

Achievements 2009/10

Equipment Energy Efficiency Program Annual Report

Report No: 2011/03

www.energyrating.gov.au





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- → Achievements 2009/10 is the annual report of the Equipment Energy Efficiency Program – formerly known as the National Appliance and Equipment Energy Efficiency Program, which commenced nationally in Australia in 1992. New Zealand joined the program in 2002.
- → This report highlights the progress made in the 12 month period from 1 July 2009 to 30 June 2010 against the goals set for the Program by the Ministerial Council on Energy.
- → More information about the E3 Program can be found at www.energyrating.gov.au

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With a history dating back over fifteen years, the E3 Program is widely acknowledged as one of the most extensive and mature appliance energy efficiency initiatives in the world, as noted by the Prime Minister's Task Group on Energy Efficiency in its final report¹:

"Well-targeted standards and labelling have a proven track record in unlocking emissions reductions and energy savings potential. The current approach to standards, ratings and labels in the equipment and appliance sectors in Australia is projected to return net benefits of \$22.44 billion from 2009 to 2024 and save the community \$5.2 billion in the year 2020 alone. Australia has a strong reputation internationally for its existing approach to appliance and equipment minimum energy performance standards."

The results of the E3 Program, together with similar overseas initiatives, have highlighted the role of energy efficiency in reducing greenhouse gas emissions, improving energy security and strengthening economies. This has caused leading governmental fora to promote energy efficiency, particularly in the building and appliance sectors, as the highest priority for developed and developing countries.

For example, the Major Economies Forum on Energy and Climate (MEF)² noted that:

"Energy efficiency in buildings often tops the list of carbon mitigation options, largely because of the opportunities that can be achieved at low or negative net cost – saving both energy and money. Moreover, many of the technologies and practices to achieve these reductions are available today. Successful strategies to improve building sector energy efficiency target whole buildings, appliances and building products (e.g. windows) and more cross-cutting areas such as capital mobilization to improve existing buildings³.

This report highlights the progress made by the Equipment Energy Efficiency Program (E3 Program) in the 12 month period from 1 July 2009 to 30 June 2010.

The E3 Program now extends into all sectors and with an expenditure in 2009/10 of AUD \$3.1 million on project related activities, is estimated to reduce greenhouse gas emissions by 250.2 Mt CO_2 -e over the period 2000-2020⁴. The cost of this to energy users is estimated to be a saving of approximately \$56 per tonne of emissions avoided (at a 7.5% discount rate), which is about twice the corresponding estimate in 2005.

It is currently estimated that the E3 Program will yield a cumulative economic benefit to Australia of AUD \$22.4 billion⁵ by 2024, plus additional benefits of NZD \$5.11 billion⁶ to the New Zealand economy by 2036. This reflects not only economic and environmental benefits, but also significant savings for households, businesses and industry throughout Australia and New Zealand. These benefits are the result of a productive working relationship between government agencies and industry.

The E3 Program has its origins in the National Appliance and Equipment Energy Efficiency Program (NAEEEP) which began more than fifteen

¹ *Report, July 2010, Canberra*, available at www. climatechange.gov.au/~/media/submissions/pmtaskforce/report-prime-minister-task-group-energyefficiency.pdf

² www.majoreconomiesforum.org – Australia, Brazil, Canada, China, the European Union, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, South Africa, the United Kingdom, and the United States

³ Source: *Executive Summary of MEF Technology Action Plan*, available at www.majoreconomiesforum.org/images/ stories/documents/MEF Exec Summary 14Dec2009.pdf

⁴ Source: Prevention is Cheaper than Cure – Avoiding Carbon Emissions through Energy Efficiency: Projected Impacts of the Equipment Energy Efficiency Program to 2010, p. 5 (Report 2009/01, available at www.energyrating.gov.au

⁵ Source: Prevention is Cheaper than Cure – Avoiding Carbon Emissions through Energy Efficiency: Projected Impacts of the Equipment Energy Efficiency Program to 2010, p. 5 (Report 2009/01, available at www.energyrating.gov.au

⁶ Source: New Zealand Energy Efficiency and Conservation Authority

years ago with an agreement in 1992 to label a few domestic appliances on a national basis. Since that time, the Program has grown continually and is now one of the key delivery mechanisms of Australia's National Framework for Energy Efficiency (NFEE)⁷ and National Strategy on Energy Efficiency (NSEE)⁸ and the New Zealand Energy Efficiency and Conservation Strategy (NZEECS)⁹.

The Program is co-funded by the Australian Government, State and Territory governments and the New Zealand Government and includes a range of measures aimed at improving the energy efficiency of equipment and appliances used in the residential, commercial and manufacturing sectors in Australia and New Zealand. Its core objectives are to deliver cost-effective greenhouse gas abatement by addressing market failures and to lower the cost to consumers of operating energyusing appliances and equipment.

The main policy tools used by the E3 Program to achieve these outcomes are:

- Mandatory Minimum Energy Performance Standards (MEPS).
- Mandatory Energy Rating Labelling (ERL).
- Voluntary measures including endorsement labelling, high energy performance standards and voluntary use of the ERL.
- Training and support to promote use of the most energy efficient products.

By the end of 2010, 17 MEPS, 7 mandatory energy rating labels and two voluntary labels were applied to 18 individual products. By 2012, it is expected that the policy mix and product coverage of the Program will expand considerably, as shown in Table ES1.

Table ES1:Distribution of E3 energy
efficiency policy measure, 2010

Description	Number of Products
	2010
Policy Tool	
Mandatory MEPS Mandatory Labelling Voluntary Labelling	16 3 8
Sector	
Residential Commercial Industrial	8 14 4
Product Category	
Air Conditioners Commercial and Industrial Home Entertainment and ICT Lighting Swimming Pool Pumps Water Heating Whitegoods	4 3 5 - 1

The Program also has links with regional and international activities, in particular those working towards common methods of testing the energy performance of selected appliances. Such work helps to reduce the burden on manufacturers of multiple tests and to encourage the growth of international markets for more energy efficient products and new energy-saving technologies. This in turn helps to ensure the timely entry of the most energy efficient products into the Australian and New Zealand markets.

The success of the E3 Program is the result of sustained investment in activity by:

- updating test methods.
- increasing the stringency of existing regulations.
- re-grading energy rating labels to keep pace with technological improvements.

⁷ www.ret.gov.au/documents/mce/energy-eff/nfee/default. html

⁸ www.coag.gov.au/coag_meeting_outcomes/2009-07-02/ docs/Energy_efficiency_measures_table.pdf

⁹ www.eeca.govt.nz/node/2639

 regulating the efficiency of new categories of appliances and equipment through MEPS and/ or ERLs. The following table shows the key achievements of the 2009/10 period, illustrating the breadth of work that serves to underpin the E3 Program.

• communicating with stakeholders.

Program Area	Quantity	Item
New MEPS	6	Close Control Air Conditioners Commercial Building Chillers Tungsten Filament Lamps Low Voltage Non-reflector Halogen Lamps Self-ballasted CFLs Televisions
Revised MEPS	1	Air Conditioners (Single- and Three-phase)
New ERLs	1	Televisions
Revised ERLs	3	Air Conditioners (Single-phase) Freezers Refrigerators
Voluntary Agreements	1	Conditional Access Set Top Boxes
Voluntary ERL	1	Swimming Pool Pump-units
Strategic Plans Released	1	Non-domestic Refrigeration
Strategic Plans in Progress	4	Catering Equipment Industrial Equipment Lighting Street Lighting
New Energy Performance Test Methods Published	2	Swimming Pool Pump-units Televisions
Revised Energy Performance Test Methods Published	5	Clothes Washers (2 revisions) Extra Low Voltage Converters Self-ballasted CFLs Set Top Boxes (2 revisions) Street Lighting
Decision Regulation Impact Statements Approved	3	Gas Water Heaters Lighting (Tungsten Filament Lamps, Compact Fluorescent Lamps and Voltage Converters) Televisions
Consultation Regulation Impact Statements Released	2	Air Conditioners (Single- and Three-phase) Greenhouse-Intensive Water Heaters
Monitoring Programs	3	Residential Energy Monitoring Program (Proof of Concept) Standby Power Store Surveys (x2)

Table ES2. Major E3 Program achievements 1 July 2009 to 30 June 2010

Program Area	Quantity	Item
Regulatory Rulings	6	Wide range of products
Check tests	85	Wide range of products
Market Surveillance Reports	1	Whitegoods
Approved Product Registrations	5,938	Wide range of products
Website Hits	12.3 million	Wide range of products
Publications	29	Wide range of products
Newsletters	3	Circuit Breaker Load Down Transformers
Stakeholder Communication Campaigns	2	Algorithm Changes (Air Conditioners, Refrigerators and Freezers) National Retailer Training Program
Consumer Communication Campaigns	1	Lighting
Training Materials	4	The Basics of Efficient Lighting - A Reference Manual for Training in Efficient Lighting Principles. Electrical Contractor's guide to new lamp technologies. Good Practice Guide to Heat Pump Installation (EECA, NZ). Transitional Plumber Training Program.

Some of the major highlights of the 2009/10 period include:

Regulation and Standards Development

Regulation, reinforced by the development of appropriate testing and performance standards, provides the Program with a mechanism to:

- Exclude the worst performing products from the market through MEPS.
- Enable consumers to compare the energy performance of appliances through mandatory energy rating labels.
- Provide assistance to all Australian States and Territories and New Zealand agencies considering

technical, legal and administrative aspects of equipment energy efficiency initiatives.

• Harmonise all MEPS, ERL and related initiatives throughout Australia and New Zealand.

During 2009/10, regulations for lighting, televisions, commercial building chillers and close control air conditioners came into force in Australia with MEPS commencing for both commercial building chillers and close control air conditioners in July 2009. In October 2009, MEPS and labelling commenced for televisions. In November 2009, point-of-sale restrictions came into force for incandescent lamps and MEPS came into force for compact fluorescent lamps.

More stringent labelling for refrigerators and freezers came into effect in April 2010. At the same time, more stringent MEPS were implemented for single- and three-phase air conditioners and more stringent labelling of single-phase air conditioners was introduced. Harmonisation of testing standards both regionally and internationally was also progressed through participation in international lighting, standby and motors projects.

The commitment of Australian industry towards improving energy efficiency and reducing greenhouse gas emissions was demonstrated during the year with the introduction of a voluntary agreement for conditional access set top boxes and a voluntary ERL for swimming pool pumps.

Compliance

Ongoing regulatory compliance activities allow the Program to:

- Verify conformity with regulatory measures.
- Administer an effective, coordinated testing regime verifying the energy efficiency claims of suppliers.
- Review existing appliance energy consumption information and to improve standards and testing protocols.
- Provide a forum for exchanging information on enforcement and compliance issues between participating jurisdictions.

During 2009/10, the Program undertook check tests on 85 appliances and carried out preparatory work for testing activities in 2010/11. Energy rating labelling compliance audits were carried out in 237 New Zealand retail premises, inspecting 16,600 appliances and recording 98% compliance. The results of an Australian energy rating labelling compliance survey, carried out in May and June 2009 and demonstrating a 98.1% national compliance rate, were published in September 2009. Over the period 1 July 2009 to 30 June 2010 there were 2,744 registered users of the online registration system and 7,484 submissions were completed and sent to regulators, resulting in 5,938 registration approvals.

International round robin testing for lighting and motors was also undertaken during this period to facilitate and improve international cooperation on cost-effective and reliable check testing.

Communication

Communication activities underpin and complement the work of the Program, helping to:

- Inform stakeholders about the Program.
- Coordinate national marketing and communication projects to support new, and enhance existing, energy efficiency programs.
- Coordinate broad consultative processes with industry and other interested parties developing and implementing energy efficiency programs.
- Monitor and report Program performance, achievements and enforcement outcomes.

During 2009/10 a comprehensive review of the Energy Rating website was completed with the production of a detailed requirements specification document for rebuilding the website; and 29 Program publications, three newsletters and two media releases were produced. In addition, in partnership with industry bodies, training materials on efficient lighting and solar and heat pump water heaters were produced and disseminated. Follow-up of the *Change the Globe* campaign point-of-sale material was undertaken and preparation for a communications campaign for the greenhouse gas-intensive water heater phase-out and a possible national retailer training program for the Energy Rating Label were initiated.

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Program Evaluation

The ongoing analysis of the projected impacts of policy measures that have been implemented is an integral part of the process of good regulation and policy making. It allows the Program to:

- Assess the actual impact of program activities against the estimates made prior to implementation.
- Verify the effectiveness of the measures implemented in reducing energy consumption and greenhouse gas emissions.
- Make more informed decisions on the development of future strategies for energy efficiency.

From evaluation of data for lighting appliances sold in Australia (using import data as a proxy) since the announcement of the phase-out of inefficient lighting in 2007 until June 2010, savings approaching AUD \$0.5 billion were calculated. Similarly, based on the analysis of 3.0 million appliances (of all kinds) sold in New Zealand during 2009/10 savings of NZD \$157 million were calculated.

Residential End-use Monitoring

The development of sound energy policy relies on an understanding of energy consumption. Without knowledge of how and why energy is used at an end-use level, the development of energy saving programs can only be based on educated guesswork. A significant step towards addressing this information need was taken in 2009/10 with the development and implementation of a 'proof of concept' (PoC) project, which has the potential to be scaled up to a more comprehensive Residential Energy Monitoring Program (REMP).

Glossary and Abbreviations

4E	Efficient Electrical End-use Equipment (an Implementing Agreement under the IEA)	DR	Demand Response (the ability to respond to an initiating signal originating from, or defined by, a	
ABARE	Australian Bureau of Agricultural and Resource Economics	DRED	remote agent) Demand Response Enabling Device	
ACCC	Australian Competition and Consumer Commission		(a device that automatically alters an electrical product's normal mode of	
ALC ANZCERTA	Asia Lighting Compact Australia New Zealand Closer		operation in response to an initiating signal originating from, or defined by, a remote agent)	
ANZ	Economic Relations Trade Agreement Australia/New Zealand	EECA	The New Zealand Energy Efficiency and Conservation Authority	
APEC	Asia-Pacific Economic Cooperation	FGFF&C	Expert Group on Energy Efficiency	
APP	Asia-Pacific Partnership on Clean Development and Climate	202240	and Conservation (one of APEC's five expert groups which assist EWG)	
AS/NZS	Australian and New Zealand	E2WG	Energy Efficiency Working Group	
ASEAN	Association of Southeast Asian Nations	E3 Program	Equipment Energy Efficiency Program (formerly known as the National Appliance and Equipment	
BATF	Buildings and Appliances Task Force (an APP working group)	EEMODS	Energy Efficiency Program) Energy Efficiency in Motor Driven	
BAU	Business-as-usual (assumed circumstances under which no policy intervention has been taken)	EER	Systems Energy Efficiency Ratio (calculated by dividing energy out by energy in)	
сѕтв	Conditional-access Set Top Box	ELV	Extra Low Voltage	
CFL	Compact Fluorescent Lamp	ELVC	Extra Low Voltage Converter (a	
CHEARI	China Household Electric Appliance Research Institute		device used to provide power to low voltage halogen lighting systems)	
CIMISB	Commercial Ice Maker and Ice	EN	European Standard denotation	
CO2 o	Storage Bin Carbon Diovido Equivalent	ENISO	European Standard based on International Standard	
	Council of Australian Covernments	EPS	External Power Supply	
COAG	(the peak intergovernmental forum in Australia, comprising the Prime	EMSA	The IEA 4E Electric Motor Systems Annex	
	Minister, State Premiers, Territory	ERL	Energy Rating Label	
	Chief Ministers and the President of	EWG	The APEC Energy Working Group	
	Association)	GEMS	Greenhouse gas and Energy Minimum Standards	
CPRS	Carbon Pollution Reduction Scheme	GLS	General Lighting Service	
DCCEE	The Department of Climate Change	GWh	Gigawatt-hour (10 ⁹ watt-hours)	
ЛЕМНА	The Department of the Environment	IEA	International Energy Agency	
EUIA	Water, Heritage and the Arts	ISO	International Organisation for Standardisation	
		HE	High Efficiency Voluntary Label	

HEPS	High Energy Performance Standards	PJ	Petajoules (1015 joules, equivalent to
HVAC	Heating, Ventilation and Air		277.78 GWh)
	Conditioning	PoC	Proof of Concept
IEC	International Electrotechnical	prEN	Denotes a Draft European Standard
17.1		RBVM	Refrigerated Beverage Vending
Kt	Kilotonnes (1000 (10 ³) tonnes)		Machine
KV	Kilovolts	RDC	Refrigerated Display Cabinet
kva	Allovolt-Ampere (a unit used for the apparent power in an electric circuit)	REEEP	Renewable Energy and Energy Efficiency Partnership
kWh	Kilowatt-hour (one thousand (10³) watt-hours)	Regulatory Rulings	Revisions to regulatory standards to provide clarification on their
kWr	Kilowatt-refrigeration		interpretation
LE	Low Efficiency Mandatory Label	REMP	Residential Energy Monitoring
LED	Light Emitting Diode	DET	Program The Depentment of Descurees
LCA	Lighting Council Australia	REI	Energy and Tourism
LPG	Liquefied Petroleum Gas	RIAT	Regulatory Impact Assessment Team.
MCE	Ministerial Council on Energy		New Zealand Government Treasury
MEF	Major Economies Forum on Energy and Climate	RIA	Regulatory Impact Analysis (the process of examining the likely
MEPS	Minimum Energy Performance Standards		impacts of a proposed regulation and a range of alternative options which
MJ	Megajoule (10 ⁶ joules, equivalent to 0.278 kWh)		could meet the government's policy objectives)
ML	Mandatory Label	RIS	Regulation Impact Statement
Mt	Megatonne (one million (106) tonnes)		(assesses the cost, benefit and impacts of proposed regulation).
NAEEEP	The National Appliance and Equipment Energy Efficiency Program (now the E3 Program)		During the RIA process, two types of RIS are produced – an initial Consultation RIS that
ΝΑΤΑ	National Association of Testing Authorities		invites comments from the wider community on the proposal and
NECA	National Electrical and Communications Association		a Decision RIS on which the MCE decision on whether or not to regulate the product is based
NFEE	National Framework for Energy	SCO	Standing Committee of Officials
NSEE	National Strategy on Energy	TLP	Tempered Liquefied Petroleum Gas
NJLL	Efficiency	TTMRA	The Trans-Tasman Mutual
NZEECS	New Zealand Energy Efficiency and Conservation Strategy		Recognition Agreement between Australia and New Zealand
OBPR	Office of Best Practice Regulation (a	TWh	Terawatt-hour (10 ¹² watt-hours)
	part of the Australian Government's Department of Finance and	USAID	The United States Agency for International Development
	Deregulation)	VL	Voluntary Label
PIC	Pacific Island Country	WELS	Water Efficiency Labelling Standards

xiv.



Introduction

Introduction to the Equipment Energy Efficiency Program

The Equipment Energy Efficiency Program (E3 Program) has its origins in the National Appliance and Equipment Energy Efficiency Program (NAEEEP) which began more than fifteen years ago with an agreement in 1992 to use the Energy Rating Label for a few domestic appliances on a national basis. Prior to that time the Energy Rating Label had been used in NSW and Victoria.

The E3 Program is now one of the key delivery mechanisms of Australia's National Framework for Energy Efficiency (NFEE)¹⁰ and National Strategy on Energy Efficiency (NSEE)¹¹ and the New Zealand Energy Efficiency and Conservation Strategy (NZEECS)¹².

The Program is co-funded by the Australian Government, State and Territory governments and the New Zealand Government and embraces a range of measures aimed at improving the energy efficiency of equipment and appliances used in the residential, commercial and manufacturing sectors in Australia and New Zealand. Its core objectives are to deliver cost-effective greenhouse gas abatement by addressing market failures and to lower the cost to consumers of operating energyusing appliances and equipment.

A range of policy mechanisms are used by the Program to maximise the energy saving outcomes including the following:

- Mandatory Minimum Energy Performance Standards (MEPS) – set out in the relevant product standards.
- Mandatory Energy Rating Labels (ERLs) also set out in the relevant product standards.

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- Voluntary measures including High Energy Performance Standards, voluntary use of the Energy Rating Label and endorsement labelling such as the voluntary ENERGY STAR label¹³.
- Training and support to promote use of the most energy efficient products.

Together these stimulate the development of worldclass products as well as helping to create fairer competition in the marketplace by:

- Informing consumers of comparative energy consumption.
- Using energy rating labels to identify the top energy efficiency performing models in a product range.
- Defining high efficiency products within relevant standards.
- Stipulating minimum energy performance levels below which products may not be sold.

The E3 Program drives product improvement by broadening the range of product categories covered, increasing the stringency of existing energy performance requirements and focusing the Program on key sectors.

The Program now extends into all sectors and will yield a cumulative economic benefit to Australia of AUD \$22.4 billion¹⁴ by 2024, plus additional benefits of NZD \$5.11 billion¹⁵ to the New Zealand

15 Source: New Zealand Energy Efficiency and Conservation Authority

¹⁰ www.ret.gov.au/documents/mce/energy-eff/nfee/default. html

¹¹ www.coag.gov.au/coag_meeting_outcomes/2009-07-02/ docs/Energy_efficiency_measures_table.pdf

¹³ ENERGY STAR is an international standard for energy efficient consumer products. It was developed in the United States (US) in the 1990s and is a joint program of the US Environmental Protection Agency and the US Department of Energy. More information can be found on the US ENERGY STAR website at www.energystar.gov or on the New Zealand EECA website at www.eeca.govt.nz/ standards-and-ratings/energy-star.

¹⁴ Source: Prevention is Cheaper than Cure – Avoiding Carbon Emissions through Energy Efficiency: Projected Impacts of the Equipment Energy Efficiency Program to 2010, p. 5 (Report 2009/01, available at www.energyrating.gov.au

economy by 2036. Savings to date for the program in New Zealand are around \$530 million or 8.6 PJ¹⁶. The most recent impact study on the Program, *Prevention is Cheaper than Cure – Avoiding Carbon Emissions through Energy Efficiency*, estimates that emissions avoided due to the Program over the period 2000-2020 will be 250.2 Mt CO_2 -e.

These savings reflect not only economic and environmental benefits, but also significant savings for households, businesses and industry throughout Australia and New Zealand. These benefits will be achieved through a productive working relationship between government agencies and industry. More details on the savings achieved by the Program can be found in Chapter 9, *Monitoring and Evaluation*.

Figure 1. E3 Program reporting structure

1.1 Governance

The E3 Program sits within, and is managed through, the overall NFEE/NSEE structure. A simple diagram of the reporting structure is shown in Figure 1 below and the full NFEE/NSEE organisational structure can be found in Appendix 1.

Administration of the E3 Program is the responsibility of the E3 Committee, which consists of officials from Commonwealth, State and Territory government agencies, as well as representatives of the New Zealand Government (the current list of the E3 Committee membership is shown in Appendix 2).

The E3 Committee is accountable to the Ministerial Council on Energy (MCE)¹⁷, which was established by the Council of Australian Governments (COAG)¹⁸ in 2001 to deliver the economic and environmental benefits to Australia from implementation of the

Mini



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¹⁶ Source: New Zealand Energy Efficiency and Conservation Authority, Sales Data Report for year ending March 2010.

