

**REGULATORY IMPACT STATEMENT**  
**Energy Labelling and Minimum Energy**  
**Performance Standards for Household**  
**Electrical Appliances in Australia**

**Supplementary Cost-Benefit Analysis on**  
**Transition to a Revised Energy Label**

**Prepared for the Australian Greenhouse Office**

**by**

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## Executive Summary

The Commonwealth, States and Territories jointly manage the mandatory electrical appliance energy labelling program via the National Appliance and Equipment Energy Efficiency Committee (NAEEEC). As a result of evaluations of the program, a number of changes are now proposed, with the objective of enhancing the effectiveness of the program so that less electricity is consumed, and less greenhouse gases emitted, than would otherwise be the case.

The changes proposed are:

- *The form of the energy labels*: new labels are to be introduced, similar to the existing labels in order to build on the already high level of consumer recognition and acceptance, but with sufficient changes in shape and text to ensure that consumers do not confuse new labels with old ones. There will also be a transitional period during which the new label will carry a message to this effect.
- *The star rating algorithms*: the new label will retain a 6 star scale but with different rating algorithms, so that a product which currently rates, say, 5 stars will rate only around 3 stars on the new scale. This is intended to renew the commercial incentive for suppliers to introduce 4, 5 and 6 star products to gain a commercial advantage over competitors. Under the new scale, these appliances will be significantly more energy efficient than those which rate 4, 5 and 6 stars on the present scale. During the transition period the new labels will also state what the rating would have been on the previous scale.
- *Other content of the energy labels*: some information will be removed, presented in a different way or added.
- *Clarification of presentation aspects*: the guidelines for presentation of partial stars on the present label are unclear, and some suppliers have printed labels in a way that arguably exaggerates the comparative star rating of the product. The description of the new label is much clearer, and so should reduce the prospect of consumers being confused or misled;
- *Changes in the energy consumption test*: the revision of the label gives the opportunity to revise minor aspects of the energy tests on which the label is based, and in the case of dishwashers, to carry out a major revision of the test.

The proposed changes are being included in the Australian Standards which describe the energy testing and labelling requirements for each product type, and which are called up in State and Territory labelling regulations. The transition will be effected through the timing of the Australian Standard revisions, through managing the product registration process and through over-sticking “old” labels with “new” labels on product in showrooms to minimise the period of potential confusion. These measures will impose some additional costs on suppliers, which are expected to be passed on to appliance purchasers, as are the costs of the existing labelling program.

The general community benefits and costs of enhancing the effectiveness of the energy labelling program were examined in a Regulatory Impact Statement (RIS) published earlier in 1999, which focussed on the costs and benefits of mandatory vs voluntary labelling, and of introducing minimum energy performance standards (MEPS) for refrigerators, freezers and electric storage water heaters.<sup>1</sup> The details of the proposed transition to new energy label formats were not however known at the time, so only general costs could be estimated.

This document supplements the original RIS, by:

1. Describing the proposed process of transition to revised energy labels;
2. Estimating the costs involved in the process;
3. Establishing whether the costs are consistent with the assumptions made in the original RIS;
4. Clarifying the benefit/cost ratios for measures to enhance labelling effectiveness, as estimated in the original modelling.

This details of the proposed transition, to take place between 1 April and 30 September 2000 (with a further stage to 30 September 2001 for dishwashers) are described in the body of the RIS. The estimated costs are summarised in the following table. The once-off cost of \$ 3.2 M, for a change of a type not likely to be repeated in less than a decade, is well within the modelled “program enhancement” expenditure of \$ 27 M over 17 years in the previous RIS.<sup>2</sup>

#### **Estimated Costs of Proposed Transition to Revised Label**

	Estimated cost (a)	% of total cost
Registration of “new” labels for models remaining on the market	\$ 920,000	29%
Re-labelling and other display management during transition period	\$ 955,000	30%
Re-testing of dishwashers after introduction of new Standard, 2001	\$ 972,000	30%
Label design development and market research	\$ 100,000	3%
NAEEEC publicity program to assist with transition period	\$ 250,000	8%
<b>Total cost of proposed change</b>	<b>\$ 3,196,000</b>	<b>100%</b>

(a) From perspective of appliance buyers: supplier and retailer costs marked up to retail price

<sup>1</sup> The energy labelling of household refrigerators, freezers, dishwashers, air-conditioners, clothes washers and clothes dryers is mandatory throughout Australia. MEPS for refrigerators, freezers and electric storage water heaters took effect on 1 October 1999.

<sup>2</sup> When the label changes in 2000 it will be the first such change in the 15 years of the program, and it would be reasonable to assume that there would not be another complete label redesign for another decade at least. However, there may be a need to change certain aspects of the label when there are changes in the MEPS levels affecting labelled appliances, as may occur every 4 to 5 years, and this may involve some reregistration or retesting. It is impossible to speculate on the scope, costs and benefits of such changes at present, but it is likely that any costs could be accommodated within the general cost projection envelope used in the modelling.

The benefit/cost ratios for action to increase the effectiveness of the labelling program that were estimated in the original RIS previous therefore still stand. The ratios were 2.7 at 0% discount rate, 2.2 at 4% discount rate and 1.8 at 8% discount rate.

This supplementary analysis confirms that enhancing the effectiveness of labelling is cost-effective, even if CO<sub>2</sub> emissions are given no monetary value. If a monetary value were assigned to the CO<sub>2</sub> emitted in generating the electricity consumed by appliances, the benefit/cost ratios of enhancing the effectiveness of labelling would increase (except in Tasmania, where electricity is generated from zero-emissions sources).

The projected reductions in greenhouse gas emissions due to increasing the effectiveness of the energy labelling program are summarised in the following table. It is projected that emissions associated with the lifetime electricity consumption of appliances purchased new over the period 1999-2015 will be reduced by about 26.0 Mt CO<sub>2</sub>-e, or 11% less than if the program effectiveness remains at its present level. The average impact during the Kyoto Protocol “commitment period”, 2008-12, is estimated at 2.2 Mt CO<sub>2</sub>-e per annum.

