

REGULATORY IMPACT STATEMENT

Energy Labelling and Minimum Energy Performance Standards for Household Electrical Appliances in Australia

**Prepared for the NSW Department of Energy and
the Australian Greenhouse Office**

by

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with assistance from

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February 1999

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Executive Summary

Regulation Proposed

This RIS relates to the proposal to introduce model regulations in each State and Territory covering mandatory energy labelling and minimum energy performance standards (MEPS) for household electrical appliances. It also assesses the consequences for the regulations of the provisions of the Trans Tasman Mutual Recognition Act 1997 (TTMRA).

There are already labelling regulations in NSW, Victoria, Queensland, SA, WA and the NT. The proposed model regulations, if adopted by all jurisdictions, would have the effect of confirming the existing mandatory labelling regime in those States, extending it to Tasmania and ACT, and slightly expanding the scope of labelling in NSW.

The model regulations would also be used to introduce MEPS for refrigerators, freezers and electric water heaters, as agreed by ANZMEC in 1995, and the introduction of new label designs which are intended to further increase the effectiveness of the labelling program.

Background

The introduction of energy labelling was endorsed by the then Australian Minerals and Energy Council (AMEC - now ANZMEC) prior to its implementation by NSW and Victoria in 1985. The introduction of MEPS was one of the measures adopted by the Council of Australian Governments (COAG) as part of the 1992 National Greenhouse Response Strategy. After considering the recommendations of a cost-benefit analysis carried out in 1993, ANZMEC Ministers agreed in 1995 that MEPS would be introduced for household refrigerators, freezers and electric storage water heaters. The ANZMEC decision was followed by extensive discussions between Commonwealth and State officials and the appliance industry, during which the MEPS levels were finalised and an implementation date of October 1999 was agreed.

The 1998 National Greenhouse Strategy (NGS) states that:

Governments are committed to introducing minimum energy performance standards for domestic electrical appliances. Standards have been developed in consultation with industry and will take full effect from October 1999.

It further states that “energy performance codes for domestic appliances...will be expanded and strengthened.”

Energy labelling has been effective in reducing the electricity consumption of appliances in Australia below what it would otherwise be. Compliance with the requirement to label is the highest of any mandatory energy labelling program in the world. There is no energy labelling

of water heaters, for which MEPS is the most likely driver for improvements in energy efficiency. There is evidence that the industry is on track to meet the MEPS levels scheduled to take effect in October 1999.

These developments have occurred in a context where all parties assume that labelling and MEPS are mandatory and will continue to be so. The fact that inconsistencies between some State and Territory labelling regimes might already allow Australia-wide sale of non-labelled appliances originating in certain Australian jurisdictions has not been an issue. However, energy labelling and MEPS would change from “mandatory” to “voluntary” programs if one or more of the following occurred:

- one or more Australian States or Territories repeal their existing energy labelling regulations, fail to renew them after sunset provisions take effect, or fail to enact MEPS regulations.¹ Mutual recognition arrangements provide that products which are manufactured in or imported via those jurisdictions can be lawfully sold even in jurisdictions which require labelling and/or MEPS;
- if the existing temporary exemption under TTMRA for energy labelling should lapse, as is currently due on 1 May 1999. In that event unlabelled products manufactured in or imported through New Zealand could be sold lawfully in all Australian jurisdictions, whether or not they have mandatory labelling regulations;
- if a TTMRA exemption for MEPS cannot be obtained by 1 October 1999, the date when MEPS is scheduled to take effect in Australia. Non-compliant products manufactured in or imported through New Zealand could then be sold lawfully in all Australian jurisdictions, whether or not they have MEPS regulations.

If the status of the program should change, it is likely that supplier behaviour would also eventually change in response. If non-compliance with MEPS or labelling becomes possible and acquires sufficient commercial value on the Australian market (eg by giving a price advantage over labelled and MEPS-complying products) then manufacture in non-complying Australian jurisdictions or in New Zealand, or import via those jurisdictions, would become more attractive.

Labelling is likely to continue at some level for some time even after suppliers adjust to the fact that it is no longer mandatory, but the proportion of products labelled and hence the effectiveness of the program is likely to decline over time.

Voluntary compliance with the proposed MEPS level (or any given MEPS level) is unlikely to be commercially advantageous for suppliers, as there would always be a risk that competitors would not comply. Some value could be given to voluntary compliance by substantial expenditure on public promotion of a compliance mark, but this is not likely to be

¹ Enactment of the model regulations currently being prepared would both confirm continuation of a uniform mandatory labelling regime and provide for the commencement of MEPS in October 1999.

worthwhile for any supplier individually. Therefore it is assumed that MEPS will only be effective if it is mandatory.

Alternatives Considered

The obvious alternative to the proposed model regulations is not to proceed with regulations. In the short term, this would have the following consequences:

- no means of coordinated revision of the label design or the mathematical algorithms determining star ratings, hence avoidance of the associated costs and benefits;
- no means of enforcing MEPS, hence avoidance of the associated costs and benefits (although given the timing some of these may already have been incurred);
- continuation of the inefficiencies associated with differing regulations in the jurisdictions which have labelling schemes.

The longer term effects are uncertain. They would depend on whether jurisdictions renew mandatory labelling as their regulations come up for review, and if not, when and in what order they allow labelling regulations to lapse.

MEPS would also be impacted by a decision not to introduce new model regulations. The extent of the impact would depend on whether the progress toward compliance already made by suppliers (in good faith and in response to government urging, it should be added) were irreversible, in which case they would be at a competitive disadvantage against future entrants who have not incurred those costs. If progress towards compliance is not yet irreversible, then a decision not to implement the proposed regulations would in effect be a decision not to introduce MEPS.

Various mandatory and voluntary combinations for labelling and MEPS are considered in this RIS. The “minimum” option considered is not to adopt the proposed model regulations at all and to allow the present State-based labelling framework to continue.

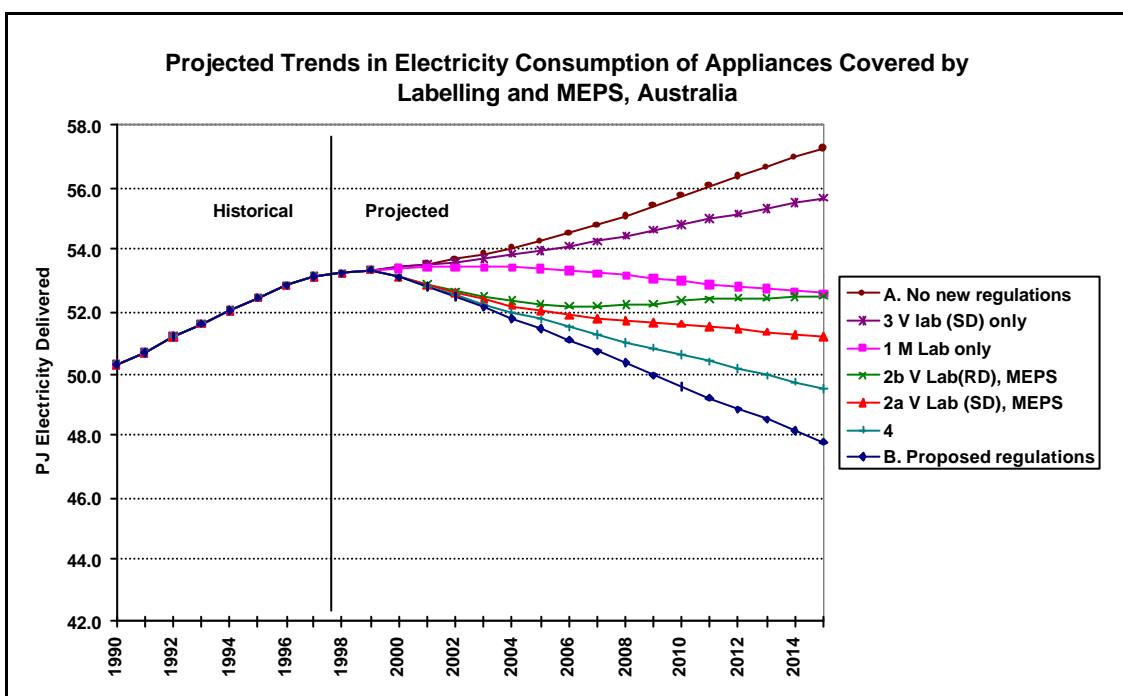
The “maximum” option considered is for all Australian jurisdictions to adopt the model regulations, and for action to be taken to ensure the effectiveness of the regulations throughout Australia through permanent exemption from the provisions of TTMRA (adoption by New Zealand of similar regulations would also have this effect). This is termed the “maximum” option, although it would represent the least departure from the present situation, and would effectively confirm and maintain the status quo.

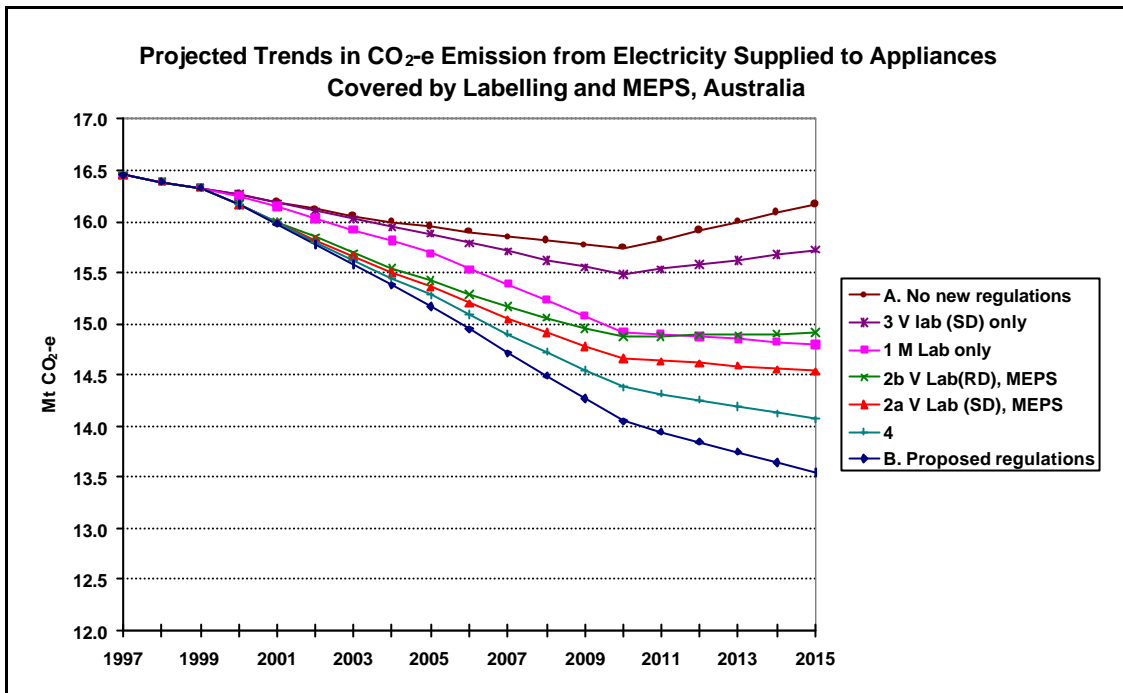
In addition, a mandatory levy on less efficient appliances was considered as an alternative to labelling and/or MEPS.

A scenario in which the labelling of laundry products becomes voluntary, but coordinated within a general mandatory labelling framework was also examined, in order to assess the costs and benefits of adding these products to the schedule of labelled appliances in NSW.

Energy and Greenhouse Impacts

The energy and greenhouse gas emissions projected under the alternative scenarios are illustrated in the following diagrams.





Benefits and Costs

The introduction of the proposed regulations would impose (or rather, continue to impose) direct administrative costs to governments and testing and labelling costs to industry, which are passed on to consumers. Substantially greater indirect costs would also be incurred by consumers, through the purchase of more efficient appliances. Against this there would be significant reductions in energy purchase costs.

The following table summarises the outcomes of the cost-benefit modelling at the national level. It indicates that the value of energy saved from implementation of a mandatory labelling and MEPS regime is twice to three times as great as the value of the reduction in direct and indirect costs. The benefit/cost ratio of the proposed regulations is estimated at between 2.8 (undiscounted) and 1.9 (discount rate of 8%).

Estimated costs and benefits of implementing proposed model regulations for mandatory labelling and MEPS (compared with “no new regulations” scenario)

	\$M NPV at discount rates of:		
	0%	4%	8%
Appliance (indirect) cost impact	+1488	+954	+639
Program (direct) cost impact	+60	+42	+31
Total cost	1548	996	670
Energy cost impact	-4382	-2287	-1286
Total benefit	4382	2287	1286
Benefit/cost ratio	2.8	2.3	1.9

The following table indicates the incremental (or “marginal”) costs and benefits of adding MEPS to the three energy labelling regimes modelled: “no new regulations” (Scenario A) which assumes a rapid decay in labelling effectiveness, a slow decay in labelling effectiveness (Scenario 3) and mandatory labelling (Scenario 1) which assumes some enhancement of effectiveness through introduction of new label designs.

Estimated marginal impacts of adding MEPS to energy labelling regimes

	Voluntary labelling - rapid decay			Voluntary labelling - slower decay			Mandatory labelling - enhanced effectiveness		
	\$ M NPV at discount rates of:			\$ M NPV at discount rates of:			\$ M NPV at discount rates of:		
	0%	4%	8%	0%	4%	8%	0%	4%	8%
Appliance cost impact	+310	+217	+159	+229	+158	+114	+391	+266	+189
Program cost impact	+5	+4	+3	+5	+4	+3	+4	+3	+2
Total cost	315	221	162	234	161	117	395	268	192
Energy cost impact	-1078	-619	-383	-948	-529	-320	-1437	-787	-467
Total benefit	1078	619	383	948	529	320	1437	787	467
Benefit/cost ratio	3.4	2.8	2.4	4.0	3.3	2.7	3.6	2.9	2.4

MEPS imposes very little additional direct cost because the infrastructure is already in place for labelling, so nearly all the cost is indirect. MEPS appears to be a cost-effective addition to each of the labelling scenarios. In fact, the marginal benefit/cost ratio is higher than the total ratio for the proposed new regulations, indicating that MEPS is somewhat more cost-effective than labelling.

These calculations do not include the value of greenhouse gas emissions avoided through mandatory labelling and MEPS. It is difficult to place a value on these until a market for tradeable emissions permits is established. Current estimates range from US\$ 5 to 30 per tonne CO₂-e for permits to emit during the Kyoto Protocol commitment period. Mandatory labelling and MEPS is projected to lower Australia’s emissions by about 2.0 Mt per annum during that period (compared with the “no new regulations” alternative), so the value of emission avoided could run to \$A 17 M to \$100 M per annum during that period (undiscounted, present exchange rates).

Projected benefits exceed projected costs in all States and Territories. The benefit/cost ratios of labelling regimes with “high” effectiveness are very similar to those of a regime of “moderate” effectiveness, so low-cost measures to enhance the impact of labelling - such as alterations to the label design and the star rating algorithms - are almost certain to be cost-effective.

For clothes washers and clothes dryers only, there is little difference between mandatory labelling and voluntary labelling alongside mandatory labelling for other products. There no disadvantage for NSW or any other jurisdiction from including these products in the schedule of appliances to be labelled under the proposed model regulations, and there would be some administrative cost savings from uniform treatment of all labelled products throughout Australia.

The Levy

As an alternative to labelling and MEPS, the brief for the RIS required the analysis of “a levy imposed upon inefficient appliances to fund programs to redress the greenhouse impact of household appliances.” Two variations of this option were considered:

- a) the proceeds from the levy are diverted to greenhouse-reduction strategies unrelated to appliance efficiency (ie the levy is “revenue-positive”); or
- b) the proceeds are used to subsidise the costs of the more efficient appliances, so that any cost differential between more and less efficient appliances is narrowed (ie the levy is “revenue-neutral”).

The proposed levy, even if legally feasible, appears to offer no direct cost savings to government, no greater greenhouse gas reductions (in fact, probably less greenhouse gas reductions) and probably higher lifetime appliance costs to purchasers, compared with the mandatory labelling and MEPS proposals.

Some form of levy *in association with* mandatory labelling and MEPS may enhance their effectiveness, but more information about the form and design of the levy would be necessary in order to form a judgement.

Effects on competition

Energy labelling is not a competition-restricting measure. Mandatory labelling enhances competition between all products bearing standard labels, and so serves overall to increase rather than restrict competition. The introduction of the existing mandatory labelling program has had no significant impact on the number of suppliers or appliance models on the Australian market. As the proposed regulation would not extend the scope of mandatory labelling it is expected to have no significant impact on the number of suppliers or models.

MEPS would prevent the sale of refrigerators, freezers and water heaters which meet the prescribed levels of energy efficiency, so may restrict competition. MEPS-complying refrigerators and freezers are already offered by all but one supplier, and all suppliers are able to manufacture, or have access to import sources of MEPS-complying product. While MEPS is likely to have some impact on supplier and price competition in the refrigerator and freezer markets, the effect on supplier competition or price is likely to be minimal. Actions

already taken by suppliers in Australia toward compliance with anticipated MEPS have had no upward impact on prices beyond the background trend.

The market for mains pressure electric storage water heaters has been dominated since the early 1980s by two suppliers. The introduction of MEPS is unlikely to affect this situation, so the impacts on competition will be neutral. The costs of complying with MEPS would slightly reduce the price advantage that electric storage water heaters currently have against gas, electric heat pump and solar types. All of those types have lower greenhouse gas emissions per unit of hot water delivered, so if some purchases were diverted there would be a further reduction in emissions beyond those estimated for MEPS.

There would be significant effects on competition if some jurisdictions allowed their existing labelling regulations to lapse as they sunset, and if some but not all proceeded with MEPS. Manufacturers in particular would face a cost penalty if they found themselves in a jurisdiction that imposed greater obligations than the jurisdiction in which their competitors were located. All manufacturers would be at a disadvantage against importers, who would generally face lower costs in shifting operations.

All jurisdictions and industry participants therefore have an interest in maintaining a uniform national program, to ensure that common policy objectives are met, and that costs are not imposed on industry participants in random and market distorting ways.