¹⁷ www.ret.gov.au/documents/mce/about/default.html

COAG national energy policy framework. The MCE is comprised of the Federal Energy Minister, each jurisdiction's Minister responsible for energy, and observers from New Zealand, Papua New Guinea and Norfolk Island (the current MCE membership list is at Appendix 3).

The New Zealand Minister for Energy has full membership and voting rights in regards to issues that fall under the Trans-Tasman Mutual Recognition Arrangement (TTMRA)¹⁹, a trigger which applies whenever any proposals for mandatory performance standards or labelling for end-use products are being considered. Measures approved by the MCE are subject to additional approval by the New Zealand Cabinet before they are adopted in New Zealand. In addition to clearance from the Office of Best Practice Regulation (OBPR), proposals with trans-Tasman implications are also subject to review by the New Zealand Government's Regulatory Impact Assessment Team (RIAT).

Under the MCE's Equipment Energy Efficiency Program, Australia and New Zealand have established common energy efficiency standards and labelling. These seek to:

- Ensure that the same regulatory standards apply to suppliers in both countries, offering improved economies of scale in local production and reduced compliance costs.
- Stimulate the development of world-class products and create fairer competition in marketing products.
- Ensure that consumers are able to make informed purchasing decisions as a result of a greater number of energy efficient products available on the market with consistent standards and labelling schemes in each country.

- Ensure that efficiency regulators deliver common regulatory proposals with resultant public sector resource savings.
- Fulfil the obligations of the Australia New Zealand Closer Economic Relations Trade Agreement²⁰ and the TTMRA.

The E3 Committee is responsible for advising the MCE on implementation measures to address the efficiency needs of all types of energy using equipment. MCE has given the E3 Committee a mandate to assess any energy-using product for possible regulation, subject to community consultation and the completion of a Regulation Impact Statement (RIS)²¹ as required by COAG and approved by OBPR. In 2006, the MCE agreed for the first time to consider regulating products even in circumstances where a cost is imposed upon the community, providing such action will offset even more expensive mitigation action sometime in the future.

1.2 Program Budget

Funding for the E3 Program comes from two sources: individual jurisdictions are responsible for funding their own staff costs in delivering the E3 Program, while all participating jurisdictions contribute to a central funding pool that is used to cover project costs. This central pool project funding is held in the MCEs Special Energy Account, which is administered by the Australian Department of Resources, Energy and Tourism (RET). The New Zealand Government contributes around 18% of E3 Program funds, with the balance being split between the Australian Government²² and the combined States and Territories according to the agreed COAG funding formula of a 50/50

²⁰ www.daff.gov.au/market-access-trade/fta/anzcerta

²¹ www.finance.gov.au/obpr/ris/index.html

²² In 2009/10, the Commonwealth contribution was jointly funded by the Department of Resources, Energy and Tourism (RET) and the Department of the Environment, Water, Heritage and the Arts (DEWHA)

split. The State and Territory contributions are determined on a pro-rata formula based on population.

In December 2007, MCE agreed on a three year forward budget of \$10 million to fund project activities as part of NFEE Stage 2. Individual annual budget allocations were set at:

- 2008/09 \$3 million
- 2009/10 \$3.5 million
- 2010/11 \$3.5 million

For the financial year 2009/10, the E3 program had an allocated budget of \$3.5 million for project activities. However, expenditure for the year totalled \$3.1 million and an under-spend (resulting from Program expenditure constraints related to the development of revised financial procedures) of \$400,000 was recorded. Unspent funds from the financial year 2009/10 have been rolled into the budget for the financial year 2010/11.

The total historical and projected budgets for the Program from 2005/06 to 2010/11 are shown in Figure 2. This figure illustrates a steady increase in funding for the E3 Program in recent years.

1.3 Objectives and Targets

The energy and greenhouse gas contribution of enduse equipment does not remain static. It changes over time due to structural changes in the economy, changes in consumer preferences and with the introduction of new technologies. Against this background, the objectives of the E3 Program are to deliver cost-effective greenhouse gas abatement, reduce energy demand (or curb its growth) by addressing market failures and to lower the cost to consumers of operating energy-using appliances and equipment.

Figure 3 provides an estimated breakdown of stationary energy end-uses in Australia's residential sector over the period 1986 to 2020.

This figure clearly illustrates that amongst the appliances that were modelled the energy consumed and the subsequent greenhouse gas emissions caused by televisions and other home electronic equipment (in particular standby power) was, in the absence of any government action, expected to grow significantly over the coming decade. Conversely, the energy used by regulated products such as refrigerators is





expected to decline, largely as a result of the effective implementation of efficiency policies over previous years. This type of data is very important in informing and identifying where government intervention could be targeted, with the E3 Program leveraging the impact of regulatory measures within particular equipment markets and aligning policies and practices throughout Australia and New Zealand. The Program also contributes to international standards development and testing programs for globally traded products such as motors and lighting, which significantly impact on energy use and related emissions in Australia and New Zealand.

1.4 Work Plans

The current three year work plan for 2008/09 to 2010/11 responds to the policy framework agreed to by COAG in the National Strategy for Energy Efficiency approved in 2008. It includes the following major objectives:

- Broadening the range of products and increasing the level of performance stringency for covered products.
- Expanding MEPS significantly into the industrial equipment sector to cover off-the-shelf products in areas such as compressors, boilers, industrial chillers, pumps and fans, heat exchangers and refrigeration equipment.



Figure 3. Trends in electrical appliance by type in Australia, 1986 to 2020

Source: Department of the Environment, Water, Heritage and the Arts: *Energy Use in the Australian Residential Sector* 1986-2020, www.energyrating.gov.au

- Improving the E3 Program's processes in terms of:
 - Engagement with industry.
 - Developing test methods and standards.
 - Regulatory Impact Assessments.
- Expanding enforcement and verification testing to maintain the E3 Program's integrity.
- Accelerating the review of the stringency in MEPS for priority appliances.

A list of products currently regulated by the Program (either with MEPS or labelling) and those expected to be covered by 2012 under the current work plan are shown in Appendix 4.

The major achievements of the 2009/2010 year are identified in Table 1, with reference to the sections in this Report that contain more complete descriptions of this work. Note that some measures are still in progress in New Zealand²³ or apply only to Australia (i.e. incandescent lamps and greenhouse gas intensive water heaters).

23 These include MEPS for commercial chillers, close control air conditioner units, external power supplies, set top boxes, televisions, and self-ballasted CFLs.

Program Area	Quantity	Item	Reference in this Document (Section)
New MEPS	6	Close Control Air Conditioners Commercial Building Chillers Tungsten Filament Lamps Low Voltage Non-reflector Halogen Lamps Self-ballasted CFLs Televisions	6.2 6.1 6.13 6.13 6.13 6.13 6.13 6.19
Revised MEPS	1	Air Conditioners (Single- and Three- phase)	6.2
New Labels	1	Televisions	6.19
Revised Label	3	Air Conditioners (Single-phase) Freezers Refrigerators	6.2 6.14 6.14
Voluntary Agreements	1	Conditional Access Set Top Boxes	6.15
Voluntary ERL	1	Swimming Pool Pump-units	6.18
Strategic Plans Released	1	Non-domestic Refrigeration	4.1
Strategic Plans in Progress	4	Catering Equipment Industrial Equipment Lighting Street Lighting	4.2
New Energy Performance Test Methods Published	2	Swimming Pool Pump-units Televisions	6.18 6.19

Table 1. Major E3 Program achievements in 2009/10

Program Area	Quantity	ltem	Reference in this Document (Section)
Revised Energy Performance Test Methods Published	vised Energy Performance t Methods Published Clothes Washers (2 revisions) Self-ballasted CFLs Set Top Boxes (2 revisions) Street Lighting		6.4 6.13 6.13 6.15 6.17
Decision Regulation Impact Statement Approved	Decision Regulation Impact Statement Approved Gas Water Heaters Compact Fluorescent Lamps and Voltage Converters) Televisions		5.1
Consultation Regulation Im- pact Statements Released	2	Air Conditioners (Single- and Three- phase) Greenhouse-Intensive Water Heaters	5.2
Monitoring Programs	3	Residential Energy Monitoring Program (Proof of Concept) Standby Power Store Surveys (x2)	9.3 9.4
Regulatory Rulings	6	Wide range of products	7.1
Check tests	85	Wide range of products	7.2
Market Surveillance Reports	1	Whitegoods	7.4
Approved Product Registrations	5,938	Wide range of products	7.3
Website Hits	12.3 million	Wide range of products	8.2
Publications	29	Wide range of products	8.3
Newsletters	3	Circuit Breaker Load Down Transformers	8.4
Stakeholder Communication Campaigns	2	Algorithm Changes (Air Condition- ers, Refrigerators and Freezers) National Retailer Training Program	8.6
Consumer Communication Campaigns	1	Lighting	8.7
Training Materials	4	The Basics of Efficient Lighting – A reference manual for training in efficient lighting principles. Electrical Contractor's Guide to new lamp technologies. Good Practice Guide to Heat Pump Installation (EECA, NZ). Transitional Plumber Training Program.	8.8



Major Domestic Achievements

2.1 Strategic Context

Throughout its development, the E3 Program has aimed to address the market failures that hinder the uptake of energy efficient equipment and lead to higher energy use and greenhouse gas emissions. The Program has enjoyed support from governments of varying political compositions, stakeholder groups and the public because it has continued to prove effective in improving energy efficiency and has been highly cost-effective. The Program's activities significantly reduce energy bills, enhance national energy security and lower greenhouse gas emissions compared to business-asusual projections. The Program is one component of a wider strategic framework and, as such, has linkages with several broader policy objectives and other programs.

2.1.1 Kyoto Protocol Commitments

Both Australia and New Zealand have ratified the Kyoto Protocol and set targets to limit greenhouse gas emissions over the 2008-2012 commitment period. Additionally, Australia has set a target to reduce greenhouse gas emissions by 60% from 2000 levels by 2050. New Zealand enacted an Emissions Trading Scheme in 2008 and the New Zealand Government has announced a provisional and conditional emission reduction target of 10-20% below 1990 levels by 2020. This complements a longer term target of reducing net emissions to 50% below 1990 levels by 2050. Improving energy efficiency is a crucial component of meeting these commitments. The Australian 2030 carbon abatement cost curve (Figure 4) shows that carbon abatement through energy efficiency can be delivered at a net negative cost. The E3 Program of appliances and equipment is a key part of the strategy to achieve this energy efficiency improvement.

2.1.2 New National Legislation

In October 2008, COAG agreed to develop, subject to Regulatory Impact Analysis, new national legislation for appliance energy performance standards and labelling that would streamline governance arrangements and regulatory processes, simplify compliance and enforcement responsibilities for all stakeholders and ensure consistency across all Australian jurisdictions. This will have considerable impact on the existing E3 Program.

Stakeholder feedback on the January 2010 consultation document, *National Legislation for Appliance and Equipment Minimum Energy Performance Standards (MEPS) and Energy Labelling*, has been received and incorporated and the design and scope of the proposed new legislation will be considered by COAG in 2011.

The objectives of the new national legislation are to:

- Capture and streamline existing administrative and compliance arrangements.
- Introduce new features to improve national consistency.
- Allow for the coverage of a wider range of products and equipment types.

It is expected that the new national legislation will adopt the following design features:

- In the first instance, the legislation would allow for:
 - Equipment types covered by the existing E3
 Program to continue to be regulated, with
 existing standards and labelling requirements
 to apply in the first instance.
 - The E3 Program to be expanded to permit:
 - Coverage of non-electrical appliances and equipment (for example, gas products).
 - Coverage of non-energy using products (for example, ducting for heating and cooling systems).



Figure 4. McKinsey Australian 2030 carbon abatement cost curve

- Management of environmental matters associated with regulated products (for example, mercury content of fluorescent lighting products).
- Greenhouse gas emissions-intensity labelling and/or standards.
- A single Regulator would be established at Commonwealth level to administer and enforce the legislation. The Regulator would have the power to delegate functions to State or Commonwealth officials on a fee-for-service basis.
- The Regulator would be able to employ a range of contemporary enforcement tools including civil and criminal penalties, enforceable undertakings, infringement notices, injunctions, de-registrations and the ability to publicise offences by firms. The enforcement tools would empower the Regulator to tailor penalties to the seriousness of an offence.
- The legislation would not be limited to the use of standards prepared by Standards Australia but could enforce any standards, requirements or recommended practices of international/national organisations that are suitable for Australian energy supply and environmental conditions.
- All new and revised standards and labelling requirements would remain subject to a consultative Regulatory Impact Analysis.
- The legislation would introduce mandatory import and wholesale data reporting requirements to improve monitoring and evaluation of the E3 Program and to improve the evidence base for revision of standards.
- The legislation would allow for the improved targeting of the E3 Program through the future expansion, subject to Regulatory Impact Analysis, of the circumstances under which firms must disclose energy efficiency information to consumers (for example, in advertising and promotional material).

2.1.3 National Hot Water Strategic Framework

The National Hot Water Strategic Framework outlines the process to transform the residential water heater market in Australia towards low emission alternatives and includes the phasing out of greenhouse gas intensive water heaters.

The Ministerial Council on Energy agreed to the implementation of a National Hot Water Strategic Framework in December 2008 under Stage 2 of the National Framework for Energy Efficiency (NFEE). This framework sets out a 10-year pathway for the Australian water heater industry to transition to the supply of low emission water heaters. It comprises a mix of regulatory measures (e.g. MEPS and measures targeting installations in new and existing homes), incentive programs and industry capacity building elements.

A key focus of work is to phase out greenhouse gas-intensive water heaters from Australian homes. It was intended that greenhouse gas-intensive (electric) water systems in gas reticulated areas be phased out from 2010 in all jurisdictions and expanded to non-gas reticulated areas in 2012. The phase-out is subject to a full cost benefit analysis.

The framework also includes complementary measures to improve minimum energy performance for low emission heaters such as solar and heat pump water heaters, along with further staged reviews of MEPS for small electric and gas water heaters.

Although implementation of the Strategy is the responsibility of the Hot Water Implementation Group, another NFEE Committee similar to the E3 Committee which has full State and Commonwealth Government representation; implementation of some MEPS measures reside with the E3 Program.

2.2 2009/10 Highlights in Australia

2.2.1 Key Sectors

E3 has the important role of developing and implementing specific, targeted measures in the residential, commercial and industrial sectors in both countries. These measures are not haphazardly or opportunistically chosen. They are selected on the basis of being the most likely to deliver cost-effective energy savings and associated greenhouse gas abatement, and they target the key equipment or equipment groups responsible for significant energy use and greenhouse gas emissions, now or in the future. Regulation of two such sectors, lighting and televisions, came into force in 2009/10.

2.2.1.1 Phase-out of Inefficient Lighting

Australia is a world leader in the phase-out of inefficient incandescent lamps and began the implementation of this phase-out on 1 February 2009 with the introduction of an import prohibition on tungsten filament general lighting service (GLS) lamps. The second stage was implemented in November 2009 when the MEPS regulations for GLS incandescent lamps, low voltage non-reflector halogen and compact fluorescent lamps (CFLs) came into force.

Further products will be covered by MEPS regulations in coming years. Preliminary analysis shows that savings of around 3.5 million tonnes CO_2 -e of greenhouse gas emissions, with total consumer financial benefits approaching half a billion dollars, are expected from the replacement of GLS incandescent lamps with more efficient lamps between February 2007 and the end of June 2010.

2.2.1.2 Mandatory Television Labelling

On 1 October 2009, mandatory Minimum Energy Performance Standards (MEPS) and labelling for televisions came into force, replacing the existing voluntary labelling scheme.



In April 2010 more stringent labelling requirements came into force for household freezers, fridges and single and three-phase air conditioners.

With Australians buying around 2 million televisions each year, this represents one of the biggest single greenhouse gas abatement measures ever taken under the E3 Program. Projections for Australia show that by 2020 over 6 Mt in CO_2 emissions will be avoided each year compared to a business-as-usual scenario.

The effects of the new regulation can already be seen. Since the introduction of compulsory energy rating labelling there has been a noticeable shift towards models with a higher energy rating, with manufacturers striving to produce models with a rating of six stars or higher.

2.2.1.3 Air Conditioners and Chillers

In July 2009, mandatory Minimum Energy Performance Standards (MEPS) came into force for chillers with a capacity of 350 kW and above and for close control air conditioners. Over the period 2009 to 2020, reductions in energy use are estimated to total 511 GWh/year and 1,923 GWh/ year respectively.

From 1 April 2010, more stringent MEPS for singleand three-phase air conditioners came into effect, as well as more stringent labelling requirements for single-phase air conditioners. The revised algorithm will reduce the number of stars on the label for the same energy consumption and once a rating exceeds six stars an additional crown will be added to accommodate 10 stars for super efficient appliances.

2.2.2 Working with Industry

The E3 Program has long been recognised and promoted as a partnership between government and industry to deliver cost-effective regulation overcoming many market failures associated with energy using products. This has been particularly evident in 2009/10 with two high profile voluntary agreements, for swimming pool pump-units and complex set top boxes, coming into force.

2.2.2.1 Swimming Pool Pump-units Voluntary Labelling

Consuming more electricity than a clothes dryer, clothes washer and dishwasher combined, a pool pump can be the largest user of electricity in the home, second only to the energy use of an electric hot water heater.

The new voluntary energy rating label for pool pump-units, negotiated during 2009/10 and launched in April 2010, therefore represents a significant energy saving opportunity. It also demonstrates a commitment by the industry to embrace energy efficiency ahead of MEPS and mandatory labelling, likely to come into force from October 2011.

The standard Energy Rating Label goes up to six stars, but pool pump-units deemed 'super efficient' are using the slightly revised label that goes up to a maximum of ten stars.

2.2.2.2 Voluntary Code for Conditional Access Set Top Boxes

A ten-year voluntary code of conduct, proposed by industry, tackles the increasing energy used by set top boxes currently exempt from regulation. The two largest pay TV providers, Austar and Foxtel, with more than 1.8 million subscribers across Australia, have agreed to improve the energy efficiency of new pay TV conditional access set top boxes (CSTBs) ordered on, or after, 1 January 2010 and to accelerate the retirement of older less efficient units. All of the Australian subscription television industry is being encouraged to join the Code.

The Code, which will meet or better European benchmarks for energy performance, commenced in January 2010. Over the 10 years to 2020, it is estimated that it will deliver energy savings of 1,124 GWh, avoid the emission of 948 Kt of CO2-e and save households subscribing to pay TV \$168 million in lower energy bills.

2.2.3 Harnessing Border Controls

The majority of electrical appliances in the Australian market are imported. Thus, an agreement negotiated in 2009/10 by the Department of Climate Change and Energy Efficiency (DCCEE) (on behalf of the E3 Program) with the Australian Customs Service represents



A typical set-top box



A standard type of swimming pool pump

a new and significant channel for communicating with suppliers. Under the agreement, when importers declare that they are importing goods under the tariff classifications that include motors, transformers and lighting products covered by MEPS, they receive advice that they may be subject to mandatory MEPS obligations.

2.2.4 Monitoring and Evaluation

Knowledge of how and why energy is used at an end-use level underpins the development of sound energy policy. Understanding how consumption patterns are changing is also important for focussing and prioritising plans for policy development. The E3 Program has developed a range of monitoring and evaluation processes to better understand energy consumption in all sectors and to track the effectiveness of its interventions. This not only supports the development of new energy efficiency policies, but highlights where improvements can be made to existing measures.

Data collection for many E3 Program monitoring projects is continuous, and is based on product registration and sales data. This information is used in major publications such as the *Greening Whitegoods* reports and end-use studies such as the *Energy Use in the Australian Residential Sector* 1986-2020²⁴ (1999, 2008).

The E3 Program has also undertaken several more detailed measurement studies, including the *Intrusive Residential Standby Survey*²⁵ (2000 and 2005); and *Standby Power Store Surveys* (since 2001) with two completed in November 2009 and in April/May 2010 (see Section 9.5, *Standby Power Store Surveys*).

In 2009/10, the following two important new projects were initiated that improve the knowledge base for the E3 Program and for all stakeholders involved in energy efficiency policy development.

2.2.4.1 Residential Energy Monitoring Program (REMP)

This 'proof of concept' (PoC) project is designed to define the methodology and improve the technical know-how required for undertaking detailed enduse monitoring of households, including a trial in five Melbourne homes. It has the potential to be scaled up to a more comprehensive Residential Energy Monitoring Program (REMP).

The PoC project has demonstrated the potential for REMP to provide a unique insight into energy consumption patterns, as well as answering many questions about the monitoring process and equipment. Further details on the project can be found in Section 9.4, *Residential Energy Monitoring Program*.

²⁴ www.energyrating.gov.au

²⁵ These Intrusive Residential Standby Studies involve taking measurements of standby power, recording ownership levels and usage patterns of electrical equipment in a sample of Australian households (64 in 2000, 120 in 2005). Survey reports are available at: www.energyrating.gov.au

Major International Activities

The effectiveness of the E₃ Program is not only measured by its achievements within Australia and New Zealand but also by its ability to influence global energy efficiency debates. Representing relatively small markets for internationally traded products, Australia and New Zealand are technology takers in the global economy. This means that global manufacturers of equipment and appliances are not usually prepared to supply products specifically for these markets. As a result, the Program has long held links with regional and international activities, in particular those working towards common methods of testing the energy performance of selected appliances. Such work helps to reduce the burden to manufacturers of multiple tests and to encourage the growth of international markets for more energy efficient products and new energy-saving technologies. This in turn helps to ensure the timely entry of the most energy efficient products into the Australian and New Zealand markets.

In 2009/10, Australia continued to work strategically with the Asia-Pacific Partnership on Clean Development and Climate (APP), the Asia-Pacific Economic Cooperation (APEC) and the International Energy Agency (IEA), and also through bilateral partnerships with China, USA and Europe.

An overview of the main international organisations associated with the E3 Program is given in this chapter and Table 2 below summarises the key projects ongoing during 2009/10. The details of the 2009/10 activities associated with these projects for lighting, motors, refrigerators and freezers and standby are given in the relevant sections of Chapter 6, *Standards Development*.

Project Name	International Funding Source	Relevant Dates	Parties Involved	Purpose			
Lighting							
Harmonization of Test Procedures: Phase out of Inefficient lighting	АРР	Jul 2007-Oct 2009	Australia (lead), Korea	To assist national action on the phase-out of inefficient lighting in order to promote the take-up of efficient lighting alternatives such as compact fluorescent lamps (CFLs).			
Harmonization of Test Procedures: Quality Assurance and Harmonisation of CFLs	APP	Jul 2007- Oct 2009	Australia and US (lead), Korea (co- lead)	To build on existing standards and efforts in the region to harmonise test procedures and specifications for compact fluorescent lamps (CFLs) and improve the quality of CFLs being sold in APP countries.			
International Collaboration Round Robin Testing	Australia	2008–2010	Australia, China	To establish a cost-effective and reliable check test method using an integrating sphere for measuring the efficacy of low voltage reflector lamps in order to protect consumers and manufacturers from the effects of sub-standard products.			

Table 2. International projects ongoing in 2009/10

14.