#### Projected Reductions in CO<sub>2</sub>-equivalent Emissions

	Mt CO <sub>2</sub> -e present level of effectiveness(a)	Mt CO <sub>2</sub> -e enhanced effectiveness(a)	Mt CO <sub>2</sub> -e saved, 1999 to 2015	% of baseline CO <sub>2</sub> -e saved	Average Mt CO <sub>2</sub> -e saved per year, 2008-12(b)
NSW	63.1	56.4	6.7	10.6%	0.6
VIC	73.7	65.5	8.2	11.1%	0.7
QLD	56.7	50.3	6.3	11.2%	0.5
WA	21.3	19.0	2.3	10.9%	0.2
SA	17.2	15.3	1.8	10.7%	0.2
Tasmania	0.0	0.0	0.0	0.0%	0.0
ACT	3.1	2.8	0.3	10.6%	0.0
NT	2.9	2.6	0.3	10.8%	0.0
Australia	238.0	212.0	26.0	10.9%	2.2

(a) Projected emissions associated with lifetime electricity consumption of appliances purchased new, 1999-2015 (b) Kyoto Protocol Commitment Period

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# 1. Background

## 1.1 The original RIS

In February 1999, George Wilkenfeld and Associates (GWA) completed a Regulatory Impact Statement (RIS) on the proposal to introduce model regulations in each State and Territory for mandatory energy labelling and minimum energy performance standards (MEPS) for household electrical appliances (GWA 1999a). The RIS also assessed the consequences for the regulations of the provisions of the Trans Tasman Mutual Recognition Act 1997 (TTMRA).

At the time there were already regulations requiring mandatory labelling in NSW, Victoria, Queensland, SA, WA and the NT. The proposed model regulations, once adopted by all jurisdictions, had the effect of confirming the existing mandatory labelling regime in those States, extending it to Tasmania and the ACT, and slightly expanding the scope of labelling in NSW.

The model regulations were also to be used to introduce MEPS for refrigerators, freezers and electric water heaters, as agreed by the Australian and New Zealand Minerals and Energy Council (ANZMEC) in 1995, and to introduce new label designs to increase the effectiveness of the labelling program.

Following public comment (see GWA 1999c) the RIS was accepted as satisfactory by the Office of Regulatory Review (ORR). ANZMEC subsequently used the RIS to justify the implementation of uniform regulations in all States and Territories, and an exemption under TTMRA, allowing labelling to be mandatory in Australia even though labelling for the same products is not mandatory in New Zealand.

## 1.2 The problem

The original RIS contains a summary of the specific problems that energy labelling and MEPS are intended to address. As the present document is concerned only with labelling, the problems related to MEPS are not reiterated.

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)<sup>3</sup> recorded for that model under standard test conditions.

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<sup>3</sup> 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).

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, the precursor of ANZMEC).

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)<sup>4</sup>
- 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 considerations of containing greenhouse gas emissions, which was not a public policy issue in 1983.

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. In the following years other States and Territories adopted the program, and it became effectively national.

By 1998 the following problems had emerged with this regime:

- There were minor differences between the labelling regulations in each State, so introducing ambiguities and administrative inefficiencies;
- The effectiveness of energy labelling in providing information for consumers and commercial incentives for manufacturers was declining, and the technical changes needed to increase effectiveness (eg a nationally coordinated reconfiguration of label designs and the mathematical algorithms determining star ratings) could not be made within the existing regulatory framework;
- Given the differences in regulation sunset provisions between States, labelling could have ceased to be mandatory in one or more jurisdictions, following which mutual recognition arrangements could have made it non-mandatory in all jurisdictions;

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<sup>4</sup> 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.

- Labelling was not mandatory in New Zealand, and the provisions of the TTMRA would by default have made it non-mandatory in Australia, unless there were a permanent exemption from TTMRA provisions (a temporary exemption was in force pending full consideration of the issue).

The original RIS was undertaken in order to assess whether the proposed model regulations and TTMRA exemption were necessary to overcome these problems, to consider alternatives and to assess costs and benefits.

### **1.3 Alternatives considered in the original RIS**

Various mandatory and voluntary combinations of labelling and MEPS were considered in the original RIS. The “minimum” option considered was not to adopt the proposed model regulations at all but to allow the State-based labelling framework to continue.

The “maximum” option considered was 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.

An alternative 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.

A mandatory levy on less efficient appliances was also considered as an alternative to labelling and/or MEPS.

### **1.4 Conclusions of the original RIS**

The original RIS came to 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 the original RIS supported 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;* [emphasis added]
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.

With the regard to the specific issue of revising the label, the RIS concluded that without the proposed regulations there would be no means of co-ordinated revision of the label design or the mathematical algorithms determining star ratings. This would avoid the associated costs of label change, but also pass up the benefits of more rapid increase in appliance energy-efficiency and reduction in greenhouse gas emissions.

## **1.5 Purpose of this supplement**

The original RIS was only able to consider the costs and benefits of the proposed label revision in general terms, because the jurisdictions had not yet agreed on the precise manner of the label transition. Now that agreement has been reached, NAEEEC has the opportunity to review the earlier work in the light of the detailed implementation plan for the label revision.

This document is a supplement to the original RIS. It does not reconsider the issues of mandatory vs voluntary labelling, or mandatory vs voluntary MEPS. The original RIS found that part of the case for mandatory MEPS was that, unlike voluntary labelling, it provides a framework in which the effectiveness of energy labelling can be increased. This document supplements the original RIS, by:

- 1 Describing the proposed process of transition to revised energy labels;
- 2 Estimating the costs involved in the process;
- 3 Establishing whether the costs are consistent with the assumptions made in the original RIS;
- 4 Clarifying the benefit/cost ratios for measures to enhance labelling effectiveness, as estimated in the original modelling.

## **2. Proposed Revision of the Energy Label**

### **2.1 Objective**

The objective of the proposed changes is to enhance the effectiveness of the existing mandatory energy labelling program for household electrical appliances, so that less electricity is consumed, and less greenhouse gases emitted, than would otherwise be the case.

The mandatory appliance labelling program was initiated in New South Wales during 1986, with label designs and rating levels developed during 1985. Appliance energy efficiency improved more rapidly than originally envisaged, partly in response to the early effectiveness of the labelling program. As the number of models at the higher end of the 6-star rating scale increased, the commercial incentive for suppliers to introduce and market still more efficient models declined. This reduction in program effectiveness was identified as early as 1991, in the first major evaluation of the program (GWA et al 1991).

### **2.2 Policy Context**

One of the measures in the National Greenhouse Strategy states that “improvements in the energy efficiency of domestic appliances and commercial and industrial equipment will be promoted by extending and enhancing the effectiveness of existing energy labelling and minimum energy performance standards programs. This will be pursued by [among other actions] revising the technical framework of the labelling program to keep pace with improvement in product efficiencies including ‘super efficient’ appliances” (NGS 1998,p48).

These measures are being pursued by the Commonwealth and all States through ANZMEC, in consultation with relevant industry and key stakeholders. The indicative timetable in the NGS called for the appliance labelling program to be revised by July 1999 and the extension of MEPS to be agreed by July 1999.

