A National Strategy for Consumer Product Resource Labelling in Australia

Prepared for the

Australian Greenhouse Office

by

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Executive Summary

Australia, like many other countries, has a number of separate resource efficiency labels, which inform buyers about the electricity, gas, fuel, water or other resource use of products, vehicles or buildings. Each labelling program has developed independently, as part of different Government and industry programs within, or in a few cases outside Australia. As each program increases its scope and coverage, there is increasing risk of buyer confusion (some products can now carry two or more labels) incompatible technical requirements and unacceptable industry costs.

Conversely, there is potential to increase the impact and cost-effectiveness of all resource labelling systems by addressing more buyers segments, by harmonising visual formats and by streamlining supplier and administrative costs.

If customers have no specific information on product resource efficiency, the average purchase will lie somewhere between the most and least efficient model. It is usually beyond the resources of individual suppliers – even those with efficient products - to establish a credible and universal resource labelling system, so a situation of information failure tends to persist in the market until Government or some other external agent facilitates or forces the introduction of resource labelling.

In the initial stages of a resource labelling program even buyers who do not use the label get some benefit from its existence, since a product randomly selected from the market will be more resource efficient than before. However, in the longer term the sustained impact of the program depends on how effectively the label influences buyer behaviour. This is influenced by factors such as:

- how well the label communicates with all segments of the target audience, or whether there are different labels targeted to different segments;
- how effectively the label is promoted (or promotes itself, as is the case with mandatory labelling);
- how easy it is for motivated buyers to identify the most efficient models as well as the least efficient ones: this can be expedited by special endorsement labels to identify the most and least efficient products;
- the range between the highest and lowest efficiencies on the market: eg if all models are similar in resource efficiency there is little point in labelling.

Labelling Modes

Information on resource use may be presented to prospective buyers in a variety of ways. Indeed, it is more useful to consider "modes" which communicate information in different ways rather than "label types", since the one label may carry several modes, and the same basic information may be presented in different modes for different segments of the target audience.

The ***informative mode*** simply advises the quantity of the stated resource consumed by the product when tested as stated.

The ***comparative mode*** in effect saves buyers the trouble of doing their own research, by locating the product along a spectrum from "low" to "high" efficiency.

The comparative mode may give too much information for buyers who only want to identify products of exceptionally high resource efficiency. These buyers may respond to an ***endorsement mode*** that is authoritative, ie from a trusted source that is independent of the manufacturer or retailer.

Finally, where products of lower resource efficiency remain on the market because MEPS are not sufficiently cost-effective, or because the products are not replaceable for certain niche applications, a ***warning mode*** label or logo will alert potential buyers to avoid those products where possible.

The development of different communication modes has contributed to the relative success of resource labelling in Australia.

Having a range of label modes becomes important at certain phases of program and product development. As average product efficiency improves a growing proportion of models rate 5 or 6 stars, so a high rating alone is not enough for consumers to quickly identify the most resource efficient. Conversely, when labels are rescaled, the visual range between most and least efficient is narrowed, also making differentiation more difficult. At these times an endorsement label such as *Top Energy Saver Award Winner* (TESAW) is an efficient way to assist consumers to identify the best on the market, since the criteria can be updated annually, whereas star rating scales tend to be locked in for a decade or more.

Convergence of Labelling Programs

The mandatory electrical appliance energy labelling program introduced in 1986 is by far the most successful resource labelling program in Australia, and one of the most successful in the world.

A number of major program changes is imminent: the introduction of a new mandatory water labelling program with both comparative and endorsement modes, a new framework for the gas labelling program and the introduction of a new endorsement mode label (TESAW) for both the electrical and gas appliance programs.

The electrical appliance, gas appliance and now the water labelling systems are converging in their coverage and in their modes of communication. It is important to manage this convergence process strategically so that the public benefit is maximised.

The need for a coordinated labelling strategy arises because:

- In some cases the one product can carry more than one label, so it is important to avoid confusion and conflict between the labels. (By 2005 the buyer of a clothes washer could be exposed to as many as three separate resource labels - Energy Rating , Water Rating and TESAW - communicating in a total of 5 modes: informative, comparative and endorsement for electricity use, and informative and comparative for water use);
- The same householders will come into contact with a succession of resource labels as they purchase successive products, and will instinctively try to interpret labels in similar ways;
- As buyers are made more aware of different resource impacts, there is a risk that they will be overwhelmed with information if the modes of communication compete with rather than complement each other;
- There is a risk that product suppliers, most of whom have been very cooperative with labelling programs in the past, will be subject to increasing testing, registration and labelling costs, and so will reduce their support for resource labelling.

Fortunately there is a historic opportunity to develop such a coordinated product resource labelling strategy, because:

- There is a large body of administrative and industry experience with resource labels, so it is possible to apply lessons learned in one program to others;
- There is a common audience for resource labels, and it is possible to build on this familiarity (especially with the electrical appliance energy label) to the benefit of all programs;
- Governments (Commonwealth, State and Territory) have the leadership role in the energy and water labelling programs, and are assuming joint leadership with the industry for the gas labelling program, so are in a position to plan for greater coordination.

Potential Benefits

The benefits and costs of a coordinated resource strategy labelling can be roughly estimated by reference to the cost/benefit studies of the existing labelling programs.

The main monetary benefits are the value of the resources saved. The greenhouse gas emissions avoided through energy saving are also estimated but not (for the time being) given a monetary value.

The main costs are:

- The costs to government of program development and administration;

- The costs to product suppliers of any additional product testing, registration, production and fixing of labels, and administration;
- The costs to consumers of any increases in average product price due to greater consumer preference for the more efficient models on the market.

Once a resource labelling framework is in place, the costs of program changes tends to be very small, and in most cases the projected increase in average product prices that is voluntarily borne by consumers represents the great majority of the total cost. This is particularly so for program elements such as endorsement labels, because suppliers are free to make their own judgements about the cost-effectiveness to them of using the label, and can opt not to do so if they wish.

It is impossible to estimate the impacts of any actions individually, let alone of strategic coordination as such, but the latter would increase the probability that actions which increase the effectiveness of resource labelling occur in a timely way. The following estimates are based on an assumption that the impact of electrical appliance energy labelling could be increased by 20% over what it would be if the program remains in its present form. The corresponding estimates for gas space heater labelling is 50%, gas water heater labelling 30%, and 10% for water efficiency labelling (which has only recently been agreed, and not yet introduced).

Over the period 2004-2020, enhancing the impact of the three resource labelling programs through a range of measures *could* lead to further electricity savings of nearly 3,000 GWh, further gas savings of nearly 14 PJ, further water savings of over 40,000 Ml, further greenhouse savings of more than 3 million tonnes CO_2-e, and further monetary savings of nearly $M 670 (undiscounted).

Summary of projected benefits of resource labelling program enhancement

	Projected savings over period 2004-2020			
	BAU label	Enhanced	Difference	Difference
Electricity savings - GWh	19024	21950	2927	15%
Gas savings - PJ	44.2	57.9	13.7	31%
Water savings - ML	451627	495762	44135	10%
Greenhouse savings - kt	18912	22218	3305	17%
Resource cost savings - $M	$M 4,001	$M 4,669	$M 668	16%

Source: Figure 7 to Figure 11

Conclusions

The three main household appliance labelling programs – for electricity, gas and water- have converged to the point where it is necessary to manage them jointly to maximise their impact and avoid conflicts.

It is possible to do so because all three programs are based on similar technical elements, employ similar communication modes and are moving towards a common administrative framework. At the same time, the energy label, as the longest-

established mandatory program, has such high recognition that it sets a precedent for the other resource labelling programs.

There is a historic opportunity to develop and implement a coordinated resource labelling strategy. However, care is needed to take advantage of this opportunity while preserving the integrity and effectiveness of the labelling programs.

Recommendations

Resource Labelling Program Management

1. Labelling should be considered as a communication system that includes informative, comparative, endorsement and (if necessary) warning modes, to address as many segments of the target audience as possible.

2. Product resource labelling should enable buyers to make their own judgements about the relative value of different resources and environmental impacts – this implies distinct (but coordinated) resource labelling rather than a combined "eco-label".

3. Product resource labelling should be based on and restricted to verifiable estimates of the quantity of resources directly consumed by the product under the stated patterns of usage, and the quantity of waste products, if that can be measured/estimated with a high degree of confidence.

4. To avoid the risk of undermining the credibility of resource labelling, Government-supported endorsement labels should be restricted to products, and should not be available for certifying services, design methods or organisations.

5. Labels themselves should not contain information which is likely to vary geographically or over time in an unpredictable way (eg resource price, greenhouse impacts, embodied resources) but this information could be accessible via websites.