Project Name	International Funding Source	Relevant Dates	Parties Involved	Purpose			
Motors							
4E Electric Motor Systems Annex (EMSA)	IEA	Nov 2008- 2011	Australia, Austria, Denmark, Netherlands, Switzerland (lead), United Kingdom	To build a Global Motor Systems network in industrialised and developing countries to stimulate knowledge, technology and policy in the field of efficient motor systems.			
Harmonization of Test Procedures: Electric Motors	APP	Jul 2007-Jun 2010	Australia (lead), China (co-lead), Korea (Japan, US, India possible participants)	To inform APP member countries of the accuracy and repeatability of various test methods which underpin electric motor policy measures such as MEPS.			
Harmonization of Test Procedures: Motor Systems	АРР	Jul 2007-Jun 2012	Australia (co- lead), China (lead), Korea, (Japan, US, India possible participants)	For APP partner countries to share experiences in improving the energy efficiency of motor systems and identify possible forward paths.			
International Collaboration IEC Round Robin Testing (under the APP Harmonization of Test Procedures Project)	Australia, China, Germany, Korea (APP)	2009- ongoing	Australia, China, Germany, Korea	To participate in the IEC round robin testing and help inform the rewriting of the IEC test method standard. This test method standard is expected to be eventually adopted in Australia as a regulatory standard.			
Standby							
Alignment of National Standby Power Approaches	APEC	2009-2010	Australia (lead), Japan, Korea, New Zealand	To undertake coordinated activities in support of policies which target the reduction of standby power.			
Alignment of National Standby Power Approaches (including Basket of Products)	APP	Nov 2006- 2015	Australia, China, India, Japan, Korea (lead), US	To reduce the standby energy consumed by electric appliances without compromising purpose and functionality. Seek to adopt the International Energy Agency (IEA) passive standby power target of 1 Watt by 2010. Use of agreed practical and cost effective policies that address standby power use. To develop a 'basket of products' to enable effective measurement of agreed standby policies. To encourage the use, understanding and acceptance of the definitions and methodologies set out in IEC 62301 in all partners.			

Project Name	International Funding Source	Relevant Dates	Parties Involved	Purpose			
4E Standby Power Annex	IEA	Apr 2009- Jun 2012	Australia (lead), Canada, Korea, Netherlands, Switzerland, United Kingdom	To monitor and report the extent of, and changes in, energy consumption by electrical appliances in low-power mode and support the development of policies which seek to minimise excessive energy consumption by products in standby mode.			
Whitegoods							
Cost-Benefit Analysis of Introducing Standards and Labelling in Pacific Island Countries	Australia	2009/10	Australia	To quantify the likely benefits of introducing labelling and MEPS for refrigeration, air conditioning and lighting in Pacific Island Countries.			
Other							
4E Mapping and Benchmarking	IEA	Apr 2009- ongoing	Australia, Austria, Canada, France, Korea, Netherlands, Switzerland, UK (lead), US	To encourage the sharing of experience among partner countries with a range of market- oriented policies and programs, including voluntary labelling and recognition programs for efficient products; utility rebates and tax incentives to both consumers and manufacturers; training and information campaigns; and aggregating buyer demand to create a 'market-pull' for efficient products.			
Energy Standards Information System	APEC	2001- ongoing	Funding contributed in 2009/10 by Australia, Korea, Chinese Taipei and New Zealand	To provide up-to-date information about appliance and equipment energy standards and regulations in the APEC region			

The international areas of work in which the E3 Program is actively engaged are represented by a handful of international organisations. The most prominent in 2009/10 were:

- The Asia-Pacific Partnership on Clean Development and Climate (APP) Building and Appliances Taskforce (BATF).
- The Asia-Pacific Economic Cooperation (APEC) Energy Working Group (EWG).
- The International Energy Agency (IEA) Efficient Electrical End-use Equipment (4E) Implementing Agreement.

These are described in more detail below, along with a description of the Australian Government Bilateral Climate Change Partnerships Program.

3.1 Asia-Pacific Partnership on Clean Development and Climate

The Asia-Pacific Partnership on Clean Development and Climate (APP)²⁶ was announced in July 2005 at the 38th ASEAN²⁷ Ministerial in Vientiane, Laos. Launched in January 2006, the Partnership brings together Australia, Canada, China, India, Japan, the Republic of Korea and the United States to address the challenges of climate change, energy security and air pollution in a way that encourages economic development and reduces poverty. The APP represents around half of the world's emissions, energy use, GDP and population.

The E3 Program leads and participates in various projects under the APP Building and Appliances Task Force (BATF), which develops projects addressing greenhouse gas emissions in the residential and commercial sectors, with the exception of transport. Under the BATF, APP member countries:

- Demonstrate technologies.
- Enhance and exchange skills relating to energy efficiency auditing.
- Share experiences and policies on best practices with regard to standards and codes, as well as labelling schemes for buildings, building materials and appliances.

Under the BATF Action Plan, Australia, along with partner countries, selected three project areas relating to appliance energy efficiency for cooperative action²⁸:

• Harmonisation of test procedures to enable all partner countries to have access to internationally harmonised test procedures for selected appliances and to develop potential performance levels upon which to base mandatory (or voluntary) requirements or labelling schemes for these products. This aims to reduce the burden on manufacturers of multiple tests and to encourage the growth of international markets for more energy efficient products and new energy saving technologies. Sub-projects in which Australia is involved under this project area are:

- Electric motors.
- Electric motor systems.
- Phase-out of inefficient lighting.
- CFL quality assurance program and harmonisation of CFL standards.
- **Standby power** to build on existing national and international initiatives to better understand market trends and optimise cost-effective technical opportunities for reducing standby power levels in a range of devices and to encourage actions by each individual country to accelerate market acceptance of new technologies that can help reduce unnecessary standby power.
- Market transformation to encourage the sharing of experience among partner countries with a range of market-oriented policies and programs. These include:
 - Voluntary labelling and recognition programs for efficient products.
 - Utility rebates and tax incentives for both consumers and manufacturers.
 - Training and information campaigns.
 - Aggregating buyer demand (e.g. by government agencies) to create a 'market-pull' for efficient products.

17.

²⁶ www.asiapacificpartnership.org

²⁷ Association of Southeast Asian Nations - www.aseansec. org

²⁸ APP runs until 30 June 2011 and discussions are underway about future directions

3.2 Asia-Pacific Economic Cooperation

The Asia-Pacific Economic Cooperation (APEC)²⁹ brings together 21 economies³⁰ from the APEC region who currently account for around 60 per cent of the world's energy demand. The APEC Energy Working Group (EWG), launched in 1990, seeks to maximise the energy sector's contribution to the region's economic and social well-being, while mitigating the environmental effects of energy supply and use.

The EWG is assisted by five expert Groups, including the Expert Group on Energy Efficiency & Conservation (EGEE&C) that promotes energy conservation and the application of energyefficiency practices and technologies and is chaired by New Zealand.

3.2.1 Energy Standards Information System

This APEC ESIS project aims to provide up-to-date information about appliance and equipment energy standards and regulations in the APEC region.

The project is chaired by New Zealand and is managed by a Steering Committee made up of contributing economies and organisations. The team includes energy experts and officials from Australia, Japan, New Zealand, Thailand, and the United States. The APEC ESIS project team reports to the APEC Expert Group on Energy Efficiency & Conservation (EGEE&C).

3.3 International Energy Agency

The International Energy Agency (IEA)³¹ is an intergovernmental organisation which acts as energy policy advisor to 28 member countries32 in their effort to ensure reliable, affordable and clean energy for their citizens. IEA Implementing Agreements provide a framework for cooperation between IEA and non-member countries on specific topics and in 2008, a new IEA Implementing Agreement on Efficient Electrical End-use Equipment (4E)³³ was launched. 4E provides an international forum for governments and other stakeholders to share expertise, develop understanding of electrical end-use equipment efficiency and facilitate coordination of policies for efficient electrical equipment. 4E's focus allows it to be effective in identifying and tackling barriers while its mandate gives it an important role in collaborating and extending existing activities. This is particularly crucial when tackling issues relating to global trade and harmonisation. 4E has 11 member countries and the following three working groups (Annexes):

- Mapping and Benchmarking to compare the trends in energy consumption by electrical appliances.
- Electric Motor Systems (EMSA) to contribute to the harmonisation of standards, to provide technical and policy advice and to distribute best practice experience in the field of motor systems.
- **Standby Power** to monitor and report the extent of, and changes in, energy consumption by electrical appliances in low-power modes (standby power) and support the development of

³¹ www.iea.org

³² Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

³³ www.iea-4e.org

²⁹ www.apec.org

³⁰ Australia, Brunei Darussalam, Canada, Chile, People's Republic of China, Hong Kong, China, Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, the Philippines, Russia, Singapore, Chinese Taipei, Thailand, the United States and Vietnam.

policies which seek to minimise excessive energy consumption by products in standby power modes.

A new Solid State Lighting (SSL) Annex is scheduled to start in July 2010. 4E has also undertaken a number of collaborative projects designed to improve procedures for monitoring, verification and enforcement of energy efficiency programs.

3.3.1 4E Mapping and Benchmarking Annex

The aim of this project is to provide policy makers with a single source knowledge-base on product performance and the associated policy tools employed by economies across the world, thus enabling more informed policy making at national and regional levels. The Annex seeks to identify:

- The differences in the performance of products sold in the various regions of the world.
- The primary causes of these differences (policy, culture, etc.).
- The potential for national, regional and global improvement in the performance of products and the potential mechanisms that policy makers may engage to realise this potential.

During 2009/10, Australia collated and submitted data on the product efficiency of cold appliances, air conditioners, clothes washers and televisions in the domestic market. The full mapping and benchmarking process for these has been completed and Annex participants are currently reviewing the reports, prior to public release on the Mapping and Benchmarking website³⁴. The schedule of products targeted by the Annex is shown below:

- 2009/10
 - Air Conditioners
 - Clothes Washers
 - Domestic Lighting
 - Household Refrigerators and Freezers
 - Televisions
- 2010/11
 - Clothes Dryers
 - Computer Monitors
 - Complex Set Top Boxes
 - Desktop PCs
 - Dishwashers
 - Integral Retail Display Cabinets
 - Notebook Computers
 - Refrigerated Vending Machines
 - Water Heaters

3.4 Bilateral Partnerships

The Australian Government Bilateral Climate Change Partnerships Program³⁵ was introduced in 2004/05. It aims to develop and implement projects that deliver mutual practical benefit for Australia and partner countries, help build the capacity of developing countries to take action on climate change and provide an additional mechanism to facilitate strategic policy dialogue with key countries.

These bilateral partnerships complement other international forums, providing more flexible mechanisms for reaching agreement and building stronger cooperative relationships on climate

³⁴ http://mappingandbenchmarking.iea-4e.org

³⁵ www.climatechange.gov.au/government/initiatives/ bilateral-cc-partnership-program.aspx

change. Energy efficiency is a focus area in a number of Australian bilateral partnerships including China, the United States, New Zealand, the European Union and Fiji. Cooperative areas include harmonisation of emissions monitoring, reporting, verification and certification procedures between Australia and partner countries.

3.5 Cost-Benefit Analysis of Introducing Standards and Labelling in Pacific Island Countries

Australia has extensive experience in regulating whitegoods for energy efficiency. An energy rating labelling program has been in operation since 1986 and the first Minimum Energy Performance Standard (MEPS) was introduced in 1999. In recent years, Australia has brought this experience to several bilateral partnerships with the aim of moving towards aligned regional standards and test methods.

During 2009/10, the Australian Department of Climate Change and Energy Efficiency (DCCEE) commissioned George Wilkenfeld and Associates Pty Ltd to carry out a cost-benefit modelling exercise for all the member countries of the Pacific Islands Forum, with the exception of Australia and New Zealand. The study aimed to quantify to the Pacific Island Country (PIC) governments the likely benefits of introducing labelling and MEPS for refrigeration, air conditioning and lighting, similar to that used in Australia and New Zealand.

The study concluded that for residential, commercial and government sectors combined, energy efficiency measures would result in a reduction of electricity use of about 13% (326 GWh), with an estimated monetary value over the entire period of about USD \$525 million. By 2025, these energy efficiency programs could be 'supplying' one eighth of the electricity used in the PICs, pollution free. This would also mean a 12% reduction in costs of importing fuel for electricity generation.

In June 2010, the key findings of the study were shared at a special Pacific Island Forum Energy Ministers Meeting in Brisbane, in the context of the proposed Framework for Action on Energy Security in the Pacific, showing the contribution that MEPS and mandatory energy rating labelling can make to the 'whole of sector' approach to energy planning and implementation.

A summary report of the study is scheduled for publication in 2010/11.

Ten Year Strategies

A major feature of the E3 Program is the development of ten-year strategies to clearly articulate government plans and to provide a road map for reducing energy use in key sectors. These strategic plans may consider several related products under the one umbrella, demonstrating the potential for transitions to new technologies and assessing a range of policy measures. The ten-year timeline provides industry with the opportunity to change product lines and bring more energy efficient technologies to the market.

This approach has proven effective in the past whereby successful engagements with stakeholders have led to agreement between government and industry on the key policies required to stimulate greater energy efficiency improvements and their uptake in the market. New Zealand participates in the development of long term strategies with Australia where there are benefits in aligning measures for both markets and where measures are captured under the joint work plan approved by the New Zealand Cabinet. Current and upcoming ten-year strategies are listed in Table 3 and are described below. Copies of completed strategies are available to download via the electronic library on the Energy Rating website at www.energyrating.gov.au

4.1 Strategies Released in 2009/10

4.1.1 Commercial Refrigeration Strategy: *In From the Cold*

The Strategy, *In From the Cold: Strategies to increase the energy efficiency of non-domestic refrigeration in Australia and New Zealand* is designed to help improve the energy performance and uptake of energy efficient non-domestic refrigeration products and services within Australia and New Zealand. It also aims to identify the priority refrigeration technologies and market sectors to be targeted over the ten years from 2010 to 2020. The draft Strategy was released for public comment in October 2009. During the three-month consultation period, more than 40 submissions were received and face-to-face consultations were carried out at discussion forums held in Sydney in

Table 3: Long-term strategies covered by the E3 Program

Strategy	Sectors	(Expected) Coverage
Published		
National Standby Strategy – Money Isn't All You're Saving	R,C	2002-2012
Lighting Strategy – Greenlight Australia	R,C, I	2005-2015
Gas Strategy – Switch on Gas	R,C,I	2005-2015
Heating, Ventilation and Air Conditioning (HVAC) High Efficiency Systems Strategy – <i>The Measures</i>	C,I	2007-2017
Under Development		
Commercial Refrigeration Strategy – In from the Cold	С	(2010-2020)
Commercial Catering Equipment Strategy	С	(2012-2022)
Industrial Equipment Strategy	Ι	(2010-2020)
Street Lighting Strategy	С	(2011-2014)
Residential Air Conditioning Strategy	R	(2011-2021)

R=Residential, C=Commercial, I=Industrial



Released in October 2009, *In From the Cold*... aims to improve the efficiency of non-domestic refrigeration products in Australia and New Zealand.



Greenlight Australia – Australia's 10-year strategy to improve energy efficiency in lighting.

November 2009 and March 2010 and Wellington in December 2009.

In parallel with these consultations, ongoing work to collect benchmarking data on commercial refrigeration equipment was undertaken in conjunction with the major supermarket chains.

Key issues raised during the consultations will be considered within the final strategy and Technical Working Groups that will be formed to provide advice and guidance to deal with specific implementation issues of a technical nature.

4.2 Strategies Progressed During 2009/10

4.2.1 Lighting Strategy: Greenlight Australia

The *Greenlight Australia* ten-year strategy for improving the efficiency of lighting in Australia was released by the MCE in November 2004. The Strategy represents the agreed plan for all jurisdictions for improving the efficiency of lighting products and reducing greenhouse gas emissions from lighting. It sets out immediate and future priorities for consideration.

In 2009, work began, in cooperation with Lighting Council Australia (LCA), to revise the Strategy to extend its scope beyond 2015 and to take into account recent advances in lighting technology. The revised Strategy will outline measures to improve the efficiency of all lighting equipment in the residential, commercial, industrial and public lighting sectors. This review and industry consultation has continued through 2009/10 and a revised draft of the strategy is expected to be released for public comment in 2010/11. Initial stakeholder comment has already been sought on the development of the revised strategy via a stakeholder meeting in March 2010.
4.2.2 Commercial Catering Equipment Strategy

During 2008/09, work began on a Discussion Paper for the development of a ten-year commercial catering equipment strategy led by Sustainability Victoria. It was informed by the results of a commercial catering equipment end-use metering study that identified the most resource-intensive items of commercial catering equipment and provided a better understanding of their energy performance characteristics. Data was collected on the electricity, gas and water consumption of key commercial catering equipment items in ten commercial kitchens in Melbourne.

This Discussion Paper will be further developed during 2010/11, prior to release for public comment.

4.2.3 Industrial Equipment Strategy

During 2009/10, Sustainability Victoria on behalf of the E3 Program continued the work to develop a ten-year industrial equipment strategy that will consider the potential to drive energy efficiency improvements to non-domestic pumps, fans, air compressors and industrial chillers and boilers. A Discussion Paper was finalised and will be released for public comment in late 2010. It presents an analysis of the contribution made by electricityand gas-fuelled industrial equipment to energy use and greenhouse gas emissions in Australia and New Zealand and investigates the feasibility of increasing the energy efficiency of key industrial equipment through a regulatory approach.

The initial work on the strategy highlighted nondomestic pumps and fans as key areas of focus for the E3 Program. As a consequence, product profiles for both these product categories commenced during 2009/10 and will be released for stakeholder comment in 2010/11. As part of this development process, initial stakeholder comments and input were sought via workshops held in Melbourne in September 2009 and in Auckland in November 2009.

4.2.4 Street Lighting Strategy

The development of a three year Street Lighting Strategy was identified as part of the Council of Australian Government's (COAG's) National Strategy on Energy Efficiency (NSEE) with the aim of:

- Identifying barriers to the uptake of more efficient street lighting and developing strategies to address any identified problems, including the introduction of mandatory standards for lighting energy efficiency while considering related cost implications for local government.
- Collecting, and making available to street lighting service providers and local governments, nation-wide information on energy efficient street lighting technologies and operational practices.
- Considering whether an incentive mechanism for distributors to install efficient equipment is needed to give effect to this measure.

Led by the South Australian Department for Transport, Energy and Infrastructure, the first steps towards the development of the Strategy were taken at a stakeholder forum held in Canberra in March 2010. The forum discussed past, current and future work on improving the energy efficiency of street lighting, along with suggestions for the implementation plan. In the final quarter of 2009/10, the implementation plan was completed and the draft scope of work for the Strategy was developed. This will be released in 2010/11 and then initial work on the production of the Strategy will commence.

4.2.5 Residential Air Conditioning Strategy

The E3 Committee agreed to commence developing a ten-year strategy to improve the energy efficiency of residential heating and cooling in 2008/09. Using a system-wide approach, it intends to map a path forward and propose a range of measures around the central theme of increased regulatory requirements. This is expected to be released in 2011.

4.3 Existing Strategies

4.3.1 Gas Strategy: Switch on Gas

The *Switch on Gas* strategy was released by the MCE in December 2004 and is a blueprint, jointly endorsed by government and industry, outlining the actions to enhance the energy efficiency of gas appliances and equipment from 2005 to 2015. The gas strategy covers the agreed implementation of a similar regulatory framework to that existing for electrical products, thereby helping to improve the efficiency of gas products and reduce greenhouse gas emissions from their use.

More information on gas policy is available in the gas appliances section of the Energy Rating website at www.energyrating.gov.au



Switch on Gas outlines plans to improve the energy efficiency of gas appliances and equipment from 2005 to 2015.



Money isn't all you're saving – the 10-year strategy advocating a 1-watt standby requirement for all home and office electrical appliances from April 2013.

4.3.2 Standby Strategy: *Money Isn't All You're Saving*

In 2002, under the umbrella of the International Energy Agency's (IEA) *One Watt Initiative*, the Ministerial Council on Energy (MCE) resolved that Australia would expand its commitment to reducing excessive standby consumption by formulating coordinated, product-specific plans to address the issue over the ten years from 2002 to 2012.

Within this timeframe, specific product types identified as being 'at risk' of using excessive standby will be targeted for specific action. For each of these products, a potentially two stage action plan designed to reduce standby to levels acceptable for that product as quickly as economically viable, will be implemented. To assess whether special policies are needed, the E3 Program has regularly monitored the standby power levels of new electronic devices entering the market since 2001. Power measurements taken in retail stores located in capital cities around Australia provide a valuable assessment of standby power trends in the most significant appliances on sale. See Section 9.5 *Standby Power Store Surveys,* for further information.

The ten-year standby strategy, *Money Isn't All You're Saving*, further recommends that Australia aligns with an EU directive³⁶, which states that all home and office electrical appliances (not already subject to energy efficiency regulation) will be subject to a uniform 1-watt requirement. This 1-watt requirement is proposed for introduction in Australia in April 2013.

More information on standby policy is available in the standby power section of the Energy Rating website at www.energyrating.gov.au.

4.3.3 Heating, Ventilation and Air Conditioning High Efficiency Systems Strategy: The Measures

The Measures strategy was released by the MCE in March 2007 and is designed to improve the energy performance of heating, ventilation and air conditioning systems. It addresses many nontechnical barriers to efficiency, while identifying and promoting both highly efficient technical solutions and systems optimisation processes. It also seeks to create the environment in which energy efficiency gains are valued, measurable and



Designed to improve the energy performance of heating, ventilation and air conditioning systems, *The Measures* strategy was published in March 2007.

sustainable. It proposes more than 20 separate, but complementary measures, grouped together under the three broad strategic areas of practices, systems and people.

³⁶ Commission Regulation (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment

Regulatory Impact Analysis

As part of the Australian and New Zealand governments' framework and on behalf of the Ministerial Council on Energy (MCE), the E3 Program is required to develop and assess the likely impacts of any proposed regulation through a Regulatory Impact Analysis (RIA) process. A key component of this analysis is the Regulation Impact Statement (RIS). RISs are written documents that inform affected parties and stakeholders of the potential impacts and regulatory options of any proposed new or amended regulation, which could directly or indirectly affect business or competition.

The RIS process provides a consistent framework for characterising the most cost-effective regulatory options and ensures industry and community involvement in identifying and analysing the impacts of those options. It comprises two stages:

- Release of a **Consultation RIS** that invites comments from the wider community – thereby providing a public cost-benefit analysis process that ensures both the social and economic impacts of regulating a product are considered in a timely, systematic, objective and transparent manner.
- Preparation of a **Decision RIS** on which the MCE decision on whether or not to regulate the product is based.

To maximise opportunities for interested parties and stakeholders to assist in identifying potential impacts, the E3 Program often augments the RIA process with public meetings or by publishing product profiles, technical reports, cost-benefit analyses or fact sheets before seeking industry and community input in response to a Consultation RIS. The E3 Program also provides early notice of potential regulation by publicly releasing a three year work plan detailing the products identified as likely to require future regulation.