The National Appliance and Equipment Energy Efficiency Committee (NAEEEC), which reports to the Energy Management Task Force, is the body charged by ANZMEC with detailed implementation of these measures. The highest priority items on the NAEEEC’s work plan for 1999 are to:

- “Facilitate and coordinate the introduction of nationally consistent labelling regulations and MEPS regulations for refrigerators, freezers and electric water heaters, effective from October 1999;
- Review and revise appliance energy label rating levels and label designs as well as develop a supporting market transition program” (NAEEEC 1999).

The issues are closely linked, because a nationally consistent system of labelling regulations is a pre-requisite for the revision of appliance energy label rating levels and label designs.

## **2.3 Details of the Proposed Changes**

### ***The form of the energy labels***

the new labels will be similar to the existing labels in order to build on the already high level of consumer recognition and acceptance, but with sufficient changes in shape and text to ensure that consumers do not confuse new labels with old ones. There will also be a transitional period during which the new label will carry a message to this effect.

### ***The star rating algorithms***

The new label will retain a 6 star scale but with different rating algorithms, so that a product which currently rates, say, 5 stars will rate only 3 stars on the new scale. This is intended to renew the commercial incentive for suppliers to introduce 4, 5 and 6 star products, which will be significantly more energy efficient than those which rate 4, 5 and 6 stars on the present scale. During the transition period the new labels will also state what the rating would have been on the previous scale.

### ***Other content of the energy label:***

Information based on assumptions that have been found to be difficult to sustain (eg that the energy consumed by an air conditioner purchased anywhere in Australia can be reasonably approximated as 500 hours of operation at full load) is to be removed, or presented in a different way (eg kWh consumed per hour of operation at full load for air conditioners).

### ***Clarification of presentation aspects***

The guidelines for presentation of partial stars on the present label are unclear, and some suppliers have printed labels in a way that arguably exaggerates the comparative star rating of the product. The description of the new label is much clearer, and so should reduce the prospect of consumers being confused or misled.

### ***Changes in the energy consumption test***

The revision of the label gives the opportunity to make changes to the energy consumption test on which the label is based. These changes will generally improve the repeatability of the test, and in the main are small enough so that models previously tested need not be retested – it will be possible to produce the new label from the original test results. The exception is dishwashers, where there are major problems of test repeatability and of ambiguity in the specification of the cycle selected for the label data. This reduces the ability of the label (whether in the existing or the new format) to fairly indicate comparative energy performance to dishwasher buyers. A new test standard to address these issues is planned in early 2001. All dishwasher models remaining on the market will need to be retested to the new standard.

The proposed changes are being included in the Australian Standards which describe energy testing and labelling requirements for each product type, and which are called up in the State and Territory labelling regulations. All such Standards are circulated for industry and public comment.

It is intended that the transition from the existing to the new label designs will be effected through the timing of the Australian Standard revisions and through managing the product registration process as described later in this report.

The process of revising the label design has taken some time, because of the need to develop a consensus amongst the many jurisdictions and stakeholders involved. The following stages have been necessary:

- 1 Revision of the regulatory and administrative structure of the program: ie agreement by the States and Territories to enact common regulations and to transfer the technical content from regulations to Australian Standards;
- 2 Review of the test procedures in the Australian Standards, and correction of identified anomalies;
- 3 Development of new label designs and market testing with consumer focus groups. NAEEEC has spent about \$ 100,000 on developing the new design;
- 4 Consulting with interested parties on the proposed changes;
- 5 Inclusion of the new algorithms (ie star rating scales) and the new label design in the revised Australian Standards;
- 6 Planning a transition process to minimise disruption and cost to manufacturers and retailers, and to minimise consumer confusion. NAEEEC has allocated a budget of \$ 250,000.

Much of this program development work was carried out during 1998 and 1999.

## 3 Costs and Benefits

### 3.1 Previous Cost-Benefit Modelling

The original RIS modelled three distinct energy labelling alternatives, described as: “...“no new regulations” [Scenario A for modelling purposes] which assumed a rapid decay in labelling effectiveness, a slow decay in labelling effectiveness [Scenario 2a] and mandatory labelling [Scenario B] which assumes some enhancement of effectiveness through introduction of new label designs” (GWA 1999a).

These alternatives were elaborated in the technical document accompanying the original RIS (GWA 1999b, p58) as follows:

“**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 continue to label may use any format so long as it is consistent with general Trade Practices legislation. 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.

**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.”

Scenario 2a best represents the situation in which labelling continues the slow decline from its early effectiveness, a process first identified and reported on in 1991. The costs and benefits of measures to restore the program's effectiveness (the label revision and relaunch was the only measure actually discussed in the RIS, but the analysis would cover other equally effective means) are modelled **as the difference between Scenario B and Scenario 2a.**<sup>5</sup>

In Scenario 2a no significant changes are made in the labelling program, and its impact on consumer and supplier behaviour continues to decline, even within a mandatory labelling framework. In Scenario B the effect of labelling on consumer and supplier behaviour increases because of the impact of the revised label, again within a mandatory framework. Under these modelling assumptions, all of the difference between the two alternatives is attributable to the label revision.

While the original analysis took into account the general costs and benefits of enhancing the effectiveness of the energy labelling program, it could not specifically address the costs and benefits of the proposed introduction of new energy labels of the types now proposed, via the mechanism and the timing proposed, because these details were not yet finalised when the modelling was carried out at the end of 1998.

The *benefits* of increasing labelling effectiveness on the timescale proposed and roughly to the extent proposed have already been modelled. There is no additional information on likely impacts on energy consumption and emissions beyond that already taken into account in the modelling. Therefore it is not necessary to repeat the original modelling of benefits.

If the *costs* of the measure are no higher than original estimates, then it would follow that the benefit/cost ratios are at least as high as estimated in previous modelling.

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<sup>5</sup> At an aggregate level, the calculation of these differences could be read from Appendices 1 and 2 in GWA 1999b In the even-numbered tables (A-2, B-2 etc) the third row up from the bottom, titled "High vs Moderate level labelling". For example, Table B-2 indicates that the NPV of labelling *with* enhancement in NSW is \$M 353 lower than *without* enhancement (at 0% disc: \$M 61 lower at 8% disc). The more detailed effects can be read from the TOTALS column in Appendix 3.

## 3.2 Transition costs

Under NAEEEC's proposed transition arrangements, all existing label registrations will expire on 1 October 2000. The only mechanism previously available for retiring registrations was voluntary notification, and it is estimated that about 70% of the models currently registered are no longer on the market (see Table 1). In future, all registrations of "new" labels will expire after a period of 5 years from the date of registration (except for "new" label registrations of dishwashers made before 30 September 2001: see below).