6. The use of the Energy Star label in Australia should be restricted to indicating standby energy only.

7. If the application of comparative labels to a product class is demonstrated to be cost-effective and effective, than the use of such labels should be made mandatory;

8. For product classes where comparative labelling is feasible, but the mandatory application of labels to the product class as a whole cannot be demonstrated to be cost-effective and effective, suppliers should still have the option of using a label, but in doing so should assume obligations as if the label were mandatory

9. The use of endorsement labels should be optional.

10. For product classes where warning labels are necessary, the use of the warning labels should be mandatory

Label Scales and Algorithms

11. Changes in comparative rating scales (eg by rescaling the algorithms) should be considered at intervals of no greater than 10 years, and whenever there is a major change in the market, eg due to introduction of more stringent MEPS.

12. There should be reasonable parity between the scaling of all comparative labels – eg 1 to 2 scale units (stars) for "acceptable" efficiency, 3 to 4 for "good" and 5 to 6 for "excellent".

13. Whenever labels are rescaled, the algorithms should be set such that there are no models at the two highest scale units at the time of introduction of the new label, but achieving the highest scale units should be technically feasible. This will retain incentive for suppliers to continue to improve their products.

14. Major label changes (eg in tests, algorithms or label format) should be phased in over periods no longer than 12 months: after 12 months, all old labels should be deregistered, and there should be no "grandfathering".

Label Formats

15. Major revisions of tests, scales etc in comparative labels should be signalled to consumers by changes in label design, bars of different colour or year markings.

16. All market-based endorsement labels should clearly indicate the year

17. All comparative resource labels for household products (whether indicating electricity, gas, water or boosted solar energy use) should have an arched shape and a scale of either 5 or 6 stars to indicate comparative ratings, in steps of no less than half stars (ie no fractional or decimal stars).

18. All informative resource labels (or the informative elements of comparative labels) for the one product type should indicate the quantity of resources consumed over the same period of operation (eg a year), or the same number of operating cycles.

19. Where there are no reliable data on typical or average operating hours or cycles, or where these vary greatly within Australia, resource us per hour or per operating cycle should be indicated.

20. Both endorsement and warning labels for each resource type should be clearly related to the corresponding comparative label through colour, shape and title, but sufficiently differentiated so that there is no confusion between the three labelling modes.

21. There should be no images of stars on stand-alone warning labels, to reduce the chances of confusion or deliberate misrepresentation.

Supporting Information

22. All resource labels should promote a website address for further information.

23. All websites should have a common look and feel, and should be linked.

24. All websites should have resource cost and greenhouse impact calculators. For products that use both energy and water (eg clothes washers, dishwashers and showers) the cost and greenhouse impact calculators should take into account both the energy and the water use.

Label Placement

25. The placement of resource labels on products or their packaging at points of display for sale should be regulated, so that prospective buyers have a high probability of seeing the labels.

26. Where products must carry more than one label, it should be permissible to print the images on the one physical label, provided that the arrangement of the images follows the regulations.

27. Regulations should control the "information space" around resource labels to prevent other labels confusing or possibly contradicting the message

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Glossary

AGA	Australian Gas Association
ALPGA	Australian Liquefied Petroleum Gas Association
AGO	Australian Greenhouse Office
DEH	Department of Environment and Heritage
EPHC	Environment Protection and Heritage Council
GAMAA	Gas Appliance Manufacturers Association of Australia
Label	A sticker or tag attached to a product, intended to be seen by prospective purchasers at the point of sale
Labelling program	A government, industry or joint undertaking to ensure that labels of a defined format appear on specified products, and to ensure the integrity of the information on the labels
Labelling system	The use of different labels, label modes and supplementary channels (eg advertising, the internet) to communicate information in a coordinated way
Label variant	Permissible variation on the label format, eg in order to avoid two physical labels by combining information on the one label
Label element	Discrete visual elements of a label, eg star rating scale, resource consumption value, authorisation statement, Standards reference
Label format	The required visual appearance of the label or label image, encompassing dimensions, colours, layout of elements, type faces and sizes etc.
Label image	An image of the label for a specific product that appears in advertisements or brochures, rather than affixed to a sample of the product.
Label mode	The mode of communication adopted by the label (or by its various elements) – ie informative, comparative, endorsement, warning
MCE	Ministerial Council on Energy
MEPS	Minimum Energy Performance Standards
NAEEEC	National Appliance and Equipment Energy Efficiency Committee
NAEEEP	National Appliance and Equipment Energy Efficiency Program
OGS	Office of Gas Safety
Program elements	The key technical, administrative and communications elements supporting a labelling program or resource efficiency program, eg legislation, tests, algorithms, labels, MEPS, check testing, websites.
Resource	An essential commodity which has high value because of its scarcity or because of the high environmental costs of its extraction and use
Resource label	A label which indicates the quantity of a designated resource used by a product during typical operation, and/or resource efficiency (the output of services per unit of resource used)
Resource Efficiency Program	A government, industry or joint undertaking to ensure that the resource efficiency of products increases more rapidly than otherwise. The program may include labels, MEPS or both.
RIS	Regulation Impact Statement
SEAV	Sustainable Energy Authority Victoria

SEDA	Sustainable Energy Development Authority (NSW)
Standard	A published document describing the technical elements of a resource efficiency program: eg product classifications, test procedures, algorithms, labels, MEPS levels, check test procedures.
TESAW	Top Energy Saver Aware Winner
TTMRA	Trans Tasman Mutual Recognition Act
WEL	Water Efficiency Labelling
WES	Water Efficiency Standards (analogous to MEPS)
WSAA	Water Service Association of Australia

1. Principles of Product Labelling

1.1 Introduction

Background

Australia, like many other countries, has a number of separate resource efficiency labels, which inform buyers about the electricity, gas, fuel, water or other resource use of products, vehicles or buildings. Each labelling program has developed independently, as part of different Government and industry programs within, or in a few cases outside Australia. As each program increases its scope and coverage, there is increasing risk of buyer confusion (some products can now carry two or more labels) incompatible technical requirements and unacceptable industry costs.

Conversely, there is potential to increase the impact and cost-effectiveness of all resource labelling systems by addressing more buyers segments, by harmonising visual formats and by streamlining supplier and administrative costs.

At present the most comprehensive approach to these issues has been within the electrical appliance energy labelling scheme, ie the National Appliance and Equipment Energy Efficiency Program (NAEEEP). The comparative mode ("star rating") label has evolved considerably over the life of the program, and new labelling modes (endorsement and warning) are planned for 2004 and 2005.

There is now a very large public investment in the integrity and credibility of the "star rating" label. The Australian energy label has become a highly recognised and respected brand in its own right, and its influence on appliance purchase is greater (and better documented) than any other comparable resource labelling program anywhere in the world.

Electricity is not the only resource of interest to public policy or to product buyers and users in Australia. Gas and water use have also been the subjects of voluntary labelling programs. There are major changes under way in the gas and water labelling programs, which will place them on a similar footing to the NAEEEP:

- Gas labelling, which has since 1988 been managed by the gas industry association, is evolving into a joint government-industry program, supported by State and Territory gas regulations but most likely managed by a NAEEEP-like framework;

- Water labelling, which has been a voluntary program managed by the water industry association, is about to become a mandatory program supported by new Commonwealth legislation.

The Commonwealth Government will now be involved with all three resource labelling programs (electricity, gas and water) and there are clearly opportunities for coordination of administration and other program functions. Greenhouse considerations introduce a further dimension, since aware buyers are now interested in the implications of the choice of energy form, not just the efficiency of energy use. This makes it especially timely to consider a deliberate and strategic approach to resource labelling issues.

Purpose of this Paper

The purpose of this paper is as follows:

1. Describe the structure, scope and functions of the main Australian product labelling programs (ie electric, gas and water) and explain how labelling programs enhance the operation of the market, in both supply and demand terms;

2. Identify areas of convergence, overlap and potential conflict *within* these programs with regard to:

    - Product coverage
    - Label types, formats and modes
    - Regulations and administration
    - Testing and other costs to suppliers, retailers and other industry participants

    and make recommendation to minimise these problems, where applicable;

3. Identify areas of convergence, overlap and potential conflict between these programs and related resource and efficiency information programs, including (but not restricted to):

    - Building codes and labelling (ie house energy rating) programs
    - Solar water heating rating and labelling programs
    - International product labelling programs (eg the US *Energy Star*)

    and make recommendation to minimise these problems, where applicable;

4. Clarify the roles of different label modes and formats (eg comparative, TESAW-type and warning-type), and supplementary information systems (eg searchable websites) in maximising the reach and effectiveness of information on product efficiency;

5. Propose a set of strategies for maximising the combined impacts of the three main resource labelling programs (electricity, gas, water). These strategies should be expressed as a set of principles suitable for consideration by stakeholders. The

appropriate resource Ministers and Ministerial Councils responsible for the programs could, after a consultation process, adopt these principles;

6. Make a preliminary estimate of the national costs and benefits (with monetary, energy, water and greenhouse savings quantified where possible) of implementing the proposed strategic approach, compared with a baseline scenario of "no coordination" and "no new label formats" (ie no TESAW or warning labels).