Effects on Trade

The introduction of mandatory labelling after 1985 had no effect on the rate of import (or export) of appliances, or on trans-Tasman trade. The temporary exemption from the provisions of the TTMRA has eliminated the risk that non-labelled appliances might be imported via New Zealand, but has not otherwise impacted on trade. If the exemption lapses, NZ will offer a point of entry to Australia for whitegoods which are not labelled and which do not have to meet the performance standards required of labelled appliances. This would increase the incentive to switch the point of import to the ANZ market from Australia, as presently tends to be the case, to New Zealand.

Exemption for the proposed Australian regulations from the provisions of the TTMRA will become more significant if MEPS are introduced for refrigerators and freezers, since the incentives for non-compliance will increase.

The introduction of refrigerator and freezer MEPS may require some Australian importers to switch suppliers for some of their models, if their present suppliers are unable to provide MEPS-complying products. Changes in supply sourcing already occur from time to time for other reasons.

Import and export of large electric storage water heaters is currently negligible, so the immediate impact on trade of MEPS for water heaters would be small. In the long term, the

proposed harmonisation of water heater standards (including MEPS levels) between Australia and NZ could increase trans-Tasman trade.

Distributional Effects

The costs of energy labelling are distributed across all appliance purchasers, and the benefits (of selecting a more efficient product) are available to all. There is a weak relationship between price and energy efficiency, so labelling may allow low-income buyers to identify models that are *both* cheaper to buy and consume less electricity.

MEPS would increase the cost of water heaters to all buyers, irrespective of income. However, the potential benefits in terms of reduced electricity expenditure are just as widely distributed, and are projected to considerably exceed the costs. There is a high probability that the energy savings for water heaters will be realised more or less equally by all householders, since MEPS act to reduce standing heat loss and the energy savings are relatively independent of volume of hot water used. MEPS would also extend benefits to residents in project-built and rental housing, where the electric water heater is selected by others.

MEPS for refrigerators and freezers will restrict consumer choice to some extent, since low-efficiency products that would otherwise remain on the market will need to be replaced or modified as a result of MEPS. On the whole this impact is likely to be small against the normal background of product changes, and any restrictions in consumer choice need to be weighed against greenhouse reduction objectives.

Consistency with other greenhouse measures

There is nothing in the proposed regulation which is inconsistent with other measures in the National Greenhouse Strategy: efficiency targets for power generation, targets for the use of renewable energy in power generation or the introduction of emissions trading. Indeed, if these measures lead to an increase in electricity prices, as is likely, the value of the projected electricity saved by labelling and MEPS would be greater than estimated in this RIS. The effectiveness of labelling would also rise, since operating costs would increase as a percentage of total appliance ownership costs and purchasers would be more inclined to take energy efficiency into account.

Conclusions and Recommendations

The analysis in this report supports the following conclusions:

1. the projected monetary benefits of a uniform national system of energy labelling and MEPS for Australia significantly exceed the projected monetary costs;

2. energy labelling enhances competition between suppliers and products, since it reveals an important aspect of product performance that would otherwise be concealed from purchasers;
3. MEPS has some impacts on competition and trade, but these are relatively minor in the light of the monetary benefits to purchasers of increased energy efficiency, and the contribution to meeting national greenhouse gas reduction objectives;
4. all stakeholders (governments, suppliers, purchasers) benefit from uniformity and consistency in labelling and MEPS, especially as progress towards compliance with initial MEPS levels is well advanced;
5. a mandatory system is more effective and cost-effective than a voluntary system for energy labelling, and in the case of MEPS is the only realistic mode of introduction;
6. the proposed model regulations, if adopted by all jurisdictions, would establish the framework for a consistent energy labelling and MEPS framework in Australia; and
7. the framework would be at risk to non-compliant imports from New Zealand, so long as the latter did not impose similar energy labelling and MEPS requirements.

The analysis in this report supports the recommendations that:

1. the proposed model regulations be adopted by all Australian jurisdictions;
2. refrigerators, freezers, dishwashers, air conditioners, clothes washers and clothes dryers be scheduled for mandatory energy labelling in all jurisdictions;
3. the regulations should allow for jurisdictions to jointly update the label, the scope of appliances covered and other aspects of the labelling program from time to time, should that prove justified in order to maintain the effectiveness of energy labelling in meeting energy efficiency and greenhouse gas reduction objectives;
4. refrigerators, freezers and electric storage water heaters be scheduled for mandatory MEPS in all jurisdictions;
5. the initial levels of MEPS should be those agreed by ANZMEC in 1995;
6. the initial MEPS levels should take effect at the time agreed by ANZMEC, ie in October 1999;
7. the regulations should allow for jurisdictions to jointly update the MEPS levels, the scope of appliances covered and other aspects of the MEPS program from time to time, should

that prove justified in order to maintain the effectiveness of MEPS in meeting energy efficiency and greenhouse gas reduction objectives;

8. reviews of the effectiveness of the energy labelling regime and of the current MEPS levels should be undertaken at intervals of not more than three years; and
9. in the absence of an undertaking by New Zealand to implement energy labelling and MEPS regimes similar to Australia's, permanent exemption of the proposed regulations from the provisions of the TTMRA should be sought.

Consultations

The public consultation process planned for this RIS is as follows:

- release of the RIS by the Australian Greenhouse Office in the first week of March 1999;
- mailing of the RIS to about 250 individuals and organisations known to be interested;
- publication of the RIS on the AGO internet site and on the internet sites of some of the State energy agencies;
- two public forums, one each in Sydney and Melbourne, to be held in the third week of March;
- public advertisement of the availability of the RIS, with offer of copies on request, and of the dates and venues of the forums.

The AGO will accept comments on the RIS up to the end of March 1999.

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Abbreviations

AEEMA	Australian Electrical and Electronics Manufacturers Association
ACA	Australian Consumers Association
AGA	Australian Gas Association
AGO	Australian Greenhouse Office
AMEC	Australian Minerals and Energy Council (predecessor of ANZMEC ministerial council)
ANZMEC	Australian and New Zealand Minerals and Energy Council
CD	Clothes dryer
CESA	Consumer Electronics Suppliers Association
CO	Cooling only (type of RAC)
COAG	Council of Australian Governments
Cont	Continuous tariff (type of WH)
CO ₂ -e	Carbon-dioxide equivalent
CW	Clothes washer
DW	Dishwasher
EMTF	Energy Management Task Force (of ANZMEC)
EU	European Union
Frz	Freezer
MEPS	Minimum Energy Performance Standards
NAEEEC	National Appliance and Equipment Energy Efficiency Committee (of EMTF)
NGGI	National greenhouse gas inventory
NGRS	National Greenhouse Response Strategy (1992)
NGS	National Greenhouse Strategy (1998)
NPV	Net present value
OP	Off peak tariff (type of WH)
PER	Price efficiency ratio
RAC	Refrigerative air conditioner
RC	Reverse cycle (type of RAC which heats as well as cools)
RD	Rapid decay (in effectiveness of energy labelling)
Ref	Refrigerator
R/F	Entire class of food storage products comprising refrigerators, freezers and refrigerator-freezers
RIA	Regulatory impact assessment
RIS	Regulatory impact assessment
SD	Slow decay (in effectiveness of energy labelling)
UNFCCC	United Nations Framework Convention on Climate Change
WH	Water heater

1 Background

1.1 Scope of this RIS

This Regulatory Impact Assessment (RIS) was commissioned by the NSW Department of Energy on behalf of the Australian and New Zealand Minerals and Energy Council (ANZMEC). Its conduct was managed jointly by the Department and the Australian Greenhouse Office (AGO). The RIS relates to the proposal to introduce model regulations in each State and Territory, covering mandatory energy labelling and minimum energy performance standards (MEPS). It also assesses the consequences of the provisions of the Trans Tasman Mutual Recognition Act 1997 (TTMRA).

Amendments to State regulations

Appliance suppliers have been advised that MEPS for refrigerators, freezers and electric storage water heaters are scheduled for introduction on 1 October 1999 (for products manufactured in Australia or imported from that date) subject to the completion of the prescribed regulatory impact assessment process and the introduction of the regulations.

Since 1995 the Council of Australian Governments has required that any new regulatory proposal from a Ministerial Council such as ANZMEC must be subject to regulatory impact assessment. Jurisdictions also require regulatory impact assessment before the introduction of any new regulation and before existing regulations subject to automatic sunset can be remade.

Energy labelling was first established under NSW and Victorian legislation in 1986 and 1987 respectively, and there are now labelling regulations in all Australian jurisdictions except Tasmania and the ACT. The proposed transition to a new, uniform regulatory regime makes it both necessary and opportune to assess the need for the regulation and to assess the potential benefits and costs.

The introduction of the model regulations would have the effect of formally extending mandatory energy labelling to Tasmania and the ACT for the first time, and of adding clothes dryers and clothes washers to the schedule of labelled appliances in NSW. This RIS accommodates these particular circumstances.

A regulatory impact assessment study has been carried out to estimate the costs and benefits nationally, and to each jurisdiction, of introducing uniform energy labelling regulations to

maintain the existing energy labelling program, and from introducing uniform MEPS.² The present RIS draws on the findings of that study.

The continuing effectiveness of energy labelling requires that the label should accurately convey both the product's absolute energy use and its relative energy efficiency in relation to the range on the market. The energy efficiency of all products covered by labelling has increased significantly since 1985, when the current 6-star label was first designed, partly in response to the impact of the program itself (GWA et al 1991). A far greater proportion of products are now rated at 5 or 6 stars than when labelling commenced, and fewer at 1 to 4 stars. The label scale gives customers a misleading impression of the relative efficiency of 5 and 6 star products, and reduces the commercial incentive for suppliers to market still more efficient products, since the label would not distinguish these from the existing 6 star products.

In 1996 the National Appliance and Equipment Energy Efficiency Committee (NAEEEC) of Commonwealth and State officials together with appliance industry and consumer group representatives set up a working group to redesign the label so that the initial objectives of the program continue to be achieved.³ It is currently proposed to introduce new label designs in 2000. Jurisdictions will need some indication that the benefits of such change are likely to outweigh the costs, and this is covered in this RIS.

The RIS does not explicitly address the costs and benefits for the labelling program of adopting model regulations rather than maintaining separate State regulations with different formats. That particular issue was the subject of an earlier RIS (Day 1996).⁴

It was not in the brief to investigate the impact of adopting MEPS levels different from those currently proposed, or to consider the extension of MEPS to other appliances.⁵

² The full study is in a separate document, *Assessment of Costs and Benefits: Energy labelling and minimum energy performance standards for household electrical appliances in Australia*. George Wilkenfeld and Associates, with assistance from Energy efficient Strategies, January 1999.

³ A number of alternative approaches and designs were developed and tested with consumer focus groups in 1997, and it is currently proposed to introduce the new labels during 2000. The labels would be based on the same energy tests as the current labels, but would have a different design: in rough terms, a product rating 5 or 6 stars on the current label may rate between 2 and 4 on the new label.

⁴ An additional RIS of the proposed regulatory changes, from a Victorian perspective, was carried out for the Office of the Chief Electrical Inspector, Victoria (Moran 1998). Neither RIS contains original cost benefit analysis. The quantification of costs and benefits in each draws almost exclusively on earlier modelling work by GWA, particularly GWA et al (1993a) and GWA (1996).

⁵ The proposed MEPS levels were established after the completion of a cost-benefit study in 1993, which recommended MEPS levels for refrigerators, freezers, water heaters and clothes driers (GWA 1993a). The study did not recommend MEPS levels for dishwashers or air conditioners for the time being, pending the resolution of issues relating to the energy tests, and recommended against MEPS for clothes washers. The MEPS levels currently proposed for refrigerators and freezers are similar to those recommended in 1993. The MEPS levels for water heaters are somewhat less stringent than those recommended in 1993. There are no plans for MEPS for clothes driers at present.

The minimum reasonable lead time for introduction of MEPS for a product or for compliance with a more stringent MEPS level is about two years. The adoption of more stringent MEPS levels at this late stage in the process would be inconsistent with the commencement of MEPS in October 1999.⁶ However, the scope for future revision of MEPS is discussed.

Trans-Tasman Mutual Recognition Act

The Trans Tasman Mutual Recognition Act 1997 (TTMRA) creates in effect a common market in Australia and New Zealand, where goods capable of being sold lawfully on one jurisdiction may be sold lawfully in all the others, if they are manufactured in or imported through the first jurisdiction.

At present energy labelling is voluntary in New Zealand. Consequently NSW and some other Australian jurisdictions have obtained a temporary exemption from TTMRA provisions with regard to energy labelling until 1 May 1999, to provide an opportunity for all jurisdictions to agree on the applicable level of labelling and MEPS.

There are no MEPS in New Zealand at present, but there are proposals to amend the Building Code which would have the effect of enforcing MEPS for electric storage water heaters at levels similar to those proposed for Australia.

In the absence of an agreement to enact common laws in all jurisdictions (including New Zealand), or an exemption for the Australian labelling and MEPS regulations, TTMRA would allow unlabelled and (from 1 October 1999) non-MEPS-compliant appliances manufactured in or imported through New Zealand to be lawfully sold in all Australian jurisdictions, whether or not they have labelling or MEPS regulations.

This RIS is therefore also required to identify the costs and benefits *to Australia* if New Zealand maintains its current position on regulation. The costs and benefits *to New Zealand* of the existence of mandatory labelling and MEPS in Australia, or how these might be affected by adopting similar regulations in New Zealand, have not been considered.⁷

⁶ Nevertheless it is likely that the optimum MEPS levels will change over time, as market trends, technology costs and energy prices change. It would be advisable to review the MEPS levels at the earliest opportunity, so that if more stringent levels are found to cost-effective be the process of adoption can commence.

⁷ One example of the effects on New Zealand is that many whitegoods carry the Australian energy label, because they are manufactured in or imported via Australia and the supplier does not (and sometimes cannot) distinguish according to ultimate product destination. Therefore the level of labelling in NZ is a by-product of the mandatory status of labelling in Australia, and not a true example of a voluntary labelling program.

1.2 Energy labelling and minimum energy performance standards

Program operation and status

Energy Labelling

Energy efficiency is a key attribute of energy-consuming appliances, but one which is not readily apparent to the prospective purchaser. Over the operating life of an appliance, energy costs can account for more than half the net present value (NPV) of total ownership costs (over 80% with water heaters). The purchase price indicates only part of these total ownership costs, so readily accessible information on product energy consumption is valuable to appliance purchasers. This is the rationale for “energy labelling” - the requirement that appliances be displayed with a removable label stating the energy consumption (in kWh or other energy units) and energy efficiency (service output per unit of energy consumed)⁸ recorded for that model under standard test conditions.

In Australia, steps towards the energy labelling of selected products were initiated by the NSW government in the early 1980s and endorsed by the Australian Minerals and Energy Council (AMEC - now ANZMEC). In 1985, after unsuccessful attempts by AMEC to introduce a voluntary scheme, the NSW and Victorian governments regulated for the mandatory energy labelling of refrigerators, freezers, dishwashers and air conditioners, to be phased in from December 1986. In 1990 Victoria introduced labelling for clothes washers and dryers. Since then other States and Territories have adopted the program, and it is now effectively national. No other appliances have been added to the program since 1990,⁹ although cookers and water heaters have been considered. Cookers were not progressed because significant technical issues need to be resolved and the potential energy savings were modest. For water heaters, it was decided that MEPS would be more effective for reasons set out below.

There is also a labelling program for gas appliances, administered by the Australian Gas Association (AGA). The transfer of electrical appliance energy labelling from the present regulatory framework to an industry-based framework has never been considered practical by either government or industry, largely because there is no single electricity industry-wide association corresponding to the AGA.¹⁰

⁸ The service is defined as volume of interior space maintained at standard temperature conditions (for refrigerators and freezers), complete operating cycles (dishwashers, clothes washers and clothes dryers) or heating and cooling task performed (air conditioners).

⁹ Mandatory Australia-wide labelling is distinct from the Galaxy, Energy Smart and Energy Star endorsement labels, which are voluntary and are restricted in their geographical or product coverage.

¹⁰ The AGA covers appliance manufacturers and importers, product standards as well as the energy suppliers. The corresponding industry associations for electricity are the Australian Electrical and

Industry compliance with the requirement to label electrical appliances at the point of sale is very high. The latest research, covering all Australian capital cities and all classes of labelled products, found an overall compliance rate of 92% in 1998 and high compliance in all States and Territories (YCHW 1998). This compares with a compliance rate for mandatory energy labelling of refrigerators in the European Union (EU) of 56% in 1998, ranging from 17% to 94% (Winward et al 1998).¹¹

Consumer awareness of energy labels is also high in Australia. At the time of the latest available survey, taken in 1993, 91% of Victorian appliance buyers and 87% of NSW buyers were aware of the label. In 1998, awareness in the EU countries ranged from 9% to 66%. The EU survey found a very close match between level of compliance and level of consumer recall in each country. This suggests that if compliance should fall, consumer awareness and hence program effectiveness would also fall.

Minimum Energy Performance Standards

Minimum energy performance standards (MEPS) differ from labelling in that products failing to meet the specified MEPS level cannot be sold. MEPS can coexist with labelling or operate independently of it. Unlike labelling, MEPS can impact on product energy efficiency even if consumers are unaware that the program exists, and where consumers have limited involvement in product choice. One justification for adopting MEPS would be if energy prices were not and could not be readily made cost-reflective, eg in regard to the costs of environmental damage.

The USA has the most comprehensive MEPS program in the world, covering all whitegoods, air conditioners, water heaters, cookers, lighting products, electric motors and packaged industrial boilers. Canada, China, the EU, Mexico and the Philippines have mandatory MEPS covering at least one class of household appliances. The EU has committed to a program of MEPS, the first of which (covering refrigerators) are scheduled to take effect in 1999.

In Australia, the introduction of MEPS was one of the measures adopted by the Council of Australian Governments (COAG) as part of the 1992 National Greenhouse Response Strategy. After considering the recommendations of a cost-benefit analysis carried out in 1993, ANZMEC Ministers agreed in 1995 that MEPS would be introduced for household refrigerators, freezers and storage water heaters. The ANZMEC decision was followed by

Electronics Manufacturers Association (AEEMA: covers most appliance manufacturers), the Consumer Electronics Suppliers Association (CESA: covers most appliance importers), the Electricity Supply Association of Australia (ESAA: covers utilities nationally - there is also an Electricity Association of NSW). Electrical product testing, safety and performance standards are issued by Standards Australia.