**Table 1 Appliance Models On Labelling Registers, April 1999**

	Models on register at 30 Sept 1999	Models on sale, April 99	Registered but not on sale, April 99	Current/all registered
Refrigerators and Freezers	1341	322	1019	24%
Dishwashers	400	139	261	35%
Air-conditioners	1957	681	1276	35%
Clothes Washers	642	152	490	24%
Clothes Dryers	220	53	167	24%
All registered models	4560	1347	3213	30%

Source: Energy Efficient Strategies, Personal Communication

Between 1 April 2000 and 30 September 2000 (the "overlap period") suppliers will have the option of registering new models with either the old or the new label, but if the old label is used the registration expires on 1 October 2000. After 30 September 2000 only registrations of the new label will be accepted. Suppliers would avoid re-registration costs if they refrained from introducing new models with the old label during the overlap period, but they may judge that the commercial advantage of being able to display a higher star rating, if only for a few months, outweighs the costs.

The major potential source of buyer confusion is the possibility of seeing models with old labels next to models with new labels in the same showroom. At first glance the new label models could appear to be less efficient than the old label models because they will display fewer stars for the same level of energy efficiency.

In order to minimise the possibility NAEEEC has planned a "display transition period" running from 1 July to 30 September 2000. NAEEEC will work with appliance suppliers and retailers to try to ensure that:

- For every unit remaining on showroom floors after 1 July 2000, the retailer sticks the new label over the old label. This will require coordination between suppliers and retailers;
- Whenever a model is put on display after 1 July 2000, the retailer selects a new labelled unit from the packaged stock in preference to an old labelled unit. This will require retail staff to take more care in selecting floor stock (and would greatly be assisted if the supplier marks the carton in some way).

NAEEEC has budgeted \$ 250,000 for retailer information and other targeted publicity for this “display transition” program, the objective of which is that no old labels should remain on showroom display after 30 September 2000. Clearly, suppliers and retailers will also bear some costs in printing, distributing and fixing over-stick labels and in managing the showroom stock more carefully during the transition process.

It remains to be seen how successful the transition process will be. There will inevitably be some showrooms where both label types are on display for significant periods, some where old labels remain on display after 30 September 2000, and some where new labels comes on display before 1 July.<sup>6</sup> There will also be some errors when labels are over-stuck.<sup>7</sup> These occurrences could disrupt the use of the label in the product selection process, but to a limited degree and for a limited period.

Furthermore, some consumers may select a model on the basis of a new label in the showroom but have a unit with the old label delivered from the warehouse. This would not impact on the selection process, but may generate some follow-up inquiries to the retailer, the product supplier or government authorities. If the reverse should occur (ie selection on the basis of the old label but having a unit with a new label delivered) the chance of confusion would be less, because of the explanation on the label and the additional contact information (ie government freecall number and internet site address).

It is impossible to estimate a monetary cost for these temporary disruptions to consumers. On the one hand, consumers who visit showrooms where the display transition is not well managed may find it more difficult to take energy efficiency into account in their purchase decision, and may purchase a somewhat less efficient model than otherwise. On the other hand, noticing the new labels could increase customer interest in energy efficiency, even if there are many old labels in the same showroom. For customers who use leaflets or the internet to compare product energy efficiency, the task will be made much easier by the removal of obsolete registrations.

The transition for dishwashers will be somewhat different. The arrangements for expiry of old label registrations, the overlap period and the display transition period will be the same. However, new labels registered during the overlap period will not be registered for 5 years as for other appliances but will expire on 30 September 2001. This is because the new dishwasher energy test standard currently being developed is expected to be ready in early 2001. Even though labels will be in the new format they cannot reflect performance under the revised test until the models are actually retested. Some (but not all) models may then need new labels. A second “display transition period” will be necessary, for dishwashers only. It is expected that this will take place a year after the initial transition period, ie 1 July to 30 September 2001.

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<sup>6</sup> Some companies may choose to replace all “old” labels on their between 1 April 2000, when new label registrations become possible, and 30 June 2000, when the “display transition” period commences. This would extend the period in which costs are incurred from 3 to 6 months, but not necessarily increase the costs.

<sup>7</sup> In the early 1980s, manufacturers advised that labelling all units leaving the factory was the most cost-effective way of ensuring that the correct label appeared on the correct model in the showroom. Matching labels to models in the showroom is bound to introduce some degree of error.

As a result of these arrangements, appliance models can be categorised into five distinct classes, as shown in Table 2. The table summarises the quantifiable cost factors associated with changing labelling arrangements for each class.

**Table 2 Stages in Transition to New Label**

Class	Description	Registration status	Additional costs imposed:
A	R,F,A/C,DW,CW,CD registered prior to 1 April 2000	Expires 1 October 2000	For obsolete registrations: none For models removed from sales during overlap period (1): none For models continuing on market after overlap period: label re-registration and display transition costs (2)
B	R,F,A/C,DW,CW,CD registered with "old" label between 1 April and 30 Sept 2000 (1)	Expires 1 October 2000	For models removed from sales during overlap period (1): none For models continuing on market after overlap period: label re-registration and display transition costs (2)
C	R,F,A/C,CW,CD registered with "new" label between 1 April and 30 Sept 2000 (1)	Expires 5 years from date of registration	No additional costs
D	DW registered with "new" labels between 1 April 2000 and 30 September 2001	Expires 30 September 2001	For models removed from sales before 30 Sept 2001: none For models continuing on market after 30 Sept 2001: retesting to new DW standard (3), label re-registration and second display transition cost
E	R,F,A/C,CW,CD registered after 30 September 2000 and DW registered after 30 September 2001	Expires 5 years from date of registration	No additional costs

(1) Overlap period (1 April 2000 – 30 Sept 2000): new registrations of both label versions accepted

(2) Display transition period (1 July 2000 – 30 Sept 2000): labels changed from "old" to "new" on showroom display models, or "new" labelled models selected for display in preference to "old" labelled models.

(3) New DW test standard expected in early 2001.

The cost of the label revision is estimated as the sum of the following factors:

1. Costs to suppliers of re-registration of models (two re-registrations in the case of some dishwasher models). This is estimated at \$ 250 per unit (\$ 150 registration fee and \$ 100 in internal administrative costs borne by the supplier).
2. Costs to suppliers and/or retailers of verifying labels, re-labelling units or selecting new-label units for display during the transition period (and second transition period for some dishwasher models). This is estimated at \$ 10 for every unit displayed in appliance showrooms during the display transition periods.
3. Costs to suppliers of retesting dishwashers. This is estimated at \$ 5,000 per model tested (three tests are needed per model).
4. Costs to government of supporting the label development (\$ 100,000, already expended) and the display transition period (\$ 250,000, budgeted).