Although the focus of this paper is on products using electricity, gas and water, there is some reference to closely related labelling and rating systems, ie those for houses and vehicles.

The focus of the paper is on labelling systems intended to influence the purchase of products used in the residential sector. Householders tend to approach all product purchases in similar ways, so a common approach across product types and resource types is possible. Products for non-residential use (eg electric motors, distribution transformers or urinals) are selected in different ways, and although information on resource use can influence the decision, the most effective mode of information delivery tends to vary from product to product, and decision-makers tend to be specialised in one resource area or another (eg energy vs water).

1.2 How Labels Impact on Markets

All appliance and equipment markets (whether for refrigerators, air conditioners or shower heads) operate as in Figure 1. The resource efficiency of the best products on the market tends to improve over time even without any labelling or Minimum Energy Performance Standards (MEPS) programs, since suppliers of high quality products are competing to improve their models in every respect including resource efficiency. At the other end of the market suppliers tend to build products for price-driven customers, and efficiency improves more slowly as innovations trickle down from the top end of the market. In fact, in Australia and the other relatively open markets in the Asia-Pacific region, resource efficiency at the bottom of the market can often deteriorate as low-cost, low-quality imports enter the market.

If customers have no specific information on product resource efficiency, the average purchase will lie somewhere between the between best and worst, as shown in Figure 1.[1] It is usually beyond the resources of individual suppliers – even those with efficient products - to establish a credible and universal resource labelling system, so a situation of information failure tends to persist in the market until Government or some other external agent facilitates or forces the introduction of resource labelling.

[1] The vertical scales in Figure 1 to Figure 3 represent an index of efficiency - the actual units do not matter. The horizontal scale indicates the time in years before and after the actual appearance of the labels in showrooms.

Figure 1 Appliance Market Without Resource Labelling

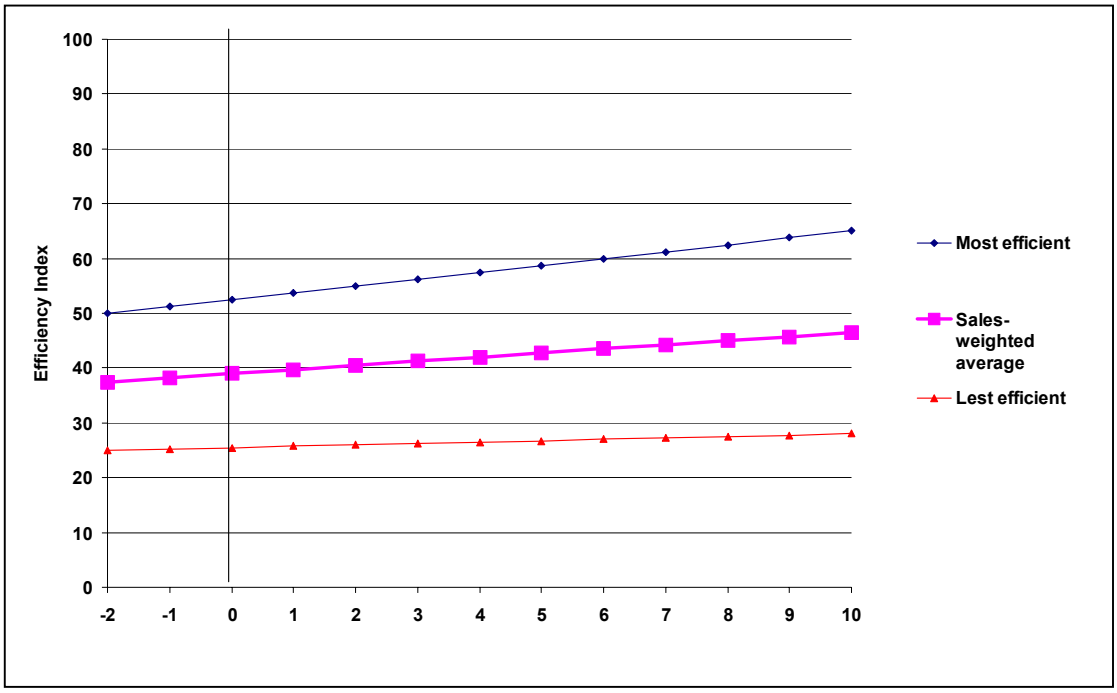


Figure 2 Appliance Market With Resource Labelling – supplier response only

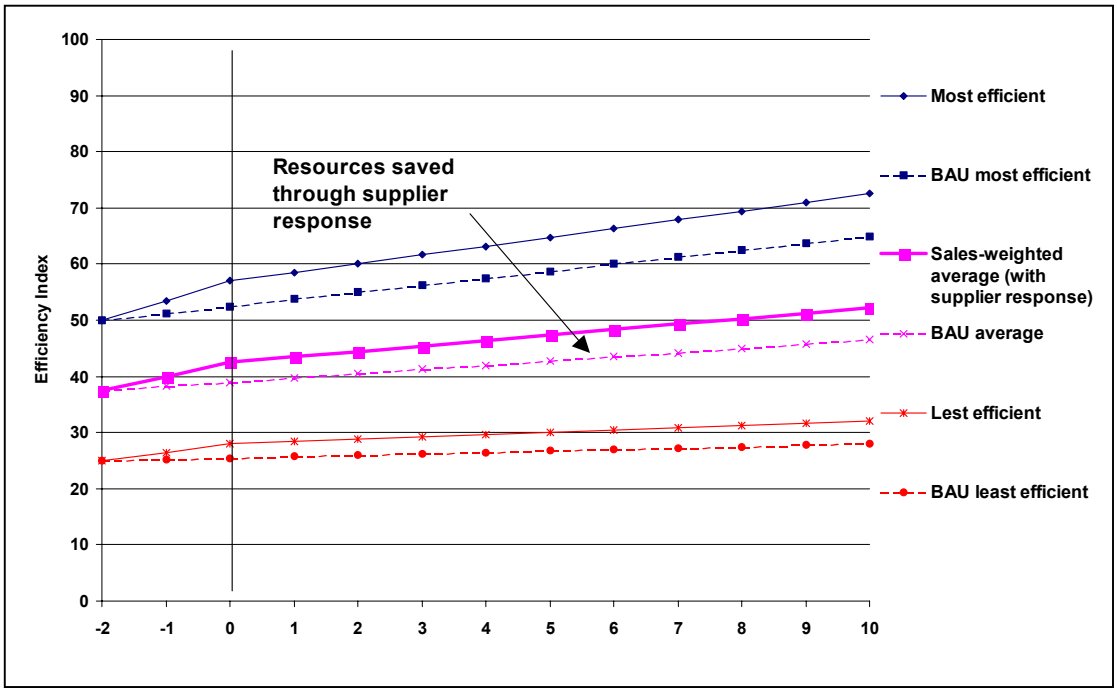
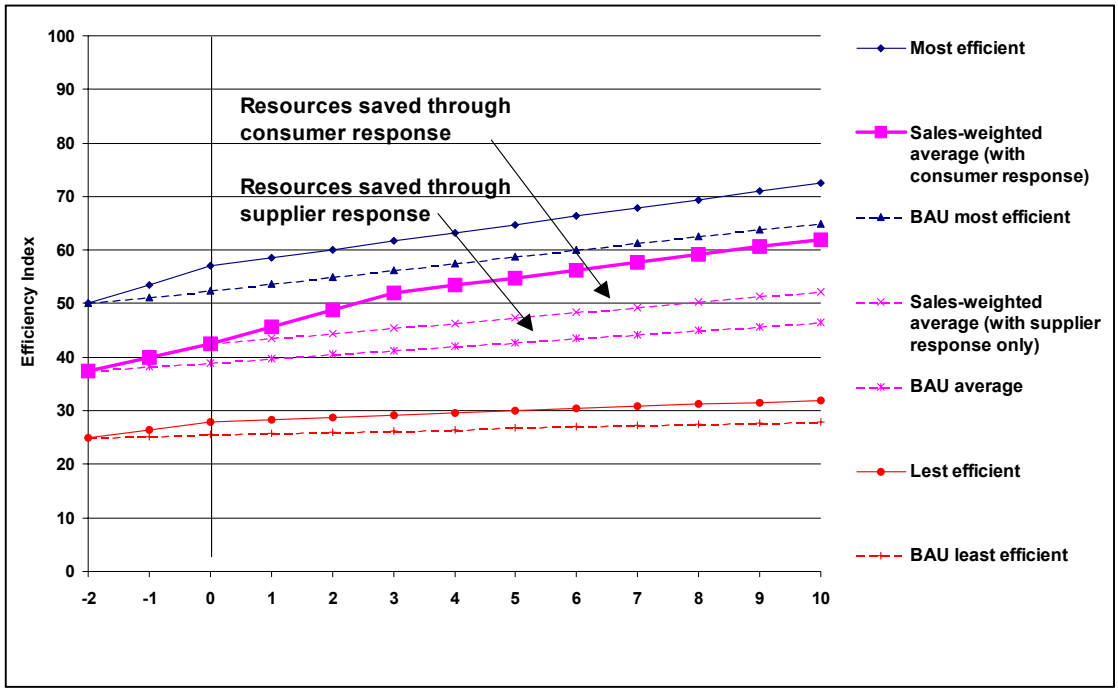


