strategy 2010-2025</i> initiatives 				

		Planned	In progress	Completed	Not actioned
Effective use of ICT					
11. Optimise ICT utilisation in Government operations	<ul style="list-style-type: none"> video and web conferencing electronic records management system tele-working follow-me network solutions e-learning and video streaming e-forms, e-claiming and e-payments integrated software systems integrated building management systems and smart metering 				
Environmental management systems					
12. Improve ICT sustainability governance and decision making	<ul style="list-style-type: none"> update CEIs, policies and procedures update business case templates update new policy proposal templates update risk assessment templates update job description and performance agreements align processes to ISO 14001 				
13. Improve organisational knowledge	<ul style="list-style-type: none"> ICT sustainability awareness programs ICT sustainability education and training 				
Reporting					
14. Establish ICT energy baseline	<ul style="list-style-type: none"> Measure energy consumption for each ICT equipment category independent energy assessments for data centres and server rooms 				
15. Report Green ICT performance	<ul style="list-style-type: none"> Green ICT Scorecard with energy measures and other Green ICT key performance indicators Annual Report - ESD reporting Energy and carbon reporting - OSCAR database 				

56. Green ICT Quick Wins, Australian Government Information Management Office, July 2009, <http://www.finance.gov.au/e-government/strategy-and-governance/sustainable-ict/quick-wins.html>