When conducting assessments, the E3 Program complies with the national regulation-making processes of Australia³⁷ and New Zealand³⁸. Before a RIS is publicly released, and later when public submissions are incorporated into the RIS, the E3 Program seeks an independent assessment of the process by the Australian Government Department of Finance and Deregulation's Office of Best Practice Regulation (OBPR) and the New Zealand Government Treasury's Regulatory Impact Assessment Team (RIAT).

A marked acceleration of the E3 Program over recent years has seen a corresponding increase in the number of RISs prepared. During 2009/10, three Decision RISs were approved by the MCE, two Consultation RISs were released for public consultation and preparatory work was carried out for a further 13 products.

Table 4 summarises the status of RISs at 30 June 2010, including those to be covered under the 2008/09 to 2010/11 Work Plan. A description of the work undertaken for each product is discussed further in this chapter. For clarity, these descriptions are grouped according to the status of the RIS.

³⁷ Council of Australian Governments (COAG): *Best Practice Regulation Handbook (June 2010)*. www.finance.gov.au/ obpr/proposal/handbook/docs/Best-Practice-Regulation-Handbook.pdf

³⁸ The New Zealand Government Treasury: Regulatory Impact Analysis Handbook (November 2009). www. treasury.govt.nz/publications/guidance/regulatory/ impactanalysis

Product Type	Type of Regulation	Sector	Status
Air Conditioners (Single- and Three-phase)	Increasing stringency of MEPS	R,C	Consultation RIS released
Commercial Refrigeration (RDCs, RBVMs and CIMISBs)	Introduction of MEPS	С	Preparatory work
Computer Monitors	Introduction of MEPS and Labelling	R,C	Preparatory work
Computers	Introduction of MEPS	R,C	Preparatory work
Demand Response Interfaces	Introduction of MEPS	R	Preparatory work
Distribution Transformers	Increasing stringency of MEPS	Ι	Preparatory work
Gas Ducted Heaters	Feasibility of regulation	R	Preparatory work
Gas Space and Decorative Heaters	Feasibility of regulation	R	Preparatory work
Gas Water Heaters	Increasing stringency of MEPS and Labelling	R,C	MCE decision
Greenhouse-Intensive Water Heaters	Phase-out through plumbing regulations	R	Consultation RIS released
Home Entertainment Products	Introduction of MEPS	R	Preparatory work
Lighting (Incandescent Lamps, CFLs and Halogen Voltage Converters)	Introduction of MEPS	R,C	MCE decision
Outdoor Radiant Gas Heaters	Feasibility of regulation	R,C	Preparatory work
Portable Air Conditioners	Introduction of MEPS and Labelling	R, C, I	Preparatory work
Standby Power	Introduction of MEPS	R, C	Preparatory work
Swimming Pool Pump-units	Introduction of MEPS and Labelling	Ι	Preparatory work
Televisions	Introduction of MEPS & Labelling	R	MCE decision

Table 4. Status of Regulation Impact Statements at 30 June 2010

Sector:

R = Residential, I = Industrial, C = Commercial

5.1 MCE Decision

5.1.1 Gas Water Heaters

Release date

The Decision RIS, *Proposal to Introduce a Minimum Energy Performance Standard for Gas Water Heaters*, was approved by the Ministerial Council on Energy (MCE) in March 2010.

Outline

The RIS outlines the proposal to introduce Minimum Energy Performance Standards (MEPS) for domestic gas water heaters in Australia and New Zealand. It targets the performance of external storage gas water heaters and all instantaneous gas water heaters for household use, requiring that they achieve a minimum annual performance of 22,871 MJ (equivalent to 6,353 KWh) per annum, which is equivalent to four stars under the current industry energy rating labelling scheme. Implementation of the new MEPS has been proposed from February 2011 for Australia and April 2011 for New Zealand.

Benefits and Costs

Gas water heaters exposed to MEPS in both Australia and New Zealand during the period 2013 to 2020 will:

- Reduce gas consumption by 17 PJ (equivalent to 4,722 GWh).
- Reduce greenhouse gas emissions by 1.15 Mt ${\rm CO}_2\mbox{-}{\rm e}.$
- Raise the cost of the 719 million gas water heaters predicted to be sold during this period by \$22.2 million, but deliver savings on household energy use worth \$147.3 million. This gives rise to a net benefit of \$124 million and a benefit-cost ratio of 6.3:1.

A parallel work stream to investigate the costs and benefits of mandatory labelling for gas water heaters is being led by New Zealand and will continue during 2010/11.



Switching to energy efficient light globes can cut home lighting costs by up to 80%.

5.1.2 Lighting

Incandescent Lamps/CFLs/Halogen Voltage Converters

Release Date

The Decision RIS, *Proposed MEPS for incandescent lamps, compact fluorescent lamps and voltage converters*, proposing point-of-sale regulation of these products was accepted by the Ministerial Council on Energy in August 2009, with the proposed regulations for incandescent lamps and compact fluorescent lamps (CFLs) coming into force in Australia on 1 November 2009 (with MEPS for extra low voltage converters (ELVCs) scheduled for introduction in October 2010).

Outline

This RIS represents the second stage of a two-stage process to remove the least efficient incandescent lamps from the market, set standards for the efficiency and quality of CFLs and to remove the least efficient extra low voltage converters (ELVCs) from the market. The first stage was the introduction of an Australian import prohibition on non-complying tungsten incandescent general lighting service (GLS) lamps. This came into effect in Australia on 1 February 2009 and was initially suggested by the lighting industry as a means of allowing depletion of stocks of GLS lamps prior to the point-of-sale restriction.

The regulations introduced in November 2009 do not ban all incandescent lamps nor mandate their wholesale replacement with CFLs. Whilst the MEPS exclude the traditional pear-shaped GLS tungsten filament incandescent lamps, it is still possible to buy tungsten halogen incandescent lamps that comply with the regulations. The CFL MEPS ensure the quality and efficiency of the increasing number of CFLs in the market.

Benefits and Costs

The savings to the environment and the Australian economy from the phase-out initiative from 2008 to 2020 will be considerable. The RIS estimates:

- Cumulative energy savings of 30,305 GWh.
- A cumulative reduction in greenhouse gas emissions of 28.5 Mt CO₂-e.
- A total cost of nearly \$12 million, with benefits of \$2,177 million from reduced lamp operating costs, resulting in an overall net benefit of \$2,165 million³⁹ (at a 7.5% discount rate).

Since the announcement of the phase-out of tungsten-incandescent GLS (general lighting service) lamps in February 2007 until the end of June 2010, preliminary analysis of sales data shows that some 75 million GLS lamps were replaced with CFLs (around 58 million) and lower wattage halogen (around 17 million) lamps. Over the life of these lamps, savings of around 3.5 million tonnes of greenhouse gas emissions are expected, with total consumer financial benefits approaching half a billion dollars. These savings can be attributed to phase-out regulations and various activities aimed at promoting the use of CFLs, such as state based replacement schemes.

CFL MEPS do not currently apply in New Zealand but the Government is investigating whether to align standards with Australia. MEPS for incandescent lamps do not apply in New Zealand but there are voluntary measures to support efficient lighting uptake.

5.1.3 Televisions

Release Date

The Decision RIS, *Proposed Minimum Energy Performance Standards and Labelling for Televisions*, was approved by the Ministerial Council on Energy (MCE) in August 2009, with the proposed mandatory Minimum Energy Performance Standards (MEPS) and labelling for televisions replacing the existing voluntary labelling scheme in Australia on 1 October 2009.

Outline

The RIS outlined a proposal to introduce mandatory labelling and MEPS not earlier than 1 October 2009. It proposed to introduce MEPS in two tiers:

- Tier 1 MEPS to be set at the equivalent of one star on the Energy Rating Label (ERL).
- Tier 2 MEPS to be set at the equivalent of four stars on the ERL and introduced no earlier

³⁹ A benefit -cost ratio was not calculated because the normal facilities management practice of treating both lamps and energy as operating costs of lighting services makes it analytically cumbersome to treat lamps as capital items (given their low unit cost and their short, variable lives)



Mandatory energy rating labels now apply to TVs in Australia.

than 1 October 2012, subject to market review confirming the feasibility of this step.

Benefits and Costs

When used over their expected service life, for 10 hours a day, the RIS estimates that in Australia in the period 2009 to 2020, the proposal will result in:

- Cumulative energy savings of up to 40 TWh.
- A cumulative reduction in greenhouse gas emissions of up to 37.7 Mt CO₂-e.
- A total cost of \$185 million, with savings of \$6 billion, resulting in a benefit-cost ratio of over 32:1 – potentially representing one of the largest single energy saving measures ever undertaken under the E3 Program.

Television MEPS do not currently apply in New Zealand but the Government is investigating

whether to align standards with Australia. New Zealand uses the ENERGY STAR mark to promote efficient models. In addition, some suppliers to the New Zealand market display the energy rating label voluntarily on their products.

5.2 Consultation RIS Released

5.2.1 Air Conditioners

Single- and Three-phase

Release Date

In June 2010, the MCE released the Consultation RIS, *Minimum Energy Performance Standards for Air Conditioners: 2011.* The consultation period will extend into 2010/11 prior to preparation of a decision RIS.

Outline

The RIS communicates the potential impacts, costs and benefits arising from the proposed introduction of more stringent Minimum Energy Performance Standards (MEPS) levels in Australia for air conditioners covered by existing regulations and within the scope of AS/NZS 3823.2, Performance of electrical appliances - Air conditioners and heat pumps: Energy labelling and minimum energy performance standard (MEPS) requirements. These changes follow a Decision RIS, released in November 2009, which included technical changes to AS/NZ S3823.2 to re-grade the Energy Rating Label algorithm (designed to move the current star ratings for air conditioners back two or more stars) which came into force in Australia in April 2010 (with a further upgrade scheduled for April 2011).

The objective behind increasing the stringency of these MEPS is to overcome the current market failure resulting from consumers lacking the information, computation skills, time and motivation required to compare the lifecycle costs of different air conditioners and thereby make informed financial choices regarding air conditioner purchases.

Benefits and Costs

Several proposals (for Australia only at this stage) are considered within the RIS. However, based on the recommended proposal, the RIS estimates:

- Cumulative energy savings to 2025 of 34,119 GWh.
- A cumulative reduction in greenhouse gas emissions to 2025 of 28.4 Mt CO₂-e.
- A total cost of \$789 million, with benefits to consumers worth \$5,388 million, resulting in an overall net benefit of \$4,599 million and a benefit-cost ratio of 6.8:1.

For air conditioners sold in New Zealand in 2011, the stringency levels for MEPS and labelling will not increase beyond the levels that Australia adopted in 2010.

5.2.2 Greenhouse gas-Intensive Water Heaters

Release date

The Consultation RIS, *Phasing Out Greenhouse-Intensive Water Heaters in Australian Homes*⁴⁰, was released for public consultation in January 2010 and submissions closed on 12 March 2010. Public consultation forums were held in every State and Territory except Tasmania. Feedback from the consultation will be incorporated into a Decision RIS scheduled for agreement by MCE in December 2010.

Outline

Water heating is the second largest energy user in homes, accounting for 22% of household greenhouse gas emissions and over 5% of total energy sector emissions.

The proposal is to phase out 'greenhouse gasintensive water heaters' (defined as those exceeding 100 g CO_2 -e/MJ of energy delivered as hot water) from the Australian market by 2012. Electric resistance water heaters, the most greenhouse gasintensive type (250 to 350 g CO_2 -e/MJ), account for nearly 80% of water heating emissions.

Generally, electric water heaters have lower capital costs but higher running costs than other types (gas, solar or heat pump). Higher energy prices would make some householders more inclined to consider running costs when choosing a replacement water heater but, without the proposed measure, there would be continuing use of electric resistance types and hence higher community costs and greenhouse gas emissions.

Economic modelling of the proposal indicates:

• A greenhouse gas abatement (compared with a no-regulations) scenario of around 30 million tonnes CO₂-e by 2020, at a cost of -\$22 /tonne

⁴⁰ www.ret.gov.au/Documents/mce/_documents/2010 bulletins/consultation ris.pdf

CO2-e (the negative sign indicates that value of energy savings alone will cover the abatement costs).

- A benefit to cost ratio of 1.6.
- Net benefits of \$1,192 million (net present value, locked in over the period to 2020).

N.B. This is an Australian-only proposal.

5.3 Preparatory Work

5.3.1 Commercial Refrigeration

Refrigerated Display Cabinets/Refrigerated Beverage Vending Machines/Commercial Ice Makers and Ice Storage Bins

During 2008/09, work on the Commercial Refrigeration Regulation Impact Statement process was deferred subject to the publication of the ten-year strategy for commercial refrigeration (see Chapter 4 *Long-term Strategies* for further information on progress with the development of the commercial refrigeration strategy).

5.3.2 Computers and Computer Monitors

During 2009/10, the E3 Committee approved a deferral of the date for the introduction of MEPS for computers and MEPS and labelling for computer monitors from October 2009 to not earlier than 30 June 2010. Based on this revised timescale, it is anticipated that the Consultation RIS will be available for comment in October 2010.

To help inform the RIS, development testing of computers continued throughout 2009/10. The report⁴¹ from one of these studies investigating the energy efficiency of ENERGY STAR desktop and notebook computers available on the Australian



MEPS and labelling for computers and computer monitors expected to come into effect from 30 June 2010.

market was published in October 2009 and further study results will be published during 2010/11.

5.3.3 Demand Response Interfaces

Demand response interfaces form part of the Australian strategy to integrate demand management, smart metering and smart grids. Current work concentrates on those appliances that make the largest contribution to residential sector peak electricity demand, namely air conditioners, swimming pool pump-units, hot water heaters and electric vehicle battery chargers. The aim is to establish a smart meter-smart appliance infrastructure by mandating the inclusion of standard demand response interfaces on these appliances to complete an inexpensive yet robust communication pathway between an appliance and the electricity network.

Preparation of the Consultation RIS covering all the elements of the project in Australia was ongoing during 2009/10 and publication is scheduled for 2010/11. New Zealand is currently taking an observation role on demand response.

⁴¹ Energy Star Computers in Australia (Report 2009/13)

5.3.4 Distribution Transformers

The draft Consultation RIS for increasing the stringency and scope of distribution transformer MEPS scheduled for release in 2009/10 was delayed due to requirements for further information and analysis. The expectation is that the RIS will be released during 2011 and that MEPS2 for transformers will not be introduced before October 2011.

To keep industry stakeholders informed and up-to-date on progress with the revision of these mandatory MEPS, an E3 Program *Transformers Newsletter*⁴² was launched during 2009/10, with the release of the first issue in August 2009. A second issue was released in April 2010 and further issues may be released periodically.



Pole-mounted distribution transformer



External gas ducted heater

5.3.5 Gas Ducted Heaters

Gas ducted heaters, also referred to as central heating systems, are a type of gas heater that can be used to heat a whole house, either alone or supplemented with other types of heating such as reverse cycle air-conditioning (heat pumps) and space (or room) heaters. During 2009/10, the first steps were taken to consider the feasibility of government regulated energy efficiency standards for residential gas ducted heaters with the development of a Product Profile. This Profile, prepared by Sustainability Victoria and scheduled for publication in early 2010/11, provides an overview of the market in Australia and New Zealand for these heaters, explores the options available for improving the energy efficiency of new heaters and makes recommendations for further policy investigation to achieve energy savings and greenhouse gas reductions. Stakeholder input and feedback on the issues raised in the Profile will be incorporated into the development of a Consultation RIS to analyse the costs, benefits, and other impacts of the proposal selected.

⁴² www.transformers.energyrating.gov.au

5.3.6 Gas Space and Decorative Heaters

Space and decorative heaters are defined as heaters which are located within the space to be heated and which transfer heat to the space by radiation or convection. During 2009/10, initial investigations were undertaken into the potential for regulating these products, with the preparation of a Product Profile on gas space and decorative heaters in the residential sector.

The Product Profile provides an overview of the gas space heating market and fuel mix and how these are evolving, highlighting the significant changes that have occurred in the market over recent years and the uncertainty around future trends. It provides estimates of the total amount of gas consumed, along with the associated greenhouse gas emissions and, against the uncertainty in the market, makes cautious projections for future consumption. It is scheduled for publication and public consultation in 2010/11.

5.3.7 Home Entertainment Products

Set Top Boxes/Video Players and Recorders/ Home Theatre System Players/Home Theatre Recorders/Audio Amplifiers/Games Consoles

Televisions and simple set top boxes (those without a recording capability) are currently the only home entertainment products subject to regulation. Consultation on the possibility of extending regulation to other types of home entertainment products was undertaken at a Home Entertainment Equipment Forum in November 2009 in Sydney. Forum participants representing most stakeholder groups (industry suppliers, retailers, testing houses, consumer advocates, efficiency experts and government officials) supported holding an annual event to discuss developments impacting on home entertainment. Participants also endorsed the need to deliver globally aligned standards and regulations and called on all interested



The range of home entertainment products that are regulated continues to expand.

stakeholders to work collaboratively to improve the efficiency of home entertainment equipment.

Further consultation was facilitated during 2009/10 with the preparation of a Product Profile on home entertainment products, which was released for public comment in June 2010.

The Product Profile provides:

- a description of the home entertainment market.
- an overview of its total energy consumption.
- the relevant standards and regulations currently in place.
- the technology scope for energy efficiency.

In addition, the Profile models the potential savings that could be made based on businessas-usual values versus energy use performance characteristics derived from the international programs already in place.

Stakeholder comments received as part of this consultation process will lead to the consideration

of policy options designed to achieve better energy use outcomes for home entertainment products, which may in turn lead to the development of a Consultation RIS.

5.3.8 Outdoor Radiant Gas Heaters

Outdoor radiant gas heaters are defined as flue-less, portable or fixed heating appliances, intended for use in outdoor areas and non-residential indoor areas, which are fuelled with natural gas, town gas, liquefied petroleum gas (LPG) or tempered liquefied petroleum gas (TLP), and with gas consumption not exceeding 70 MJ/h as described in AS 4565-2004, *Radiant gas heaters for outdoor and nonresidential indoor use*.



An outdoor radiant gas heater.

During 2009/10, a Product Profile for these products was prepared to provide updated information relating to outdoor radiant gas heaters in Australia and to investigate the potential for regulating these products. The Profile contains:

- An overview and description of the current technology.
- Current market and stock estimates, as well as an assessment of market trends.
- Energy consumption estimates by type and application.
- An analysis of the potential to reduce energy consumption and greenhouse gas emissions.
- Information on international trends and standards applicable to outdoor radiant gas heaters.
- Details of current efficiency regulation and test standards applied to these products.

The Product Profile suggests that the potential greenhouse gas reductions and savings in fossil fuel use from the introduction of Minimum Energy Performance Standards (MEPS) or other forms of regulation are unlikely to be justifiable, given the cost of such a program to the public and industry. This position will be reviewed after three years. The Product Profile is scheduled for publication in September 2010.

5.3.9 Portable Air Conditioners

In preparation for the development of a Consultation RIS covering single duct portable space conditioners and spot coolers, preliminary information gathering activities and discussions with stakeholders were undertaken during 2009/10 as follows:

• An industry stakeholder meeting, held in Sydney in July 2009, canvassed key industry representatives on regulatory proposals.

- A consultation paper, *Single Duct Portable Space Conditioners and Spot Coolers,* was released for public comment in September 2009.
- Market research was undertaken to investigate consumer attitudes and behaviour with regard to the purchase of portable space conditioners and spot coolers, including consumer focus groups and retailer interviews in October 2009⁴³ and quantitative interviews in February 2010⁴⁴.
- Testing of 25 single duct portable space conditioners was conducted from March to May 2010 to gain a fuller understanding of the energy consumption and performance of these products.

The issues raised, and outcomes from, these activities will be incorporated into the development of the Consultation RIS during 2010/11.

5.3.10 Standby Power

In 2009/10, an update to the Consultation RIS, *Horizontal One Watt Standby*, was initiated to reflect amendments to the modelling assumptions and to remove the home entertainment product data, which will now be considered in a separate home entertainment products consultation. It is expected that the finalised Consultation RIS will be released in mid 2011.

5.3.11 Swimming Pool Pump-units

For a home with a pool, the pool pump-unit can be the single largest user of electricity unless there is an electric hot water heater present. In April 2010, a Voluntary Energy Rating Labelling Program developed in conjunction with the industry was introduced. This voluntary labelling program aims to build the energy efficiency awareness of pool owners so they can make an informed decision when purchasing a more efficient pool pump. The labelling program is tied to the recently published standard AS 5102:2009 *Performance of Household Electrical Appliances—Swimming Pool Pump-Units*, and covers single-phase pool pump-units with an input power of 2.5 kW or less, that are capable of a flow rate of 120 l/min or greater and that form part of a new pool installation or are intended for sale as a replacement for existing units.

This voluntary program will also assist the swimming pool pump industry to transition to mandatory Minimum Energy Performance Standards (MEPS) and labelling which are likely to come into force in the future. Development work on the Consultation RIS for this proposal began in 2009/10 and is scheduled for completion in 2011.

⁴³ Final Report, *Possible Labelling of Portable Space Conditioners and Spot Coolers: Market Research on Consumer Attitudes and Behaviour*, published December 2009 and available at www.energyrating.gov.au

⁴⁴ Final report submitted June 2010 and scheduled for publication in 2010/11.

Standards Development

The role of standards within the E3 Program portfolio is an essential one, with broad agreement being reached between industry and government in the 1990s to use Australian and New Zealand Standards (AS/NZS) as the primary reference to deliver consistent regulations. Typically the AS/ NZS consists of two elements:

- Test Method which describes the method and procedures to be used for testing the energy performance of products.
- **Energy Performance** which details the technical and regulatory requirements for energy rating labelling and Minimum Energy Performance Standards (MEPS).

Generally, the activities required to publish a new or revised energy efficiency performance standard occur through a two stage process. The first stage comprises preparation of a draft standard by a joint industry/government working group involving industry stakeholders and technical experts. Once the draft is complete further work is placed on hold until the Ministerial Council on Energy agrees to regulate the product, after which the draft standard is submitted to the relevant Australian Standards constituted committee and stage 2 begins.

A preliminary review of the draft is undertaken by the Standards Australia committee prior to releasing it for public comment. Assuming that no significant comments are received from the public consultation process, the committee will then agree that the standard should be published and advise Standards Australia of their decision.

Standards provide a 'one-stop-shop' for stakeholders that describe the testing and performance requirements for products, whether for energy rating labelling or MEPS. It also ensures that regulatory standard requirements, which are given force through State government legislation, are defined in a nationally consistent manner in all jurisdictions.

Moreover, the use of Australian and New Zealand Standards processes provides an additional level of public input and scrutiny from key stakeholders in the development and implementation of energy efficiency requirements. A service agreement is in place between the E3 Program and Standards Australia to streamline the delivery of any new or revised standards over the three year period from 2008 to 2011.

From time to time, regulatory rulings may be issued to complement these standards. These rulings usually follow a formal application from a manufacturer to a regulator for an interpretation on a particular issue. Such interpretations are required where a provision in a standard is found to be ambiguous, or in circumstances where the standard does not adequately cover an issue or is silent in relation to a particular matter. Often, interpretations are sought in relation to the scope of a standard with a view to having a particular class or type of product deemed exempt from the regulations.

In developing a formal response, the regulator who receives the application confers with all other regulators in Australia and New Zealand to develop a consensus interpretation on the context as the basis for the regulatory ruling.