Figure 3 Appliance Market With Resource Labelling and Low Level MEPS



When a mandatory resource labelling program is introduced, there is usually a lead in period of a year or two to allow for product testing and other administrative arrangements. Suppliers often improve the efficiency of their products during this lead in period in order to gain commercial advantage (or avoid commercial damage) once labels actually appear. As a result the trend in average product resource efficiency follows a different path, shown in Figure 2, even before consumers become aware of labels at all. The resource savings to society are indicated by the area between the "BAU" and "sales weighted average with supplier response" lines. This phenomenon was documented in the first evaluation of electrical appliance labelling (GWA et al l991).

If labelling is voluntary suppliers will only label their more efficient models, not their less efficient ones. The increase in weighted average efficiency of purchases is much less than if labelling were mandatory for all products – ie the area "Resources saved through supplier response" will be smaller than in Figure 2.

Once labels appear some buyers begin to take them into account, and actively seek out more efficient models than the ones they would otherwise have purchased. This moves the trend in average efficiency even higher than what it would have been through supplier response alone (Figure 3). Product suppliers monitor the market, and they respond to growing consumer awareness of the resource efficiency labels by further increasing product efficiency. Conversely, if the labelling program is ineffective in influencing consumer choice suppliers will ease off their response and emphasise other aspects of product differentiation.

In the initial stages of a resource labelling program even buyers who do not use the label get some benefit from its existence, since a random selection from the market will give a more efficient appliances than before. However, in the longer term the sustained impact of the program depends on how effectively the label influences buyer behaviour. This is influenced by factors such as:

- how well the label communicates with all segments of the target audience, or whether there are different labels targeted to different segments;

- how effectively the label is promoted (or promotes itself, as is the case with mandatory labelling);

- how easy it is for motivated buyers to identify the most efficient models as well as the least efficient ones: this can be is expedited by special endorsement labels to identify the most and least efficient products;

- the range between the highest and lowest efficiencies on the market: eg if all models are similar in resource efficiency there is little point in labelling.

Experience has shown that even where labelling is mandatory, it does not remove the least efficient products from the market. This is because some buyers will always be driven by purchase price, even if they know that they would save more in running costs than the extra they would need to spend to buy a more efficient model. Also, some buyers will not bother to buy more efficient products because someone else will pay the running costs. This is typically the case with appliances bought for rented housing or offices (the "split incentives" effect).

For this reason, Australia has introduced MEPS in addition to energy labelling for some products, in order to drive the average efficiency level even higher than with labelling alone. Some MEPS are "low-level", in that they remove the least efficient segment of the existing models on the market. It is important to continue labelling even after such MEPS are introduced, since there is still a wide range of efficiencies from best to worst, and buyers will still benefit from seeking out the more efficient.

Sometimes it is only possible to have a significant impact on a product market through "high-level" MEPS, which eliminate all but the most efficient stratum of existing products or, in extreme cases, require the introduction of completely new models. High level MEPS will have a dramatic effect on the average efficiency of products, and will lead to greater reduction in energy use than other approaches. However, high level MEPS narrows the range between best and worst to such an extent that comparative energy labelling becomes much less effective, at least for a while. The buyer will take less notice of labelling if MEPS has eliminated all but the models with the highest efficiency ratings. Even so the efficiency range will probably widen over time as the best on the market continues to improve, and the influence of comparative labelling will again increase.

1.3 How Labels Communicate

Label Modes

It is possible to describe the types, functions or modes of resource labelling in a number of different ways (see for example CLASP 2001). The following typology (summarised in Table 1) is based largely on experience with and observation of the resource labelling schemes operating in Australia.

Information on resource use may be presented to prospective buyers in a variety of ways. Indeed, it is more useful to consider "modes" which communicate information in different ways rather than "label types", since the one label may carry several modes, and the same basic information may be presented in different modes for different segments of the target audience.

Information Modes

The ***informative mode*** simply advises the quantity of the stated resource consumed by the product when tested as stated (or perhaps the consumption based on time or usage cycle multiples of the tested consumption). Examples of the informative mode are the kWh per year, per usage cycle or per hour values on the Energy Label, the MJ per hour and MJ per year values on the Gas Label, and the litres per 100 km value on the Fuel Consumption Label. Another example of the informative mode is a mark indicating the presence of a feature considered to contribute to greater resource efficiency, but the effect of which cannot be quantified.[2]

On its own, the informative mode tells the prospective buyer nothing about the relative resource-efficiency of the product, but if buyers collect the information for a number of different products then some comparison is possible. Buyers would still have to make their own judgements about other factors that could affect the comparison, such as differences in product capacity or function.

The ***comparative mode*** in effect saves buyers the trouble of doing their own research, by locating the product along a spectrum from "low" to "high" efficiency. In order to place all the products on the same scale it is usually necessary to adjust the raw data of the informative mode for differences in capacity, function or other factors. The most effective way of communication in the comparative mode is by means of clear graphic devices, such as stars or other icons.

Even the comparative mode, however, may give too much information for buyers who only want identify products of exceptionally high resource efficiency. These buyers may respond to an ***endorsement mode*** that is authoritative, ie from a trusted source

[2] Sometimes the impact of the feature could eventually be quantified once there is agreement on how to incorporate its effect into the standard energy test – eg inverter (DC) motor-driven compressors in air conditioners.

that is independent of the manufacturer or retailer. An endorsement can be communicated by the presence of a recognised logo or symbol.

Finally, where products of lower resource efficiency remain on the market because MEPS are not sufficiently cost-effective, or because the products are not replaceable for certain niche applications, a ***warning mode*** label or logo will alert potential buyers to avoid those products where possible.

Table 1 Examples of Communication Modes of Resource Labels

Mode	Technical basis (slower revision)	Market/Judgement basis (more rapid revision)
Informative	L/100 km value on Fuel Consumption label kWh value on Energy Label MJ value on Gas Label	Indication of presence of features known to contribute to resource-efficiency, eg 'inverter' compressor or ability to wash in cold water
Comparative	Star rating scale on Energy Label Star rating scale on Gas Label 'A' scale on voluntary Water Label	No examples in Australia – was tried on original US energy label
Endorsement	Energy Star Galaxy Award for reaching preset star ratings	Former *Galaxy Innovation Award* *TESAW* Award
Warning	Proposed Water Warning label for showers Proposed Energy Warning label for electric water heaters below new (2005) MEPS	Proposed Energy Warning for high standby products

Technical Basis vs Market Basis

The information on the label may be based solely on technical criteria or it may communicate something about the current range of products on the market. For example, the level of energy consumption or energy efficiency which products must attain to get each additional star are specified in the test standards. These are technical criteria, which would not change even if every single model on the market rated six stars.

Endorsement labels, on the other hand, are most useful if they are market based, so they enable buyers to identify the most efficient models on the market at that time when they are making their selection. The endorsement criteria must therefore be reviewed regularly to ensure that they are up to date.

The distinction between technical and market based criteria is not always clear. Perhaps the more accurate distinction is between criteria that are revised infrequently, and criteria that are updated regularly to reflect the changing conditions of the market (eg *TESAW*) or expert judgements about the significance of design innovations (eg the now discontinued *Galaxy Innovation Award*). The technical criteria for the star rating levels on the energy label were originally set in 1985 (1989 for clothes washers and dryers). Although the need for re-rating was identified as early as 1991 (GWA et al 1991) it took until 2000 for all stakeholders to agree on the necessary changes in the underlying test methods and in rating algorithms.

Resource Use vs Price and Environmental Impact

Existing resource labels in Australia only convey information about resource use or resource efficiency. It has been argued that the costs and environmental impacts of resource use should also be labelled, but this is not feasible for the following reasons:

- Energy and water prices are highly variable from place to place, and change over time;
- The impact on household bills of a given product is difficult to estimate without reference to the tariff structure;
- The environmental impacts of resource use also tend to vary from place to place, and change over time: eg the greenhouse gas intensity of electricity supply depends on the mix of fossil and renewable energy forms used to generate it.[3]

In any case, the costs and environmental impacts of using a given product are roughly proportional to the resources it consumes, so if a product uses half the resources it will tend to have half the running costs and half the environmental impact. This message has been successfully conveyed to users of the energy label. The actual running costs and environmental impacts (eg greenhouse gas emissions) are better estimated on a website, where the user can specify the location and the energy tariffs.