The RIS cost/benefit model ultimately aggregates all costs and benefits from the perspective of the appliance buyer, although business compliance costs and administrative costs are distinctly identified. Given that compliance is mandatory, all suppliers incur labelling costs, which they are more or less equally able to pass on to consumers.<sup>8</sup> It is assumed that when supplier labelling costs are passed on to appliance buyers they are marked up in the same proportion as the ratio of retail to wholesale price, ie a factor of 2. Therefore the total costs to consumers of elements 1 to 3 above is estimated as twice the calculated amount. Government costs are not marked up.

In order to calculate the number of models subject to re-registration, it is necessary to make assumptions about the average number of new models registered each month and the rate at which models become obsolete. Table 3 indicates the actual rate of monthly registrations recorded during the full calendar year 1998, and the rates assumed for modelling purposes.

**Table 3 Assumptions re Registration Cost Estimates**

	Average registrations per month, 1998	New registrations per month assumed for modelling	Obsolete registrations per month assumed for modelling	Net increase per month assumed for modelling
Refrigerators and Freezers	8.3	10	6	4
Dishwashers	4.9	6	3	3
Air-conditioners	33.2	36	25	11
Clothes Washers	8.8	10	7	3
Clothes Dryers	2.5	4	1	3
All models	57.7	66	42	24

Table 4 summarises the assumptions regarding the number of units which will incur re-labelling (or label selection) costs during the first display transition period of three months. The July to September period has a somewhat lower rate of sales than the annual average for refrigerator and air conditioners, but higher for clothes dryers. It is assumed that 10% of units sold pass through showrooms and incur label change costs, while 90% are delivered direct from warehouse to buyer and need no label change.

**Table 4 Assumptions re Display Transition Cost Estimates**

	Annual sales ('000)	Sales during transition period ('000)	% of sales displayed in showroom	Units needing label change ('000)	Costs of label change
Refrigerators and Freezers	750	150	10%	15.0	\$ 150,000
Dishwashers	180	45	10%	4.5	\$ 45,000
Air-conditioners	250	42	10%	4.2	\$ 41,667
Clothes Washers	500	125	10%	12.5	\$ 125,000
Clothes Dryers	280	93	10%	9.3	\$ 93,333
All models	1960	455		45.5	\$ 455,000

<sup>8</sup> The testing and administrative costs per unit sold would be somewhat greater for suppliers with lower sales per model, and competitive pressures may force such suppliers to absorb somewhat more of these costs in the short term, but these factors may be less significant than the ability of suppliers to increase sales of more efficient – and higher margin – products as a result of the existence of universal labelling.

The supplier costs, calculated from the cost estimates given earlier and the volume assumptions in Table 3 and Table 4, are detailed in Appendix A. The three cost factors (label re-registration, display transition and retesting of dishwashers) are similar in magnitude, and the total cost to appliance suppliers (manufacturers and retailers) is estimated at about \$ 1.4 M. Given the normal retail markups, this implies a cost to appliance buyers of over \$ 2.8 M.

Table 5 summarises the cost of introduction of the new labels as about \$ 3.2 million from the perspective of appliance buyers (undiscounted). Nearly 90% of this would be supplier costs passed on to consumers, and the rest government administration costs. The costs equate to about \$1.63 per appliance sold if spread over one year, and \$ 0.14 per appliance sold if spread over 10 years.

When the label changes in 2000 it will be the first such change in the 15 years of the program, and it would be reasonable to assume that there would not be another complete label redesign for another decade at least. However, there may be a need to change certain aspects of the label when there are changes in the MEPS levels affecting labelled appliances, as may occur every 4 to 5 years, and this may involve some reregistration or retesting. It is impossible to speculate on the scope, costs and benefits of such changes at present, but it is likely that any costs could be accommodated within the general cost projection envelope used in the modelling.

**Table 5 Total Costs from Consumer Perspective**

	Total costs to suppliers	With retail markup	Share of total costs	\$/unit sold in one year	\$/unit sold in 10 years
Refrigerators & Freezers	\$ 247,000	\$ 494,000		\$ 0.66	\$ 0.05
Dishwashers	\$ 625,300	\$ 1,250,600		\$ 6.95	\$ 0.58
Air-conditioners	\$ 256,167	\$ 512,333		\$ 2.05	\$ 0.17
Clothes Washers	\$ 175,000	\$ 350,000		\$ 0.70	\$ 0.06
Clothes Dryers	\$ 119,583	\$ 239,167		\$ 0.85	\$ 0.07
<b>All types</b>	<b>\$ 1,423,050</b>	<b>\$ 2,846,100</b>	<b>89.1%</b>	<b>\$ 1.45</b>	<b>\$ 0.12</b>
Label design and market research		\$ 100,000	3.1%	\$ 0.05	\$ 0.00
Publicity during transition		\$ 250,000	7.8%	\$ 0.13	\$ 0.01
Grand total		\$ 3,196,100	100.0%	\$ 1.63	\$ 0.14

### 3.3 Benefit/Cost Ratios

The main characteristics of the two relevant scenarios from the RIS modelling are summarised in Table 6, for the whole of Australia. The values relate to sales of all labelled and MEPS-compliant appliances in the period 1999-2015 inclusive: ie 17 years of appliance sales in all. Both scenarios include the impact of mandatory MEPS for refrigerators, freezers and electric water heaters, so the difference between the two scenarios is due solely to the increased effectiveness of energy labelling

It was estimated that the costs of testing, labelling and program administration in the enhanced labelling scenario are about \$ 27 M higher than in the baseline labelling scenario. As Table 5 shows, the estimated cost of the label change is about \$ 3.2 M,

or about 12% of the increased labelling cost allowed in the modelling. This means that a further \$ 24 M could still be spent on other measures to enhance the effectiveness of labelling, such as advertising and promotion, without exceeding the cost estimates in the model.

**Table 6 Modelled Benefits and Costs of Labelling Enhancement**

		Baseline (declining labelling effectiveness)(a)	Chosen option (enhanced labelling effectiveness)(b)	Difference (Baseline option – chosen option)(c)
Lifetime energy	GWh	256004	228003	-28001 (d)
Lifetime CO <sub>2</sub>	kt	237990	211962	-26028 (d)
NPV, Energy costs	\$M (1998)	25947	23183	-2764 (d)
NPV, Purchase costs	\$M (1998)	35990	36990	1001 (e)
NPV, Labelling costs	\$M (1998)	83	110	27 (e)
Total NPV	\$M (1998)	62020	60284	-1737

(a) Scenario 2a (b) Scenario B (c) Both scenarios include the impact of mandatory MEPS for refrigerators, freezers and electric water heaters, so the difference between the two scenarios is due solely to the increased effectiveness of energy labelling. (d) Negative value indicates greater benefit for chosen option. (e) Positive value indicates higher cost for chosen option.