The E3 Committee also recognises that electrical equipment and appliances are increasingly global products. Therefore it is advantageous to promote the development and use of international standards for these. Australia will continue to contribute to the development of International Electrotechnical Commission (IEC)⁴⁵ and International Organization for Standardization (ISO)⁴⁶ energy efficiency and test method standards and adopt these whenever possible. The adoption of international test methods allows meaningful comparison between the data sets collected around the world. They also provide the opportunity for internationally aligned standards that provide manufacturers with level playing fields spanning national boundaries.

⁴⁵ www.iec.ch

⁴⁶ www.iso.org

Details of the standard development activities carried out during 2009/10 are described below, along with details of the regulatory rulings that were released during the year. A summary of the standards and regulatory rulings that were released in 2009/10 can be found in Appendix 5.

6.1 Air Conditioning Chiller Towers

On 1 July 2009 mandatory Minimum Energy Performance Standards (MEPS) came into force for chillers with a capacity of 350 kW and above. Over the period 2009 to 2020, reductions in energy use are estimated to total 511 GWh/yr. This amounts to a cumulative greenhouse gas emission saving of 463 kt CO2-e. The benefits to consumers are estimated to be worth \$82 million, resulting in a benefitcost ration of 3.04. MEPS for chillers also include minimum requirements for part operating loads (called integrated part load values).

In October 2009, Regulatory Ruling 23A, *Exemption for Free Cooling; Heat Recovery; and Heat Pump Liquid-Chilling Packages* was released for commercial building chillers. The ruling states that free cooling, heat pump (reverse cycle), and heat recovery liquidchilling packages be exempted under clause 1 of AS/ NZS 4776.1.1:2008, Liquid-chilling packages using *the vapour compression cycle. Part 1.1: Method of rating and testing for performance—Rating.*

6.2 Air Conditioners

To ensure the smooth introduction of the measures proposed in the Consultation RIS, *Minimum Energy Performance Standards for Air Conditioners: 2011*, (see Chapter 5, *Regulatory Impact Analysis*), a transition timetable was implemented in 2008/09. In accordance with this:

• The new standard AS/NZS 3823.2:2009, Performance of electrical appliances - Air conditioners and heat pumps. Part 2: Energy labelling and minimum energy performance standard (MEPS) requirements, was published in October 2009.



Strengthening minimum energy requirements for home air conditioners became effective from 1 April 2010.

• More stringent Minimum Energy Performance Standards (MEPS) for single- and three-phase air conditioners, along with more stringent labelling requirements for single-phase air conditioners, were introduced in Australia from 1 April 2010 requiring all products manufactured or imported after that date to be registered online to ensure compliance with the 2010 MEPS levels.

From April 2011, all products manufactured or imported will be required to meet the more stringent 2011 MEPS, with standby power and other non-operation power included in the MEPS limits.

In addition, two regulatory rulings were released for air conditioners during 2009/10:

- Regulatory Ruling 26B, *Application of Labelling and MEPS to Boats*, was issued in January 2010 to extend the exclusion in AS/NZS 3823.2:2009 to include boats.
- Regulatory Ruling 29A, *Scope of Standard for Air Conditioners and Heat Pumps*, was issued in May 2010 to confirm that solar boosted air conditioners are not exempted from labelling and/or MEPS requirements unless they are excluded under Clause 1.2 of AS/NZS 3823.2:2009.

On 1 July 2009, mandatory MEPS came into force for close control air conditioners. Regulation occurred after close consultation with industry from 2004 to 2008. Over the period 2009 to 2020, reductions in energy use are estimated to total 1,923 GWh. This amounts to a cumulative saving of 1.72 Mt CO2-e. Savings to consumers result in a benefit-cost ratio of 6.25.

6.3 Clothes Dryers

During 2009/10, work continued towards a revision of AS/NZS 2442.1:1996, *Performance of household electrical appliances - Rotary clothes dryers -Energy consumption and performance.* The dryer working group, EL015/4, is exploring a revised energy rating label to show the water consumption (if any) on the dryer label (only combination washer-dryers at this stage) and to include Minimum Energy Performance Standards (MEPS) requirements for standby modes on dryers. A new test method will be developed in conjunction with a revised clothes washer standard.

6.4 Clothes Washers

In order to tighten the measurement tolerances and improve the rinse performance test method, AS/NZS 2040.1:2005 *Performance of household electrical appliances - Clothes washing machines -Methods for measuring performance, energy and water consumption*, was amended twice during 2009/10 as follows:

- Amendment 2, published in November 2009:
 - Continues to work towards alignment with the IEC test standard IEC 60456, Clothes washing machines for household use - Methods for measuring the performance.
 - Continues to improve the repeatability and reproducibility of the test standard mainly



Standard AS/NZ 2040.1:2005 for clothes washers was amended twice during 2009/10.

through tighter specification of materials and test procedures where there are known issues.

- Introduces a part-load test option that will allow credit to be achieved in the form of improved star ratings for machines that can reduce energy and water consumption in response to a reduced load size.
- Revises the Energy Rating Label to include the new expanded 10 star rating scale and provides enhanced levels of information for consumers.
- Upgrades the stringency of the water extraction (spin) performance requirement as a means of reducing the energy consumption of dryers.
- Amendment 3 was published in April 2010. This publishes the transitional arrangements relating to Amendment 2 (see Regulatory Ruling 25B below).

The revision program commenced with an industry forum held on 16 March 2010 and was followed by a series of focus group sessions.

Two regulatory rulings were also issued for clothes washers during 2009/10:

- Regulatory Ruling 25B, *Revised Transitional Arrangements*, released in December 2009, which explains the transitional arrangements for amendment 2 to AS/NZS 2040.1.
- Regulatory Ruling 28A, *Quartz Cell Specification*, released in April 2010, which amends the acceptance criteria in AS/NZS 2040.1:2005 for a spectrophotometer cell.

6.5 Commercial Refrigeration

Refrigerated Display Cabinets/Refrigerated Beverage Vending Machines/Commercial Ice Makers and Ice Storage Bins

In parallel with the development of the ten-year strategy for commercial refrigeration which was



Open supermarket refrigerated display cabinet.

published in October 2009, work commenced during 2009/10 on the revision of AS1731, *Refrigerated Display Cabinets*, to address ambiguities in the existing standard; incorporate recommendations from the Strategy and align the standard more closely with the international standard ISO 23953-1 and 2:2005, *Refrigerated display cabinets*.

In addition, three refrigerated beverage vending machines (RBVMs) were tested by a National Association of Testing Authorities (NATA) accredited testing laboratory in accordance with AS and ISO commercial refrigeration standards to collect energy consumption data to better inform future regulatory developments for this technology sector.

6.6 Computers and Computer Monitors

The development of the necessary Australian Standard for testing of computers and computer monitors began in 2009/10 with the preparation of a draft standard for consideration by a yet to be convened sub-committee of the joint Standards Australia/Standards New Zealand Committee TE-001. The standard draws on the United States Environmental Protection Agency administered ENERGY STAR Program, with ENERGY STAR version 5.0 for computers and version 5.0 for computer monitors being the de facto internationally recognised test standard.

6.7 Demand Response Interfaces

The Australian Standard AS 4755, *Demand response capabilities and supporting technologies for electrical products*, is being developed to facilitate the participation of electrical appliance owners in electricity utility demand response programs. The responsible committee, EL-054, was established in 2005 and has a broad representation from the electricity utility industry, the appliance industry, CSIRO and government.

Two parts of AS 4755, AS 4755.1, *Framework for demand response capabilities*, and AS4755.3.1, *Interaction of demand response enabling devices and electrical products - Operational instructions and connections for air conditioners*, were published prior to 2009/10.

During 2009/10, work continued on the preparation of the remaining parts. These relate to:

- Operational instructions and connections for swimming pool equipment.
- Electric and electric boosted water heaters.
- Electric vehicle battery recharge equipment.
- Overall architectural requirements of demand response systems and enabling.

6.8 Dishwashers

Details of the test methods for dishwashers are given in AS/NZS 2007.1:2005, *Performance of household electrical appliances - Dishwashers -Methods for measuring performance, energy and water consumption.*

Comparative testing was undertaken in early 2010 to determine a suitable soiling agent for standards testing due to the unavailability of the previous agent. The alternative unfrozen product has now been specified in the testing of dishwashers. However the option for using an alternative frozen product (as used in the IEC standard) is pending the results of tests on the equivalent IEC frozen spinach product.

In future, a revision that fully aligns with IEC 60436, Electric dishwashers for household use – Methods for measuring the performance, will be considered.

6.9 Distribution Transformers

The standards that specify the Minimum Energy Performance Standards (MEPS) regulatory requirements and test methods for distribution transformers have been revised and renamed: AS/ NZ 60076.1:2005, *Power transformers*, and AS/NZ 60076.11:2006, *Dry-type power transformers*.

During 2009/10, work continued on the development of more stringent MEPS for distribution transformers in a new draft standard AS/NZS 60076.99, which will not be implemented before October 2011. This standard is expected to expand the scope of transformer MEPS to include 33 kV networks and transformers rated up to 3,150 kVA.

6.10 Electric Motors

Electric motors are globally traded products and therefore Australia's strategy to develop policies for improving the efficiency of electric motors concentrates on close cooperation with international initiatives in this area. This includes providing input into:

- The revision of the International Electrotechnical Committee (IEC) test method standard for motors, IEC 60034-2-1 (which is expected to eventually be adopted in Australia as the regulatory standard for motors).
- The APP (Asia-Pacific Partnership on Clean Development and Climate) BATF 'Harmonization of Test Procedures' Electric Motors and Motor Systems sub-projects.
- The International Energy Agency (IEA) 4E Electric Motor Systems Annex (EMSA).

More information on these organisations and a summary of ongoing projects can be found in Chapter 3, *Major International Achievements*, while the details of the specific motors activities undertaken during 2009/10 are described in Appendix 8.

6.11 Evaporative Air Conditioners

A Technical Research Report on the feasibility of rating the energy performance of evaporative air conditioners was completed in March 2010 in Australia. The report recommended that the test method within Australian Standard AS 2913-2000, *Evaporative Air Conditioning equipment*, be revised to enable energy and water performance to be measured.

The report was distributed to industry stakeholders for their review, and comments on the proposed approach and testing methodology were received in May 2010.

During 2009/10, the feasibility of combining resources to draft, and then revise, the current standard was investigated with the Water Efficiency Labelling Scheme (WELS) Expansion team. The South Australian Department for Transport, Energy and Infrastructure (DTEI) is currently preparing a formal proposal for this work on behalf of E3, for consideration by the E3 Committee and the WELS Expansion team. A decision on the proposal is expected to be reached in 2010/11 and further work commissioned as appropriate.

6.12 Gas Water Heaters

The Decision RIS, *Proposal to Introduce a Minimum Energy Performance Standard for Gas Water Heaters*, was approved by the Ministerial Council on Energy (MCE) in March 2010. Implementation of the new MEPS has been proposed for no earlier than December 2010 in Australia and April 2011 in New Zealand.

During 2009/10, work was carried out on two new standards for gas water heaters – a performance standard and a test method standard. A draft of AS/NZS 4552.2 *Gas fired water heaters for hot water supply and/or central heating - Minimum Energy Performance Standards for gas water heaters,* was completed and submitted to Standards Australia with the intention of publishing this standard in December 2010.

Development of a new test method that will provide industry with a more robust, repeatable, reproducible and up-to-date method for assessing the energy use of gas hot water systems continued during 2009/10.

6.13 Lighting in Australia

6.13.1 CFLs

The test method and Minimum Energy Performance Standards (MEPS) for compact fluorescent lamps (CFLs) are specified in AS/NZS 4847, *Self ballasted lamps for general lighting services*. In May 2010, the interim versions of both parts of this standard were superseded by:

- AS/NZS 4847.1:2010, Self ballasted lamps for general lighting services - Test methods -Energy performance.
- AS/NZS 4847.2:2010, Self ballasted lamps for general lighting services - Minimum Energy Performance Standards (MEPS) requirements.



A more decorative example of a compact fluorescent lamp.

6.13.2 Incandescent Lamps

The interim standard for incandescent lamps, AS/NZS 4934(Int):2008, *Incandescent lamps for general lighting service*, is currently under review. However, in November 2009, Regulatory Ruling 24A, *Exclusions from the Scope*, was released, specifying that coloured, automotive and special purpose lamps be excluded from the scope of AS/NZ 4934.2, *Incandescent lamps for general lighting services - Minimum Energy Performance Standards (MEPS) requirements*, and that further attribute information on GLS and ELV halogen nonreflector lamps be added.

6.13.3 Mains Voltage Halogen Nonreflector Lamps

Requirements for mains voltage halogen nonreflector lamps are also included in AS/NZS 4934(Int):2008, *Incandescent lamps for general lighting service*, with regulation scheduled to come into force in October 2010. During 2009/10, in response to industry concerns about the stringency of these MEPS, consultation on possible revision of these limits was initiated. This has led to the timing of the MEPS for these lamps being adjusted to January 2011.

6.13.4 Extra Low Voltage Converters

AS/NZS 4879, Performance of transformers and electronic step-down convertors for ELV lamps, specifies the test method and Minimum Energy Performance Standards (MEPS) for these converters. In February 2010, AS/NZS 4879.2:2010, Performance of transformers and electronic stepdown convertors for ELV lamps - Minimum Energy Performance Standards (MEPS) requirements, replaced the interim standard AS/NZS 4879.2(Int) Part 2, and is scheduled to come into force in October 2010.

6.13.5 Light Emitting Diodes

To determine the need for testing and efficiency/ quality standards or guidelines for Australia, the collection of information on light emitting diode (LED) technologies and markets commenced in 2008/09 and continued in 2009/10.

In October 2009, a testing program was initiated with the anonymous purchase of a range of LEDs from retail outlets in Australia, the United Kingdom and the United States. The results of the testing, which will be published in 2010/11, will be used to benchmark the performance of LEDs and to provide information to help understand the requirements and potential for developing LED test methods.

In November 2009, a review was carried out of known international standards relating to the performance of LEDs to investigate which LED attributes should be controlled and might be used as a basis for action in Australia. In New Zealand investigations are being made into a potential ENERGY STAR specification for LEDs.

6.13.6 International Liaison

Australia has been a global leader in phasing-out inefficient lighting products. The E3 Program supports and participates in many international initiatives to share Australia's experience of developing a regulatory framework and to encourage the development of international harmonised lighting standards.

This includes:

- International fora, such as En.lighten, the Asia Lighting Compact and lites.asia.
- Market transformation projects, such as PILESLAMP.
- Testing round robins.

An overview of the main organisations involved in this international work and a summary of ongoing projects can be found in Chapter 3, *Major International Achievements*, while the details of the specific lighting activities undertaken during 2009/10 are described in Appendix 8.

6.14 Refrigerators and Freezers

New energy rating labelling requirements for refrigerators and freezers came into force on 1 April 2010 in Australia, with transitional arrangements being in place since 1 October 2009. While the appearance and dimensions of the labels are similar, the revised algorithm reduces the number of stars on the label for the same energy consumption. Once a rating exceeds six stars, an additional crown will be added to accommodate up to 10 stars for 'super efficient' appliances. The revised Minimum Energy Performance Standard requirements and the updated star rating algorithm for energy rating labelling are covered in Australian and New Zealand Standards AS/NZS 4474.2:2009, Performance of household electrical appliances - Refrigerating appliances - Energy labelling and Minimum Energy Performance Standard requirements.



Internal view of a large two-door refrigerator

6.14.1 International Test Method

Refrigerators are an important energy consuming appliance in the residential sector with world production estimated to be 90 million units per annum in 2008. Internationally, there are about 60 countries worldwide that have some sort of program to regulate the energy efficiency of refrigerators and separate freezers, mostly in the form of mandatory comparative energy rating labelling and Minimum Energy Performance Standards (MEPS).

Although there is a significant trade in household refrigerators around the world, refrigerators have poorly aligned test procedures. Currently a new global test procedure is being developed for refrigerators that will quantify the key relationship between ambient temperature and energy consumption. It should include the quantification of a load-related (usage) factor that can be scaled up (or down) to reflect actual usage in different parts of the world. If achieved, this will facilitate the identification of, and trade in, highly efficient models and will ensure that energy rating labelling and MEPS systems correctly rank and regulate refrigerators on the basis of their actual energy consumption for typical use. Australia has been involved in this harmonisation process and ultimately aims to align with the new international test standard.

6.15 Set Top Boxes

AS/NZS 62087, *Power consumption of audio, video and related equipment*, specifies the test methods and the Minimum Energy Performance Standard (MEPS) for set top boxes (STBs). Minor revisions were made to the standard during 2009/10 to reflect changes requested by committee members, resulting in:

- The release of AS/NZS 62087.1:2010, *Power* consumption of audio, video and related equipment - Methods of measurement, in February 2010.
- Amendments 1 and 2 to AS/NZS 62087.2.1:2008, Power consumption of audio, video and related equipment. Part 2.1: Minimum Energy Performance Standards (MEPS) requirements for digital television set-top boxes, in July 2009 and February 2010 respectively.

The MEPS in AS/NZS 62087.2.1:2008 apply only to free-to-air STBs without a recording function. STBs with a recording function and the conditional access set top boxes (CSTBs) used by the pay TV industry to supply programming to subscribers are currently exempt from this regulation.

In January 2010, a voluntary code of conduct that will meet or better European benchmarks for energy

performance commenced operation. The agreement, negotiated with the predominant pay TV providers in Australia, Foxtel and Austar, is valid for 10 years. In this time it is estimated that it will deliver energy savings of 1,124 GWh, avoid the emission of 948 Kt of CO_2 -e and save households subscribing to pay TV \$168 million in lower energy bills.

6.16 Standby

Australia's strategic approach on standby involves close cooperation with those international projects working towards similar objectives. Australia participates in the IEA 4E Standby Annex⁴⁷ and is the lead partner on the APP (Asia-Pacific Partnership on Clean Development and Climate) Alignment of National Standby Approaches initiative.

As part of its contribution, the E3 Program produces *Load Down*⁴⁸, a newsletter dedicated to information on the latest standby power research studies and policy initiatives, both in Australia and internationally. Three editions of this newsletter were produced during 2009/10 (July 2009 and in February and June 2010) and are intended to keep industry stakeholders informed and up-to-date on standby developments.

In November 2009, the first joint IEA 4E Standby Annex meeting and an APP Standby meeting were held in Seoul, Korea as part of the fourth 4E Executive Committee meeting. In March 2010, the fifth 4E Executive Committee meeting in Vienna, Austria hosted a joint IEA-APP-European Union International Standby Power Workshop.

⁴⁷ www.iea-4e.org/annexes/standby-power

⁴⁸ www.energyrating.gov.au



Opportunities exist for significant savings in adopting more efficient street lights.

6.17 Street Lighting

Australian/New Zealand Standard AS/NZS 1158, *Lighting for roads and public spaces*, applies to the lighting of roads and other outdoor public spaces (voluntary standard). This was subject to two revisions during 2009/10:

- In July 2009, an updated version of part 4 AS/ NZS 1158.4:2009, *Lighting for roads and public spaces - Lighting of pedestrian crossings*, was published.
- In June 2010, an update of AS/NZS 1158.1.2:2010, Lighting for roads and public spaces - Vehicular traffic (Category V) lighting
 Guide to design, installation, operation and maintenance, was released.

6.18 Swimming Pool Pump-units

Following the close of the public consultation period on draft standards at the end of July 2009, both parts of a new Australian Standard AS 5102:2009 were finalised and published in December 2009:

- AS 5102.1:2009, Performance of household electrical appliances - Swimming pool pumpunits - Energy consumption and performance.
- AS 5102.2:2009, Performance of household electrical appliances - Swimming pool pumpunits - Energy labelling and Minimum Energy Performance Standard requirements.

These will form the foundation for the proposed mandatory Minimum Energy Performance Standards (MEPS) and labelling for these units currently being developed for discussion.

Leading up to the possible introduction of mandatory MEPS and labelling, a Voluntary Energy Rating Labelling Program was introduced in April 2010 that has the same requirements as those contained in AS 5102.2:2009.

6.19 Televisions

In February 2010, two standards were published: AS/NZS 62087.1:2010, *Power consumption of audio, video and related equipment. Part 1: Method of measurement*, and AS/NZS 62087.2.2:2010, *Power consumption of audio, video and related equipment. Part 2 Minimum Energy Performance Standards (MEPS) and Energy Rating Label requirements for television sets.*

In September 2009, the report *Baseline TV Power Consumption 2009* was published which examined the results of over 80 plasma and LCD televisions tested under the interim version of this standard. The report provides a snapshot of the power consumption, energy rating labelling characteristics and sales of televisions during the introduction of the voluntary energy rating labelling program for televisions. It also provides benchmark information for the revised standard for mandatory energy rating labelling and MEPS.

Regulatory Compliance

Ongoing compliance monitoring and enforcement is a key element of the E3 Program, with the aim of maintaining Program integrity by:

- Ensuring that stakeholders are aware of their responsibilities.
- Giving clear guidance on all requirements.
- Administering an effective, coordinated testing regime verifying the energy efficiency claims of suppliers.
- Providing a forum for exchanging information on enforcement and compliance issues between participating jurisdictions.
- Providing suppliers and retailers with feedback on compliance results in a timely fashion.
- Reviewing existing appliance energy consumption information and improving Australian standards and testing protocols to make compliance easier.

As a result, manufacturers and importers can expect their products to undergo systematic check testing and have confidence that bona fide complaints will result in timely action.

In 2009/10, the E3 Program activities in support of this strategy included:

- Communication activities targeted at stakeholders coinciding with the introduction of new or changed regulations.
- Check testing of products assessed as being at risk of either not meeting MEPS requirements or the efficiency and/or capacity statements made by suppliers on energy rating labels. Where necessary, this has been followed by appropriate enforcement measures.
- The use of border control services to advise importers of their obligations.
- The publication of a compliance newsletter in September 2009.
- Continuing market surveillance by contractor Australian Refrigeration Council (ARC).



Circuit Breaker, compliance newsletter for the E3 Program

- Releasing the results of a survey of whitegoods compliance with energy rating labelling laws and communication of individual performance to suppliers and retail outlets.
- Undertaking a survey of commercial refrigeration registration and labelling.
- An ongoing bi-annual New Zealand program of labelling compliance visits.
- Preparatory work for check testing in future years.

7.1 Administrative Guidelines

The energy efficiency legislative scheme is delivered by State and Territory legislation. The use of nationally endorsed model regulations allows each jurisdiction to follow a nationally consistent scheme.

The scheme operates through a set of mutual expectations. Industry expects that regulatory agencies will act in a nationally consistent and cooperative manner and will use the Standards Australia processes in setting and publishing technical standards. Regulatory agencies expect that industry will participate constructively in those technical debates to ensure that technical requirements are fair and equitable for all participants.

The Administrative Guidelines and Regulatory Rulings play a crucial role in meeting these expectations. They help State and Territory regulatory agencies work in a consistent manner so that costs and inconvenience to industry are minimised and regulations concerning energy efficiency labelling and performance standards are enforced efficiently. The guidelines provide an explanation to industry about:

- The way legislation operates and is administered by State and Territory regulatory agencies.
- The standard procedures, rules and processes that underpin State and Territory legislation.
- The responsibilities of all stakeholders.