¹¹ However, the EU survey was taken about 3 years after commencement of the mandatory labelling requirement, whereas the Australian survey was taken more than 12 years into the program.

extensive discussions between Commonwealth and State officials and the appliance industry, during which the MEPS levels were finalised and an implementation date of October 1999 was agreed.

MEPS are also currently being considered for a range of non-household products: electric motors, fluorescent lamp ballasts and packaged air conditioners (AGO 1999). For electric motors and packaged air conditioners, “labelling” is proposed concurrently with MEPS.¹² For ballasts, MEPS alone is proposed.

The 1993 analysis found that cost-effective purchase decisions were being passed up, especially in the refrigerator and freezer market. It also found that the allowable heat losses for electric storage water heaters were high by world’s best practice standards, and that reductions in allowable heat losses would be cost-effective for purchasers, even though the price of water heaters would increase. It was argued that labelling of water heaters would not be effective, so MEPS represents the best option for realising the cost-effective potential for greater energy efficiency in water heaters.

The rationale for proposing MEPS *without* labelling for electric storage water heaters is as follows:

- electric water heating is the largest single contributor to greenhouse gas emissions in the household sector, so measures to reduce the electricity required for water heating are consistent with national greenhouse gas reduction objectives;
- electric storage water heaters all use the same energy conversion technology (ie immersed resistance heaters, which are close to 100% efficient) and tend to be built to the same heat loss standards, so there is little difference in the performance of different models on the market at any one time. All models would have the same label rating, so the label would have no comparative value;
- the first water heater for a dwelling is often purchased by the builder or landlord, whose concern is to minimise purchase price rather than overall cost of ownership (which in the case of water heaters will be dominated by energy costs). Because of this split incentive many water heater purchasers would not use a label even if it revealed a range of energy efficiencies;
- replacement purchases usually occur under emergency conditions when the previous water heater breaks down. Unlike whitegoods, the owner does not have time to consider the purchase in advance, rarely takes the trouble to view alternatives, and usually commissions a plumber or other intermediary to obtain a replacement unit as quickly as possible. Under these purchase conditions labelling would have minimal impact;

¹² For these products, “labelling” would be mandatory disclosure of energy information in model specifications and catalogues rather than labels on the actual product, which would not be seen until after installation.

- electric storage water heaters are technologically less complicated than whitegoods and provide a far simpler and more consistent energy service, so determining the cost-effectiveness of various MEPS levels is a relatively straightforward and robust process, with high probability that no other aspects of product performance are compromised.

The rationale for proposing MEPS *with* labelling for refrigerators and freezers is as follows:

- refrigeration is the second largest contributor to greenhouse gas emissions in the household sector (well ahead of space heating and cooling combined), so measures to reduce the electricity required for refrigeration are consistent with national greenhouse gas reduction objectives;
- while labelling has been effective in helping to increase the sales-weighted energy efficiency of refrigerators and freezers, there is significant additional scope for cost-effective improvements in sales weighted efficiency, realisable through setting relatively modest MEPS levels;
- refrigerators and freezers are commonly traded products (unlike water heaters) and as more countries adopt MEPS for them the risk of dumping of low-efficiency product in countries without MEPS increases. The risk for Australia will increase after adoption of refrigerator and freezer MEPS in the EU in September 1999, since many manufacturers supply into both markets, and the EU and Australian markets have similar product preferences (unlike the US market, which is mainly supplied locally and which prefers larger styles than the Australian market);
- the adoption of MEPS levels similar to the EU's will advance harmonisation of product standards between Australia and the countries (other than NZ) that are the source of most of its appliance imports.

New Zealand

The appliance and equipment energy efficiency programs of Australia and New Zealand have always been closely linked technically, commercially and administratively. The standards which underpin labelling and MEPS are mostly joint Australian and New Zealand standards. For most products, the same manufacturers and importers supply the same model range into both markets, and even where different products are made for the two markets (eg electric storage water heaters), the same firms tend to dominate in both countries.

Administratively, New Zealand is represented on ANZMEC and in many of its working groups, including the National Appliance and Equipment Energy Efficiency Committee (NAEEEC). TTMRA has now established an indirect regulatory link.

Despite this convergence, the New Zealand appliance and equipment energy efficiency program has developed independently in the most critical areas. Energy labelling is not mandatory, although the Australian star rating labels often appear on models imported from

Australia and on models manufactured in New Zealand for sale in both markets. New Zealand has its own “WaterMark” label for storage water heaters, which are not labelled in Australia. MEPS are under consideration for much the same range of products as in Australia: refrigerators, freezers, storage water heaters, motors, fluorescent lamps and lamp ballasts.

It is understood that there is a proposal to amend the New Zealand Building Code to require new electric water heaters to comply with the heat loss limits in the NZ standard, which are similar to the MEPS levels proposed in Australia. The Code would oblige the dwelling owner (ie the builder in the case of speculative or project housing) to install MEPS-compliant water heaters at the time of construction or refurbishment.¹³

The proposed NZ MEPS level would be equivalent to the top WaterMark grade (“A”), and would eliminate the other grades (“B” and “C”) from the market. Most water heaters sold are already Grade A, so there will be relatively little impact.¹⁴ This progression - labelling *followed by* MEPS - does not seem to be an option in Australia. NZ has historically had more water heater manufacturers than Australia, largely because the low-pressure type of unit is still popular. Low-pressure electric water heaters are less capital-intensive to manufacture than the mains pressure types which have come to dominate the Australian market, so smaller firms with relatively low production continue to operate and have successfully upgraded their models to meet WaterMark Grade A. The initial diversity of models and types meant there was a wide enough range in energy efficiency on the NZ market to make labelling effective. This key condition for water heater labelling is not present in Australia.

Appliance industry response

The appliance industry has been formally involved in the operation of the energy labelling program since early 1992, when ANZMEC’s Energy Management Task Force established a National Electrical Appliance Energy Labelling Panel comprising representatives of manufacturers and importers and their associations, some electricity utilities, the Australian Consumer groups and Standards Australia.

¹³ It will continue to be lawful to sell non-compliant water heaters, but effectively unlawful to install them. The Building Code will require replacement water heater installations to be brought up to present safety standards, including the installation of a tempering valve. This will make water heater replacements subject to the Building Code even if no other construction takes place. The heat loss limit in the NZ standard (corresponding to WaterMark grade A) is somewhat more stringent than the proposed Australian MEPS levels for water heater sizes up to about 270 litres, and similar for larger sizes (EES 1997). Direct comparisons are complicated by the fact that, unlike whitegoods, NZ has a slightly different water heater test standard from Australia. It is intended to harmonise the standards.

¹⁴ Many of the Grade B models still sold originate in Australia. These would be discontinued if MEPS were implemented in Australia, since it is uneconomic for Australian manufacturers to make two levels of energy efficiency.

The industry was consulted formally in 1994 on the MEPS proposals published in 1993. In 1995 and 1996 there were extensive discussions between the industry and Commonwealth and State Governments, with the following outcomes:

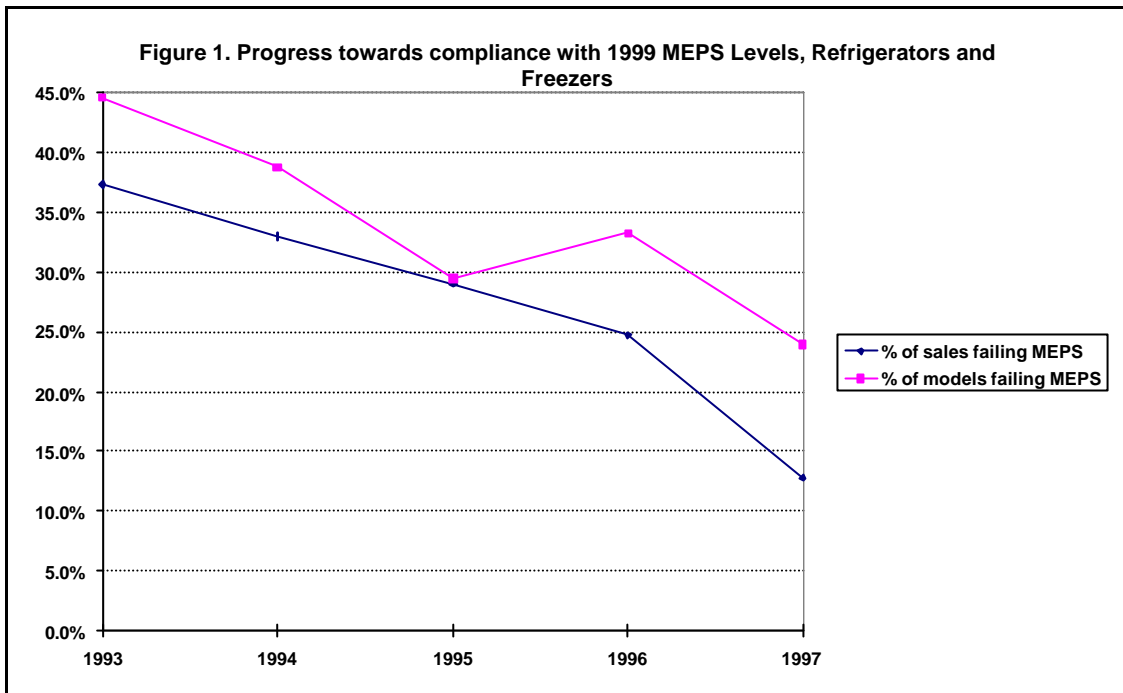
- refrigerator and freezer suppliers agreed to MEPS levels which were similar in overall effect to the levels proposed in 1993, but with slightly different formulae than those originally recommended¹⁵;
- water heater suppliers agreed to less stringent MEPS levels than those originally recommended¹⁶;
- the suppliers accepted ANZMEC's 1996 decision to implement MEPS in 1999;
- the parties agreed that the MEPS levels would remain constant for periods of at least 3 years for refrigerators and freezers, and 5 years for water heaters, and that any proposed revisions would be notified far enough ahead to allow a clear 3 years between adoption of new levels and their implementation.¹⁷

Suppliers of refrigerators and freezers have already taken steps towards ensuring that their entire product range complies with the proposed MEPS levels by September 1999. This is evident by the rapid decline in non-compliant models between 1996, when ANZMEC made its decision, and 1997, the latest year of complete sales data (see Figure 1). There is always some change in the model range, and it appears that suppliers have been taking the opportunity to anticipate and accommodate MEPS requirements when replacing models.

¹⁵ Refrigerator and freezer MEPS are expressed as formulae which relate maximum electricity consumption to the internal volume of the fresh food compartment, if any, and the freezer compartment, if any. There are different formulae for different product categories (eg frost-free vs cyclic defrost, refrigerator vs freezer).

¹⁶ MEPS levels for water heaters are expressed as maximum heat loss per 24 hrs. The recommendation was that heat loss for water heaters of less than 80 litre delivery volume should be 70% of the level in the current Australian Standard, and for larger water heaters, 55% of the current level. The compromise negotiated between the parties was that MEPS should be set at 100% of the current Australian Standard for the smaller water heaters (which would have some effect, since a few models do not meet the current Standard) and 70% of the current Australian Standard for larger water heaters.

¹⁷ There is some doubt about whether this applies to the smaller water heaters, since these were not to be subject to any more stringent heat loss levels than in the pre-existing Australian Standards.



The suppliers of mains pressure water heaters are also understood to be planning to replace their model ranges with MEPS-complying models by September 1999. As production lines need to be retooled to produce models with thicker insulation the changes are likely to occur over a short period leading up to the implementation date, so intention to comply will not be indicated as far in advance as for refrigerators.

Suppliers have expressed concern that regulations and enforcement mechanisms should be in place prior to September 1999, so that any companies that have not made efforts to comply should not enjoy a competitive advantage on that account (NAEEEC 1997).

Program objectives

Increasing Energy Efficiency

In 1983, the policy objectives for household appliance energy labelling were stated in the following terms:

- to enable the consumer to make an informed choice between energy consuming products (a higher initial purchase price may be offset by accumulated energy cost savings over the appliance's lifetime)¹⁸
- to provide an incentive for manufacturers in the medium term to design and market appliances with improved energy performance, and consequently better tailored to consumers' requirements
- to promote energy conservation on a national scale and to retard growth in energy demand" (NECP 1983).

Informing consumer choice and providing incentive for manufacturers remain central objectives of energy labelling. The third objective has been progressively expanded to include other appliance-related measures including MEPS, and to consideration of greenhouse gas emissions, which was not a public policy issue in 1983. Revised objectives for an integrated appliance and equipment energy efficiency program, covering both energy and greenhouse objectives, have recently been drafted by the AGO (1999).

Energy labelling is intended to address an information failure in the market. All consumers, and the suppliers of more efficient products, benefit from a consistent, credible and universal means of conveying information about product energy efficiency. Neither suppliers nor consumers acting on their own could establish such a program without coordination by government. (How the program would fare at lesser levels of coordination is considered in this RIS).

If labelling is effective in influencing consumer choice, it will also influence suppliers to develop and market more efficient products. Even if product development ceased, however, there would still be a rationale for labelling so long as there is a range in the energy efficiency of the products on the market. Analysis of the models for which energy labels are currently registered indicates that there is still a wide range.¹⁹

The rationale for expansion of the program scope from labelling to MEPS was discussed previously in relation to water heaters, refrigerators and freezers, and may be summarised as follows:

1. environmental externalities in electricity pricing: appliance purchasers, even if they use the label, tend to under-value energy efficiency because energy prices are artificially low, since they do not include the environmental costs of global warming that the use of fossil fuels may be bringing about;

¹⁸ A consumer survey undertaken at the time found very low awareness of appliance costs, or of the extent of variation in running costs between models and brands. It also found that after these issues were introduced nearly nine in ten respondents maintained that labels were necessary.

¹⁹ For example, the sales-weighted average energy consumption of refrigerators sold new in 1997 was 1.92 kWh per annum per adjusted litre internal volume, but the range was from 1.26 to 3.50. The range in some sub-categories was even wider. "Adjusted volume" adjusts for the proportion of the internal volume, if any, that is freezer space.

2. some product groups are at a uniform, low level of energy-efficiency, so labelling is ineffective in helping consumers choose choice within an energy efficiency range, and does not provide enough incentive for suppliers to improve their products;
3. labelling at the point of sale is not effective for product types which the purchaser tends not to inspect in the showroom, such as water heaters;
4. “split incentives” market failure: information alone is ineffective where the purchaser is not the ultimate user, and so is less concerned with lifetime operating costs than with initial purchase price;
5. as large markets such as the EU adopt MEPS, there is likely to be diversion of internationally traded products to alternative markets without, or with lower MEPS.

Reducing Greenhouse Gas Emissions

Appliance energy labelling and MEPS are integral parts of Australia’s greenhouse gas reduction strategy, consistent with the fact that the household sector represents nearly 24% of stationary energy emissions, or nearly 13% of total net emissions in the National Greenhouse Gas Inventory (NGGI). The 1992 National Greenhouse Response Strategy (NGRS) stated:

Governments will develop, in consultation with manufacturing industry, and implement as soon as practicable a national scheme for mandatory energy labelling for major domestic appliances.

Governments will develop, in consultation with manufacturing industry, and implement nationwide energy performance standards for major domestic appliances, after considering the costs and benefits involved. ANZMEC will be the coordinating national body for this initiative.

The 1998 National Greenhouse Strategy (NGS) notes that energy labelling for major domestic appliances has been in place in most Australian states for several years. It states that:

Governments are committed to introducing minimum energy performance standards for domestic electrical appliances. Standards have been developed in consultation with industry and will take full effect from October 1999.

It further states that “energy performance codes for domestic appliances...will be expanded and strengthened.”

Australia is a party to the United Nations Framework Convention on Climate Change (UNFCCC), and has signed the Kyoto Protocol to that Convention. If ratified, the Protocol will commit Australia to a legally binding limit on its future greenhouse gas

emissions. Australia's target would be to limit average annual greenhouse gas emissions during the first commitment period, 2008 - 2012, to no more than 8% over the 1990 level.

The allowable quantity of emissions is not entirely clear. Parties are able to take account of removals of carbon by sinks (subject to the sink activity commencing in 1990 or later) and changes in land clearing, and the methodologies for calculating these are still evolving. Australia's greenhouse gas emissions (excluding land clearing and sinks) totalled 409.0 million tonnes of CO₂ equivalent (Mt CO₂-e) in 1990, and are projected to increase to 526.8 Mt in 2010 under "business as usual" (*Climate Change*, 1997). If the 8% limit were applied to these sectors alone, emissions during the commitment period would need to be held to 441.7 Mt, or 85 Mt below business as usual. The projected impact of the proposed labelling and MEPS regulations would be to reduce emissions by about 2.0 Mt, or 2.4% of the reduction requirement.

Australia's second national report to the UNFCCC lists the projected impacts in 2010 of all reduction measures and policies likely to reduce emissions implemented up to November 1997. The impact of residential appliance labelling and MEPS was estimated at 1.4 Mt CO₂ in 2010. The detailed modelling for the present RIS has projected an impact of 2.0 Mt, and this value has been substituted in the table.

The values in the table indicate that:

- labelling and MEPS are projected to account for about 14% of the total impact of identified energy efficiency programs; and
- labelling and MEPS are projected to account for 4% of all identified policies and measures with a greenhouse gas reduction potential;²⁰
- labelling and MEPS are projected to lead to greater reductions than all programs addressing the transport and commercial sectors combined.

²⁰ The total impact of the package is estimated at 39 Mt by 2010, but it is possible that there is a large element of double counting with the projected impact of "micro-economic reform".