It has also been argued that resource labels should include some indication of the energy or water "embodied" in the manufacture or distribution of the product. If this were to be done thoroughly it would increase the complexity of the calculation by an order of magnitude. Appliances are freely trade internationally, so it would be necessary to have data on the materials content, the source of the materials, the resource intensity of materials manufacture at that location and an estimate for transport energy. Alternatively, if the "embodied resource" estimate were based on arbitrary averages it would be misleading and could undermine the credibility of the resource labelling program as a whole.

The Rationale for Different Communication Modes and Labels

The development of the different communication modes in Table 1 has not been accidental, and has contributed to the relative success of resource labelling in Australia. Different communication modes address the motivations of different groups of product buyers. The more modes covered by the one label, or by several labels, the higher the probability that any given buyer will be influenced to take resource efficiency into account in the purchase – provided of course, that the proliferation of modes and labels does not itself become confusing.

[3] For fuel using products, some of the environmental impacts can be calcualted directly from the quantity of fuel used. For example, the new Fuel Consumption Label indicates not only litres per 100 km but also grams CO_2 emitted per km. The latter depends partly on former, and partly on the fuel type (eg petroleum, diesel or LPG).

Market Segmentation

Understanding the different attitudes, behaviours and information needs of different buyers is vital to developing an effective labelling system. The following segmentation of private consumers (ie buyers of household products) was developed by Artcraft Research, which has been undertaking regular consumer research for Australian resource labelling programs since 1982 (Artcraft 2003).

Segment A – THE 'PRO-ENVIRONMENT' SEGMENT:

- around one quarter of consumers;
- make largely emotional decisions based on their perception that what they are doing is good for the environment per se, rather than on more specific cost or energy efficiency criteria;
- tend to make decisions on the basis of simple messages or catch-cries, and do not wish to get bogged down in the detail; for example, once they have selected several similar appliances they would be happy to buy, these people might then look for the 'star' rating and buy the appliance with the most stars, often with no further reference to the label – indeed, a few of them do not even want any further information to be there, although most realise that others do need it;

The communication modes most likely to influence this segment are the simplest ones: the endorsement mode, the comparative mode and the warning mode.

Segment B – THE 'ENERGY EFFICIENT' SEGMENT:

- around one-quarter of consumers, with some moving between segments B and C;
- make decisions based on more specific technical data on the relative energy efficiency of appliances;
- tend to be more rational than emotional decisions (eg, not wasting resources) than Segment A, so look for quite specific detail on which they can judge resource efficiency; for example, once they have selected several similar appliances they would be happy to buy, these people then look for energy consumption data on the appliance label and seek to buy the appliance that uses the least energy for its class;
- Many will also refer to manufacturer, retailer and other sources (including occasionally the energyrating.gov.au website) to ensure that the ones they are looking at are the most efficient of all, without necessarily ever referring to the star rating – indeed, a few of them do not even want the stars to be there, although most realise that others do need them;

- They will also take some steps to look at water use as well, but more at this stage from the viewpoint of not wanting to waste water unnecessarily rather than to specifically look to saving it. These people have the potential to look for, and will willingly act on, detailed information about water consumption characteristics.
- Most of this segment are pro-environment as well.

The communication mode most likely to influence this segment is the informative mode, followed by the comparative mode.

Segment C – THE 'COST CONSCIOUS' SEGMENT:

- around one-third of consumers, with some moving between B and C;
- tend to make decisions based on whatever information they can find that might indicate comparative running costs of appliances;
- Decisions tend to be more rational than emotional, or constrained by money, so look for quite specific detail; for example, once they have selected several similar appliances they would be happy to buy, these people may then look for energy consumption on the appliance label (as a proxy for cost of running) and buy the appliance that is assumed by its lower energy figure to cost less to run, without necessarily being concerned about the star rating – indeed, some do not even want the stars to be there, although most realise that others do need them;
- In terms of water, they have similar specific information needs to Segment B, although their search for it is less urgent as they generally perceive that more money is to be saved with energy efficiency than with lower water consumption.
- Many of these people are pro-environment as well, but some pursue lower cost-of-running for its own sake or out of necessity.

The communication mode most likely to influence this segment is the informative mode, with quantified data on resource consumption, preferably linked to running cost data (via a website or ready reckoner). This segment will also be responsive to warning labels, since they fear taking on a product that will have high running costs.

Segment D – THE 'LATENT PRO-ENVIRONMENT/EFFICIENCY' SEGMENT:

- around 10-15% of consumers
- profess some concern for the environment, but do not yet apply this concern to appliance purchase decisions (ie, little or no priority). For example, although often aware of appliance labels, these people may not currently appreciate their relevance — in short, this is a segment that the current labelling program may be failing to reach.

- This group is steadily declining as they move into one or other of the first three segments largely as a result of ongoing exposure to resource labels.

All communication modes are effective in that they raise awareness of resource issues, and bring forward the day when the buyer moves into one of the "active" user segments (A.B or C).

Segment E – THE 'CURRENTLY UNREACHABLE' GROUP:

- Now probably less than 5% of Australian consumers;
- People in this small and declining segment express little or no concern for the environment or energy efficiency or even cost-of-running arguments.

It is currently beyond the capacity of resource labelling programs to reach these people. However, they like other segments will be affected by MEPS, since the possibility of purchasing the least efficient products will be removed.

Program Development

The value of different label modes also depends on the phase of program and product development. When energy labelling was first introduced, most labelled products rated 2 to 4 stars, so a 5 or 6 star rating was sufficient to identify the most efficient products. As average product efficiency improved a growing proportion of models rated at 5 or 6 stars, so a high rating alone was not enough for consumers (Segment A in particular) to quickly identify the most resource efficient. A voluntary TESAW type endorsement label is an efficient way to do this, since the criteria can be updated annually to track the market, whereas star rating scales on mandatory labels tend to be locked in for a decade or more.

If the star rating scales are revised by making them more stringent there may be a period when consumers cannot find many 5 or 6 star appliances on the market at all.[4] Again, a TESAW type label can identify those 3 or 4 star products that are the most efficient of their type.

Warning mode labels (which would have to be mandatory or no supplier would use them) may only be necessary for certain products or at a certain phases of program development. For example, a warning message is proposed for mains pressure storage water heater labels, during the 5 year period when models less efficient than the proposed MEPS level will be permitted to remain on the market to satisfy certain niche applications. Once that period is over and the new MEPS level applies without exception the warning message will no longer be necessary.

[4] It has been suggested that an alternative way to deal with bunching at the top of the scale is to extend the scale, eg to 10 stars. However, consumer research has consistently shown that label impact falls rapidly as the number of comparison steps increases above 6.

2. Resource Labelling Programs in Australia

2.1 Electric Appliance Labelling

In Australia, steps towards the energy labelling of selected products were initiated by the NSW government in the early 1980s. In 1985, after unsuccessful attempts by the Australian Minerals and Energy Council (a predecessor of the Ministerial Council for Energy) to introduce a voluntary scheme, the NSW and Victorian governments regulated for the mandatory energy labelling of refrigerators, freezers, dishwashers and air conditioners, to commence in December 1986. In 1990 Victoria introduced labelling for clothes washers and dryers, and SA made labelling mandatory for all six products. Since then other States and Territories have adopted mirror legislation, and the program is now national.

The electrical appliance labelling program is managed by the National Appliance and Equipment Energy Efficiency Committee (NAEEEC), comprising officials of Commonwealth, State, Territory and New Zealand agencies responsible for energy efficiency. An official of the Australian Greenhouse Office (AGO) chairs NAEEEC, and the Commonwealth provides about half the resources for the program.

The following sections describe the evolution and function of the various label types within the electrical appliance labelling program.

Informative and Comparative

The "star rating" label communicates in both the informative and the comparative modes. It states the electricity consumption of the product in kWh (per operating hour for air conditioners, per operating year for refrigerators and freezers, per 365 uses for clothes washers and dishwashers, and per 200 uses for clothes dryers). It also indicates the energy efficiency of the product on a scale of 6 stars (Figure 4).