It should be noted that the additional labelling costs are in fact only a minor part of the projected costs of the enhanced labelling scenario. By far the larger part is the estimated \$ 1 billion extra that consumers are expected to spend on appliances, as a result of their greater preference for more efficient appliances due to the enhanced effectiveness of labelling. Even so, this equates to less than 3% increase in the average purchase price of appliances.

From the modelling, the benefit of label enhancement is the net present value (NPV) of the projected energy saving over the period 1999-2015 through the purchase of more efficient appliances than otherwise: \$2,764 M (undiscounted). The cost is the NPV of the additional appliance cost (\$1,001 M) and the additional labelling costs (\$27 M): \$1,028 M in all. Therefore the benefit/cost ratio is  $2,764/1,028 = 2.7$  (undiscounted). The ratio at 4% discount rate is 2.2, and at 8% discount rate, 1.8 (see Appendix A).

Because the labelling cost is such a small proportion of the additional cost of the enhanced labelling scenario, the benefit/cost ratio is insensitive to change in labelling cost assumptions. For example, if the cost estimated for the label changeover (\$3.2M) were used instead of \$27 M, the benefit/cost ratio would change only from 2.7 to 2.8 ( $2,764/1,004$ ). However, this implies that the same level of benefit could be obtained at the lower expenditure. This may not be the case. Continuing promotional effort may well be necessary to realise the *potential* for enhanced effectiveness that the change in the label design will create. If this additional program expenditure amounted to about \$1.6 M per year (ie \$24 M over the modelling period) the total cost would approximate the \$27 M assumed in the modelling.

If a monetary value were assigned to the CO<sub>2</sub> emitted in generating the electricity consumed by appliances, the benefit/cost ratios of enhancing the effectiveness of labelling would increase (except in Tasmania, where electricity is generated from zero-emissions sources).

### 3.4 CO<sub>2</sub> Reductions

The projected reductions in greenhouse gas emissions due to increasing the effectiveness of the energy labelling program are summarised in Table 7. It is projected that emissions associated with the lifetime electricity consumption of appliances purchased new over the period 1999-2015 will be reduced by about 26.0 Mt CO<sub>2</sub>-e, or 11% less than if the program effectiveness remains at its present level. The average impact during the Kyoto Protocol “commitment period”, 2008-12, is estimated at 2.2 Mt CO<sub>2</sub>-e per annum.

**Table 7 Projected Reductions in CO<sub>2</sub>-equivalent Emissions**

	Mt CO <sub>2</sub> -e present level of effectiveness(a)	Mt CO <sub>2</sub> -e enhanced effectiveness(a)	Mt CO <sub>2</sub> -e saved, 1999 to 2015	% of baseline CO <sub>2</sub> -e saved	Average Mt CO <sub>2</sub> -e saved per year, 2008-12(b)
NSW	63.1	56.4	6.7	10.6%	0.6
VIC	73.7	65.5	8.2	11.1%	0.7
QLD	56.7	50.3	6.3	11.2%	0.5
WA	21.3	19.0	2.3	10.9%	0.2
SA	17.2	15.3	1.8	10.7%	0.2
Tasmania	0.0	0.0	0.0	0.0%	0.0
ACT	3.1	2.8	0.3	10.6%	0.0
NT	2.9	2.6	0.3	10.8%	0.0
Australia	238.0	212.0	26.0	10.9%	2.2

(a) Projected emissions associated with lifetime electricity consumption of appliances purchased new, 1999-2015 (b) Kyoto Protocol Commitment Period

## 4. Consultation

The public consultation process on the original RIS included a mailout to about 250 individuals and organisations. The AGO advertised the availability of the RIS and the dates and venues of public fora in Sydney and Melbourne, which were held in March and April 1999. The consultation process is summarised in *Regulatory Impact Assessment: Energy Labelling and Minimum Energy Performance Standards for Household electrical appliances in Australia: Responses to Public Comments* (GWA (1999c)).

This supplementary cost-benefit analysis is being mailed out to the same individuals and organisations as was the original RIS, and also to participants in the public fora.

## 5. Evaluation

The estimated costs and benefits if the proposed transition to a revised energy label, to take place between 1 April and 30 September 2000 (with a further stage to 30 September 2001 for dishwashers) are summarised in Table 8.

The estimated once-off cost of the transition is \$ 3.2 M. It was projected in the original RIS that the costs of testing, labelling and program administration in the enhanced labelling scenario would be about \$ 27 M higher than in the baseline labelling scenario. Therefore the cost estimate based on later, more detailed information is well within the original projection.

The original estimates of labelling costs and community benefits in the RIS therefore still stand, and are indeed reinforced by this supplementary analysis.

**Table 8 Estimated Costs of Proposed Transition to Revised Label**

	Estimated cost (a)	% of total cost
Registration of "new" labels for models remaining on the market	\$ 920,000	29%
Re-labelling and other display management during transition period	\$ 955,000	30%
Re-testing of dishwashers after introduction of new Standard, 2001	\$ 972,000	30%
Label design development and market research	\$ 100,000	3%
NAEEEC publicity program to assist with transition period	\$ 250,000	8%
Total cost of proposed change	\$ 3,196,000	100%

(a) From perspective of appliance buyers: supplier and retailer costs marked up to retail price

## **6. Review of Regulations**

The regulations which enable the revision of the energy label to take place are the model regulations which have been (or are in the process of being) adopted by the States and Territories following the original RIS. The need for the regulations will presumably continue to be reviewed from time to time, as it was in the RIS, and the regulations will be renewed or retained so long as Governments are satisfied there is a need for them.

So long as the model regulations are retained, the range of appliances scheduled, the precise labelling requirements (if any) for scheduled appliances and the MEPS levels (if any) for scheduled appliances can change from time to time. The revision of the energy label covered in the present study represents such a change.

When the label changes in 2000 it will be the first such change in the 15 years of the program, and it would be reasonable to assume that there would not be another complete label redesign for another decade at least. However, there may be a need to change certain aspects of the label when there are changes in the MEPS levels affecting labelled appliances, as may occur every 4 to 5 years, and this may involve some reregistration or retesting. It is impossible to speculate on the scope, costs and benefits of such changes at present, but it is likely that any costs could be accommodated within the general cost projection envelope used in the modelling.