Table 1.1 Summary of policies and measures and projected emissions reductions

Sector	Activity	Mt CO₂	kt CH₄	kt N₂O	kt PFC	Mt CO₂-e
Energy Supply	Micro-economic reform	16.5				16.5
	Renewable energy	1.0				1.0
	Reduced fugitive emissions		383			8.0
	Total of above					25.5
Energy Use	Transport	1.4				1.4
	Industry	10.5				10.5
	Residential (appliance labelling and MEPS)	2.0(a)				2.0
	Commercial	0.4				0.4
	Total of above					14.3
Industrial Waste	Aluminium smelting				0.03	0.2
			264			5.5
Agriculture			188	1.32		4.4
All of above		31.8	835	1.32	0.03	49.9

Source: *Climate Change 1997*. Excludes estimates of sink and land clearing impacts, since it is not clear that the measures listed are consistent with Kyoto Protocol emissions accounting. (a) Estimate from present study; original estimate was 1.4 Mt. Excludes effects of additional package of measures announced by Prime Minister on 20 November 1997.

1.3 The proposed regulations

Objectives of the regulations

The objectives of the proposed regulations are to:

- establish an effective and uniform national framework for the continuation and development of the existing energy labelling program; and
- extend the framework to support uniform national MEPS.

Although energy labelling operates as a national program, there is no Commonwealth legislation in this area. Energy labelling legislation currently applies at the State and Territory level. Tasmania and the ACT do not have regulations at present. A 1996 review of the need for common model regulations (Day 1996) identified a number of inconsistencies between the State regimes with regard to:

- **Law:** liability for compliance; stage at which labelling is required (eg manufacture or retail), position of the label, recognition of other jurisdictional labels, penalties for incorrect labelling (ranging from \$ 500 to \$ 1,000); ability to cancel registration.
- **Declarations:** Of the jurisdictions that have labelling regulations all cover refrigerators, freezers, refrigerative air conditioners and dishwashers; all but NSW also cover clothes washers and clothes dryers.
- **Regulations:** process of application and approval; requirement to maintain a register of manufacturers; application of technical standards; definition of algorithms; fixing of labels on products; definitions of offences and penalties

The need to remove these inconsistencies, particularly in advance of extending the State regimes to cover MEPS, prompted NAEEEC to establish a Regulatory Issues Working Group, which has now developed model regulations based on the following principles:

- all technical requirements for product energy testing and minimum performance standards (both energy and other aspects of product function) will be in the appropriate Australian and New Zealand Standards;
- all labelling requirements (including label design and placement, and algorithms for calculating star ratings from the raw energy test data) will be in the appropriate Australian and New Zealand Standards;
- the model regulations will call up the relevant Standards; and
- the contents of the Standards will remain under the control of the jurisdictions acting together.

It is intended that once the model regulations are finalised, and each State and Territory has satisfied itself that both the labelling/MEPS program and a more coordinated approach to its

management are cost effective, each State and Territory will then repeal its existing regulations and enact the model regulations. No jurisdiction has yet regulated for MEPS, pending the preparation of this RIS.

Exemption from the provisions of TTMRA (or adoption by New Zealand of regulations similar to those proposed) is not an element of the proposed regulations *per se*, but may be necessary to ensure that the objectives of the regulation are met.

Alternatives considered

No New Regulation

If the proposed model regulations are not adopted, then energy labelling will continue under existing State regimes. The present framework does not provide for MEPS, nor does it allow the introduction of the new form of label that NAEEEC considers to be necessary to maintain the effectiveness of the labelling program. Furthermore, some of the State regimes (notably NSW and Victoria) are subject to regular sunset and review provisions, so the framework would not operate indefinitely in its current form.

The first alternative considered is one of no new regulation. In the short term, this would have the following consequences:

- no means of coordinated revision of the label design or the mathematical algorithms determining star ratings, hence avoidance of the associated costs and benefits;
- no means of enforcing MEPS, hence avoidance of the associated costs and benefits (although given the timing some of these may already have been incurred);
- continuation of the inefficiencies associated with differing regulations in the jurisdictions which have labelling schemes (Day 1996).

The longer term effects are uncertain. They would depend on whether jurisdictions renew mandatory labelling as their regulations come up for review, and if not, when and in what order. For example, Australia's appliance manufacturing and importing are concentrated in NSW and Victoria, with significant activity in SA and Queensland. All four States maintain registration capabilities to accommodate local suppliers, although there is nothing to prevent product registration in a different jurisdiction. NSW has by far the largest number of refrigerator, freezer and air conditioner models registered, but cannot register clothes washers and dryers since their labelling is not required in NSW. If the three other registering jurisdictions withdrew, there would be no capability to register those products anywhere in Australia, so making their labelling unworkable in WA and the NT, unless those jurisdictions set up their own registers.

Conversely if NSW withdrew, suppliers with products registered there would have the choice of re-registration elsewhere, or of taking advantage of manufacture in or import via

NSW to lawfully sell non-labelled products everywhere. It is not difficult to envisage scenarios in which costs to suppliers of continuing to label would exceed the costs of opting out, especially as the commercial value of the label declines.

While it is impossible to project a precise sequence of events, it is likely that energy labelling would change from a “mandatory” to a “voluntary” program if either or both of the following should occur:

- one or more Australian States or Territories repeal their existing energy labelling regulations or fail to renew them after sunset provisions take effect. Mutual recognition arrangements provide that products which are manufactured in or imported via those States can be lawfully sold even in States which require labelling;
- if the existing temporary exemption for energy labelling from the provisions of the TTMRA lapse, as they are currently due to on 1 May 1999. In that event unlabelled products manufactured in or imported through New Zealand could be sold lawfully in all Australian jurisdictions, whether or not they have mandatory labelling regulations.

These scenarios would provide one or more points of entry for unlabelled products, but the extent and rate at which suppliers might use these points to avoid compliance in other jurisdictions would depend on a range of factors. For example, if a refrigerator plant were located in a jurisdiction that withdrew from labelling, the operator would have a lower-cost non-compliance option than the operator of a plant in a jurisdiction that continued to require labelling. The first operator would be able to avoid labelling costs in all jurisdictions, whereas the second could either:

- continue to supply labelled products in all jurisdictions, so incurring a cost penalty in comparison with the first operator (supplying non-labelled products outside its own jurisdiction would probably increase rather than decrease costs, given the difficulty of ensuring that products go to the right points of sale); or
- move production to the non-labelling jurisdiction, which would almost certainly involve higher costs than continuing to label.

There is considerable experience in Australia and elsewhere with the development phases of labelling programs, and with growth in levels of awareness (often brought about by the transition from voluntary no mandatory), but no corresponding experience with the opposite. High initial public awareness of the energy label would slow the rates of decline in compliance, but there is no reason to believe that either awareness or compliance would remain high indefinitely. Some jurisdictions, even those without mandatory labelling, might continue to promote the program so long as it had a critical mass, and possibly contribute to the maintenance of a coordination framework for the use of firms that choose to continue labelling. However, it would be expected that if participation fell below a critical level the program would ultimately be abandoned altogether.

Therefore all jurisdictions and industry participants have an interest in maintaining a uniform national program, to ensure that common policy objectives are met, and that costs are not imposed on industry participants in random and market distorting ways.

Inclusion or exclusion of MEPS

MEPS would also be impacted by a decision not to introduce new model regulations. The extent of the impact would depend on whether the progress toward compliance already made by suppliers (in good faith and in response to government urging, it should be added) were irreversible, in which case they would be at a competitive disadvantage against future entrants who have not incurred those costs.

If progress towards compliance is not yet irreversible, then a decision not to implement new regulations would in effect be a decision not to introduce MEPS. Voluntary compliance with any MEPS level that required a change in model range would only be commercially advantageous for suppliers if they had a low cost way to convince buyers that compliance is an attribute worth paying for. A proprietary "MEPS compliance mark" would have little credibility, unless it were very heavily promoted. Experience with the star rating label suggests that government support gives credibility, so it may well be less costly for governments to promote a compliance mark.²¹ The costs of establishing and supporting such a mark would be substantial, and would add significantly to costs without increasing energy savings.

Energy savings under a voluntary MEPS scenario would be less than in a mandatory one, since compliance would be less than complete. Costs would also be less, in that some consumers could still prefer less efficient, and presumably less costly products. However, if a high level of voluntary compliance were achieved - most likely by a high level of promotional expenditure on a compliance mark - then it is possible that suppliers would rationalise their product ranges and reduce inventory costs by withdrawing non-compliant models (as has happened with water heaters in NZ). If so, the objective of maintaining consumer choice would be frustrated, and substantial costs added to the program for no lasting advantage.

A decision to implement the new regulations would still be insufficient to ensure universal MEPS compliance in Australia. If a TTMRA exemption for MEPS cannot be obtained by 1 October 1999, the date when MEPS is scheduled to take effect in Australia, non-MEPS-compliant products manufactured in or imported through New Zealand could be sold lawfully in all Australian jurisdictions, whether or not those jurisdictions have MEPS

²¹ The US Environment Protection Agency introduced the *Energy Star* label for office equipment in the early 1990s. The label has high recognition in the USA and moderate recognition in Australia. Most product suppliers have products that qualify for the label, but the greatest force for compliance is the fact that the US Government has chosen to give tender preference to qualifying products, so establishing a form of "Government MEPS". This is clearly only workable for some product types.

regulations. As with labelling, the practical effect of this would depend on how any suppliers chose not to comply, the products involved and the timing.

Options Considered

Various **mandatory and voluntary combinations** for labelling and MEPS have been considered, as detailed in the following section. The “minimum” option considered is not to adopt the proposed model regulations at all, to allow the present State-based labelling framework to continue until it lapses and accept whatever erosion in the effectiveness of the program might occur.

The “maximum” option considered is for all Australian jurisdictions to adopt the model regulations, and for action to be taken to ensure the effectiveness of the regulations throughout Australia - either through permanent exemption from the provisions of TTMRA or through a New Zealand decision to adopt similar regulations. Although this is termed the “maximum” option it would represent the least departure from the present situation, and would effectively confirm and maintain the status quo.

In addition, a **mandatory levy on less efficient appliances** was considered as an alternative to labelling and/or MEPS. This is described fully in Appendix A.

Constraints

The objective of the regulations is to reduce greenhouse gas emissions in a way which also reduces the costs of energy services to householders - what was termed in the NGRS a “no-regrets” measure.

The proposed regulations requiring mandatory energy labelling and MEPS compliance may not be the only means to achieve these objectives, but the range of Government action is constrained by:

- the existence of a uniform national energy labelling program, and a high degree of support for it among appliance purchasers and the general public; and
- the announcement by ANZMEC in 1996 of the intention to implement MEPS for certain products in 1999, and subsequent discussions with and undertakings to the suppliers of those products

The adoption of the proposed regulations would increase the flexibility of the energy labelling program. Changes in label design and algorithm which no jurisdiction could make unilaterally under the present regime could be made collectively. New products could also

be added to the scope of the program more readily, although this is still possible under State regimes (as evidenced by Victoria's decision to schedule more products than NSW).

The model regulations would implement MEPS by prohibiting sale of appliances not conforming to the energy limits in the relevant Australian Standards, which could not be altered without agreement of governments. This is similar to the existing approach for energy labelling, which makes some performance aspects of the Standards mandatory so that products cannot achieve high apparent energy ratings by reducing function.

The 1993 MEPS study recommended that the MEPS levels in Australia should be reviewed from time to time as average energy efficiency, technology costs and energy prices (and externalities) change. It also recommended that additional appliances be considered for MEPS once certain technical issues were resolved. There is nothing in the proposed regulations that would prevent these actions should they prove justified in future, although there is no mechanism for regular and automatic review, as there is in the National Appliance Energy Conservation Act which governs the US MEPS regime.

2. Costs and Benefits

2.1 Modelling approach

Scenarios modelled

At present suppliers are assuming that labelling will continue to be mandatory and MEPS will become mandatory as scheduled. If the situation should change, it is assumed that supplier behaviour would also eventually change in response. If non-compliance with MEPS or labelling becomes possible and acquires sufficient commercial value on the Australian market (eg by giving a price advantage over labelled and MEPS-complying products) then manufacture or assembly in NZ or in non-complying Australian jurisdictions, or import via those jurisdictions, would become more attractive.

Labelling is likely to continue for some time even after suppliers adjust to the fact that it is no longer mandatory, but the proportion of products labelled and hence the effectiveness of the program is likely to decline.

Thus a “voluntary” form of labelling is assumed to influence the market toward greater energy efficiency than if there were no labelling at all, but the influence would be less than that of mandatory labelling and would decline over time. The rate of decline could be slowed by sustained promotional expenditure, but as there is no assurance of budget support this option is not modelled.²²

Voluntary compliance with any given MEPS level is unlikely to be commercially advantageous for suppliers, without high promotional expenditure by governments (since no individual supplier will have sufficient interest in establishing a public demand for voluntary MEPS compliance). Therefore it is assumed that MEPS will only be implemented and sustained if it is mandatory.

Cost-benefit analysis has been used to model a number of distinct scenarios describing alternative paths for labelling and MEPS.

²² Experience with voluntary labelling programs in other countries (eg Thailand) indicates that suppliers will label their more efficient products but, understandably, choose not to label their less efficient ones unless forced to (IIEC 1998). This can undermine program impact, since consumers perceive a smaller efficiency range and are less likely to be prompted by the presence of labels to consider energy in their purchase decisions. Alternatively, high promotion costs are necessary to achieve the same level of public awareness (and hence pressure for supplier compliance) as in a mandatory program. The Thai electricity utility, EGAT, spent US\$8 million per annum on advertising to support the labelling program in the early 1990s (IIEC 1998). This is more than 40 times the estimated promotional budget in Australia.

Scenario A is the “no new regulations” or “minimum” case, in which the proposed model regulations are not introduced, and existing State and Territory regulations allowed to lapse as they sunset. Firms who then to continue to label may use any format so long as it is consistent with general Trade Practices legislation.²³ It is projected that under these circumstances consumer awareness of and confidence in the label fall rapidly (hence the term “rapid decay”). MEPS are not introduced.

Scenario B is the “proposed new regulations” or “maximum” case. It includes mandatory labelling for all product classes presently labelled, the redesign and relaunch of the label as planned, and the implementation of MEPS as planned.

Scenario 1 is a continuation of mandatory labelling, but no introduction of MEPS.²⁴

Scenarios 2a and 2b assume that mandatory MEPS is implemented, but the effectiveness of energy labelling declines as follows:

- in 2a labelling falls to a “moderate” level of effectiveness, consistent with making it non-mandatory and/or abandoning the label redesign and relaunch strategy. However, labelling remains constrained in that firms who choose to label must use the present design and tests (this is called “slower decay”);
- in 2b labelling falls to a “low” level of effectiveness, consistent with fully voluntary labelling.

Scenario 3 corresponds to 2a, but without MEPS.

Scenario 4 is a special case modelled at the request of the NSW Department of Energy. It is identical to Scenario B except that the labelling of clothes washers and dryers becomes voluntary. However, labelling for other products continues to be mandatory, so the overall infrastructure of labelling is retained and the rate of compliance for clothes washers and dryers decays slowly.

It is difficult to assess how supplier reaction might differ according to whether non-compliant entry were to become possible via NZ or via an Australian jurisdiction, and whether con-compliant entry were possible for all product classes or only for some. However, it is

²³ Even where labelling and MEPS are mandatory, their effectiveness depends largely on the degree of cooperation between governments and the appliance industry. Failure to introduce long-foreshadowed arrangements at this late stage would seriously undermine industry confidence in the programs, making the prospect of rapid decline in the program quite plausible. Once it became possible for other labels to be used, it would be attractive for importers to apply (or simply retain) labels from countries of origin if they suggested higher apparent energy efficiency than the rating under the present Australian labelling system.

²⁴ It is possible that supplier preparations for MEPS compliance are sufficiently advanced and hard to reverse (especially with regard to retooling for water heater production) that a large part of the costs and benefits would be realised even if the model regulations did not proceed. As this would be an accident of timing rather than intentional policy, it has not been explicitly modelled.

reasonable to assume that the greater the scope for non-compliant entry, both geographically and by product class, the more rapid the decay in compliance.

Table 2.1 Summary of scenarios modelled

Scenario	Labelling		MEPS	
	Status	Product Coverage	Status	Product Coverage
A. No new regulations ^a	Voluntary: rapid decay (RD)	R/F, DW, RAC, CW, CD	Voluntary ^d	None
B. Proposed new regulations ^b	Mandatory	As above	Mandatory	Agreed 1999 levels for R/F, WH
1	Mandatory	As above	Voluntary ^d	None
2a	Voluntary: slow decay (SD)	As above	Mandatory	Agreed 1999 levels for R/F, WH
2b	Voluntary: rapid decay (RD)	As above	Mandatory	Agreed 1999 levels for R/F, WH
3 ^c	Voluntary: slow decay (SD)	As above	Voluntary ^d	None
4	Mandatory	R/F, DW, RAC	Mandatory	Agreed 1999 levels for R&F, WH
	Voluntary: slow decay (SD)	CW, CD		

(a) Corresponds to Scenario 3b in some model output tables. (b) Corresponds to Scenario 0 in some model output tables. (c) Corresponds to Scenario 3a in some model output tables. (d) No impact assumed.

Modelling undertaken

Two separate computer models are used in the analysis. A cost/benefit model was designed to project the lifetime ownership costs of appliances purchased new over a given time period, rather than the energy consumption of the total household appliance stock. This is the appropriate approach for assessing the impact of changes to the labelling and MEPS regime, since the energy consumption of *existing* products will be unaffected by future changes in the regime. The model is fully documented in the impact assessment accompanying this RIS (GWA 1999).

In order to illustrate the impact of proposed alternatives on the total energy consumption of the appliance stock, not just new appliances stock, a stock model developed by Energy Efficient Strategies was also used (EES 1998b).

The cost/benefit model allows adjustment of the following key variables with regard to each appliance:

- the rate of change in the most efficient on the market (largely an indicator of supplier response to labelling-driven customer preference);
- the rate of change in the least efficient on the market (largely an indicator of MEPS levels);
- the rate of change in the sales-weighted average, which must lie between the two other points: whether it lies closer to the most or least efficient is an indicator of the effectiveness of labelling in influencing consumer preference.