The guidelines have operated since the Program began but were first published in April 2000. A major revision was published in 2005, with the guidelines now updated from time to time on the Energy Rating website⁴⁹. Further guidance is also provided through the Frequently Asked Questions section.

Where regulatory agencies in all Australian and New Zealand jurisdictions reach common agreement on points of interpretation of the energy efficiency regulations, these are published as Regulatory Rulings. Since 2004, 24 Regulatory Rulings have been released. A summary of the six Rulings released in 2009/10 is given in Appendix 5 and further details on all Regulatory Rulings can be found on the Energy Rating website.

7.2 Check testing and Enforcement in 2009/10

Check testing is a quality assurance process which aims to ensure that regulated products offered for sale in the Australian and/or New Zealand markets meet Minimum Energy Performance Standards (MEPS) and/or performance claims made by suppliers.

Since 1991, the Program has conducted regular check testing of all products registered for either MEPS or energy rating labelling. One aim of this testing is to ensure that consumers can rely on the information contained in the Energy Rating Labels affixed to appliances and that suppliers provide accurate information when registering products for sale.

In previous years, the Australian Competition and Consumer Commission (ACCC) action in relation to incorrect energy rating labelling has resulted in court-enforceable undertakings from product suppliers.

During 2009, the Australian consumer advocacy group Choice found that LG were not rating refrigerators built with a low energy 'storage mode' correctly according to the energy rating labelling requirements. As a result of discussions initiated by ACCC, LG Australia announced in March and May 2010 that it would offer compensation to all customers that had bought one of the relevant refrigerators. Compensation includes either a

Table 5.Summary of check tests
performed over 2009/10 and
their outcomes as at 30 June
2010

Product	Number of tests performed	Pass	Fail
Electric Motors	26	25	1
Refrigerator/ Freezers	19	17	2
Air Conditioners	2		2
Water Heaters	9	9	
Refrigerated Display Cabinets	4	4	
Clothes Washers	1	1	
Fluorescent Lamps	24	21	3
Total	85	77	8

⁴⁹ www.energyrating.gov.au

cash rebate, repayment of the purchase price or replacement with an equivalent refrigerator. Further follow up is expected during 2010/11.⁵⁰

Table 5 provides a summary of the check tests performed across all product categories during 2009/10.

As a result of these check testing efforts during 2009/10, one air conditioner was deemed to be non-compliant. This led to the product being de-registered and these models can no longer be sold or imported into Australia and New Zealand.

7.2.1 Ongoing testing

7.2.1.1 Linear Fluorescent Lamps and Ballasts

In late 2009, a Minimum Energy Performance Standard (MEPS) check testing program involving 19 models of linear fluorescent lamps and 10 models of linear fluorescent lamp ballasts was initiated using samples which were either purchased anonymously from Canberra-based electrical products suppliers or online.

Testing for these products is currently underway and the results will contribute to the compliance and check testing programs for these products. The results will also be considered in the proposed revision of the MEPS for both of these products. In the case of the linear fluorescent lamps, their mercury content is also being evaluated using AS/NZS 4782.3(Int):2006, Double-capped fluorescent lamps - Performance specifications - Procedure for quantitative analysis of mercury present in fluorescent lamps.

7.2.1.2 CFLs

In March 2010, an extensive testing program for CFLs was initiated with the purchase of samples of more than 160 CFL models in a range of locations across Australia, including Sydney, Perth and Brisbane. The testing will be carried out in 2010/11

7.2.2 New capacity

Preparatory work was undertaken for compliance and check testing exercises scheduled for 2010/11.

7.2.2.1 Distribution transformers

Because of their size and the nature of the distribution transformer market, laboratory testing of these products is a barrier to cost effective compliance and check testing. As a consequence, work was undertaken during 2009/10 to develop and trial a mobile testing unit for transformers. Successful field trials of this mobile testing unit were conducted on spare transformers held by a South Australian utility.

The development of this unit, and the verification of the validity of the results obtained through in-situ trials, will facilitate an expansion in the compliance and check testing program for distribution transformers by extending field trials during 2010/11.

7.2.3 Compliance Rates

The check testing of regulated products is an important component of the overall E3 Program compliance regime and the only means to validate that the energy performance of an individual appliance is as claimed on the registration details and, where required, on the Energy Rating Label.

and the results will contribute to the compliance and check testing program for CFLs. In addition, resulting data will be benchmarked against the results of a testing exercise carried out on CFL models sampled in early 2008 in Australia, India, Indonesia, the Philippines, Thailand and Vietnam⁵¹ to gain an understanding of the evolution of the Australian market in terms of quality and energy consumption.

⁵¹ Joint ECO-Asia and E3 Program project, *Testing for Quality* - www.asiapacificpartnership.org/pdf/ TestingforQuality_CFLReport2010Apr.pdf and www.energyrating.gov.au

 $^{50\} www.accc.gov.au/content/index.phtml/itemId/947285$

Year	Number Tests	Failed Check tests	Cancelled Registrations
2004 (Australia)	58	28	11
2005 (Australia and New Zealand)	40	24	10
2006 (Australia and New Zealand)	18	13	9
2007 (Australia and New Zealand)	85	35	10

Table 6: Record of check tests and the results undertaken between 2004 and 2007

Source: Gadgets and Gigawatts, IEA 2009, Paris.

The Program has conducted in excess of 1,000 check tests since the agreement in 1992 to label domestic appliances on a national basis under the National Appliance and Equipment Energy Efficiency Program (NAEEEP). Groups of test results are published periodically in order to show suppliers that incidents of non-compliance are likely to be discovered (for example see Table 6).

Typically the rate of products failing a check test range from 30-50% depending on the type of appliance and other factors such as how long it has been regulated. However, check tested products are not randomly selected from the marketplace, but identified through an established set of criteria described in the 'Check testing Criteria'52 that aims to target products most likely to be non-compliant. Since check tests can be expensive, this process ensures that the E3 Program's financial resources are used most efficiently. In addition, without knowing the market share of models failing check tests, the rate of non-compliance indicated by these test results does not represent the chance that any regulated appliance sold will not match its performance claims.

Nevertheless, this can lead to misunderstandings, as evident in criticism about the high rate of failed check tests and for the perceived lack of enforcement levelled at the E3 Program in several press articles⁵³ during 2009/10. While the Program recognises that ensuring compliance requires constant vigilance, such information can give consumers and participating industries the wrong impression and unfairly damage the Program's credibility. As a result, considerable efforts were made by staff during March-May 2010 in refuting the basis of these criticisms and addressing the subsequent concerns raised by stakeholders.

Analysis of tests conducted between 1997 and 2008 by the Australian Consumers' Association (ACA) of a random sample of 260 refrigerators suggests that the actual rate of non-compliance is one-third of the figure indicated by refrigerator check test results. In the ACA sample, 41 models (16%) were found to exceed the label claim by more than the tolerance level and these represent approximately 10% of the current refrigerator market.

While this demonstrates that the selection criteria used for check tests is effective in targeting products most likely to fail, the E3 Program is committed to making further improvements to the compliance regime for the benefit of all participants. During 2009/10, attention was given to facilitating compliance by ensuring that suppliers are aware of their responsibilities and provided with industry-specific guidance and training where necessary. Market surveillance was also increased over previous years and the internal processes of monitoring compliance activities and following-up results in a timely fashion were streamlined.

⁵² See www.energyrating.gov.au

⁵³ For example see: http://www.theage.com.au/digitallife/digital-life-news/white-lies-appliance-rort-snaresshoppers-20100319-qm9w.html

7.3 Online Database for Product Registrations

The online registration database system was introduced in 2002 to facilitate the registration process for prescribed appliances and equipment and is an integral part of the Energy Rating website, www.energyrating.gov.au. The website also hosts an interactive interface that allows users to search the database of registered products to gain comparative information on their performance.

Over the period 1 July 2009 to 30 June 2010, there were 2,744 registered users of the online registration system. 7,484 submissions were completed and sent to regulators, resulting in 5,938 registration approvals. This has increased from 2,000 registered users of the online registration system in 2008/09, making 5,731 submissions, resulting in 4,022 approvals. This is shown graphically in Figure 5 below.

Figure 5. Comparison of 2008/09 and 2009/10 online registration details



A summary of the submitted and approved registrations by product type is given in Table 7.

Table 7.Number of submitted and
approved registrations for
regulated products in 2009/10

Product Type	Submissions	Approvals*
Air Conditioners	1,747	1,015
Closed Control Air Conditioners	109	76
Chillers	252	298*
Clothes Dryers	55	31
Clothes Washers	122	68
Commercial Refrigerators	288	150
Compact Fluorescent Lamps	207	72
Dishwashers	129	67
Distribution Transformers	29	17
Electric Motors	657	851*
ELV Converters	2	0
External Power Supplies	1,705	1,704
Linear Fluorescent Ballasts	24	3
Linear Fluorescent Lamps	54	31
Incandescent Lamps	8	0
Refrigerators/ Freezers	830	643
Set Top Boxes	100	74
Televisions	1,094	809
Water Heaters	72	29
Total	7,484	5,938

⁴ Note: This table relates only to the 2009/10 financial year. Some registrations were submitted before 1 July 2009 and were subsequently approved in 2009/10. In the case of chillers and electric motors, this has resulted in more approvals in 2009/10 than submissions.

7.4 Market Surveillance

7.4.1 Whitegoods Energy Rating Label Compliance Survey

In September 2009, the results of a major survey of whitegoods energy rating label compliance were released in a report, *Survey of Compliance with Energy Efficiency Labelling Laws - Whitegoods 2009*, which is available on the Energy Rating website⁵⁴.

The survey examined refrigerators, freezers, dishwashers, clothes washers and clothes dryers in 256 stores throughout Australia, inspecting 24,851 products on display during May and June 2009. It targeted retail outlets selling whitegoods in all jurisdictions of Australia, with the exception of the Northern Territory, and included stores in capital cities, suburban locations and in rural areas, as well as products offered through the internet.

The study found that the national compliance rate for energy rating labelling was 98.1% and that the national compliance rate for meeting the legislative requirement to register products prior to offering them for sale was 99.4% for all inspected whitegoods.

The compliance rates for energy rating labelling in the various jurisdictions are shown in Table 8.

The survey confirms that virtually all whitegoods appliances subject to these laws comply with the registration and labelling requirements and, as shown in Figure 6, the results demonstrate the continued improvement in compliance over this decade, with the national average rising from 93% in 2001 and 96% in 2004.



Figure 6. Labelling compliance for whitegoods, Australia 2001-200955

⁵⁴ www.energyrating.gov.au

⁵⁵ Source: Energy Efficiency Labelling for Whitegoods -Compliance Improving Throughout Australia, August 2009, available at www.energyrating.gov.au

Table 8.	Compliance rates for energy
	rating labelling by jurisdiction

Jurisdiction	Energy Rating Label Compliance
Western Australia	99.7%
Tasmania	99.7%
Victoria	98.7%
South Australia	98.2%
Queensland	97.5%
New South Wales	97.4%
ACT	95.9%

7.5 New Communication Channels

The E3 Program has been keen to respond to industry concerns about the possibility of noncompliant products being brought into the country. As a response, the Department of Climate Change and Energy Efficiency (DCCEE) on behalf of the E3 Program has negotiated with the Australian Customs Service for entry messages to be sent to importers when they declare that they are importing goods under those tariff classifications that include the motors transformers and lighting products covered by MEPS. This message advises importers that they may be subject to mandatory MEPS obligations.

This activity builds upon the relationship established with the Australian Customs Service with the introduction of an Australian import prohibition on non-complying general lighting service (GLS) lamps on 1 February 2009.

7.6 Compliance Newsletter

In October 2006, the E3 Committee published its first compliance newsletters to inform stakeholders of compliance related outcomes. Towards the end of the 2008/09 reporting period, the E3 Committee made the decision to revamp the format of the newsletter – the object being greater engagement of audience members, with the emphasis on current topical issues. A new name for this publication was chosen, with the first edition of *Circuit Breaker*⁵⁶ launched in September 2009.

7.7 New Zealand Labelling Compliance Visits

New Zealand has an ongoing program of bi-annual labelling compliance visits to audit compliance with labelling regulations. These are conducted in April and October. During 2009/10:

- 237 premises were visited.
- 16,600 appliances were inspected.
- 98% compliance was recorded.

⁵⁶ www.energyrating.gov.au

Communications

Effective and ongoing communication activities underpin and complement the work of the Program. The objective of these communications is to ensure that consumers and stakeholders are aware of the requirements for, and the other benefits of, regulations relating to the energy efficiency and performance of individual products. These communications complement the ongoing consultation with stakeholders that takes place as standards and regulations are developed.

The main communication activities undertaken during 2009/10 are described below.



The E3 Program's interim revised design for its publications

8.1 E3 Program Branding

In the second half of 2009/10, the E3 Program communications team developed a new design for E3 Program printed materials to modify the look and feel of these materials, as necessitated by the Program's move from the Department of the Environment, Water, Heritage and the Arts into the newly formed Department of Climate Change and Energy Efficiency in March 2010.

8.2 Website

The Energy Rating website, www.energyrating.gov.au is the primary portal for the E3 Program. Its function is two-fold:

- To educate stakeholders about the Program and current energy efficiency regulations and to promote and facilitate the sale of energy efficient appliances.
- To provide a single entry point for the registration of regulated appliances sold in Australia and New Zealand and a feed-in to compliance testing of registered appliances.

The former is achieved through a comprehensive range of online information and publications about the ongoing work of the Program, the products



Home page of the existing Energy Rating website.

covered and the current energy efficiency programs and regulatory requirements. In addition, an interactive listing of all registered products is available to help guide consumers when choosing an energy efficient appliance, while a dedicated registration interface allows suppliers to register details of appliances that comply with the regulations. More information on the registrations submitted during 2009/10 can be found in Chapter 7 *Regulatory Compliance*. Since its launch in 2000, the website content and structure has evolved significantly and the registration data requirement has grown exponentially. Consequently, a review of the website was initiated in 2008/09 and completed in 2009/10 with the production of a detailed requirements specification document for rebuilding the website. A public tender exercise for the rebuild will commence in July 2010.

The total number of visits⁵⁷ and website hits⁵⁸ for 2009/10 and historically are illustrated in Figure 7.



Figure 7. Energy Rating website visits and hits over time

⁵⁷ The number of times people have visited the website. A 'visit' ends once the user has been idle for 20 minutes or more. A new visit is generated when they return.

⁵⁸ Any time information is requested from the website.

8.3 Publications

Twenty-nine publications covering a range of products and serving various purposes were released during 2009/10. These included Regulation Impact Statements (RIS), discussion papers, market surveys, program reports, fact sheets, brochures, two reference manuals and a draft strategy.

A full list of the publications produced, along with a brief description of each, can be found in Appendix 6. Electronic copies (along with those from previous years) are available for download from the electronic library of the Energy Rating website⁵⁹.

8.4 Newsletters

Newsletters are a special category of Program publication, which provide an ongoing method of communication with stakeholders, and are particularly useful to facilitate consultation and dialogue for products where the development process for standards and regulation is complex and, therefore, often lengthy.

Three electronic newsletters were produced during 2009/10:

- Circuit Breaker⁶⁰
- Load Down⁶¹
- Transformers newsletter⁶²

More details on these and the issues produced can be found in Appendix 6.



A range of materials produced during the 2009/10 period.

- 60 www.energyrating.gov.au
- 61 www.energyrating.gov.au
- 62 www.energyrating.gov.au

⁵⁹ www.energyrating.gov.au

8.5 Media Releases

Media releases are periodically used by the Program to highlight key issues and initiatives. Two releases were issued in 2009/10:

- Energy Efficient Appliances and Lighting: Helping Aussies Live Greener and Smarter, in November 2009.
- Energy Efficiency Agreement for Pay TV Subscribers Good for the Wallet and the Environment, in December 2009.

Copies of these releases are included in Appendix 7.

8.6 Stakeholder Communication Campaigns

Ensuring that stakeholders at all levels are informed of, and engaged with, E3 Program activities is essential for the smooth transition to new standards and regulations. Focused stakeholder communication campaigns, which use a mix of communication tools and channels to convey the key messages as effectively and extensively as possible, are often used to complement the communications surrounding the regulatory impact analysis process and during the development of the standard or regulation.

Several stakeholder campaigns were developed or implemented during 2009/10.

8.6.1 Refrigerator, Freezer and Air Conditioning Algorithm Changes

In April 2010, revised algorithms for refrigerators, freezers and air conditioners came into force, resulting in a re-grading of the Energy Rating Label designed to move the star ratings back two or more stars for these products.





To ensure that retailers were aware of the transitional arrangements for these labels, two fact sheets63 (see left) were developed for industry associations. Analysis of the market identified these industry organisations as the most effective communication channel for targeting these stakeholders. The associations agreed to disseminate the information to their members and publicise the information on their websites.

This was complemented by advertising in the key trade journal, *Appliance Retailer*, in November 2009, alerting retailers to the algorithm changes.

⁶³ www.energyrating.gov.au

8.6.2 National Retailer Training Program

Historically, the training of retailers on the application and use of the Energy Rating Label has been the domain of the States and Territories. However, discussions with key retailers during the refrigerator, freezer and air conditioning algorithm campaign suggested the need to develop a national retailer training strategy, with a suite of nationally consistent training materials to be used by the States and Territories.

To this end, a feasibility study was conducted in October 2009. This included interviews with several large retailers and confirmed the need for national training and retailer support for the initiative. Therefore, in December 2009, a panel of representatives from the States and Territories was convened to contribute their experiences to the development of the strategy.

The first step towards the strategy was the preparation of a brief to market-test the current materials with consumers and retailers prior to the creation of the new range of products. This is currently being assessed by the States and Territories and this activity will be progressed in 2010/11.

8.7 Consumer Communications Campaigns

One of the aims of the National Strategy on Energy Efficiency is to improve consumer awareness of the need for, and benefits of, energy efficiency, as well as to encourage the adoption of energy efficiency measures by informed choice.

This is achieved through mass-communications campaigns designed to equip consumers (and businesses) with information to improve the efficiency of high energy consuming items.

No major mass consumer communications campaigns were carried out in Australia during 2009/10. However, planning activities were initiated for future campaigns and evaluation was undertaken of previous ones.

8.7.1 Lighting

During the lead-up to the sales ban of inefficient traditional pear-shaped incandescent light globes in November 2009, the *Change the Globe* campaign provided information to help consumers choose more efficient lighting. The main component of the campaign was the development and supply of a range of point-of-sale materials to retailers, supermarkets and hardware stores.

In August 2009, an informal telephone survey was conducted of these organisations to gather feedback on both the point-of-sale material itself and to investigate how it had been used. In parallel, the artwork for the materials was supplied on compact disc to these organisations to assist them should they wish to create their own materials in the final months prior to phase-out.

Overall, the feedback on the materials was positive and retailers were pleased with the assistance that they had received, although several stores indicated that they would have liked to have seen a media campaign. In particular, the conversion chart (see image below) was found to be useful and the electronic versions of the artwork and logos were felt to be helpful for the production of printed material such as catalogues and other in-house material as retailers progressed with their own phase-out campaigns.


In addition, retailers reported activities such as:

- Incorporating *Change the Globe* material into their websites.
- Distributing leaflets with catalogue mailings.
- Raising staff awareness of the campaign through company expos and in-house magazines and other internal materials.

Negative feedback focussed mainly on broader consumer confusion and resistance to the phaseout campaign, such as confusion about the phaseout date and around quality and price perception issues. Some stores reported stock shortages of replacement lamps and that older people were stockpiling incandescent lamps.

More formal research on the effectiveness of the *Change the Globe* campaign is scheduled to occur in early 2010/2011, with results assisting in further communications with other identified audiences.

8.8 Training materials

Periodically, if there is perceived to be a gap in the availability of training materials relating to energy efficiency issues around a particular product or sector that is unlikely to be filled by normal market forces, the E3 Program will support the development of such materials in consultation with affected groups.

8.8.1 NECA Training

During 2009/10, the Program worked with NECA (National Electrical and Communications Association), the peak national body for the electrical and communications industry, to improve the lighting component of NECA's EcoSmart Electricians⁶⁴ program and to assist in converting the course materials for delivery via online training $^{65}\!.$

As a consequence, the training manual, *The Basics of Efficient Lighting: A Reference Manual for Training in Efficient Lighting Principles*⁶⁶, was produced which: provides the lighting and allied industry workforce with an overview of the key principles of light and lighting (including an understanding of basic design concepts and lighting technologies currently available) in the context of sustainability; helps users understand the importance of energy efficiency and the implications of choosing a product in the overall scope of energy consumption; and assists users with the selection process when specifying, recommending, designing and installing various lighting systems.

The manual is also being used by the Illuminating Engineering Society of Australia and New Zealand Limited (IES: The Lighting Society) as the core text for their introductory lighting course, *ENLIGHTENMENT: The Basics of Efficient Lighting.* The course is delivered by a combination of face-to-face teaching and online assessment and revision and is designed to give participants a working knowledge of energy efficient lighting. The face-to-face seminar program began in 2009/10 and will continue into 2010/11⁶⁷.

8.8.2 Lighting Council Australia Supplement

In June 2009, the E3 Program worked with Lighting Council Australia to produce a 16-page educational supplement, *Electrical Contractor's Guide to New Lamp Technologies*, to the Winter edition of *Electrical Connection*. The supplement

⁶⁵ www.ecosmartelectricians.com.au/starter-kit/do1_01. html

⁶⁶ www.energyrating.gov.aul

⁶⁷ www.iesanz.org/education/education-seminar/thebasics-of-efficient-lighting

⁶⁴ www.ecosmartelectricians.com.au/starter-kit/index.html

was also printed as a stand-alone magazine for other promotional opportunities.

The supplement contained information on environmental and economic savings, some facts about technology advances and training initiatives and details about the *Change the Globe* marketing materials.

This supplement was reprinted in November 2009 and supplied to NECA (National Electrical and Communications Association) for use in their 2009 Road Show.

8.8.3 National Solar and Heat Pump Hot Water Transitional Plumber Training

To help households reduce their electricity bills and Australia's greenhouse gas emissions, the Australian and State and Territory governments are phasing-out greenhouse gas intensive hot water systems. The phase-out is taking place progressively between 2010 and 2012.

To support the phase-out, the Australian Government and States and Territories under the auspice of the NFEE Hot Water Implementation Group designed and commenced delivery of the National Solar and Heat Pump Hot Water Transitional Plumber Training⁶⁸ in June 2010. This training is funded by the National Framework for Energy Efficiency and is intended to provide a transitional program for qualified and experienced plumbers (installers) to gain the skills and knowledge required to install and commission solar and heat pump water heaters.

The training has commenced in South Australia and will be rolled out nationally through Registered Training Providers during 2010/11, on a state-bystate basis.

8.8.4 Good Practice Guide to Air Conditioner Heat Pump Installation

Good design and installation are fundamental to a heat pump system's effectiveness and efficiency. During 2009/10, a *Good Practice Guide to Heat Pump Installation*⁶⁹ was prepared to provide good practice guidelines for designing and installing the most common type of residential heat pump system, air-to-air single-split heat pump systems (also known as reverse-cycle air conditioners) used primarily for heating.