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## References

COAG (1997) *Council of Australian Governments: Principles and Guidelines for National Standard Setting and Regulatory Action by Ministerial Councils and Standard-Setting Bodies*. Endorsed by COAG April 1995, Amended by COAG November 1997.

GWA et al (1991) *Review of Residential Appliance Energy Labelling*, George Wilkenfeld and Associates, with Test Research and Artcraft Research. Prepared for the State Electricity Commission of Victoria, September 1991

GWA (1999a) *Regulatory Impact Statement: Energy Labelling and Minimum Energy Performance Standards for Household electrical appliances in Australia*. George Wilkenfeld and Associates, with assistance from Energy Efficient Strategies, February 1999.

GWA (1999b) *Regulatory Impact Assessment: Energy Labelling and Minimum Energy Performance Standards for Household electrical appliances in Australia*. George Wilkenfeld and Associates, with assistance from Energy Efficient Strategies, February 1999.

GWA (1999c) *Regulatory Impact Assessment: Energy Labelling and Minimum Energy Performance Standards for Household electrical appliances in Australia: Responses to Public Comments* George Wilkenfeld and Associates, May 1999.

NAEEEC (1999) *National Appliance & Equipment Energy Efficiency Program*  
National Appliance and Equipment Energy Efficiency Committee

NGS (1998) *National Greenhouse Strategy*

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## Appendix A Estimated Costs of Transition

<b>Class A</b>	Models on Register at 1 Apr 2000	Models obsolete at 1 Apr 2000	Models current at 1 Apr 2000	Models removed by 1 Oct 2000	Models remaining, 1 Oct 2000	Label re-registration costs	Display transition costs	<b>Total costs, Class A products</b>
Refrigerators & Freezers	1461	1091	370	36	334	\$ 83,500	\$ 129,124	<b>\$ 212,624</b>
Dishwashers	472	297	175	18	157	\$ 39,250	\$ 37,184	<b>\$ 76,434</b>
Air-conditioners	2389	1576	813	150	663	\$ 165,750	\$ 32,197	<b>\$ 197,947</b>
Clothes Washers	762	574	188	42	146	\$ 36,500	\$ 91,250	<b>\$ 127,750</b>
Clothes Dryers	268	179	89	6	83	\$ 20,750	\$ 73,778	<b>\$ 94,528</b>
<b>All types</b>	<b>5352</b>	<b>3717</b>	<b>1635</b>	<b>252</b>	<b>1383</b>	<b>\$ 345,750</b>	<b>\$ 363,533</b>	<b>\$ 709,283</b>
<b>Class B</b>	Models on Register at 1 Apr 2000			Models removed by 1 Oct 2000	Models remaining, 1 Oct 2000	Label re-registration costs	Display transition costs	<b>Total costs, Class B products</b>
Refrigerators & Freezers	60			6	54	\$ 13,500	\$ 20,876	<b>\$ 34,376</b>
Dishwashers	36			3	33	\$ 8,250	\$ 7,816	<b>\$ 16,066</b>
Air-conditioners	216			21	195	\$ 48,750	\$ 9,470	<b>\$ 58,220</b>
Clothes Washers	60			6	54	\$ 13,500	\$ 33,750	<b>\$ 47,250</b>
Clothes Dryers	24			2	22	\$ 5,500	\$ 19,556	<b>\$ 25,056</b>
<b>All types</b>	<b>396</b>			<b>38</b>	<b>358</b>	<b>\$ 89,500</b>	<b>\$ 91,467</b>	<b>\$ 180,967</b>
<b>Class D</b>	Registered Apr 2000 to Oct 2001		Models removed by 1 Oct 2001	Models remaining, 1 Oct 2001	Costs of retesting to standard	Label re-registration costs	Display transition costs	<b>Total costs Class D products</b>
<b>Dishwashers</b>	<b>108</b>		<b>11</b>	<b>97</b>	<b>\$ 486,000</b>	<b>\$ 24,300</b>	<b>\$ 22,500</b>	<b>\$ 532,800</b>
<b>All classes affected</b>					Costs of testing to new standard	Label re-registration costs	Display transition costs	Total costs Class D products
Refrigerators & Freezers						\$ 97,000	\$ 150,000	\$ 247,000
Dishwashers					\$ 486,000	\$ 71,800	\$ 67,500	\$ 625,300
Air-conditioners						\$ 214,500	\$ 41,667	\$ 256,167
Clothes Washers						\$ 50,000	\$ 125,000	\$ 175,000
Clothes Dryers						\$ 26,250	\$ 93,333	\$ 119,583
<b>All types</b>					<b>\$ 486,000</b>	<b>\$ 459,550</b>	<b>\$ 477,500</b>	<b>\$1,423,050</b>



## Appendix B Cost/Benefit Modelling Outputs

**Table B1. Impact of Enhanced Effectiveness of Energy Labelling, 0% discount**

			NSW	VIC	QLD	WA	SA	TAS	NT	ACT	Totals
	Sales	'000	13590	10134	10313	4140	3229	987	519	638	43550
<b>Labelling at current level of effectiveness (+MEPS)</b>	Lifetime energy	GWh	78159	58019	64305	23095	18615	5609	4630	3572	256004
	Lifetime CO2	kt	63087	73678	56663	21331	17156	10	3148	2916	237990
	NPV, Energy costs	\$M (1998)	7414	6813	5498	2829	2160	350	597	285	25947
	NPV, Purchase costs	\$M (1998)	11367	8608	8252	3292	2807	668	468	528	35990
	NPV, Labelling costs	\$M (1998)	26.7	20.8	17.1	7.5	7.0	1.5	1.3	1.2	83
	Total NPV	\$M (1998)	18808	15441	13767	6129	4974	1019	1067	814	62020
<b>Labelling at increased level of effectiveness (+MEPS)</b>	Lifetime energy	GWh	69816	51492	57052	20578	16595	5147	4140	3183	228003
	Lifetime CO2	kt	56414	65479	50314	19015	15312	10	2815	2602	211962
	NPV, Energy costs	\$M (1998)	6654	6067	4897	2521	1934	321	534	255	23183
	NPV, Purchase costs	\$M (1998)	11673	8850	8492	3387	2880	685	480	543	36990
	NPV, Labelling costs	\$M (1998)	35.5	27.8	22.6	10.0	9.3	2.0	1.7	1.6	110
	Total NPV	\$M (1998)	18363	14944	13411	5918	4823	1008	1016	800	60284
<b>Difference (ie impact of increasing the effectiveness of labelling)</b>	Lifetime energy	GWh	-8343	-6526	-7253	-2517	-2021	-462	-491	-388	-28001
	Lifetime CO2	kt	-6672	-8199	-6349	-2316	-1844	-1	-333	-314	-26028
	NPV, Energy costs	\$M (1998)	-760	-746	-601	-308	-226	-29	-63	-31	-2764
	NPV, Purchase costs	\$M (1998)	306	242	240	94	73	17	12	15	1001
	NPV, Labelling costs	\$M (1998)	8.7	6.9	5.5	2.5	2.3	0.5	0.4	0.4	27
	Total NPV	\$M (1998)	-445	-497	-356	-211	-151	-11	-51	-15	-1737