Variables were externally specified, but checked for plausibility against actual historical data. For example, the highest rate of change projected in the sales-weighted energy consumption of new refrigerators (-1.5% per annum over the period 1999 to 2015) was significantly lower than the actual rate in the period 1987 to 1997 (-2.4% per annum).²⁵

The cost/benefit model then carries out the following sequence of analysis for each State and Territory, and then aggregates the results nationally:

1. Estimate the number of each currently labelled product type, and electric storage water heaters, which will be sold in each State and Territory in the period 1999 to 2015 (ie 17 years' sales in all). 1999 is the "base year" in that appliance energy consumption in that year will be the same under all the modelled scenarios. It is assumed that 2000 will be the first year in which policy changes (eg to make MEPS voluntary rather than mandatory) begin to influence supplier behaviour;

2. For each appliance sold, estimate the total electricity use over the entire service life. The longest service life assumed is 15 years (for refrigerators), so the model takes into account projected energy use as far ahead as 2029 for refrigerators installed in 2015, the last year of the period analysed;

3. For each appliance sold, estimate the total carbon dioxide-equivalent emissions associated with electricity used. These are calculated using projections of the CO₂-e intensity of electricity supply in each State and Territory;

4. For each appliance sold, estimate the Net Present Value (NPV) in 1998 dollars of the total electricity use over the entire service life. Household tariffs are assumed to remain steady (for reason discussed below);

²⁵ Labelling has influenced the refrigerator market since the mid 1980s. However, the sales weighted energy consumption of refrigerators would have declined even without labelling, so to assess the impact of labelling it is necessary to estimate what the no-labelling background case would have been. GWA (1991) estimated that it was considerably less than -2.4% per annum.

5. For each appliance sold, estimate the NPV of the total retail purchase price, including the direct and indirect costs imposed by labelling and/or MEPS;

6. Calculate the common administrative and publicity costs imposed by labelling and/or MEPS. Some of these are fixed and some vary with the number of units sold.

7. Sum the NPV of energy costs, purchase costs and labelling costs to obtain a total cost to appliance buyers of obtaining the specified energy services over the period. Sensitivity is tested at discount rates of 0%, 4% and 8%;

The sequence above is carried out with input variables adjusted to correspond to the assumptions in each modelled scenario. The scenarios are then compared with respect to projected electricity energy consumption, CO₂-e emissions and costs.

2.2 Costs/benefit evaluation

Direct program costs

The energy labelling regulations provide that products in the designated categories cannot be displayed for sale unless they have a registered label affixed in a specified (ie prominent) location. Four of the States have established a capability to approve and register labels, and all recognise each others' registrations.

The product supplier's application for registration must be accompanied by a fee. Until recently this was \$ 150 in Queensland and a lesser amount in the other States, but it is now expected to rise to \$ 150 in all States. At an estimated registration rate of 300 models per annum, the cost to suppliers would be \$ 45,000 per annum. This may increase by 10 to 15% after MEPS takes effect, as water heater models will also need to be registered.

The application for registration must be accompanied by a report on an energy test carried out in accordance with the appropriate published Standard. Applicants may carry out the test in their own laboratories, or use a commercial laboratory. Commercial test fees range from \$ 3,000 to \$ 6,400 depending on product type (Day 1996). However, many suppliers use their own facilities, and carry out energy testing as part of normal product development, so their actual marginal cost of preparing a test report for labelling purposes is negligible. It is estimated that the effective average cost to suppliers is about \$ 4,100 and the total cost of testing (water heaters included) will be about \$ 1.38 M per year.

Suppliers also bear the costs of printing and fixing the detachable labels. This is generally done at the factory, even for imported products, since this is the most cost-effective way to

ensure that the products which are actually displayed for sale and so have to comply with labelling regulations have the correct label affixed. It is estimated that this costs \$ 0.50 per unit, for a total cost of \$ 0.96 M per year.

It is estimated that the total cost to suppliers of testing, registering and labelling appliances is about \$ 2.40 M per annum (this includes an estimate for testing and registering heaters for MEPS, but not labelling them). This averages about \$ 1.20 per labelled appliance, and \$ 0.25 per water heater produced for the Australian market.

Distribution and retail costs are estimated to add about 100% to ex-factory or ex-import costs, so appliance buyers face a total cost of about \$ 4.78 M per annum: about \$ 2.40 per labelled appliance and about \$ 0.50 per water heater, or an average of about \$ 2.10 per appliance covered by the program. This equates to just under 0.3% of the average purchase price of these appliances.

The program also imposes costs on governments. Some of these are fixed, and some vary from year to year. The government costs comprise:

- administration of the program by Commonwealth, State and Territory officials (salaries and overheads, attendance at NAEEEC and Standards meetings etc);
- costs to the States of maintaining a registration and approval capability;
- costs to the States of processing applications for registration, beyond the income from the fee;
- costs to the States of verifying compliance with labelling requirements at the point of sale (these costs are now largely absorbed in general electricity safety work);
- random check testing to protect the integrity of the program. These costs are borne by the Commonwealth and States jointly, and currently run at \$ 150,000 per year. They may rise somewhat after the introduction of MEPS, as the need to verify that test reports are accurate will increase;²⁶
- costs of producing leaflets and other consumer information from the labelling registers (these costs are optional);
- cost of advertising and promoting the program (also optional);
- consultant costs for Standards development, market research, RISs etc.

It is difficult to identify the actual costs to each jurisdiction, so the following simplified assumptions have been made:

- salary and overheads for officials administering the program total \$ 250,000 per year, distributed by jurisdiction as shown in Table 2.2;

²⁶ Testing by competitors is also an important check on compliance. The costs of this have not been included, because suppliers routinely examine each others' product. Check testing also covers aspects of performance other than energy, which the labelling regulations specify must be met, and checks that statements about capacity and performance which bear on the label rating are correct.

- check testing, research and other costs underpinning the program total \$ 390,000 per year, half of it borne by the Commonwealth and the other half by other jurisdictions in proportion to their population, in accordance with long-standing cost-sharing arrangements for NAEEEC activities;
- States and Territories produce leaflets and other promotional materials at a cost of \$0.20 per product sold in NSW and Victoria, and \$0.10 in other jurisdictions.

The direct program costs summarised in Table 2.2 total about \$ 5.72 M per year (about \$ 2.50 per product sold). Some 84% of this is borne by appliance purchasers and 16% by governments.

The costs to appliance purchasers include the additional costs of MEPS testing for water heaters. Refrigerators and freezers are already tested for labelling purposes, so there would be no additional costs for MEPS. For governments, the additional costs of administering MEPS would be negligible.

Table 2.2 Estimated Direct Program Costs, Australia 1997 (a)

	\$ M/yr	% of total program cost
Product testing (marked up)(b)	2.75	48.0%
Registration (marked up)(b)	0.10	1.8%
Product labelling (marked up)(b)	1.93	33.7%
Total cost to appliance purchasers(b)	4.78	83.5%
Fixed admin (Centralised functions)	0.25	4.4%
Fixed admin (Distributed functions)	0.39	6.8%
Promotional costs to govt	0.31	5.3%
Total cost to governments	0.95	16.5%
Total Direct Program Costs	5.72	100.0%

(a) Includes estimate for additional costs of MEPS, although MEPS not operational in that year.

(b) Includes allowance for retail markup on manufacturer and importer costs

Indirect costs

Direct program costs are significantly exceeded by the “indirect” costs: the additional appliance costs which consumers incur when they purchase more efficient appliances in response to labelling, and which they incur as a result of MEPS because the least efficient - and by inference, the cheapest - models are excluded from the market.

For modelling purpose, it has been assumed that the average price of new appliances increases if average efficiency increases, and declines if efficiency declines. However, the relationship between price and energy-efficiency is complex and inconclusive. Studies of the

Australian appliance market (GWA 1991,1993a) have not been able to determine any statistical links between energy efficiency and product price, because:

- for some products (eg refrigerators, clothes washers), many early energy efficiency improvements were cost-free, provided they could be integrated into the suppliers' normal product redesign and retooling schedules;
- for some products (eg dishwashers, air conditioners), energy-efficiency has been positioned as another marketing "feature" at the high-cost end of the model range, so products which have been more energy-efficient have also incorporated more features and functions. This association of variables has frustrated statistical analysis.

Nevertheless it would be expected that after the first, relatively cheap efficiency options are taken up, subsequent developments will carry some cost because more materials (eg insulation), higher quality components (eg compressors) or additional research and development will be required.

The relationship between price and energy efficiency can be described in terms of "marginal price/efficiency ratios" (PERs). For example, a PER of 0.2 would mean that, if energy efficiency increased 1% and all other attributes of the appliance remained constant, then the price would increase 0.2%. Analyses of the Australian refrigerator market have found CPI-adjusted PERs ranging from 0.85 to -0.1: ie for some product categories price per volume has actually declined over the same period as energy efficiency has increased (GWA 1996). A PER of 0.2 has been used in this analysis. On this basis, it is estimated that mandatory labelling indirectly increases the price of appliances by a total of about \$ 30M per annum, and that MEPS will increase it by a further \$ 7 M. . As total expenditure on labelled appliances and water heaters in 1997 was \$ 1,802 M, the indirect costs are about 2.1% of appliance purchase costs.

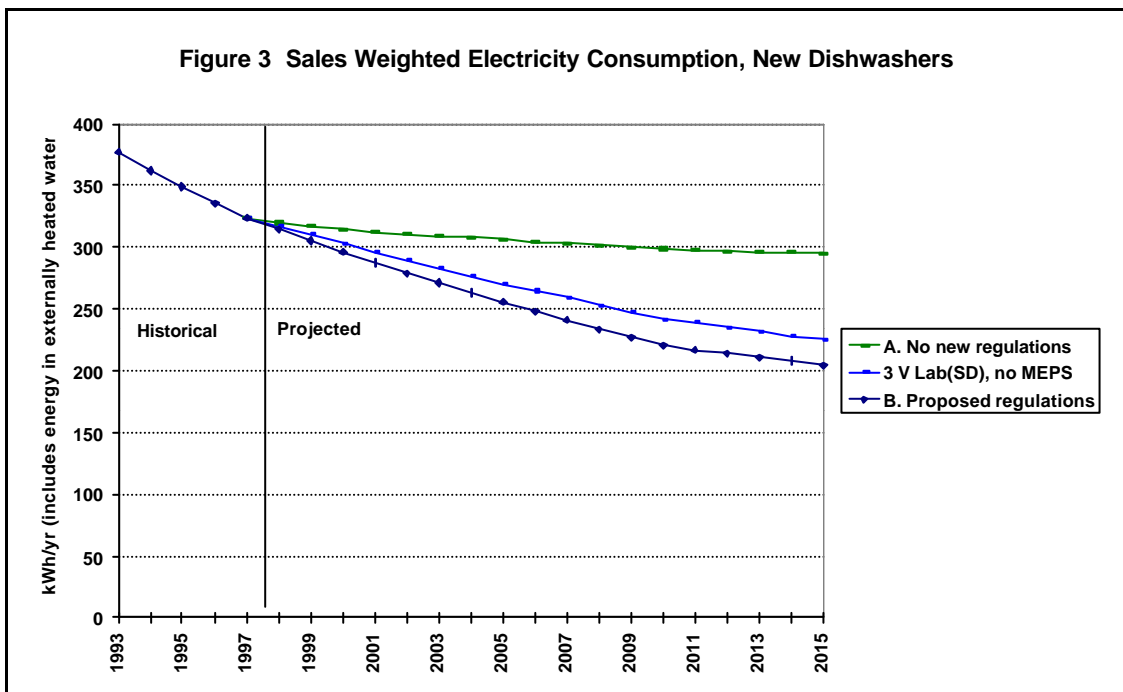
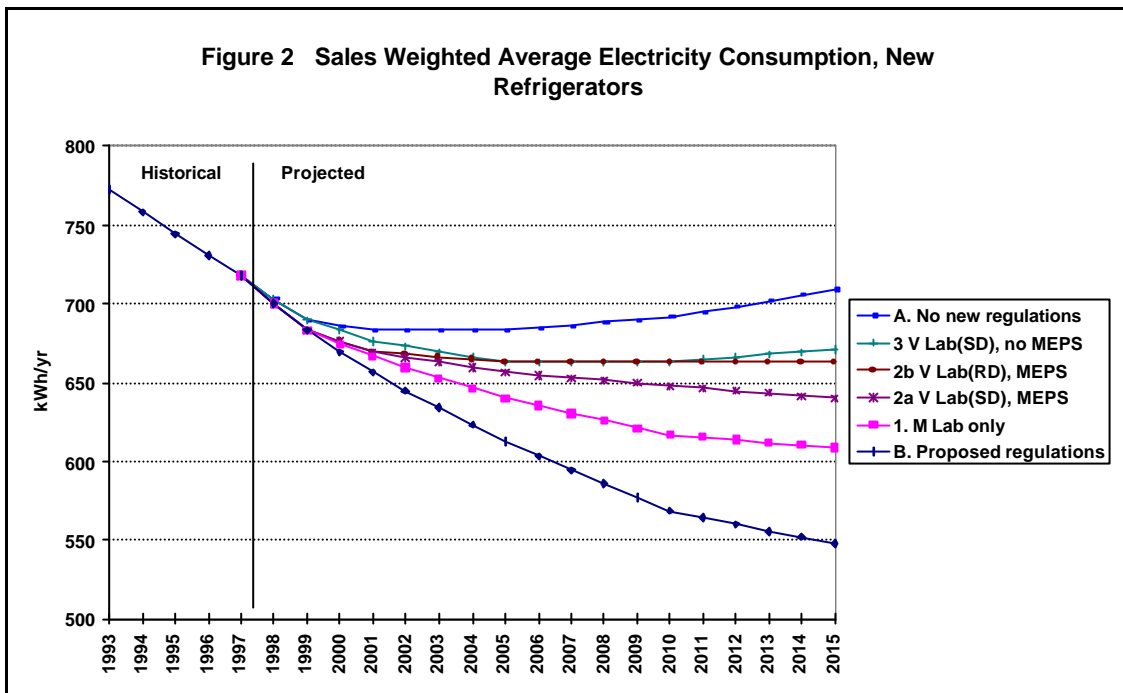
The direct costs in Table 2.2 represent less about 0.3% of appliance purchase costs, so the total program costs - the maximum that could be avoided by making labelling and MEPS voluntary - are about 2.4% of appliance purchase costs.

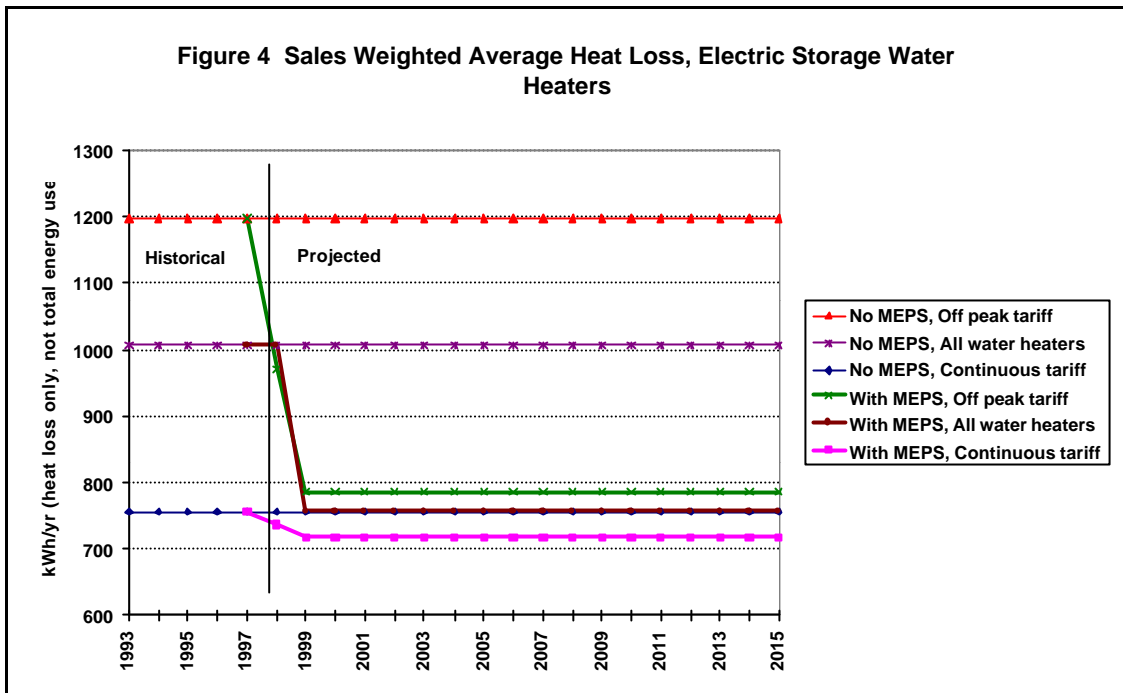
Energy and greenhouse benefits

The benefits of energy labelling and MEPS are that electricity consumption, and hence electricity expenditures and greenhouse gas emissions, are lower than they would otherwise be. Figures 2, 3 and 4 illustrate the projections for sales-weighted average efficiency of refrigerators, dishwashers and water heaters respectively, under the range of scenarios modelled.