The scale is a technical one, in that the number of stars is determined by a formula contained in the relevant Australian and New Zealand Standard called up in the regulations. As average product energy efficiency improved after the introduction of labelling over the period 1986 to 1990, the number of models at or near the top of the scale increased, and the number at or near the bottom declined. In 2000 a number of major changes were introduced, largely to address the clustering at the top of the scale (Figure 5):

- new labels were introduced, similar to the original 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 did not confuse new labels

with old ones. (There was a transitional period during which the new labels carried a message to this effect);

- the new labels retained a 6 star scale but with different rating algorithms, so that a product which previously rated, say, 5 stars rated only around 3 stars on the new scale. During the transition period the new labels stated what the rating would have been on the previous scale;
- some minor label elements were removed, some were added (eg the website address) and some were presented in a different way;
- the guidelines for presentation of partial stars on the original label were unclear, and some suppliers printed labels in a way that exaggerated the comparative star rating of the product. The description of the new label format was made much clearer, and label increments were restricted to half stars;
- there were several minor, and in the case of dishwashers a major, revision of the energy tests.

The immediate impact of the re-rating, and the development in the three years since, are indicated in Table 2.

Table 2 Highest rated appliances, 1999, 2000 and 2003

Appliance	Type	Sept 1999 (old scale)	Sept 2000 (new scale)	Nov 2003 (new scale)
Airconditioner	Cooling only	6	4.5	5.0
	Reverse cycle – cooling mode	6	5.0	6.0
	Reverse cycle – heating mode	6	5.0	6.0
	Reverse cycle – combined (a)	11	9.5	12.0
Clothes dryer	Heat pump	6	6.0	6.0
	Conventional	4	3.0	3.0
Clothes washers	Top loader	5	4.5	4.0
	Front loader	5	4.0	4.5
Dishwasher	Full size (600 mm wide)	6	3.5	4.0
Refrigerator	Single door refrigerator	5	6.0	6.0
	Two door refrigerator-freezer	5	4.0	4.5
	Two door refrigerator-freezer (side by side)	6	3.5	4.0
Freezer	Chest freezers	6	2.5	5.0
	Upright freezers	5	5.5	5.5

Source: Wilkenfeld (2001) and www.energyrating.gov.au November 2003 (a) Sum of star ratings in cooling and heating mode for the same model: theoretical maximum is 12.

For four product types (airconditioners, dishwashers, refrigerators and freezers) there has been further increase in efficiency at the top end, and there are 5 or even 6 star products again in many categories. For clothes dryers there has been no significant change in the highest ratings. The results for clothes washers are mixed: an apparent reduction in the highest rating for top loaders, but an increase for front loaders. During the period there was considerable check testing of clothes washers, with the result that three models were deregistered, so the apparent de-rating may have been associated with greater supplier caution about performance claims.

Endorsement

In the mid 1990s the Sustainable Energy Authority of Victoria introduced the *Galaxy Award* endorsement label for all new electrical appliances that reached 5 or 6 stars on the comparative scale. There was also a *Galaxy Innovation Award* for the product judged by an expert panel to incorporate features and technology that would lead to significant reductions in energy use in Australia.

By 2000 there were seven distinct Galaxy award categories, some for products and some for companies, and covering both gas and electricity:

- The *Galaxy Star Award* "for the company that best demonstrates its commitment to, and excellence in, the development and marketing of energy efficient appliances";
- The *Most Innovative Appliance Award*, with similar criteria to the earlier *Galaxy Innovation Award*,
- The *Environmental Excellence Award* "for the organisation which displays an outstanding commitment to reducing the environmental impacts of producing and distributing domestic appliances in Australia";
- Two *Best Retailer Awards* - one for an appliance retail chain or buying group, and one for an individual store or state-based appliance retail network;
- The *Galaxy Electric Award*, available to all new electrical products that reached at least 3.0 or 4.0 stars (depending on category)[5] on the new, more stringent scale; and
- The *Galaxy Gas Award,* available to all new gas products that reached at least 5.0 stars on the gas rating scale.

The winners of the product awards were entitled to use point-of-sale Galaxy Award labels (with year date) and some did so, but consumer awareness of the Galaxy label has been very low in comparison with the star rating label. The Galaxy Award program was discontinued after the 2001 awards.

In 1998 the Sustainable Energy Development Authority of NSW (SEDA) introduced an endorsement scheme called *Energy Smart Appliance*, which was a label available to "the most energy efficient products of their class" (SEDA 1988). Like the Galaxy Award, Energy Smart listed the minimum star ratings for qualifying products, but for sub-classes rather than for entire classes. For example, there were different qualifying ratings for clothes washers of different capacities, so that there was at least one Energy Smart product in each category. The label was restricted to NSW, had only limited use, and has since been discontinued.

In October 2003 the AGO introduced a new endorsement label, the *Top Energy Saver Award* (TESAW). This is intended to help buyers identify the most energy efficient models on the market at the time they are purchasing, and so carries a year indication.

[5] The minimum qualifying rating for chest freezers and for frost-free upright freezers was 2.0 stars.

The criteria are set in November each year by the scheme administrator based on an analysis of all models registered for energy labelling, and the administrator's assessment of likely developments in energy efficiency over the coming year.

Once the criteria are published (either as minimum star ratings or as formulae based on the energy rating algorithms) suppliers of qualifying models are automatically advised if their product meets the endorsement criteria when they register for the mandatory comparative energy label. If they agree to the conditions of use, they would be free to use the endorsement label in their marketing (subject to copyright and other controls).

There is a particular need for such a label at present, because the rescaling of the energy label in 2000 reduced the number of models with 5 and 6 stars, the ratings which many buyers had come to look on as the most energy efficient. The TESAW label will help the less technically-minded segment of buyers to identify higher-efficiency products during the period in which average star ratings creep up again, as is already happening.

Energy Star

The *Energy Star* endorsement label is copyright and controlled by the United States Environment Protection Agency (EPA). It was originally designed specifically for office equipment, to indicate that the equipment was capable of entering a low-power standby mode after a certain period of inactivity (in some cases this was a potential capability only, which needed to be activated by the user and could be deactivated). Since then the *Energy Star* label scheme in the USA has expanded to a wide range of equipment types, and its presence now indicates that a product or building meets a range of criteria related to operating energy performance, not just standby.

In Australia, the use of the *Energy Star* label is restricted to office equipment (computers, monitors, printers, fax machines and copiers) and home entertainment products (TVs, VCRs and DVDs), and still for the original purpose only: to indicate compliance with the standby and low-power mode criteria established by the US EPA. There would be no advantage, and possibly some disadvantage, in using *Energy Star* as a general endorsement label as in the USA, because:

- The endorsement criteria are controlled by US rules and based on US operating energy tests;
- The Energy Star label has relatively low recognition in Australia; and
- Restricting the label's application to indicating standby and low-power performance leaves open the scope for introducing comparative labelling for on-mode performance for selected products such as TVs, using the widely recognised star rating label.

Warning Labels

The "disendorsement" or warning mode is now being introduced to the electrical appliance energy labelling program. The first application is likely to be for small electric water heaters, for which more stringent MEPS are to be introduced in 2005. Models meeting the current MEPS levels (introduced in 1999) will be allowed to remain on the market for a 5 year period, to satisfy the need for replacement water heaters in confined spaces.

This development will make two modes of labelling possible for electric water heaters:

- As there will be a range of efficiency levels, comparative labelling will be helpful to consumers; and
- There will be an additional warning message on the comparative label: "This appliance fails to meet government energy efficiency standards. Install only where a more efficient model will not fit."

It is also envisaged that warning labels could be introduced for products of high standby power consumption in the event that the "one watt" initiative being pursued by Australian governments is not completely successful (NAEEEC 2002).

Supporting Information

In the early years of labelling in the 1980s, the only way that consumers could obtain a list of all labelled products in a given category was through leaflets compiled by State energy agencies, Commonwealth Government departments or, occasionally, energy utilities. Because of the time lag between compilation, printing and distribution these leaflets were always incomplete and out of date to some extent. Apart from the inefficiencies of over- or under-printing, it was also difficult to get the information to users at the time they were most likely to use it – when they were thinking about buying a labelled appliance.

These problems have mostly been overcome with the introduction of the internet, and the website www.energyrating.gov.au maintained by the AGO on behalf of NAEEEC. The site lists the characteristics of all labelled products, is searchable in a number of ways, and has a running cost calculator that allows users to input electricity prices. The new energy label introduced in 2000 prominently displays the website address.

2.2 Gas Appliance Labelling

Informative and Comparative

Gas appliance labelling was first introduced in Australia in 1981 by the Gas and Fuel Corporation of Victoria (GFCV), when the first "high efficiency" balanced fuel gas storage water heaters (SWH) came on to the market. The scheme was largely designed to promote the new products, which were distinguished in GFCV showrooms with an "E" label. This first gas appliance label was in effect an endorsement label, since it had no informative or comparative content.