The guide was produced by New Zealand's Energy Efficiency and Conservation Authority (EECA)⁷⁰ in conjunction with Building Research Association of New Zealand (BRANZ)⁷¹ with input from industry. It was published in September 2009 and is directed at experienced installers of heat pumps, providing details of the process to follow for system design and installation in both new and existing homes.



EECAs guide for good design and installation of air conditioner heat pumps.

⁶⁹ www.energywise.govt.nz/sites/all/files/heat-pumpinstallation-guide-2009.pdf

⁷⁰ www.eeca.govt.nz

An independent and impartial research, testing,
 consulting and information company providing resources for the building industry

⁶⁸ www.climatechange.gov.au/what-you-need-to-know/ appliances-and-equipment/hot-water-systems/phase-out. aspx



Monitoring and Evaluation

The ongoing analysis of the projected impacts of the policy measures implemented under a program is an integral part of the process of good regulation and policy making and is an essential element of any successful program. The E3 Program is no exception and undertakes analysis in several ways, through:

- Program-wide Impact Studies that evaluate the impact of the Program as a whole.
- Ex-post evaluations that focus on the impacts of activities implemented within particular product sectors.
- Ad-hoc evaluations of individual products or product sectors.

Equally, a comprehensive understanding of how and why energy is used at an end-use level is fundamental to the development of energy saving programs. A significant step towards addressing this information need was taken in 2009/10 with the development and implementation of a 'proof of concept' (PoC) project which has the potential to be scaled up to a more comprehensive Residential Energy Monitoring Program (REMP).

9.1 Impact Studies

The most recent Impact Study, *Prevention is Cheaper than Cure – Avoiding Carbon Emissions through Energy Efficiency*, was released in January 2009 (see cover image, right). It was the fourth Impact Study undertaken by the Program and analysed the projected impacts of the E3 Program over the period 2000-2020 in Australia. Taking into account the latest information on the policy measures implemented, as well as those still to be implemented under the 2008/09 to 2010/11 Work Plan, the report estimated the value of energy saved and compared this with the cost of the Program to energy users. A summary of the report's findings is given in Sections 9.1.1 to 9.1.4 inclusive.

Subsequently modelling was extended to include the projected impacts in New Zealand of the E3 Program. The projected energy savings calculated from this exercise for the residential and nonresidential sectors in New Zealand are shown in Figure 9 and Figure 11 respectively.



9.1.1 Residential Energy Savings

In the residential sector, energy savings are projected to reach nearly 22,000 GWh per annum by 2020. Until 2008, refrigerators dominated the energy savings among electrical appliances. Going forward, water heating is estimated to represent over 33% of the projected savings from 2009 to 2020 (mostly from the phase-out of electric resistance water heaters), while refrigerators and freezers will account for 29%. Other major contributors to projected electricity savings are televisions and set top boxes (10%), lighting (8%) and air conditioners (8%).

E3 Program measures already implemented will reduce household electricity use in 2020 by about 13% compared with business-as-usual (BAU), while measures currently planned could bring about a further reduction of nearly 15%.

In order for residential sector electricity demand to remain constant despite population growth, average household electricity consumption per capita must decline. ABARE estimates that BAU household electricity use per capita will increase at about 1.0% per annum, yet the E3 Program could result in a reduction of 0.8% per annum.

The historical and projected impacts of E3 Programs on residential sector electricity use in Australia are shown in Figure 8.

The historical and projected impacts of E3 Programs on residential sector electricity use in New Zealand are shown in Figure 9.

Figure 8. Historical and projected impacts of E3 Programs on residential sector electricity use in Australia



(Source: Prevention is Cheaper than Cure - Avoiding Carbon Emissions through Energy Efficiency)



Figure 9. Historical and projected impacts of E3 Programs on residential sector electricity use in New Zealand

9.1.2 Non-residential Energy Savings

Electricity savings below BAU are projected to reach about 10,300 GWh per annum by 2020 in the non-residential sector. This is slightly less than projected for the non-residential programs in the 2005 Impacts Study, as a result of delays in implementing regulatory proposals. Lighting products will account for nearly 30% of the projected electricity savings between 2009 and 2020, followed by transformers (21%), air conditioning products (20%), motors (13%) and computers and electronic devices (9%).

Total electricity savings from all sectors targeted by the E₃ Program are projected to exceed

32,000 GWh per annum by 2020. The Program is still focussed on the residential sector, which will account for more than two thirds of total energy savings. Almost 80% of the energy savings will come from Minimum Energy Performance Standard (MEPS) programs, and the other 20% from labelling or labelling combined with MEPS.

The historical and projected impacts of E3 Programs on non-residential sector electricity use in Australia are shown in Figure 10.

The historical and projected impacts of E3 Programs on non-residential sector electricity use in New Zealand are shown in Figure 11.

Equipment Energy Efficiency Program : Achievements 2009/10





(Source: Prevention is Cheaper than Cure – Avoiding Carbon Emissions through Energy Efficiency, Figure 22)

Figure 11. Historical and projected impacts of E3 Programs on non-residential sector electricity use in New Zealand



9.1.3 Greenhouse gas Impacts

An earlier 2005 Impact Study estimated that emissions avoided due to E3 Programs over the period 2000-2020 would be 207.3 Mt CO_2 -e. The present Study estimates 250.2 Mt CO_2 -e over the same period. By 2020, greenhouse gas abatement from the Program will be in the order of 26.2 Mt CO_2 -e per annum, about two-thirds from greater efficiency of energy use and the rest from declining emissions intensity.

Looking at electricity use over the period 2009-2020, it is estimated that about 34% of total Program savings will occur in New South Wales, 24% in Queensland, 20% in Victoria, 9% in Western Australia and the remaining 13% in the other four jurisdictions (including New Zealand). The projected electricity savings by State and Territory to 2020 are illustrated in Figure 12.

The greenhouse gas emissions avoided in each jurisdiction depend on the emissions intensity of the electricity supplied. However it is projected that over the period 2009-2020, New South Wales would account for about 36% of total emissions avoided, Queensland for 25%, Victoria for 22%, Western Australia for 8% and the remaining States and Territories for 9%. These figures include the impacts of increased or reduced gas use, where appropriate, in each jurisdiction. The projected emissions avoided by State and Territory to 2020 are illustrated in Figure 13.



Figure 12. Projected electricity savings by jurisdiction to 2020

(Source: Prevention is Cheaper than Cure – Avoiding Carbon Emissions through Energy Efficiency, Figure 28)



Figure 13. Projected emissions avoided by jurisdiction to 2020

(Source: Prevention is Cheaper than Cure - Avoiding Carbon Emissions through Energy Efficiency, Figure 29)

9.1.4 Costs and Benefits

For Australian energy users as a whole, the E3 Program is projected to return net benefits of approximately AUD \$22 billion⁷² over the 16 years 2009-2024. This gives an overall benefit/cost ratio of 2.9. For New Zealand, the benefits of new activity included in the work program is NZD \$5.11 billion⁷³.

In this latest analysis, the benefit (not cost) of each tonne of CO_2 -e avoided by the E3 Program was adjusted to account for projected falls in the intensity of electricity supply likely to be brought about by a potential Carbon Pollution Reduction Scheme (CPRS). Unadjusted figures are not currently available but, even with this adjustment, it is estimated that the Program will save energy users about \$56 per tonne of emissions avoided (at a 7.5% discount rate) – about twice the corresponding estimate in 2005.

73 Source: NZ Energy Efficiency and Conservation Authority

9.2 Evaluation Activities

9.2.1 Phase-out of Inefficient Lighting

The phase-out of tungsten-incandescent GLS (general lighting service) lamps was announced in February 2007 and implementation is being carried out in stages:

- An Australian import prohibition on noncomplying GLS lamps came into effect on 1 February 2009.
- MEPS and point-of-sale regulation for tungsten filament general lighting service (GLS) incandescent lamps, low voltage non-reflector halogen and compact fluorescent lamps (CFLs) came into force in Australia on 1 November 2009.

As Australia has no domestic lamp manufacturing capacity the number of lamps imported is equivalent to the number of lamps sold. This

⁷² Net present value (NPV) in 2008, at a discount rate of 7.5%, excluding a carbon price

therefore presents a unique opportunity for monitoring the impact of the transition to more efficient lighting as import data is readily available and may be used as a reliable proxy for sales data.

Preliminary analysis of import data since the announcement of the phase-out until the end of June 2010 shows that some 75 million GLS lamps were replaced with compact fluorescent (around 58 million) and lower wattage halogen (around 17 million) lamps. Over the life of these lamps, savings of around 3.5 million tonnes of greenhouse gas emissions are expected, with total consumer financial benefits approaching half a billion dollars. These savings can be attributed to the phaseout regulations and various activities aimed at promoting the use of CFLs, such as state based replacement schemes.

9.2.2 New Zealand Savings

In the year ending March 2010, sales data was collected on the sales of 3.0 million appliances. From this and information held in the Energy Rating database, savings attributable to the E3 Program were calculated. The Program achieved savings of up to approximately 706GWh (2.5 PJ) in New Zealand, which is equal to NZ \$157 million. These savings were an increase of 0.5 PJ over the previous year's savings. Since the beginning of the Program, cumulative savings have now reached NZ \$530 million or 2,397 GWh (8.6PJ) Figure 14 shows the annual breakdown of these savings.

9.2.3 Recognition of Energy Rating Label in New Zealand

Market research conducted by EECA over the last two years shows that 96-98% of consumers recognise the Energy Rating Label.

Market research conducted by EECA in 2009/10 on the impact of energy rating labelling found that:

- 70% of consumers will choose one appliance over another if it has a better energy rating (on the label)
- 69% of consumers will pay more for an appliance if they know it will use less energy and save them money in the long term



Figure 14. Annual energy savings in New Zealand attributable to the E3 Program.

9.3 Residential Energy Monitoring Program

9.3.1 Background

The development of sound energy policy relies on an understanding of energy consumption. Without knowledge of how and why energy is used at an end-use level, the development of energy saving programs can only be based on educated guesswork. Given the strong political imperative to reduce greenhouse gas emissions in response to climate change, there is an increasing need to improve our understanding of energy consumption in all sectors in order to develop and introduce effective energy saving policies.

Key applications of end-use data may include:

- Developing programs to reduce energy consumption.
- Assessing the impact of improved equipment efficiency.
- Examining the impact of fuel switching.
- Projecting future energy consumption and greenhouse gas emissions.
- Quantifying the energy consumption at the household level, including understanding the impact of user behaviour.
- Assessing energy savings from load management and controls.
- Evaluating the success of a range of energyrelated programs.
- Quantifying the drivers of peak load.

The proposal for a Residential Energy Monitoring Program (REMP) in Australia, as a mechanism to collect and analyse data to address this information need, was first tabled at an *End-Use Metering in the Residential Sector* meeting held in Sydney in February 2009. A REMP would complement the existing data collection projects, including the Intrusive Residential Standby Survey (2000 and



The Proof of Concept project involved the installation of power box monitoring equipment, see photo above, and wireless transmission of data, see photo below.



2005) and Standby Power Store Surveys (since 2001) (see Section 9.5, *Standby Power Store Surveys*, for more information).

Representatives from the Australian and New Zealand governments and the States and Territories met with energy experts, international end-use



An installed light meter in the PoC REMP.



Installed gas monitoring equipment seen above the gas box.

metering program co-ordinators and members of the electricity supply industry to discuss a proposal for a Residential Energy Monitoring Program (REMP) in Australia. It was agreed that a REMP required the development of methodology papers and a standardised data and reporting framework for end-use monitoring.

9.3.2 Proof of Concept

As a result of ongoing discussions, a 'proof of concept' (PoC) REMP was developed, which has the potential to be scaled up to a more comprehensive Residential Energy Monitoring Program (REMP).

The PoC REMP involved:

- Outlining the key issues and approaches to measuring energy end-uses in houses, by developing the following methodology papers to support data monitoring:
 - Lighting Residential Energy Monitoring Program (REMP) Lighting End-Use Measurement, January 2010.
 - Hot water Hot Water End-Use Measurement, March 2010.
 - Space heating and cooling *REMP Metering Requirements for Heating and Cooling Loads*, March 2010.
 - Plug Loads Collection and Analysis of End Use Metering Data for General Plug Loads, May 2010.
 - Data handling *Data Handling and Database* Specification, May 2010.
- Creating a robust data framework to handle the data collected and developing software to assist in its cleaning, smoothing and analysis.
- Installing monitoring equipment in five homes in Melbourne.

The monitoring equipment was installed in March 2010 and monitoring proceeded smoothly and without problems. By June 2010, the project had already collected and analysed more than 35 million records (capturing around 500,000 data points a day). An illustration of this data is given in Figure 15.



Figure 15. Illustrative data from Residential Energy Monitoring Program proof of concept project

9.3.3 Technical Workshop

On 4 June 2010, 35 stakeholders, including energy utility representatives, government departments, consultants and energy regulators, met for a daylong technical workshop to discuss:

- The project outline.
- End-use methodologies.
- Preliminary results from the pilot program.
- Possible scale up to a full Residential Energy Monitoring Program.

There was agreement at the workshop that the PoC was a high quality study and that a scaled up REMP would be important to understand where, and how, energy is consumed in Australian homes. It was concluded that the data provided by an expanded REMP would meet the various, but often different, needs of all participants. For example, energy retailers were more interested in understanding drivers of peak demand while government departments were more interested in data that helps to inform the development of energy policy.

9.3.4 Preliminary Findings

The PoC demonstrated the potential for a REMP to provide a unique insight into energy consumption patterns as well as answering many questions about the monitoring process and equipment.

Typically, today's homes have up to 70 plugin appliances, as well as air-conditioning and traditional appliances, and a mixture of lighting sources. Electricity consumption varies considerably between houses and from day-today. The pilot demonstrates that without detailed monitoring, it is impossible to pinpoint the cause of this variation or how to resolve it.

For example, some houses run hot water at least 50 times per day but in many cases use less than one litre at a time. Since it is unlikely that the householder actually receives hot water from such a small draw-off, this information highlights a possible energy saving opportunity.

A report summarising the details and findings of the PoC REMP project will be published in 2010/11. More information on the PoC REMP, along with copies of all the available documents, can be found on the Energy Rating website at www.energyrating.gov.au.

9.4 Standby Power Store Surveys

Since 2001, Australia has measured standby power performance in over 7,500 new products sold in major retailers, spanning over 30 of the most common electronic devices. This has enabled policy makers to monitor the changes in electricity consumption by appliances in their low power modes and therefore establish which appliance types have increasing or decreasing standby trends.

As demonstrated in Figure 16, which shows the time series for measurements of passive standby measurements in microwaves, the store survey results allow the tracking of power levels in appliances as they enter the market. Where levels are increasing, this can indicate the need for policy intervention. By taking measurements in retail outlets using a portable meter, a large range of appliances across a number of manufacturers can be measured quickly and at relatively low cost. During 2009/10, 632 individual devices were measured in Melbourne stores, and the full list of measured products is shown in Table 9.

Figure 16. Passive Standby Power Measurements in Australian Microwaves, 2003-2010



(Source: Figure 22, Source: Figure 22, APP Alignment of National Standby Power Approaches Project: 2009/10 Data Outcomes)⁷⁴

74 Available at www.energyrating.gov.au

Appliance	Total Number of Appliances	Average of Off Power (W)	Average of Passive Standby Power (W)	Average of Active Standby Power (W)
Air Conditioner	2	0.0	2.4	0.0
AV Receiver	8	0.0	1.1	48.0
Dishwasher	27	0.3		1.6
Dryer	27	0.3	1.2	2.2
DVD Player	40	0.0	1.5	7.4
DVD Recorder	6	1.1	2.7	13.2
Espresso Machine	26	0.6		1.7
External Power Supplies	55		0.4	
Fan	4	0.0	0.7	
Hard Disk Recorder	15	0.0	6.0	22.9
Heater - Electric portable	29	0.0	2.0	
Heater - Gas	1	0.0		
Home Entertainment Other	11	2.1	2.6	16.3
Home Theatre System	14		0.4	25.7
Juicer	25	0.5		2.6
Microwave	31		2.3	2.1
Set Top Box	13	0.0	3.9	8.1
Stereo - Integrated	40	4.3	2.8	13.4
Subwoofer	12	0.0	0.4	8.6
Toaster	27	0.4		
TV - CRT	6	0.0	3.7	
TV - LCD	27	0.0	1.7	
TV - Plasma	24	0.2	0.8	0.0
VCR	1		1.8	1.8
Clothes Washer Front Loader	30	0.4		2.9
Clothes Washer Top Loader	25	1.2		3.5
Computers - Laptop	40	0.6	0.6	
Computers - Monitor	17	0.6	0.7	
Computers - Speakers	9	3.1	5.4	5.3
Multi Function Device	22	1.1		5.9

Table 9. Products measured during 2009/10 Melbourne Standby Store Survey

Appliance	Total Number of Appliances	Average of Off Power (W)	Average of Passive Standby Power (W)	Average of Active Standby Power (W)
Printer - Inkjet	1	2.5		2.7
Printer - Laser	1	0.0		12.4
Hand - held Vacuum Cleaner	5		0.9	4.7
Computers - Desktop	4	0.7		
Digital photo frame	7	0.3	1.9	4.8
Total Appliances Measured	632			
Average		0.5	1.7	9.2

Through the Asia-Pacific Partnership on Clean Development and Climate (APP) Standby Project⁷⁵ (see 3.1, *Asia-Pacific Partnership on Clean Development and Climate*), Australia has encouraged several other countries to collect and report data using a common procedure, thereby enabling international comparison. Nearly 12,000 individual measurements have been reported over the past three years from a wide variety of countries in addition to Australia, including Canada, China, the Czech Republic, Europe (SELINA), Hungary, Korea, India, New Zealand and the USA. The results are available at www.energyrating.gov.au

⁷⁵ www.energyrating.gov.au



- 1. E3 Program Governance
- 2. E3 Committee member organisations
- 3. Ministerial Council on Energy membership
- 4. Standards and Regulatory Rulings
- 5. Publications
- 6. Media Releases
- 7. E3 Program International Lighting and Electric Motors activities

1. E3 Program Governance

Figure 17. E3 Program governance



2. E3 Committee member organisations

The Commonwealth, New Zealand and each State and Territory are represented on the E3 Committee and participate in its deliberations. Representatives are officials within government departments, agencies and statutory authorities, or people appointed to represent these bodies, and are usually senior officers directly responsible for energy efficiency. Current membership includes:

Jurisdiction	Government Agency	Further Information
Commonwealth	Department of Climate Change and Energy Efficiency	www.climatechange.gov.au (Provides support for the E3 Committee's activities and a DCCEE Officer is the current Chair of the Committee)
Australian Capital Territory	ACT Planning and Land Authority	www.actpla.act.gov.au
New South Wales	Industry and Investment NSW	www.industry.nsw.gov.au/energy (Regulatory Authority)
Northern Territory	Department of Resources	www.nt.gov.au/d/Minerals_Energy
Queensland	Office of Clean Energy, Queensland Department of Employment, Economic Development and Innovation	www.cleanenergy.qld.gov.au
	Electrical Safety Office, Queensland Department of Justice and Attorney- General	www.justice.qld.gov.au/fair-and-safe-work/ electrical-safety (Regulatory Authority)
South Australia	Department for Transport, Energy and Infrastructure	www.dtei.sa.gov.au
	South Australian Office of the Technical Regulator	www.technicalregulator.sa.gov.au/office_ of_the_technical_regulator (Regulatory Authority)
Tasmania	Office of Energy, Planning and Conservation	www.dier.tas.gov.au/energy/home
Victoria	Sustainability Victoria	www.sustainability.vic.gov.au
	Energy Safe Victoria	www.esv.vic.gov.au (Regulatory Authority)
Western Australia	Office of Energy	www.energy.wa.gov.au
	Energy Safety, Department of Commerce	www.commerce.wa.gov.au/EnergySafety/
New Zealand	New Zealand Energy Efficiency and Conservation Authority	www.eeca.govt.nz (Regulatory Authority)

Table 10. E3 Committee member organisations as at 30 June 2010

3. Ministerial Council on Energy membership

(as at 30 June 2010)

The Hon Martin Ferguson AM, MP Minister for Resources, Energy and Tourism, COMMONWEALTH (Chair, Ministerial Council on Energy)

The Hon Stephen Robertson MP Minister for Natural Resources, Mines and Energy, QUEENSLAND

The Hon Paul Lynch MP Minister for Energy, NEW SOUTH WALES

The Hon Peter Batchelor MP Minister for Energy and Resources, VICTORIA

The Hon Peter Collier MLC BA DipEd Minister for Energy, WESTERN AUSTRALIA

The Hon Patrick Conlon MP Minister for Energy, SOUTH AUSTRALIA

The Hon Delia Lawrie MLA Treasurer, Northern Territory Treasury NORTHERN TERRITORY

Mr Simon Corbell MLA Minister for Energy, AUSTRALIAN CAPITAL TERRITORY

The Hon Bryan Green MP Minister for Energy and Resources, TASMANIA

Observers

The Hon Gerry Brownlee Minister for Energy and Resources, NEW ZEALAND

The Hon William Duma LLB LLM MP Minister for Petroleum and Energy, PAPUA NEW GUINEA

The Hon André Nobbs MLA Minister for Finance, NORFOLK ISLAND

4. Standards and Regulatory Rulings

Number	Title	Date of Issue or Amendment
AS/NZS 1158.1.2:2010	Lighting for roads and public spaces - Vehicular traffic (Category V) lighting - Guide to design, installation, operation and maintenance	2010-JUN
AS/NZS 1158.4:2009	Lighting for roads and public spaces - Lighting of pedestrian crossings	2009-JUL
AS/NZS 2040.1:2005	Performance of household electrical appliances - Clothes washing machines - Methods for measuring performance, energy and water consumption	2009-NOV, Amendment 2 2010-APR, Amendment 3
AS/NZS 3823.2:2009	Performance of electrical appliances - Air conditioners and heat pumps. Part 2: Energy labelling and minimum energy performance standard (MEPS) requirements	2009-OCT
AS/NZS 4847.1:2010	Self ballasted lamps for general lighting services - Test methods - Energy performance	2010-MAY
AS/NZS 4847.2:2010	Self ballasted lamps for general lighting services - Minimum Energy Performance Standards (MEPS) requirements	2010-MAY
AS/NZS 4879.2:2010	Performance of transformers and electronic step- down convertors for ELV lamps - Minimum Energy Performance Standards (MEPS) requirements	2010-FEB
AS 5102.1:2009	Performance of household electrical appliances - Swimming pool pump-units - Energy consumption and performance	2009-DEC
AS 5102.1:2009	Performance of household electrical appliances - Swimming pool pump-units - Energy labelling and minimum energy performance standard requirements	2009-DEC
AS/NZS 62087.1:2010	Power consumption of audio, video and related equipment - Methods of measurement	2010-FEB
AS/NZS 62087.2.1:2008	Power consumption of audio, video and related equipment. Part 2.1: Minimum Energy Performance Standards (MEPS) requirements for digital television set-top boxes	2009-JUL, Amendment 1 2010-FEB, Amendment 2
AS/NZS 62087.2.2:2010	Power consumption of audio, video and related equipment. Part 2 Minimum Energy Performance Standards (MEPS) and Energy Rating Label requirements for television sets	2010-FEB

 Table 11. Australia and New Zealand standards released during 2009/10

Ruling Number	Date	Product Type	Subject
23A	2009-OCT	Commercial Building Chillers	Exemption for Free Cooling; Heat Recovery; and Heat Pump Liquid-Chilling Packages That free cooling, heat pump (reverse cycle), and heat recovery liquid-chilling packages be exempted under Clause 1 of AS/NZS 4776.1.1:2008.
24A	2009-NOV	Incandescent Lamps	Exclusions From the Scope (see Clause 1.2) That coloured, automotive and special purpose lamps be excluded from the scope of AS/NZ 4934.2 and that further attribute information on GLS and ELV halogen non-reflector lamps be added
25B	2009-DEC	Clothes Washers	Revised Transitional Arrangements That the standard be modified to explain appropriate transitional arrangements for Amendment 2 to AS/NZS 2040.1.
26B	2010-JAN	Air Conditioners	Application of Labelling and MEPS to Boats That the scope of exclusions detailed in Clause 1.2g of AS/NZS 3823.2:2009 (i.e. "Air conditioners powered by mains electricity specifically designed and sold only for installation in end-use mobile applications of caravans, mobile homes, camper vans and rail cars") be extended to include boats.
28A	2010-APR	Clothes Washers	Quartz Cell Specification That the acceptance criteria in AS/NZS 2040.1: 2005 for a spectrophotometer cell be amended from a transmittance of between 100% and 97.949% to a transmittance of between 100% and 80% and that the additional reference in the particular standard clause to an absorbance of "between 0 to 0.009" should be ignored.
29A	2010-MAY	Solar Boosted Air Conditioners	Scope of Standard for Air Conditioners and Heat Pumps That air-conditioners of the vapour compression type are not exempted from labelling and/or MEPS requirements under Clause 1.1 of AS/NZS 3823.2:2009, unless they are excluded under Clause 1.2 of AS/NZS 3823.2:2009.