The most complex diagram is that for refrigerators, since all combinations of MEPS and labelling have been modelled. There are no MEPS proposals for dishwashers, so only

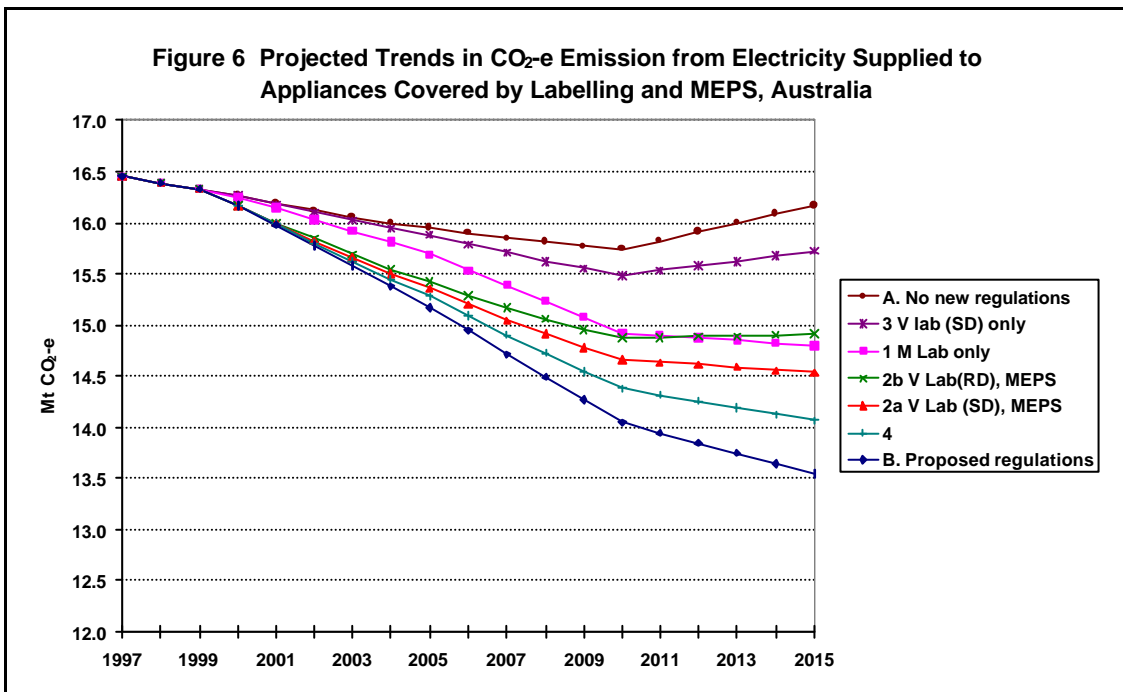
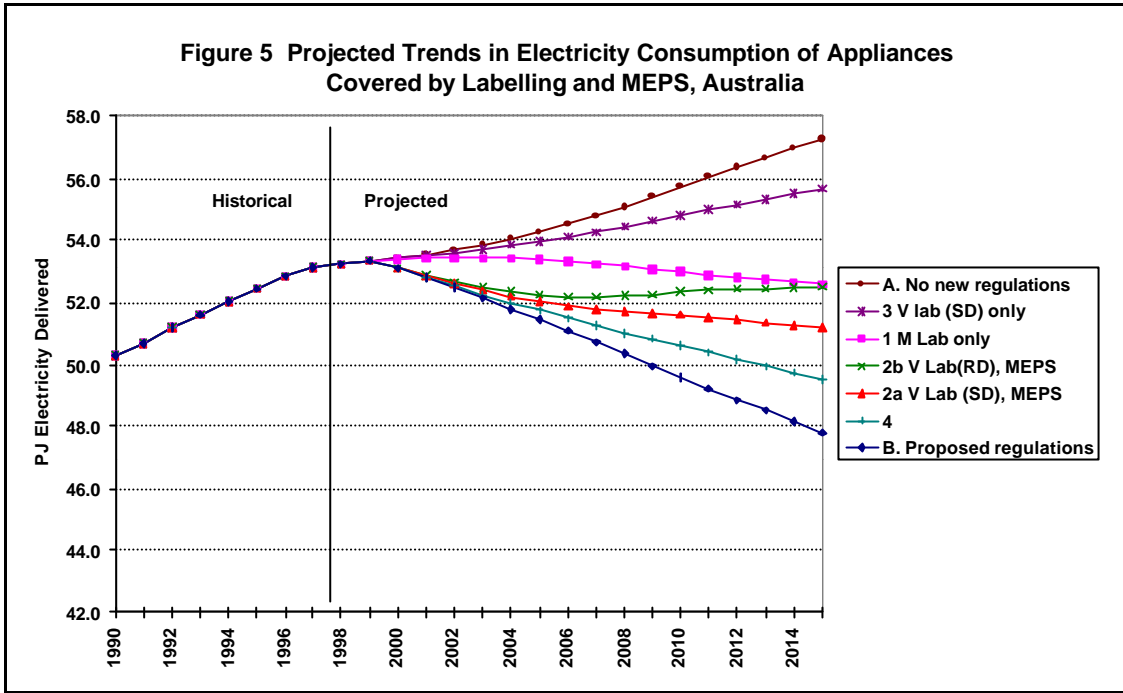
labelling scenarios are illustrated. Conversely, there are no labelling proposals for water heaters, so all scenarios default to “with-MEPS” or “without-MEPS”.





The relatively rapid fall in average refrigerator energy use in the past few years has been driven by large shifts in the product mix from cycle defrost to frost-free designs, in which there has been greater technical development, and (in 1997) by replacing their less efficient models in anticipation of MEPS. Nevertheless new models of low efficiency are still entering the market, and if both labelling and MEPS become voluntary these provide the basis for a reversal in the trend to greater efficiency. This is not the case with dishwashers, where permanent design changes ensure that efficiency would continue to improve, albeit more slowly, even if labelling became voluntary. The step-change in water heater efficiency (as indicated by the reduction in standing heat loss) illustrates how the implementation of MEPS is expected to lead to substantial and immediate efficiency gains in the year that MEPS take effect. These gains would be foregone if MEPS became voluntary (if suppliers were not already irreversibly committed to complying with MEPS by October 1999).

Figures 5 and 6 aggregate the projections of electricity consumption and greenhouse gas emissions of the entire appliance stock - not just new appliances - under the various scenarios. The effect of the changes in new product efficiency illustrated in Figure 2 to 4 are dampened somewhat by the stock turnover rates. The trend line giving lowest electricity consumption is Scenario B, in which the proposed model regulations are implemented. Scenario 1 (mandatory labelling but no MEPS) still leads to a decline in the total energy consumption of the appliance stock, but the extent of energy savings foregone by making MEPS voluntary can be clearly seen. Scenario A (“no new regulations”), and the other scenarios in which both labelling and MEPS become voluntary, lead to an increase rather than a decline in energy use.



The CO₂-e projections in Figure 6 generally follow the electricity trend projections in Figure 4, except that CO₂-e initially declines, even under the scenarios where energy rises. This is because it is assumed that the National Greenhouse Strategy programs to increase the efficiency of fossil fuel power stations and increase the use of renewable energy in power

generation by 2010 will be successful, but that the rate of reduction in CO₂-intensity will decline after then.²⁷

Scenario A (“proposed regulations”) is projected to lower Australia’s emissions by about 2.0 Mt per annum during the Kyoto Protocol commitment period, compared with Scenario B (“no new regulations”).

The intermediate scenarios indicate the sensitivity of the outcomes to slower rates of decay in labelling compliance. The other key model parameters - PER and energy price - were set at what are considered the midpoint of a plausible range. For example, there are factors which could raise as well those which could lower household electricity tariffs, so no change is a reasonable modelling assumption. Once values are chosen in this way it would not be particularly informative to run explicit sensitivity tests at extreme values, since movements in one parameter within the plausible range would be countered by opposite movements in another, also within the plausible range.

Table 2.3 summarises the projections of lifetime electricity consumption for each appliance under Scenarios A, B and three others. Table 2.4 compares each of the scenarios to the Base Case.

Table 2.3 Projected Electricity Consumption over operating lives of appliances purchased new, 1999 to 2015

	Scenario A No new regulations	Scenario B With proposed regulations	Scenario 1 M Lab only	Scenario 2b V Lab (SD), MEPS	Scenario 4 V lab (SD) for CD, CW
Refrigerators	113240	98203	104010	109067	98203
Freezers	30285	24738	26219	30493	24738
Dishwashers	14363	11171	11171	14363	11171
Clothes Dryers	7722	6478	6478	7722	7143
Clothes Washers	19578	16740	16740	19578	18858
Air conditioners	35874	31217	31217	35874	31217
Water heaters(a)	52564	39458	52564	39458	39458
All appliances	273626	228003	248398	256555	230787

All values GWh. (a) Heat losses only; energy in heated water is not affected by water heater MEPS.

²⁷ The potential impacts of these measures on electricity prices has not been taken into account. If they lead to an increase in electricity prices, as is likely, the value of the projected electricity saved by labelling and MEPS would be greater than estimated in this study. The effectiveness of labelling would also rise, since operating costs would increase as a percentage of total appliance ownership costs and purchasers would be more inclined to take energy efficiency into account.

Potential price reductions from market reform have been taken into account either. Given that both impacts are highly uncertain, it has been assumed that their effects will neutralise one another and household tariffs will remain constant in real terms.

Table 2.4 Projected differences in electricity consumption, compared with Scenario A (no new regulations), 1999 to 2015

	Scenario B With proposed regulations		Scenario 1 M Lab only		Scenario 2b V Lab (SD), MEPS		Scenario 4 V lab (SD) for CD, CW	
	GWh	% Base	GWh	% Base	GWh	% Base	GWh	% Base
Refrigerators	-15037	-13.3%	-9230	-8.2%	-4173	-3.7%	-15037	-13.3%
Freezers	-5547	-18.3%	-4066	-13.4%	-208	-0.7%	-5547	-18.3%
Dishwashers	-3192	-22.2%	-3192	-22.2%	0	0.0%	-3192	-22.2%
Clothes Dryers	-1244	-16.1%	-1244	-16.1%	0	0.0%	-579	-7.5%
Clothes Washers	-2839	-14.5%	-2839	-14.5%	0	0.0%	-720	-3.7%
Air conditioners	-4657	-13.0%	-4657	-13.0%	0	0.0%	-4657	-13.0%
Water heaters (a)	-13106	-24.9%	0	0.0%	-13106	-24.9%	-13106	-24.9%
All appliances	-45622	-16.7%	-25228	-9.2%	-17487	-6.4%	-42839	-15.7%

Source: Derived from Table 2.3 (a) Heat losses only; energy in heated water is not affected by water heater MEPS.

The following conclusions may be drawn:

- the proposed regulations would lead to a reduction in total electricity consumption by appliances purchased over the projection period by about 17% compared with the “no new regulations” case;
- mandatory labelling with voluntary MEPS would reduce electricity consumption by about 9% compared with the “no new regulations” case;
- mandatory MEPS and voluntary labelling would reduce total electricity consumption by appliances purchased over the projection period by about 6% compared with the “no new regulations” case;
- making the labelling of laundry appliances voluntary but regulating for mandatory labelling and MEPS for all other products would reduce total electricity savings over the projection period by about 1%.

Table 2.5 breaks down the projected electricity energy saving from implementing the proposed regulations, ie the projected difference in electricity consumption by new appliances between Scenarios A and B. It indicates that:

- refrigerators and freezers are projected to contribute about 45% of the savings, water heaters nearly 29%, air conditioners 10% and the other appliances 16%;
- mandatory labelling is projected to contribute about 55% of the savings, and MEPS 45%.
- about two thirds of the projected impact of MEPS comes from water heaters;
- water heater savings are only realisable through MEPS;
- about 65% of the refrigerator and freezer savings are projected to come from labelling, and 35% from MEPS;

- refrigerator and freezer MEPS are projected to save as much energy as the labelling of dishwashers, clothes washers and clothes dryer combined.

Table 2.5 Projected electricity saving from implementing the proposed model regulations, by appliance

	Mandatory labelling impact GWh saved	MEPS impact GWh saved	Total impact of proposed regulations GWh saved	Share of total impact
Refrigerators	9230	5807	15037	33.0%
Freezers	4066	1481	5547	12.2%
Dishwashers	3192	0	3192	7.0%
Clothes Dryers	1244	0	1244	2.7%
Clothes Washers	2839	0	2839	6.2%
Air conditioners	4657	0	4657	10.2%
Water heaters (a)	0	13106	13106	28.7%
All appliances	25228	20394	45622	100.0%
Share of total impact	55%	45%		

Source: Derived from Table 2.4 (a) Heat losses only; total energy in heated water is not affected by water heater MEPS.

Monetary benefits and costs

The introduction of the proposed regulations would incur (or rather, continue to incur) small direct costs, and substantially greater indirect costs from purchase of more efficient appliances. Against this there would be significant reductions in energy purchase costs. Table 2.6 summarises the outcomes of the cost-benefit modelling at the national level. It indicates that value of energy saved from implementation of a mandatory labelling and MEPS regime is twice to three times as great as the value of the reduction in direct and indirect costs. Therefore the estimated benefit/cost ratio of the proposed regulations is estimated at between 2.8 (undiscounted) and 1.9 (at a discount rate of 8%).

Table 2.6 Estimated costs and benefits of implementing proposed model regulations for mandatory labelling and MEPS (compared with ‘no new regulations’ scenario)

	\$ M NPV at discount rates of:		
	0%	4%	8%
Appliance cost impact	+1488	+954	+639
Program cost impact	+60	+42	+31
Total cost	1548	996	670
Energy cost impact	-4382	-2287	-1286
Total benefit	4382	2287	1286
Benefit/cost ratio	2.8	2.3	1.9

Table 2.7 identifies the impacts of the labelling elements of the proposed regulations, excluding MEPS. Scenario 1 would allow the introduction of the new label design proposed by NAEEEEC, and ensure that high rates of labelling compliance are maintained. In Scenario 3 the new label design would not be introduced, and suppliers who choose to label would be required to use the present label design and no other. This would slow the rate of decay in compliance and hence effectiveness compared with the “no new regulations” scenario.

Table 2.7 Estimated costs and benefits of implementing increasing levels of labelling only, compared with Scenario A (no new regulations) (ie excluding MEPS)

	Scenario 3 (Voluntary labelling: slow decay)			Scenario 1 (Mandatory labelling)		
	\$ M NPV at discount rates of:			\$ M NPV at discount rates of:		
	0%	4%	8%	0%	4%	8%
Appliance cost impact	258	163	108	1097	688	449
Program cost impact	28	20	14	56	39	29
Total value of cost	286	183	122	1153	727	479
Energy cost impact	-670	-352	-195	-2945	-1500	-818
Total benefit (value of saving)	670	352	195	2945	1500	818
Benefit/cost ratio	2.3	1.9	1.6	2.6	2.1	1.7

Tables 2.7 indicates that the benefit/cost ratio of increasing compliance with labelling is in the range 2.3 to 2.6 (undiscounted) and 1.6 to 1.7 (8% discount). The major difference in the energy projections underlying Scenarios A, 3 and 1 are in the rates of change in sales weighted energy consumption. The fact that the benefit/cost ratios of Scenarios 1 and 3 are relatively close despite significant differences in rates of change suggests that the outcomes are relatively insensitive to decay rate assumptions.

Table 2.8 indicates the incremental (or “marginal”) costs and benefits of adding MEPS to the three energy labelling regimes modelled: “no new regulations” (Scenario A), which assumes a rapid decay in labelling effectiveness, “slow decay” (Scenario 3) and mandatory labelling (Scenario 1). MEPS imposes very little additional program cost because the infrastructure is already in place for labelling, so nearly all the cost is the increase in appliance cost.

MEPS appears to be a cost-effective addition to each of the labelling scenarios. In fact, and benefit/cost ratio of MEPS is higher than total ratio for the proposed new regulations, indicating that MEPS is the more cost-effective element..

These calculations do not include the value of greenhouse gas emissions avoided through maintenance of mandatory labelling and MEPS. It is difficult to place a value on these until a market for tradeable emissions permits is established. However, current estimates range from \$US 5 to 30 per tonne CO₂-e for permits to emit during the Kyoto Protocol commitment period. The retention of mandatory labelling and MEPS is projected to lower Australia's emissions by about 2.0 Mt per annum during that period (compared with the voluntary alternatives), so the value of emission avoided could run to \$A 17 M to \$ 100 M per annum during that period (undiscounted, present exchange rates).

Table 2.8 Estimated marginal impacts of adding MEPS to energy labelling regimes

	Voluntary labelling - rapid decay			Voluntary labelling - slower decay			Mandatory labelling		
	\$ M NPV at discount rates of:			\$ M NPV at discount rates of:			\$ M NPV at discount rates of:		
	0%	4%	8%	0%	4%	8%	0%	4%	8%
Appliance cost impact	310	217	159	229	158	114	391	266	189
Program cost impact	5	4	3	5	4	3	4	3	2
Total cost	315	221	162	234	161	117	395	268	192
Energy cost impact	-1078	-619	-383	-948	-529	-320	-1437	-787	-467
Total benefit	1078	619	383	948	529	320	1437	787	467
Benefit/cost ratio	3.4	2.8	2.4	4.0	3.3	2.7	3.6	2.9	2.4

Benefits by State

The benefits of the proposed regulations are distributed fairly evenly across jurisdictions, according to their share of population (see Table 2.8).

Table 2.8 Projected electricity and greenhouse gas saving impact of proposed regulations (Scenario B) compared with no new regulations (Scenario A), by jurisdiction

	GWh saving	Share of national	kt CO ₂ -e saving	Share of national
NSW	14280	31.3%	11710	26.9%
Victoria	10246	22.5%	13353	30.7%
Queensland	12312	27.0%	10973	25.2%
WA	3447	7.6%	3358	7.7%
SA	3288	7.2%	3088	7.1%
Tasmania	720	1.6%	1	0.0%
NT	727	1.6%	503	1.2%
ACT	602	1.3%	508	1.2%
Australia	45622	100.0%	43495	100.0%

There are minor variations with respect to the ownership of appliances, especially electric water heaters. Queensland's has a smaller gas system and a higher proportion water heaters that are electric, and so has a relatively high share of the national electricity and CO₂-e savings. Conversely, Tasmania's hydro-based electricity system means that it has a negligible share of the national greenhouse gas savings.

Table 2.9 summarises the projected net cost savings by jurisdiction from proceeding with the proposed regulation, and having a mandatory labelling and MEPS regime rather than a voluntary one. Nearly all benefits and costs are indirect, and accrue to appliance buyers, except for the Commonwealth jurisdiction, which bears only direct program costs. Consequently, the Commonwealth is the only jurisdiction apparently better off by through making the program voluntary.

The benefit/cost ratios of proceeding with the proposed regulations vary according to electricity tariffs and factors such as electricity consumption per appliance: the modelling takes into account the fact that refrigerators and air conditioners in the NT, for example, use more energy per unit than those in Victoria, so the value of a more efficient purchase is higher. There is no benefit/cost ratio for the Commonwealth jurisdiction, since there are no program benefits: all energy price savings are assigned to the States and Territories.