In 1985 the Australian Gas Association (AGA) took control of the program and devised a scheme whereby products could carry "20%", "30%" or "40%" labels to indicate the extent to which they consumed less gas than the maximum specified in Australian Gas Standard AG102. This was a comparative labelling scheme limited to three efficiency levels. In 1988 the AGA adopted an informative and comparative label based on a star rating design (Figure 4) that was visually consistent with the electrical appliance label. In the late 1990s there were some changes in the energy tests and in the informative elements of the label, and minor visual changes to the comparative label in 2000.

In 2002 the AGO initiated a review of the existing MEPS and labelling program for gas appliances in Australia, and a comparison with overseas MEPS levels (Ellis et al 2002). In 2003 the Sustainable Energy Authority of Victoria (SEAV), the Victorian Office of Gas Safety (OGS) and AGO formed a joint industry-government working group with the Gas Appliance Manufacturers' Association of Australia (GAMAA), Australian Gas Association (AGA) and Standards Australia, to explore options for improving the effectiveness of the current industry-run gas appliance efficiency scheme. The aim is to put in place a new national gas appliance energy efficiency program as a joint government-industry partnership, modelled on the NAEEEP (SEAV 2003). .

The first priority for action under the new framework will be water heaters, and to this end a gas water heater testing program funded by AGO is under way, with the aim of developing a revised test standard and revised MEPS levels and labelling algorithms for gas water heaters.

The transition to a new national government-industry gas appliance energy efficiency program will require the approval of the Ministerial Council for Energy (MCE).

Endorsement

The very first gas label in Australia, the "E" label in use between 1981 and 1985, was in fact an endorsement mode label. However, the endorsement mode was not revived until the inclusion of gas appliances in the Galaxy Award program in the late 1990s.

The Galaxy Award has as little recognition in the gas appliance market as in the electric appliance market (Artcatft 2003). In October 2003 the AGO introduced a new endorsement label, the *Top Energy Saver Award* (TESAW). It is intended that there will be a gas TESAW label, similar in format to the gas comparative label. The criteria are to be set in November each year by the scheme administrator based on an analysis of all models registered for energy labelling, and the administrator's assessment of likely development in energy efficiency over the coming year.

Warning Label

There is no gas appliance efficiency warning label at present, and none is planned.

Supporting Information

Since 1989 the star rating of most products have been published in the AGA and ALPGA *Directory of Certified Gas Appliances and Components*, intended largely for the use of AGA and ALPGA members. Since January 2000 the *Directory* has been publicly accessible via the AGA website, but in a non-searchable format. Because some products have still not been tested to the new methods introduced in 2000, they are listed as "not tested" or " to be retested".

The SEAV lists products rated with 4 or more stars on its internet site, but there are no brochures or internet sites designed to assist consumers to search through and rank all appliances by energy efficiency, as there are for electrical appliances.

2.3 Water Efficiency Labelling

Informative and Comparative

A voluntary water efficiency labelling scheme has been in existence since 1988. It is now managed by the Water Services Association of Australia (WSAA). The scheme originally covered only shower heads and dishwashers, and offered two efficiency grades (A and AA). A third rating (AAA) was introduced in 1992, and two higher ratings (AAAA and AAAAA) in 2001. The label, shown in Figure 4, has no informative component. The WSAA program now covers shower heads, toilets, taps, clothes washers, dishwashers, urinal flushing devices and flow regulators.

Because the WSAA scheme is voluntary, few suppliers have chosen to label, and those that have tend to label only their better performing products – for obvious reasons. The main incentive for labelling has been the support of the water utilities (the members of WSAA), many of whom have publicised the scheme, or offered cash rebates to their customers for the purchase of labelled appliances. Consequently, despite nominally being a comparative labelling program it operates more in the endorsement mode, assisting water utilities and their customers to identify models for

rebate purposes, rather than in the comparative mode, which encourages and enables buyers to compare the water efficiency of different models.

In late 2002 the Department of Environment and Heritage (DEH) commissioned a feasibility study to examine the potential for, and impacts of, introducing a national mandatory water efficiency labelling (WEL) scheme and minimum water efficiency standards (WES) for appliances, fixtures and fittings as a method of reducing urban water consumption.

The review recommended the implementation of a mandatory national WEL program for selected products (GWA at al 2003). In May 2003, the Environment and Heritage Protection Council (EPHC) of Ministers of the Commonwealth, State and Territory Governments and of New Zealand agreed to develop an implementation plan for a national mandatory water efficiency labelling scheme. The implementation plan was subsequently endorsed by the EPHC in October 2003, and the Commonwealth undertook to legislate for the implementation of the program, with a target starting date of mid 2005.

The water efficiency tests, algorithms and label designs are now being finalised. Preliminary consumer research suggests that the most effective format for a comparative and informative water label would be similar to the energy and gas label formats (Figure 5) (Artcraft 2003).

Endorsement

There are three main uses of endorsement mode labelling for water-related products under consideration at present:

1. to identify the most water-efficient of the comparatively-labelled products on the market, analogous to the Top Energy Saver Award Winner label. There are no proposals at present to introduce an endorsement mode water label for comparatively-labelled products, but once the comparative scheme becomes established the case for such a label should be considered;
2. to identify products that are known to contribute to efficient water use in practice, but for which there is no performance test allowing comparative labelling. Examples are garden products such as trigger nozzles and irrigation controllers. The review report (GWA et al 2003) recommended that (a) an expert advisory panel for the endorsement of outdoor water using products should be established, comprising representatives of the regulators, the water services industry, the landscaping and horticultural industries, Standards Australia, manufacturers and consumers; and (b) the endorsement label should be controlled and awarded by the regulator/s, acting on the advice of the expert panel;
3. for products that are considered to contribute to the reduction or avoidance of mains water consumption, or in other ways contribute to lowering water use in the community.

The first area of endorsement above is clearly linked to the comparative label.

With regard to the third area, the WSAA, together with the Irrigation Association of Australia (IAA) and Nursery and Garden Industry Australia (NGIA) is developing a certification program for products other than those covered by comparative labelling (potentially overlapping with the second area above) and also for plants, methods of design (eg drought-resistant garden design), services, organisations and even individual households. The working title for the scheme is Smart WaterMark, but alternatives such as Aquatik are under consideration.

The second endorsement area above will be the interface between the WEL program and the proposed Aquatik program, and will need to be carefully managed. Any label endorsing outdoor water products that is linked to the mandatory WEL by graphic cues and elements should be controlled by the regulators, to safeguard the integrity of the WEL program and of the other resource labelling programs.

Warning Labels

The WEL program will include a mandatory "Water Warning" label for showers with a flow rate higher than 16 litres per minute at mains pressure. These types cannot be excluded from the market because there are many households on low pressure water supply which need access to shower head designs that work at moderate pressures. However, these non-flow-regulated types should not be connected to mains pressure supply because they would result in very high flow rates, and the warning labels are intended to convey this message.

Supporting Information

The WSAA already website already carries searchable lists of the products for which voluntary labels have been registered. It is proposed that a website be set up to support the new mandatory program, and that this be linked to the energy and gas rating websites.

2.4 Appliance Coverage

The present application of electrical, gas and water resource labelling to household products is summarised in Table 3. By 2005 the buyer of a clothes washers, say, could be exposed to as many as three separate resource labels (eg Energy Rating , Water Rating and TESAW) communicating in a total of 5 modes (informative, comparative and endorsement for electricity use, and informative and comparative for water use).

This pattern of resource labelling has not emerged by chance. The case for extending mandatory comparative electricity and water labelling to each product has been accepted by Governments after a rigorous process of Regulation Impact Statements.

The case for Government-mandated gas labelling is currently being examined. The use of the endorsement label by the supplier is optional, so does not need to be examined by RIS. Nevertheless, Governments incur some additional cost in establishing, servicing and promoting the endorsement mode labels, and it needs to be established that those additional costs are justified by increased consumer impact (see Section 3.3)

Some degree of strategic coordination is clearly required in order to avoid buyer confusion, maximise the usefulness of the information and reduce the costs and administrative burdens on suppliers, not to mention the physical area of the displayed product that is covered by resource labels.