5. Publications

The E3 Program publications listed below were released from July 2009 to June 2010 and are available from the electronic library on Energy Rating website at www.energyrating.gov.au

Date	Publication Type	Publication Title and Summary	Publication Reference
2009-JUN ⁷⁶	Report	<i>Computers and Energy Efficiency in Australia.</i> Summarises the results of testing carried out between July 2008 and March 2009 on desktop and notebook personal computers, bought on the open market, to understand the energy use and energy efficiency of appliances and equipment sold in Australia.	Report 2009/09
2009-JUL	Fact Sheet	Voluntary Labelling Program for Swimming Pool Pump- units - Draft Rules for Participation v1, July 2009 program. Sets out draft Rules for Participation for suppliers who choose to take part in this voluntary program (superseded by Report 2010/02, 2010-APR)	Report 2009/07
2009-AUG	Discussion Paper	Discussion Paper on Proposed National Legislation for Minimum Energy Performance Standards (MEPS) and Energy Labelling Poses a series of questions based around the high level objectives of the proposed national legislation, to encourage stakeholders to start thinking about the proposed legislation.	Report 2009/08
2009-AUG	Fact Sheet	<i>Mandatory TV Labelling and MEPS</i> Summarises the requirements for mandatory energy rating labelling and compliance with Minimum Energy Performance Standards (MEPS) for televisions.	
2009-AUG	Report	Energy Efficiency Labelling for Whitegoods - Compliance Improving Throughout Australia Provides a headline summary of the results of a store survey carried out in May and June 2009 to examine the level of compliance of whitegoods to mandatory product registration and energy efficiency labelling.	
2009-SEP	Reference Manual	Good Practice Guide to Air Conditioner Heat Pump Installation ⁷⁷ Provides good practice guidelines for designing and installing the most common type of residential heat pump system - air-to-air single-split heat pump systems (also known as reverse-cycle air conditioners), used primarily for heating.	

Table 12. E3 Program publications released from July 2009 to June 2010

⁷⁶ Released in early 2009/10

 $^{77\} www.energywise.govt.nz/sites/all/files/heat-pump-installation-guide-2009.pdf$

Date	Publication Type	Publication Title and Summary	Publication Reference
2009-SEP	Report	Survey of Compliance with Energy Efficiency Labelling Laws - Whitegoods 2009 Provides a detailed summary of the results of a store survey carried out in May and June 2009 to examine the level of compliance of whitegoods to mandatory product registration and energy efficiency labelling.	Report 2009/10
2009-SEP	Report	Baseline TV Power Consumption 2009 Examines the results from the testing of over 80 Plasma and LCD TVs under the new Australian and New Zealand Standard, AS/NZS 62087.1(Int), Power consumption of audio, video and related equipment - Methods of measurement.	Report 2009/19
2009-SEP	Discussion Paper	Single Duct Portable Space Conditioners and Spot Coolers Sets out a number of proposals to regulate single duct portable space conditioners and spot coolers with respect to energy performance and provides information on the different types of products currently on the market.	
2009-OCT	Regulation Impact Statement	Regulatory Impact Statement: Proposal to Introduce a Minimum Energy Performance Standard for Gas Water Heaters Outlines the proposal to implement a Minimum Energy Performance Standard that requires gas water heaters to achieve a minimum energy rating of four stars from October 2010.	Report 2009/22
2009-OCT	Report	<i>ENERGY STAR Computers in Australia</i> Summarises the results of testing 22 computers marked with ENERGY STAR V4.0 and V5.0 to confirm the energy efficiency claims by major-brand computer suppliers.	Report 2009/13
2009-OCT	Strategy	In From The Cold - Strategies to Increase Energy Efficiency of Non-Domestic Refrigeration in Australia and New Zealand Identifies the priority refrigeration technologies and market sectors to be targeted over the next ten years to make a significant improvement to the energy performance of products and services throughout the non-domestic refrigeration sector.	Report 2009/12a
2009-OCT	Report	In From The Cold - Strategies to Increase Energy Efficiency of Non-Domestic Refrigeration in Australia and New Zealand: Background Technical Report, Volume 1 Provides supporting information relating to refrigerated cabinets, including display cabinets, for the non-domestic refrigeration strategy.	Report 2009/12b
2009-OCT	Report	In From The Cold - Strategies to Increase Energy Efficiency of Non-Domestic Refrigeration in Australia and New Zealand: Background Technical Report, Volume 2 Provides supporting information relating to sectors and technologies other than refrigerated cabinets for the non- domestic refrigeration strategy.	Report 2009/12c

Date	Publication Type	Publication Title and Summary	Publication Reference
2009-OCT	Fact Sheet	<i>Transitional Arrangements Refrigerators and Freezers</i> 2009 – 2010 Provides details of the new MEPS and energy rating labelling requirements for refrigerators and freezers coming into force on 1 April 2010.	
2009-OCT	Fact Sheet	<i>Transitional Arrangements Air Conditioners 2009-2011</i> Provides details of the implementation of new Minimum Energy Performance Standards and Energy rating labelling requirements for air conditioners with a cooling output up to 65kW coming into force on 1 April 2010 and 1 April 2011.	
2009-OCT	Fact Sheet	<i>Commercial Building Chillers - Standards and Regulations</i> Provides a summary of the standards and regulations relevant to commercial building chillers and signposts sources of further information	
2009-NOV	Fact Sheet	<i>Close Control Air Conditioners - Standards and Regulations</i> Provides a summary of the standards and regulations relevant to close control air conditioners and signposts sources of further information	
2009-DEC	Report	<i>Achievements 2008/09</i> Annual Report for the E3 Program – July 2008 to June 2009	Report 2009/14
2009-DEC	Market Survey	Possible Labelling of Portable Space Conditioners and Spot Coolers - Market Research on Consumer Attitudes and Behaviour Documents a research study carried out to assist with the development of labelling for single-duct portable space conditioners and spot coolers.	Report 2009/17
2009-DEC	Reference Manual	A Reference Manual for Training in Efficient Lighting Principles: The Basics of Efficient Lighting, First Edition, December 2009. Provides an overview of the key principles of light and lighting, including information on basic design concepts, the lighting technologies currently available and the importance of energy efficiency.	
2010-JAN	Regulation Impact Statement [Consultation]	Consultation Regulation Impact Statement: National Legislation for Appliance and Equipment Minimum Energy Performance Standards (MEPS) and Energy Labelling Explores opportunities to improve and streamline the existing appliance energy efficiency program. It is the first step in a commitment by the Council of Australian Governments to look at new national legislation for MEPS and energy rating labelling.	Report 2010/01
2010-FEB	Technical Report	Proposed Clothes Washer Standards Revision Program - AS/NZS 2040.1 and AS/NZS 2040.2 Sets out the details of a revision program proposed by regulators to both the clothes washer test standard and the associated clothes washer regulatory standard.	

Date	Publication Type	Publication Title and Summary	Publication Reference
2010-APR	Fact Sheet	Voluntary Energy Rating Labelling Program for Swimming Pool Pumps Units - Rules for Participation Sets out the Rules for Participation for suppliers who choose to take part in this voluntary program (supersedes Report 2009/07, 2009-JUL).	Report 2010/02
2010-MAY	Presentation	Household Refrigerators - Humidity Controlled Anti- Condensation Heaters Summarises working group investigations into the issues surrounding the use of humidity controlled anti- condensation heaters.	
2010-JUN	Product Profile	Home Entertainment Products: Product Profile Provides details of the range of home entertainment products including both their standby and operating energy requirements and surveys international methods of improving their energy.	Report 2010/06
2010-JUN	Technical Report	APP Alignment of National Standby Power Approaches Project: 2009/10 Data Outcomes Provides a summary of progress with this international data collection project and presents the results of the multi- country survey of standby power consumption.	
2010-JUN	Regulation Impact Statement [Consultation]	Consultation Regulatory Impact Statement: Minimum Energy Performance Standards for Air Conditioners: 2011 Discusses the potential impacts, costs and benefits arising from the proposed introduction of more stringent Minimum Energy Performance Standards levels for air conditioners which are covered by existing regulations and within the scope of AS/NZS 3823.2.	
2010-JUN	Brochure	<i>Energy Rating Labelling for Swimming Pool Pump Units</i> Summarises the main features of the Voluntary Energy Rating Labelling Program for swimming pool pump-units	

Table 13. E3 newsletters issued from July 2009 to June 2010

Newsletter	Description	lssues
Circuit Breaker	Designed to report and promote compliance within Australia's equipment energy efficiency mandatory programs.	SEP 2009
Load Down	Dedicated to information on the latest standby power research studies and policy initiatives, both in Australia and internationally.	JUL 2009 FEB 2010 JUN 2010 AUG 2010
Transformers newsletter	Designed to keep industry stakeholders informed and up-to-date on progress with the revision of mandatory Minimum Energy Performance Standards for distribution transformers	AUG 2009 APR 2010

6. Media Releases

Energy Efficient Appliances and Lighting: Helping Aussies Live Greener and Smarter

THE HON PETER GARRETT MP

Minister for the Environment, Heritage and the Arts

1 November 2009

Today marks another milestone in Australia's journey towards an energy efficient economy, with three major initiatives announced to improve the performance and efficiency of household appliances and lighting.

Minister for the Environment Peter Garrett announced new performance standards and energy rating labels for televisions; the extension of the 10star energy rating scale for super efficient fridges, freezers and air conditioners; and the next steps in the phase-out of inefficient household lighting.

Upcoming measures to improve the energy efficiency of desktop and laptop computers, computer monitors and swimming pool pumps are also on the table.

These household energy efficiency measures are expected to:

- Deliver energy savings of 32,000 gigawatt hours per year by 2020 – equivalent to 14% of all electricity generated in Australia in 2006-07.
- Prevent up to 19.5 million tonnes of carbon emissions every year by 2020.
- Save the Australian economy up to \$22 billion over the next 16 years, and
- Save Australian householders up to \$5 billion by 2020.

"Energy efficiency is one of the cheapest, smartest and most effective actions we can take to drastically cut carbon pollution, live and work more comfortably, and help householders take control of their energy use," Mr Garrett said.

Energy rating labels have been helping Australians compare the efficiency of whitegoods for over 20 years, and are now appearing on one of Australia's most-popular household appliances: the television.

"In Australia, we buy over two million TVs every year, adding to the 18 million already in homes and businesses. In a single day, a large widescreen TV can use more energy than a dishwasher, washing machine and clothes dryer *combined*," Mr Garrett said.

"For the first time, TVs imported into Australia must now meet new minimum energy performance standards and display an energy rating label, helping consumers select the most efficient model that suits their needs and budget," he said.

The energy rating scale for fridges, freezers and air conditioners has also been increased from six stars to 10 stars, helping consumers better differentiate between an 'efficient' product and a 'super efficient' product. New models must now also meet even stricter minimum energy performance standards.

"The race is on for Australia's first 'super efficient' whitegoods, and you can spot these products because their label will have seven or more stars," Mr Garrett said.

Inefficient lighting has also been targeted, with the traditional incandescent light bulb removed from Australian shop shelves from today.

"Lighting is the fourth highest energy user in the home. Australians spend more than \$900 million a year on lighting and by switching to more efficient light bulbs householders can cut their costs by up to 80 per cent," Mr Garrett said. "The traditional incandescent light bulb wastes 90 per cent of its energy as heat, not light, and only lasts for up to 1,000 hours."

"We are also introducing stricter performance standards for CFLs, which means that the performance and quality of CFLs will improve rapidly, and the range of choices for consumers will also increase.

"This Government has the most comprehensive range of energy efficiency measures in Australia's history.

"It's the smart, efficient actions we take every day that will move us into a greener, cleaner and smarter future."

Energy Efficiency Agreement for Pay TV Subscribers Good for the Wallet and the Environment

THE HON PETER GARRETT MP

Minister for the Environment, Heritage and the Arts

16 December 2009

Australian pay television subscribers stand to save millions of dollars and prevent significant greenhouse gas emissions over the coming years, thanks to a new energy efficiency agreement struck between the Australian Government and the subscription television industry.

Minister for the Environment Peter Garrett was in Sydney today to announce the agreement between the Government, Foxtel and Austar. It's the latest measure in the Government's comprehensive program improve the energy efficiency of appliances, equipment and lighting.

Energy efficiency is the critical second plank in the Australian Government's plan to tackle climate change, alongside the Carbon Pollution Reduction Scheme and unlocking the potential of renewable energy.

"In Australia, pay TV subscriber numbers are on the rise; additional functionality is increasing energy use and set-top boxes are staying on for longer. If we were to do nothing, energy use would more than double over the next 10 years.

"Improving the energy efficiency of pay TV set-top boxes is an area where we can achieve great results. Experts predict that this agreement will deliver energy savings of 1,124 gigawatt hours, prevent 948 kilo-tonnes of carbon emissions -the equivalent of taking almost 28,000 cars off the road -and save pay TV subscribers \$168 million in lower energy bills between 2009 and 2020." The agreement requires signatories to provide new pay TV set-top boxes of high energy efficiency, and to consider accelerating the retirement of older, less efficient products.

"This landmark agreement demonstrates world's best practice when it comes to industry and government working together to reduce energy consumption and greenhouse gases for pay TV settop boxes," Mr Garrett said.

"Not everyone's got a pay TV subscription, so it's also good to know that free-to-air set-top boxes are also more energy efficient – the Government introduced minimum energy performance standards earlier this year, helping consumers save greenhouse gases and reduce energy use.

"And if you're looking for a new TV for a gift or at the upcoming holiday and stocktake sales, don't forget to check the energy rating label: the more stars, the more efficient it is and the less it will cost you to run.

"2009 has been a big year for energy efficiency in this country with the most comprehensive program of measures in the nation's history being rolledout across all sectors of the Australian economy including homes, commercial buildings, appliances and equipment, industrial energy efficiency, skills and education, Mr Garrett said.

"After 12 years of inaction in this space, it is a really positive and rapid turnaround."

The agreement with the pay TV industry comes on the back of recent announcements regarding new performance standards and energy rating labels for televisions; the extension of the 10-star energy rating scale for super efficient fridges, freezers and air conditioners; and the next steps in the phaseout of inefficient household lighting. Improving the energy efficiency of appliances, equipment and lighting is expected to deliver significant environmental and economic savings for Australia:

- Greenhouse gas abatement of up to 19.5 million tonnes of carbon emissions every year by 2020.
- Energy savings of up to 32,000 gigawatt hours per year by 2020 – equivalent to 14 per cent of all electricity generated in Australia in 2006-07 (ABARE).
- Estimated savings to the Australian economy of up to \$22 billion over the period 2009-2024.
- Estimated savings for householders of up to \$13 billion over the period 2009-2024.

"On his recent visit to Australia, Dr Nigel Jollands, Head of Energy Efficiency at the International Energy Agency praised Australia for its efforts when it comes to improving the energy efficiency of appliances, equipment and lighting," Minister Garrett said.

The energy efficiency agreement for pay TV set-top boxes will start on 1 January 2010 and run for 10 years until 2020. 7. E3 Program International Lighting and Electric Motors activities

International Lighting

En.lighten

The UNEP Global Market Transformation for Efficient Lighting Project, known as en.lighten or Efficient Lighting for Emerging and Developing Countries⁷⁶, was launched in September 2009 and has been established to promote, accelerate and coordinate global efforts to push for efficient lighting. The E3 Program, on behalf of the Australian Government, will participate in the Policy, Legislation and Regulation taskforce, contributing Australian experience and expertise to help shape the first global strategy for market transformation towards efficient lighting worldwide.

Asia Lighting Compact

In October 2009, the *Asia Lighting Compact* (ALC)⁷⁷, a partnership comprising governments, regional lighting associations and the world's largest lighting manufacturers, was launched in Hong Kong to support the widespread adoption of high-quality, energy efficient lighting in Asia.

The initiative aims to foster harmonisation of performance requirements at a regional level by establishing a mechanism for identifying and verifying the quality and performance of compact fluorescent lamps. The E3 Program acts as the ALC secretariat and an E3 Program official sits on the ALC Board and participated in the ALC meetings in Hong Kong in October 2009 and Beijing in June 2010.

lites.asia

Jointly supported by the Australian Government and USAID's ECO-Asia Program as part of the Asia Pacific Partnership on Clean Development and Climate, the Asian Network for '*Lighting Information and Technical Exchange on Standards*' (or lites.asia)⁷⁸ is an initiative working towards harmonising the implementation of international standards across Asia. E3 Program officials took an active role in the network during 2009/10, in particular during the set-up phase from October 2009, right through to participation in the first lites.asia information exchange event in Beijing in June 2010. Australian Government APP funding has been provided for lites.asia project management and meeting organisation and support.

PILESLAMP

The PILESLAMP, or *Phase-Out of Incandescent Lamps and Energy Saving Lamps Promotion*, project⁷⁹ is an important collaboration between the United Nations Development Program (UNDP), the Global Environment Facility (GEF), the Chinese Government and the private sector. Its aim is to assist China in developing a road-map to:

- phase-out the production and sale of inefficient lighting.
- increase the penetration of more efficient alternatives into the market.
- increase production capacity for energy efficient lamps within China, and thereby their global availability.

In June 2010, E3 Program officials took part in *Phase-out of Inefficient Lighting: International Workshop on Policies, Strategies and Issues*, a continuation of a series of conferences that began in 2008 and have received significant funding from the Australian Government. They facilitate the

⁷⁶ www.enlighten-initiative.org/Home/tabid/4915/Default. aspx

⁷⁷ www.asialighting.org

⁷⁸ www.lites.asia

⁷⁹ www.undp.org.cn/projects/00062179.pdf

sharing of international knowledge and experience on the development and/or implementation of phase-out road maps in both developed and developing countries. The conference provided a focused and timely opportunity to share Australian best practice and to contribute to, and learn from, discussions on related issues of current relevance, i.e. management of environmental impacts of lighting and the recent developments in LEDs.

International Round Robin Testing of Lowvoltage Halogen Reflector Lamps

In late 2008, a round robin testing program of 90 MR16 low-voltage halogen reflector lamps was initiated to establish a cost-effective and reliable check test method using an integrating sphere for measuring the efficacy of reflector lamps. This sought to protect consumers and manufacturers from the effects of sub-standard products, given their proliferation in the Australian market.

A total of six test laboratories across the globe are involved: four manufacturer laboratories who provided their own branded lamps; and two independent laboratories, the Queensland University of Technology, Australia and the National Lighting Test Centre in Beijing, China.

Testing was conducted in accordance with AS/NZS 4934.1(Int):2008, *Incandescent Lamps for General Lighting Service Part 1: Test Methods – Energy Performance*, with minor variations, and continued through 2009/10. Publication of the results is expected in 2010/11 and analysis of the results will contribute to finalising the test method.

Electric Motors

IEC

The International Standard IEC 60034-2-1, Rotating electrical machines – Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles), is currently being redrafted by the relevant IEC working group (IEC TC2 WG28). Throughout 2009/10, the E3 Program and the Australian Standards Committee, EL-009, *Rotating Electrical Machinery*, were active in support of this redrafting process, providing input based on the E3 Program's experience regulating motors.

During the year, DCCEE also co-ordinated Australia, China and Korea's participation in the IEC motor testing round robin under the APP BATF 'Harmonization of Test Procedures' Electric Motors sub-project. By the end of 2009/10, the motors had been tested in Germany, Australia and China and the final round of testing is expected to be completed by September 2010. Results from this round robin will be supplied to the IEC to further inform the redrafting of the international test method standard. This test method standard is expected to eventually be adopted by the E3 Program as a regulatory standard.

APP

Under the auspices of the APP Buildings and Appliances Taskforce (BATF), Australia contributed to projects on the harmonisation of testing procedures for electric motors and motor systems. During 2009/10, work continued on comparing the various test methods listed in the IEC test method standard, IEC 60034-2-1. 27 industrial motors were purchased in China and were tested at the Shanghai Electrical Apparatus Research Institute (SEARI) test laboratory. These motors were tested according to three test methods listed in the new IEC test method, enabling APP partners to assess the difference between the three test methods and help inform policy decisions.

IEA 4E EMSA

Working through its seven tasks, EMSA⁸⁰ aims to promote harmonisation of standards and promotion of high-efficiency electric motors in

⁸⁰ www.iea-4e.org/annexes/motor-systems

appliances. Australia leads the testing centres task, with the objective of raising the quality of motor testing worldwide by developing networks between laboratories around the world. Australia is also participating in the new motor technologies task.

As part of the testing centres network, an online forum, www.leonardo-energy.org/testing-centresmotor-efficiency, was developed in 2009/10 to facilitate discussion among test laboratories. Work also commenced on an interpretive guide to IEC 60034-2-1 and to develop a test data set for laboratories to compare algorithms.

The first meeting of representatives from motor testing laboratories from around the world took place in Nantes, France in September 2009 in conjunction with the EEMODS (Energy Efficiency in Motor Driven Systems) 2009 conference⁸¹. This testing centres workshop progressed the development of an interpretative guide to the IEC test method standard and discussed the future work of the task. Australia was also a key contributor to EEMODS '09 itself, with three conference papers being presented.

⁸¹ www1.cetim.fr/eemods09/index.jsp







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