Table 2.9 Projected cost savings and benefit/cost ratios by jurisdiction, of proposed regulations (Scenario B) compared with no new regulations (Scenario A)

Jurisdiction	NPV \$ M (1998) saved, at:			Benefit/cost ratio, at:		
	0.0%	4.0%	8.0%	0.0%	4.0%	8.0%
NSW	768	348	164	2.6	2.1	1.8
Victoria	777	356	171	3.1	2.5	2.1
Queensland	612	277	131	2.6	2.1	1.8
WA	312	141	67	3.3	2.7	2.2
SA	241	112	55	3.1	2.5	2.1
Tasmania	21	8	3	1.8	1.5	1.3
NT	77	38	19	5.3	4.3	3.6
ACT	25	11	4	2.1	1.7	1.4
Commonwealth	-12	-8	-6	NA	NA	NA
Australia	2833	1291	615	2.8	2.3	1.9

Table 2.10 indicates the value of applying mandatory rather than voluntary labelling to clothes washers and clothes dryers. While it is currently possible to lawfully sell unlabelled clothes washers and dryers produced in or imported via NSW, NT or the ACT there is no evidence that this is occurring. The difference between the mandatory labelling and coordinated voluntary labelling is marginal. In other words, there is no *disadvantage* from

including these products in the schedule of appliances to be labelled under the proposed model regulations.

Table 2.10 Projected cost savings and benefit/cost ratios by jurisdiction, mandatory compared with voluntary (slow decay) labelling for clothes washers and dryers

Jurisdiction	NPV \$ M (1998) saved, at:			Benefit/cost ratio, at:		
	0.0%	4.0%	8.0%	0.0%	4.0%	8.0%
NSW	25	4	-4	1.2	1.1	0.9
Victoria	58	23	8	1.7	1.4	1.2
Queensland	3	-5	-7	1.0	0.9	0.8
WA	19	7	2	1.5	1.3	1.1
SA	14	5	2	1.5	1.3	1.1
Tasmania	-2	-2	-1	0.8	0.7	0.6
NT	1	0	0	1.4	1.2	1.1
ACT	0	-1	-1	1.0	0.8	0.7
Commonwealth	-1	-1	-1	NA	NA	NA
Australia	119	34	0	1.3	1.1	1.0

2.3 Comparison with levy option

The brief for the RIS required the analysis of “a levy imposed upon inefficient appliances to fund programs to redress the greenhouse impact of household appliances.” Two variations of this option have been considered:

- a) the proceeds from the levy are diverted to greenhouse-reduction strategies unrelated to appliance efficiency (ie the levy is “revenue-positive”); or
- b) the proceeds are used to subsidise the costs of the more efficient appliances, so that any cost differential between more and less efficient appliances is narrowed (ie the levy is “revenue-neutral”).

A detailed discussion of these options is at Appendix A. The main points are summarised below.

Raising and disbursing the Levy

Any levy would obviously have to be mandatory. A threshold question is whether the Commonwealth or State tax regimes as they stand (or as reformed) could support the raising of the levy.

Under the “revenue-positive” option, the transfer of the funds raised to the intended greenhouse reduction activity should be readily achievable within governments’ normal

administrative arrangements, or existing Commonwealth-State arrangements, if the levy were to be raised at the State level but applied to national programs. The “revenue-neutral” option would require a mechanism for returning the funds raised in a way which meets the desired objective, of narrowing the cost differential between more and less efficient appliances. Possible approaches include:

- energy-efficiency-weighted scaling of sales tax on the more efficient products (this option depends on the continuation of sales taxes);
- energy-efficiency-weighted scaling of tariffs and duties (this would only affect imports);
- payments to manufacturers or importers according to a formula based on sales and efficiency;
- rebates direct to the purchasers of the energy-efficient products for example “\$70 cashback for purchase of a 5 star refrigerator, \$30 for purchase of a 4 star” (of course, if labelling were abandoned in favour of the levy regime it would be necessary to find different means of identifying qualifying products).

The only way to ensure that the funds were actually applied to the purchase price of the more efficient appliances would be to offer rebates direct to purchasers. However, this would create the following difficulties:

- high fixed costs to establish a publicity, verification and payment infrastructure;
- high transaction costs as a proportion of each payment;
- “free riders”: a large number purchasers who would have bought the more efficient appliances in any case will claim payments.

Conclusions

There are no apparent means for raising the proposed levy. While expert legal advice would need to be obtained, it is likely to be extremely difficult under existing taxation or energy labelling legislation. However, it may become feasible if general provisions were introduced to enable import duty, sales or other tax rates to be linked to product energy efficiency.

The product registration, check testing and ongoing administrative costs to governments would be no less than for labelling and MEPS. The only potential cost savings are from abandonment of physical labels, which account for about a third of direct program costs. These savings would flow to suppliers, and hence purchasers.

The abandonment of mandatory labelling in favour of the levy would deprive purchasers of a ready means to identify the more efficient products on the market and to avoid the less efficient ones.

In the “revenue-positive” case, where the funds raised by the levy were applied to greenhouse gas reduction programs outside the appliances sphere, there is no evidence that

potential greenhouse gas reductions from other possible application of the funds would be more cost-effective, or even equally cost-effective, to energy labelling or MEPS.

In the “revenue-neutral” case, where the funds raised were to be applied to reducing the cost differential between more- and less-efficient appliances, it would be difficult and/or administratively costly to ensure that payments to appliance suppliers and/or purchasers were targeted as intended.

At best, the reference efficiency adopted for the a “revenue-neutral” levy might act as a form of mandatory MEPS in which the mandatory element would enforce the payment of the levy rather than prescribe characteristics to be met for lawful sale. Suppliers would be free to sell products less efficient than the reference level, but would incur a financial penalty. With the MEPS regime currently proposed, suppliers who sell a non-MEPS compliant product are also subject to a financial penalty. The main difference is that the levy provides an in-built mechanism for scaling the extent of the penalty to the extent by which MEPS is exceeded, whereas the current MEPS proposals do not. However, if such a feature is considered desirable it may be more straightforward to incorporate it into the MEPS regulations than to establish a levy regime.

The proposed levy, even if legally feasible, appears to offer no direct cost savings to government, no greater greenhouse gas reductions (in fact, probably less greenhouse gas reductions) and probably higher lifetime appliance costs to purchasers, compared with the mandatory labelling and MEPS proposals.

Some form of levy *in association with* the mandatory labelling and MEPS proposals may enhance the effectiveness of labelling and MEPS, but more information about the form and design of a levy proposal would be necessary in order to form a judgement.

3. Other Considerations

3.1 Effects on competition

Supplier and price competition

Energy labelling is not a competition-restricting measure. Mandatory labelling enhances competition between all products bearing standard labels, and so serves overall to increase rather than restrict competition.

The introduction of the existing mandatory labelling program has had no significant impact on the number of suppliers or appliance models on the Australian market. The Australian whitegoods industry went through a major period of consolidation in the 1980s, from 6 major local manufacturers in 1981 to four in 1989: Email, Hoover, Vulcan (owned by SA Brewing) and Fisher & Paykel. The consolidation process was well under way by the time energy labelling was introduced in 1986.

Significant consolidations among appliance suppliers since 1989 were the acquisition of Hoover's whitegoods business by Southcorp (formerly SA Brewing) and, in February 1999, the sale of Southcorp's whitegoods business by Email.²⁸ Email, which produced about 70% of all whitegoods sold in 1989, still has a dominant market share.

Of the whitegoods import brands represented in 1989, almost all are still on the market.²⁹ Some new brands, mainly Korean, have been introduced. For air conditioners, Email remains the only local manufacturer and there are as many import brands as there were in 1989.

It appears that the existence of mandatory energy labelling since 1986 has had no discernible impact on the rate of consolidation among whitegoods suppliers or the rate at which brands enter the market. Nor does it appear to have reduced product choice. The number of models registered for energy labelling was higher in 1998 than in 1989.

As the proposed regulation would not extend the scope of mandatory labelling it is expected to have no significant impact on the number of suppliers or models.

²⁸ The businesses transferred includes Chef cookers, Dishlex dishwashers and Hoover clothes washers and dryers, but not Hoover refrigerators, which will be closed (Southcorp press release, 8 February 1999).

²⁹ In a few cases the import brands have disappeared, but the products are still being imported from the same overseas sources by the major manufacturers; eg Email now markets some Gorenje products sourced from Solvenia as Frigidaire, rather than Gorenje Pacific as they were formerly branded.

Refrigerator and Freezer MEPS

MEPS would prevent the sale of refrigerators and freezers which fail to meet the prescribed levels of energy efficiency. It may restrict competition in that consumers will not have access to existing sub-MEPS models (which in 1997 comprised about 13% of sales - see Figure 1) but new and re-engineered models are constantly introduced in the normal course of business. MEPS-complying refrigerators and freezers are already offered by all but one supplier, and all suppliers are able to manufacture, or have access to import sources of MEPS-complying product. Many models are close enough to their MEPS level so that they could comply with moderate redesign of components (GWA et al 1993).

Some of the market impacts of supplier compliance with refrigerator and freezer MEPS can already be observed. As Figure 1 shows, there is evidence that 1997 was the first year of adjustment in anticipation of MEPS taking effect in late 1999, and similar adjustments would be expected in 1998 and early 1999.

Table 3.1 indicates the observed movements in sales weighted average price and efficiency for refrigerators and freezers from 1993 to 1997, the only years for which reliable tracking data are now available (EES 1998). Prices are expressed as \$ per litre of adjusted volume to even out changes in the size and configuration of units sold.

Table 3.1 Changes in refrigerator and freezer price and efficiency, 1993 to 1997

	Sales weighted average price: \$ per litre adjusted volume(a)			CPI(b)	Sales weighted average Energy Efficiency Ratio(c)		
	Refrigs	Freezers	All		Refrigs	Freezers	All
1993	2.36	1.63	2.25	107.3	3.56	4.17	3.66
1994	2.44	1.75	2.33	107.7	3.62	4.14	3.70
1995	2.55	1.84	2.45	109.1	3.71	4.40	3.81
1996	2.59	1.88	2.49	111.7	3.69	4.38	3.78
1997	2.57	1.92	2.48	113.8	3.90	4.34	3.96
Change 1996-97, current \$	-0.8%	2.2%	-0.4%	1.9%	5.7%	-0.9%	4.8%
Change 1996-97, CPI adjusted	-2.7%	0.3%	-2.3%				
Annual rate of change 1993-97, current \$	2.1%	4.3%	2.5%	1.5%	2.3%	1.0%	2.0%
Annual rate of change 1993-97, CPI adjusted	0.6%	2.8%	1.0%				

Source: EES (1998) (a) Volume weighted for proportion of freezer space and freezer temperature. (b) Consumer Price Index for household equipment and operation (1989-90 = 1.00). (c) Measure of energy efficiency derived from energy labelling algorithm

The average volume-adjusted price of refrigerators and freezers fell 0.4% in 1997 in current \$, or 2.3% CPI-adjusted. Sales weighted average energy efficiency of new models increased 4.8% over the same period. The fall in price ran counter to the longer term trend of 1% increase per annum (CPI-adjusted), even though the rate of efficiency improvement was well ahead of the longer term trend (2.0% per annum).

It appears that market moves toward compliance with anticipated MEPS have had no upward impact on prices beyond the background trend - in fact, the opposite has happened so far. It is reasonable to conclude that while MEPS is likely to have some impact on supplier and price competition in the refrigerator and freezer markets, the effect on supplier competition or price is likely to be minimal.

Water Heater MEPS

The mains pressure electric water heater market is dominated by the Rheem and Vulcan brands (both owned by Southcorp), with the most significant competitor being Dux (formerly owned by James Hardie, now acquired by GWA International Group). There are a few manufacturers of low pressure electric water heaters, which are not proposed to be subject to MEPS.

Each supplier produces models corresponding to each of the delivery capacities defined by the Australian Standard (eg 50 litres, 250 litres etc). The suppliers usually make more than one model in each capacity, differentiated by quality of materials (and hence warranty period) or the number and power of the heating elements, but not by heat loss.³⁰

In order to comply with MEPS, suppliers will need to revise almost their entire range of models of 80 litres or more by September 1999. Many of the smaller water heaters already meet the MEPS level, so can be retained. Water heater model ranges are designed to share critical dimensions in order to rationalise manufacture, so simultaneous change to large parts of the model range is not uncommon. However, the introduction of MEPS imposes timing and design constraints.

It is understood that the suppliers are well advanced with plans to have all models MEPS-compliant by the target date. There should be no reduction in model range, but all water heaters on the market will presumably increase in price somewhat to reflect the additional material costs of thicker insulation. The fact that there is more than one supplier should restrain price increases somewhat, but competition in the market is limited. The cost-benefit analysis which recommended MEPS levels assumed that the full production cost increase would be passed on to consumers (GWA et al 1993).

³⁰ The overall task efficiency of an electric water heater varies with its "standing heat loss", which is a function of the tank insulation. The efficiency with which electricity is converted to heat is virtually 100% in every water heater with an immersed element.

As the first years of MEPS are likely to coincide with a shift from wholesale sales tax to goods and services tax, it is possible that reductions in the rate of tax will offset most or all of any apparent price increases.

There is some possibility that MEPS would assist the entry of new suppliers from New Zealand, since the proposed level is close to the NZ WaterMark A Grade. Imports of such water heaters would have been at a competitive disadvantage against less insulated local product, but as Australian manufacturers will now also be required to bear those costs, this barrier to entry may actually be reduced (although there are few suppliers in NZ not affiliated with the Australian suppliers). Harmonisation of standards would make it more economic to produce the same models for both markets, so lowering unit production costs and hence prices.

It is reasonable to conclude that while MEPS is likely to have some impact on supplier and price competition in the electric water heater market, the direction is uncertain, and the overall impact on the market is likely to be minimal.

Competition between energy and technology types

Electric water heating competes with gas water heating in all capital cities and many regional cities on mainland Australia.³¹ Gas is the more expensive option. A gas water heater with equivalent delivery capacity is more complex and costs more than an electric water heater. The dwelling must have gas connected, and this, unlike electricity connection, is not universal. Electric water heater MEPS would increase the relative price of electric water heaters and so reduce this cost differential.

On mainland Australia, gas water heating is typically one third as greenhouse gas intensive as electric water heating when relative conversion efficiencies are taken into account. Therefore any price movements in favour of gas would be lead to some further reductions in greenhouse gas emissions beyond those estimated to come from MEPS.

The same principle would apply with the other competing electric water heating technologies that are not covered by MEPS. The price premium for electric-boosted solar and heat pump water heaters would be reduced, so the balance would shift slightly from conventional electric to the other, less greenhouse gas intensive technologies.

Timing of consumer purchase

Hot water is considered an essential household service. A water heater is installed at the time of construction, and immediately replaced if it fails. The introduction of MEPS should

³¹ Tasmania has no natural gas supply for the present.

have no effect on this pattern. Refrigerators are also considered household necessities, but there is some more flexibility in purchase timing, especially in replacement purchases where the existing unit is unsuitable but has not actually failed. The price impact of MEPS is likely to be far smaller than for water heaters (since the comparative increase in efficiency is lower and the market competition higher) so any purchase delay effects are likely to be negligible.

3.2 Effects on trade

The share of the whitegoods market supplied by products manufactured outside Australia has been gradually increasing since the 1980s. Most imports are sold either by local manufacturers under their own brands, or by importers tied to a brand. Very little product is imported by independents.

All Australian whitegoods manufacturers export to New Zealand. Fisher & Paykel has manufacturing facilities in both New Zealand and Australia. Appliance exports to NZ from other countries tend to be routed via Australia. If TTMRA exemption is not obtained, importing via NZ would avoid complying with labelling and MEPS requirements, so suppliers would have some greater incentive to change their current arrangements. However, this consideration is likely to be outweighed by the investment in existing distributional arrangements and by the relative market sizes.

Importers (other than the Australian manufacturers) tend to get tests done and products labelled in the country of product origin. There are occasional difficulties with test results, but these tend to be resolved by changing labels rather than withdrawing products. However, there are commercial test facilities in Australia, so importers without access to home-country tests can (and some do) have tests done in Australia.

The introduction of MEPS for refrigerators and freezers may require some importers to switch suppliers for some of their models, but such changes already routinely occur for other reasons. Australian refrigerator and freezer manufacturers exporting to NZ are unlikely to be disadvantaged by having to comply with Australian MEPS. The same models tend to be supplied to NZ as to Australia, so the possibility of having to compete with non-compliant product in NZ once Australia adopts MEPS is remote. In the absence of MEPS, however, low-efficiency product will continue to be imported to Australia.

The introduction of mandatory labelling in Australia has had no discernible effect on the rate of import (or export) of appliances, or on trans-Tasman trade. All in all, the impact of the proposed regulation on trade appears to be minimal.

Import and export of large electric storage water heaters is currently negligible, so the immediate impact on trade of MEPS for water heaters would be small. In the long term, however, the proposed harmonisation of water heater standards (including MEPS levels) between Australia and NZ could increase trade.

3.3 Distributional effects

The costs of energy labelling are distributed across all appliance purchasers, and the benefits (of selecting a more efficient product) are available to all. In fact, even buyer who do not use the label benefit indirectly from the program, since the range of models on the market is more energy efficient than it would be otherwise, and even random selections from the model range will be more energy-efficient than otherwise.

There is a weak relationship between price and energy efficiency, so labelling may allow low-income buyers to identify models that are *both* cheaper to buy and consume less electricity.

The distributional issue related to MEPS are analogous to those of pollution control standards for motor vehicles. The costs of catalytic converters are borne by all purchasers, even though some may drive much less distance than the average, or operate the vehicle outside the urban areas where air pollution is a problem. In the same way, the costs of MEPS are borne by all appliance purchasers, even though some may use the appliance less than the average. Indeed, the distributional effects are less distorted than for motor vehicles, since all appliance purchasers bear the costs of global air pollution leading to climate change, whereas only some motor vehicle purchasers bear the costs of local air pollution.

MEPS would increase the cost of water heaters to all buyers, irrespective of income. However, the potential benefits in terms of reduced electricity expenditure are just as widely distributed, and are projected to considerably exceed the costs. There is a high probability that the energy savings will be realised more or less equally by all householders, since MEPS act to reduce standing heat loss and the energy savings are relatively independent of volume of hot water used. MEPS would also extend benefits to residents in rental housing where the electric water heater is selected by others.