**Table B2. Impact of Enhanced Effectiveness of Energy Labelling, 4% discount**

			NSW	VIC	QLD	WA	SA	TAS	NT	ACT	Totals
<b>Labelling at current level of effectiveness (+MEPS)</b>	Lifetime energy	GWh	78159	58019	64305	23095	18615	5609	4630	3572	256004
	Lifetime CO2	kt	63087	73678	56663	21331	17156	10	3148	2916	237990
	NPV, Energy costs	\$M (1998)	4207	3833	3069	1576	1225	201	334	161	14606
	NPV, Purchase costs	\$M (1998)	8052	6095	5760	2316	2000	476	328	373	25399
	NPV, Labelling costs	\$M (1998)	18.9	14.8	11.9	5.3	5.0	1.1	0.9	0.9	59
	Total NPV	\$M (1998)	12279	9942	8840	3897	3230	678	663	535	40064
<b>Labelling at increased level of effectiveness (+MEPS)</b>	Lifetime energy	GWh	69816	51492	57052	20578	16595	5147	4140	3183	228003
	Lifetime CO2	kt	56414	65479	50314	19015	15312	10	2815	2602	211962
	NPV, Energy costs	\$M (1998)	3818	3454	2762	1423	1110	187	302	145	13200
	NPV, Purchase costs	\$M (1998)	8247	6247	5911	2375	2047	487	336	383	26032
	NPV, Labelling costs	\$M (1998)	25.1	19.7	15.8	7.0	6.7	1.4	1.2	1.2	78
	Total NPV	\$M (1998)	12089	9722	8689	3805	3163	675	639	529	39310
<b>Difference (ie impact of increasing the effectiveness of labelling)</b>	Lifetime energy	GWh	-8343	-6526	-7253	-2517	-2021	-462	-491	-388	-28001
	Lifetime CO2	kt	-6672	-8199	-6349	-2316	-1844	-1	-333	-314	-26028
	NPV, Energy costs	\$M (1998)	-390	-378	-307	-153	-116	-15	-32	-16	-1406
	NPV, Purchase costs	\$M (1998)	194	153	151	59	46	11	8	10	632
	NPV, Labelling costs	\$M (1998)	6.2	4.9	3.8	1.7	1.6	0.3	0.3	0.3	19
	Total NPV	\$M (1998)	-189	-220	-151	-93	-67	-3	-24	-6	-754

**Table B3. Impact of Enhanced Effectiveness of Energy Labelling, 8% discount**

			NSW	VIC	QLD	WA	SA	TAS	NT	ACT	Totals
<b>Labelling at current level of effectiveness (+MEPS)</b>	Lifetime energy	GWh	78159	58019	64305	23095	18615	5609	4630	3572	256004
	Lifetime CO2	kt	63087	73678	56663	21331	17156	10	3148	2916	237990
	NPV, Energy costs	\$M (1998)	2581	2333	1853	951	752	125	202	98	8897
	NPV, Purchase costs	\$M (1998)	5981	4525	4218	1709	1494	355	241	276	18799
	NPV, Labelling costs	\$M (1998)	14.1	11.0	8.8	3.9	3.7	0.8	0.7	0.6	44
	Total NPV	\$M (1998)	8576	6869	6080	2665	2249	481	444	375	27739
<b>Labelling at increased level of effectiveness (+MEPS)</b>	Lifetime energy	GWh	69816	51492	57052	20578	16595	5147	4140	3183	228003
	Lifetime CO2	kt	56414	65479	50314	19015	15312	10	2815	2602	211962
	NPV, Energy costs	\$M (1998)	2366	2127	1685	869	688	117	184	90	8126
	NPV, Purchase costs	\$M (1998)	6109	4626	4318	1747	1524	362	246	283	19216
	NPV, Labelling costs	\$M (1998)	18.7	14.6	11.6	5.2	5.0	1.0	0.9	0.9	58
	Total NPV	\$M (1998)	8494	6767	6014	2622	2217	480	431	373	27399
<b>Difference (ie impact of increasing the effectiveness of labelling)</b>	Lifetime energy	GWh	-8343	-6526	-7253	-2517	-2021	-462	-491	-388	-28001
	Lifetime CO2	kt	-6672	-8199	-6349	-2316	-1844	-1	-333	-314	-26028
	NPV, Energy costs	\$M (1998)	-216	-207	-169	-82	-64	-8	-18	-9	-771
	NPV, Purchase costs	\$M (1998)	129	101	100	38	31	7	5	6	417
	NPV, Labelling costs	\$M (1998)	4.6	3.6	2.8	1.3	1.2	0.2	0.2	0.2	14
	Total NPV	\$M (1998)	-82	-102	-66	-43	-32	0	-12	-2	-340

**Table A4. Summary of Costs and Benefits of Enhanced Labelling, by State**

		NSW	VIC	QLD	WA	SA	TAS	NT	ACT	Totals
<b>0% discount rate</b>	Benefit (lower energy costs) \$M	760.2	745.8	601.4	307.9	226.3	28.7	63.3	30.6	2764.3
	Higher purchase & label costs \$M	315.1	248.9	245.1	96.7	75.6	18.0	12.7	15.8	1027.8
	Benefit/cost ratio	2.4	3.0	2.5	3.2	3.0	1.6	5.0	1.9	2.7
<b>4% discount rate</b>	Benefit (lower energy costs) \$M	389.8	378.2	306.6	153.2	115.6	14.5	32.2	15.6	1405.6
	Higher purchase & label costs \$M	200.5	157.8	155.2	60.4	48.1	11.3	8.0	10.0	651.3
	Benefit/cost ratio	1.9	2.4	2.0	2.5	2.4	1.3	4.0	1.6	2.2
<b>8% discount rate</b>	Benefit (lower energy costs) \$M	215.6	206.6	168.6	82.1	63.6	7.9	17.6	8.6	770.6
	Higher purchase & label costs \$M	133.3	104.5	102.6	39.3	32.0	7.5	5.2	6.6	431.0
	Benefit/cost ratio	1.6	2.0	1.6	2.1	2.0	1.1	3.4	1.3	1.8