3.4 Consistency with other greenhouse measures

The Prime Minister's statement of November 1997, *Safeguarding the Future: Australia's Response to Climate Change* contains a commitment to

work with the States and industry to develop and implement by the year 2000, efficiency standards for fossil fuel electricity generation, including for brown and black coal and gas fired plants.

The statement also says that:

the Government will work with the States and Territories to set a mandatory target for electricity retailers to source an additional two per cent of their electricity from renewable energy sources by 2010.

The measures are included in the NGS (as is emissions trading, but not a carbon tax). It has been assumed that the measures included in the NGS will be successfully implemented, and that they will accelerate the rate of reduction in the greenhouse gas intensity of electricity generation (indicated by kg CO₂-e per kWh delivered) up to 2010, after which the intensity reduction rate falls back to the background consistent with a gradual rise in the natural gas share of generation fuel. These projections have been taken into account in modelling, with the effect that the amount of CO₂-e saved per kWh avoided will decrease throughout the period.

There is nothing in the proposed regulation which is inconsistent with other measures in the National Greenhouse Strategy. Indeed, if these measures lead to an increase in electricity prices, as is likely, the value of the projected electricity saved by labelling and MEPS would be greater than estimated in this RIS. The effectiveness of labelling would also rise, since operating costs would increase as a percentage of total appliance ownership costs and purchasers would be more inclined to take energy efficiency into account.

4. Conclusions and Recommendations

4.1 Conclusions

The analysis in this report supports the following conclusions:

1. the projected monetary benefits of a uniform national system of energy labelling and MEPS for Australia significantly exceed the projected monetary costs;
2. energy labelling enhances competition between suppliers and products, since it reveals an important aspect of product performance that would otherwise be concealed from purchasers;
3. MEPS has some impacts on competition and trade, but these are relatively minor in the light of the monetary benefits to purchasers of increased energy efficiency, and the contribution to meeting national greenhouse gas reduction objectives;
4. all stakeholders (governments, suppliers, purchasers) benefit from uniformity and consistency in labelling and MEPS, especially as progress towards compliance with initial MEPS levels is well advanced;
5. a mandatory system is more effective and cost-effective than a voluntary system for energy labelling, and in the case of MEPS is the only realistic mode of introduction;
6. the proposed model regulations, if adopted by all jurisdictions, would establish the framework for a consistent energy labelling and MEPS framework in Australia; and
7. the framework would be at risk to non-compliant imports from New Zealand, so long as the latter did not impose similar energy labelling and MEPS requirements.

4.2 Recommendations

The analysis in this report supports the recommendations that:

1. the proposed model regulations be adopted by all Australian jurisdictions;
2. refrigerators, freezers, dishwashers, air conditioners, clothes washers and clothes dryers be scheduled for mandatory energy labelling in all jurisdictions;
3. the regulations should allow for jurisdictions to jointly update the label, the scope of appliances covered and other aspects of the labelling program from time to time, should

that prove justified in order to maintain the effectiveness of energy labelling in meeting energy efficiency and greenhouse gas reduction objectives;

4. refrigerators, freezers and electric storage water heaters be scheduled for mandatory MEPS in all jurisdictions;
5. the initial levels of MEPS should be those agreed by ANZMEC in 1995;
6. the initial MEPS levels should take effect at the time agreed by ANZMEC, ie in October 1999;
7. the regulations should allow for jurisdictions to jointly update the MEPS levels, the scope of appliances covered and other aspects of the MEPS program from time to time, should that prove justified in order to maintain the effectiveness of MEPS in meeting energy efficiency and greenhouse gas reduction objectives;
8. reviews of the effectiveness of the energy labelling regime and of the current MEPS levels should be undertaken at intervals of not more than three years; and
9. in the absence of an undertaking by New Zealand to implement energy labelling and MEPS regimes similar to Australia's, permanent exemption of the proposed regulations from the provisions of the TTMRA should be sought.

4.3 Consultations with interested parties

During the preparation of this RIS there were discussions with the Consumer Electronics Supply Association (CESA) and the Australian Consumers Association (ACA). Approaches were also made to the Australian Electrical and Electronics Manufacturers Association (AEEMA), but a meeting could not be arranged at the time. All parties have been involved in the operation of the labelling program since 1992, the discussion of MEPS proposals since 1994 have been consulted previously on the model regulations.

The public consultation process planned for this RIS is as follows:

- release of the RIS by the Australian Greenhouse Office in the first week of March 1999;
- mailing of the RIS to about 250 individuals and organisations known to be interested;
- publication of the RIS on the AGO internet site and on the internet sites of some of the State energy agencies
- two public forums, one each in Sydney and Melbourne, to be held in the third week of March.
- public advertisement of the availability of the RIS, with offer of copies on request, and of the dates and venues of the forums.

The AGO will accept comments on the RIS up to the end of March 1999.

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Appendix A. A levy on less efficient appliances

The brief for the RIA required the analysis of “a levy imposed upon inefficient appliances to fund programs to redress the greenhouse impact of household appliances.” Two variations of this option have been considered:

- the proceeds from the levy are diverted to greenhouse-reduction strategies unrelated to appliance efficiency (ie the levy is “revenue-positive”); or
- the proceeds are used to subsidise the costs of the more efficient appliances, so that any cost differential between more and less efficient appliances is narrowed (ie the levy is “revenue-neutral”).

Raising and disbursing the Levy

Any levy would obviously have to be mandatory. A threshold question is whether the Commonwealth or State tax regimes as they stand (or as reformed in line with current proposals, which include a goods and services tax) could support the raising of the levy.

It may be possible to link it to the energy labelling registration process, so that the fee charged would be calculated on the basis of the product’s energy efficiency. There are about 160 distinct refrigerator models on the market, with total annual sales of about 600,000 units, so the mean sales per model is 3,750 per year. (In fact the range is from less than a hundred to perhaps 15,000, and about half the models account for 85% of the sales). Therefore a registration fee calculated solely on the basis of the energy efficiency of the product, without reference to its sales, would have a highly variable impact per unit sold. If the levy were set on an estimate of average model sales, its actual effect may range from perhaps 40 times as great as intended for the low-selling models, to one quarter as great as intended for high-selling models.

Alternatively, any attempt to link State-levied label registration fees to actual sales may well be struck down by the High Court, as were tobacco franchise fees. Therefore any arrangement that has the effect of a levy per unit sold would almost certainly have to be supported by Commonwealth legislation.

It is highly unlikely that a sound, defensible levy mechanism applying solely to household appliances could be devised within the existing framework of Commonwealth and State taxation arrangements. However, if a general mechanism allowing taxation levels to be linked to the energy efficiency of goods were to be adopted when those arrangements are reformed, the levy option may become feasible.

Under the “revenue-positive” option, the transfer of the funds raised to the intended greenhouse reduction activity should be readily achievable within governments’ normal

administrative arrangements, or existing Commonwealth-State arrangements, if the levy were to be raised at the State level but applied to national programs.

However, the “revenue-neutral” option would require a mechanism for returning the funds raised in a way which meets the desired objective, of narrowing the cost differential between more and less efficient appliances. Possible approaches include:

- energy-efficiency-weighted scaling of sales tax on the more efficient products (this option depends on the continuation of sales taxes);
- energy-efficiency-weighted scaling of tariffs and duties (this would be effective only to higher-efficiency imports);
- payments to manufacturers or importers according to a formula based on sales and efficiency;
- rebates direct to the purchasers of the energy-efficient products for example “\$70 cashback for purchase of a 5 star refrigerator, \$30 for purchase of a 4 star” (of course, if labelling were abandoned in favour of the levy regime it would be necessary to find different means of identifying qualifying products).

Although the revenue would be raised on the basis of sales of particular low-efficiency models, it may be difficult to ensure a proportional cost impact on the sale of those models. Where a supplier has both more *and* less efficient models it would be free to spread the levy costs as it wishes. Only suppliers whose model range was entirely below the average efficiency would be fully exposed.

The only way to ensure that the funds were actually applied to the purchase price of the more efficient appliances accurately targeted would be to offer rebates direct to purchasers. However, this would raise the following difficulties:

- high fixed costs to establish a publicity, verification and payment infrastructure
- high transaction costs as a proportion of each payment;
- “free riders”: a large number purchasers who would have bought the more efficient appliances in any case will claim payments.

Administrative Costs

The energy efficiency of each model will need to be established with at least as much precision as for energy labelling and MEPS purposes. Therefore suppliers will continue to bear the same energy testing costs as in the MEPS/Labelling Base Case, and governments will continue to bear the same registration costs. Since significant payments will be involved, the incentive for suppliers to mis-state energy consumption will be greater than it is now, so government check-testing costs would rise.

In addition, a far more precise sales monitoring system than is currently used will need to be implemented. For refrigerators, the present system tracks sales of about 50% of models, accounting for about 85% of sales, and analyses the distribution by energy efficiency of the other 50% to check that it matches the energy distribution of the model group tracked. This is adequate for monitoring trends in sales-weighted average energy efficiency, but would not be adequate for revenue-raising (or revenue disbursement) purposes.

The direct program costs that would be avoidable by a levy-only program are those which are avoidable by a MEPS-only program: the actual labelling costs (about \$ 1.93 M in 1997, or 34% of direct costs) and promotional costs to government (about \$ 0.31 M in 1997, or 5% of program costs). Doubling the existing check testing and monitoring costs, and adding a revenue collection and disbursement function could add about \$0.35 M to annual program costs, so the maximum operational savings would be about \$ 1.9 M, or about 33% of direct costs. However, all of the savings accrue to appliance purchasers, who no longer bear the costs of physical labels. Government costs would remain unchanged or increase slightly.

Initial setup costs such as obtaining legal advice, drafting legislation and carrying out RIS processes have not been estimated. Nor have the possible legal costs of ongoing challenges and disputes, which may well be substantial.

Potential impact on sales prices

The mean price of refrigerators sold in 1997 was \$980, and the mean annual energy consumption was 717 kWh. It is not possible to establish a statistical relationship between price and energy efficiency of refrigerators from the historical data. The appliances which cost more do so for a range of reasons, one of which may be greater energy efficiency. In many cases, the cheaper comparable appliance uses less energy because it has fewer features. However, it has been assumed for cost-benefit modelling purposes that each 1% improvement in refrigerator energy efficiency will increase the production cost, and hence the sale price, by 0.2%, ie a “Price/Efficiency Ratio” of 0.2. Applying these standardised assumptions to refrigerators sold new in 1997 gives the characteristics in Table A1.

Table A1 Standardised Characteristics of Refrigerators Sold New, 1997

	kWh per year per adjusted litre(b)	Standardised to SWA = 1.0	KWh per year per unit	Standardised price, \$ unit(c)
Most efficient(a)	1.26	0.66	475	1057
SW Average	1.92	1.00	717	980
Least efficient(a)	3.50	1.82	1309	917

(a) Taking most and least efficient on labelling register for each Australian Standard product category, and weighting it for that category’s share of all refrigerators sold. (b) Standard adjusted for volume of freezer space, if any. (c) Applying Price/Efficiency Ratio of 0.2

If an efficiency-scaled levy were set with the intention of increasing the purchase price of the least efficient model to that of the most efficient, and assuming that the price signal were not be distorted (as it almost certainly would be) then the levy would need to be \$140. However, this would be “revenue-positive” since all but the most efficient would have to bear it. The impact at the SW average point would be \$ 70. In 1997 the average refrigerator purchase price was \$ 980, so the effect of the levy, if not returned to the buyers of the more efficient refrigerators, would be to increase the average price of refrigerators by 7%.

Alternatively, if the levy were revenue-neutral, it would need to be struck at a point where the revenue raised from the group of less efficient models (say \$70 on average) was returned to the more efficient models. This would also nominally equalise the price of the most and least efficient models. The cash transfers under this option would be as follows:

- by definition, 50% of sales are of models with an efficiency below the sales-weighted average value: this might be called the “reference efficiency” for levy calculation purposes;
- say the deviation from the mean is linear, so the average impact on the price of each of the 300,000 sub-reference units is \$ 35, or 3.7% of the group average price of $$(980+917)/2$.
- assuming a 100% retail markup factor, the average levy that would be payable by the suppliers of those units would be \$ 17.50;
- with refrigerator sales of 600,000 per annum, and half these sales liable to an average levy of \$ 17.50, the total revenue raised from suppliers would be \$5.1 M. With the retail markup this would represent an impost of \$ 10.2 M on the buyers of less efficient refrigerators.

The entire rationale for the levy is that it is supposed to compensate buyers for the extra cost of buying the more efficient product. However, if life cycle costs are taken into account, buyers are usually better off purchasing the more efficient product anyway, all else being equal. This is illustrated in Table A2.

Table A2 Indicative costs and benefits of preferring more energy efficient refrigerator

Preference shift	kWh/yr saved	Extra purchase price(a)	Value of annual saving (b)	Simple payback (years)	Benefit/cost ratio of preference shift at discount rates of:		
					0%	4%	8%
SWA to most efficient	242	\$ 77	\$ 26.1	3.0	18	13	10
Least to most efficient	834	\$ 140	\$ 90.1	1.6	12	9	7
Least efficient to SWA	592	\$ 63	\$ 63.9	1.0	5	4	3

(a) See Table 4.x (b) At national weighted average tariff of 10.8 c/kWh, no change in real tariff over 15 year operating life

The simple payback for customers who prefer the most efficient to the SW average is about 3 years, and for those who prefer the SW average to the least efficient is only 1 year. Those who shift from the least to the most efficient would incur the highest increase in purchase price and also save the most energy, but given that preferences tend to shift only part way along the scale, this is the least likely outcome.

The objectives of the energy labelling program are to encourage and enable purchasers to make the kind of preference shift implicit in Table A2. The impact of labelling would certainly be enhanced by the existence of a levy program which, in effect, amplifies the signals on the label by further tilting the benefit/cost advantage in favour of the more efficient. Eventually, however, the levy would default to a form of MEPS, as explained below.

Application of the Revenue

If the intention of the levy were to produce a continuing stream of revenue that could be applied for general greenhouse reduction purposes, the reference efficiency would need to be raised each year, or the costs of falling below it increased. Otherwise, revenues would decline as appliance suppliers took steps to reduce their exposure to the levy.

It is not possible to assess how effectively any revenues raised would be used, without knowing considerable detail of the greenhouse gas reduction programs to which the revenues would be applied. However, there is no evidence that efficiency reductions could be achieved more cost-effectively through means other than increasing the efficiency of electricity consumption, which are the objectives of MEPS and labelling.

The MEPS levels currently proposed have been adopted after cost-benefit analysis which established that appliance purchasers as a group would be better off after the application of MEPS, ie projected reductions in average lifetime operating costs would exceed projected increases in appliance purchase price. In other words, the total costs of obtaining the energy services supplied by the appliances covered by MEPS is lower with MEPS than without MEPS, so any greenhouse gas reductions are “no regrets”: ie obtained at negative cost.

If MEPS were abandoned in favour of a revenue-positive levy, the cost of energy services to appliance buyers would rise unless the efforts made by suppliers to avoid the levy resulted in efficiency gains more or less equal to those projected through MEPS.

In effect, the reference efficiency adopted for the levy would act as a form of MEPS. Suppliers would be free to sell products less efficient than this level, but would incur a financial penalty. With the MEPS regime currently proposed, suppliers who sell a non-MEPS compliant product are also subject to a financial penalty. The main difference is that the levy provides an in-built mechanism for scaling the extent of the penalty to the extent by

which MEPS is exceeded, whereas the current MEPS proposals do not. However, if such a feature is considered desirable it may be more straightforward to incorporate it into the MEPS regulations than to establish a levy regime.

Abandoning labelling would deny appliance purchasers a benefit that could not be compensated by any other greenhouse gas reduction program, however effective. It would deny, or make much less accessible, the information necessary for purchasers to make decisions based on the operating costs of appliances. Differences in lifetime operating cost will almost certainly remain greater than differences in purchase price, even if (as is most unlikely) the levy can be tightly targeted to impact on the price of appliances in proportion to their efficiency.

Conclusions

There are no apparent means for raising the proposed levy. While expert legal advice would need to be obtained, it is likely to be extremely difficult under existing taxation or energy labelling legislation. However, it may become feasible if general provisions were introduced to enable import duty, sales or other tax rates to be linked to product energy efficiency.

The product registration, check testing and ongoing administrative costs to governments would be no less than for labelling and MEPS. The only potential cost savings are from abandonment of physical labels, which account for about a third of direct program costs. These savings would flow to suppliers, and hence purchasers.

However, the abandonment of mandatory labelling in favour of the levy would deprive purchasers of a ready means to identify the more efficient products on the market and to avoid the less efficient ones.

In the “revenue-positive” case, where the funds raised by the levy were to be applied to greenhouse gas reduction programs outside the appliances sphere, there is no evidence that potential greenhouse gas reductions from other possible application of the funds would be more cost-effective, or even equally cost-effective, to energy labelling or MEPS.

In the “revenue-neutral” case, where the funds raised were to be applied to reducing the cost differential between more- and less-efficient appliances, it would be difficult and/or administratively costly to ensure that payments to appliance suppliers and/or purchasers were targeted as intended.

At best, the reference efficiency adopted for the a “revenue-neutral” levy might act as a form of mandatory MEPS in which the mandatory element would enforce the payment of the levy rather than prescribe characteristics to be met for lawful sale. Suppliers would be free to sell products less efficient than the reference level, but would incur a financial penalty. With the MEPS regime currently proposed, suppliers who sell a non-MEPS compliant

product are also subject to a financial penalty. The main difference is that the levy provides an in-built mechanism for scaling the extent of the penalty to the extent by which MEPS is exceeded, whereas the current MEPS proposals do not. However, if such a feature is considered desirable it may be more straightforward to incorporate it into the MEPS regulations than to establish a levy regime.

The proposed levy, even if legally feasible, appears to offer no direct cost savings to government, no greater greenhouse gas reductions (in fact, probably less greenhouse gas reductions) and probably higher lifetime appliance costs to purchasers, compared with the mandatory labelling and MEPS proposals.

Some form of levy *in association with* the mandatory labelling and MEPS proposals may enhance the effectiveness of labelling and MEPS, but more information about the form and design of a levy proposal would be necessary in order to form a judgement.