Table 3. Resource labels for household products in use and under consideration, Australia

Product	Comparative electricity label	Comparative gas label	Comparative water label	Endorse-ment label	Dis-endorsement label	Energy Star (standby) label	Minimum Energy Performance Standards
Refrigerators	M [a]			O [e]			M
Freezers	M [a]			O [e]			M
Dishwashers	M [a]		M UC [c]	O [e]			
Air conditioners	M [a]			O [e]			
Clothes washers	M [a]		M UC [c]	O [e]			
Clothes dryers	M [a]			O [e]			
Water heaters	UC [f]	V [b]		O [e]	M UC [i]		M [h]
Space heaters		V [b]		O [e]			M
Ducted heaters		V [b]		O [e]			M
Shower heads			M UC [c]		M UC [d]		
Toilet cisterns			M UC [c]				M [k]
Taps, flow controls			O UC [c]				
Entertainment	UC [f][g]					V	

M = Mandatory, V = Voluntary, UC = Under consideration, O = optional. [a] Mandatory energy labelling for electric appliances commenced 1986; label format updated 2000. [b] Voluntary energy labelling for gas appliances commenced 1981; present label format adopted 1988. [c] Voluntary water efficiency labelling commenced 1988; present label format adopted 2001. A mandatory scheme is under consideration. [d]. It is proposed that shower heads with flow rates greater than 15 litres/min carry an advisory notice: *This product uses excessive amounts of water and should not be used with mains supply*. [e] The label would be available to models in the top 10% of energy efficiency, with the criteria to be reviewed each year. [f] Labelling options still under consideration. [g] "On mode" labelling as distinct from Energy Star, which covers "standby" or "off-mode". [h] Maximum standing heat loss for electric water heaters, minimum combustion efficiency for gas water heaters. [i] Disendorsement message proposed for small electric water heaters of current efficiency levels, after higher levels introduced.

2.5 Other Resource Ratings and Labels

There are several other resource rating systems in use in Australia (as well as MEPS programs).

- "high-efficiency" designations for electric motors and distribution transformers;
- Electrical Efficiency Index (EEI) marking in fluorescent lamp ballasts;
- Informative and comparative energy labelling of luminaires (light fittings);
- the Australian Greenhouse Building Rating for office buildings;
- Window Energy Ratings.

As these systems are mostly targeted at commercial or industrial decision makers, it is not necessary to consider their interaction with household appliance resource labelling. However, there are two programs which are relevant because they are targeted largely at householders.

Home Energy Ratings

There are several methods of establishing a rating for the thermal performance of houses or flats. These methods use information about the orientation, layout and materials of a building (either projected or actual) to estimate the heating and cooling energy requirement and the occupant comfort levels.

Some methods also use information about the actual or intended heating and cooling equipment to estimate an annual energy cost, and some go beyond space conditioning to assess the other fixed energy systems as well, typically water heating and lighting.

A number of software packages incorporating such rating methods have been developed, including the National House Energy Rating Scheme (*NatHERS*) and the SEAV's *FirstRate* program. The outputs of the analysis can be presented in a number of ways, but it has become customary to do so as star ratings, to build on familiarity with the household energy rating program. Indeed, the *NatHERS* logo is clearly based on the appliance energy label: an arched shape with 5 stars, above a stylised house. However, the logo is not used as a comparative rating label to display a number of stars alongside an actual design or in the documentation for an actual building.

Home energy rating systems operate very differently from household appliance resource labelling systems programs in a number of ways:

- Home energy rating systems are more often used to compare designs before they are built, or indeed to develop the designs, than to compare actual houses. The use of ratings as a guide to the purchase of existing dwellings (which accounts for the vast majority of transactions) is limited by the fact that almost every dwelling is unique in its location, quality, affordability and suitability for the buyer.

- Unlike appliance ratings, house ratings cannot directly indicate probable resource consumption, running cost or environmental impacts. Those will depend on whether there is any heating or cooling equipment installed at all, its energy type and efficiency, and the patterns of use (which will tend to deviate far more from the assumed standard pattern of use than is the case with appliances);
- Unlike appliance rating claims, which can be tested in the laboratory, house rating claims cannot be directly tested, even after a house is built. (It is even difficult to establish that a house has been built fully in accordance with the approved design).

In fact, a "5 star" home energy rating has come to be used by marketers as an endorsement rather than as a comparative rating, to signify to users that the design is the best available in terms of thermal comfort and energy efficiency.

Home energy ratings are also being used by some Governments as one means of demonstrating that a design complies with mandatory minimum thermal performance standards.[6] The Victorian Government, for example, has decided that from July 2004, new dwellings will be required to achieve a rating of at least 4 stars on the *FirstRate* program, and from July 2005 a rating of at least 5 stars. The existing Victorian building regulations, which have been expressed in terms of minimum element insulation standards rather than ratings, have led to an average rating of 2.2 stars for new construction (EES 1999).

These two common uses of the home energy ratings are largely contradictory. A five star rating on the present scale should now indicate the *least* efficient home available, and if any use is to be made of the comparative mode of the rating, it will need to be either rescaled (eg so that 5 stars become 1 star) or expanded to more stars.

Given that the resource labels to which householders are exposed have no more than 6 stars, and the ratings are rescaled rather than expanded when change is necessary, it would be consistent to apply the same approach to the house energy rating scale.

Motor Vehicle Labels

Since 1 January 2001, Australian Design Rule (ADR) 81/00 has required all new passenger vehicles, off road vehicles and Light Commercial Vehicles (LCV's) up to 2.7 tonnes Gross Vehicle Mass (GVM) sold in Australia to carry a fuel consumption label on the windscreen at the point of sale. The labelling scheme was developed by the AGO in conjunction with the Department of Transport and Regional Services. Consultations were held with all stakeholders, including the motor vehicle industry during the process.

[6] There are usually alternative ways by which a design can be "deemed to comply", eg if its main elements are constructed and insulated in accordance with a set of minimum specifications.

The label is an informative one, with no comparative or endorsement modes. It indicates fuel consumption values in litres per 100 km rounded to the first decimal place.

Three changes to the program have recently been announced:

- Changing from two separate fuel consumption values (city cycle and highway cycle) to a single value reflecting a mix of urban plus highway drive cycles;[7]
- An increase in the maximum GVM for which labelling is mandatory to 3.5 tonnes, to cover heavy four wheel drive vehicles; and
- The addition of information on CO_2 emissions per km travelled for petrol, diesel and LPG vehicles. This is intended to indicate the different greenhouse impact of different fuels; ie for the same fuel consumption value emissions would vary with the fuel type.

As long as the Motor Vehicle Label is informative only, there is little possibility of confusion in the minds of users with the communication modes of appliance resource labelling. However, if comparative or endorsement modes were to be introduced, it would be desirable to ensure that the formats were consistent.

[7] The latest available Fuel Consumption Guide (2002-03) published August 2003, still lists only the two separate city and highway cycle fuel consumption values for most models, and only the one combined value for a few. Therefore consistent comparison across all models is not yet possible. The Guide does not yet contain values for vehicles of higher than 2.5 tonnes GVM.

3. A Coordinated Labelling Strategy

3.1 Need for a Coordinated Strategy

Risks and opportunities of convergence

Appliance buyers in Australia are presented with a wide and growing array of labels communicating product resource efficiency. The electrical appliance, gas appliance and now the water labelling systems are converging in their coverage and in their modes of communication. It is important to manage this convergence process strategically so that the public benefit is maximised.

The need for a coordinated labelling strategy arises because:

- In some cases the one product can carry more than one label, so it is important to avoid confusion and conflict between the labels;
- The same householders will come into contact with a succession of resource labels as they purchase successive products, and will instinctively try to interpret labels in similar ways;
- As buyers are made more aware of different resource impacts, there is a risk that they will be overwhelmed with information if the modes of communication compete with rather than complement each other; and
- There is a risk that product suppliers, most of whom have been very cooperative with labelling programs in the past, will be subject to increasing testing, registration and labelling costs, and so will reduce their support for resource labelling.

Fortunately there is a historic opportunity to develop such a coordinated product resource labelling strategy, because:

- There is a large body of administrative and industry experience with resource labels, so it is possible to apply lessons learned in one program to others;
- There is a common audience for resource labels, and it is possible to build on this familiarity (especially with the energy label) to the benefit of all;
- Government has a leadership role in all three resource labelling programs; and the leadership role of the Commonwealth is exercise via two closely related agencies: the AGO (for energy and gas labelling) and DEH (for water labelling);
- The increasing tendency of householders to use the internet to research appliance purchases allows resource efficiency considerations to be injected into the search process in new ways, at very low cost; and
- A number of major program changes is imminent: the introduction of a new mandatory water labelling program with both comparative and endorsement

modes, a new framework for the gas labelling program and the introduction of a new endorsement mode label for the electrical and gas appliance programs.

The three main resource labelling programs are only now coming together after disparate beginnings and nearly two decades of parallel development, so for the first time there is an opportunity to establish the elements of a coordinated labelling strategy. This progression is in many respects the opposite of that in the USA, where the national labelling and minimum performance standards for many products (electric, gas, oil and some water) were initiated by Federal legislation.

The legislation and the working arrangements between the Commonwealth, State and Territory governments that manage electric appliance energy labelling and MEPS have taken over a decade to develop. Gas appliances are regulated under different legislation and, in most cases, by different State agencies from electrical appliances, and water-using products by separate agencies again. Although the Commonwealth has now agreed to take the lead on water efficiency labelling, the water supply utilities still retain some of the product regulation functions which the electricity and gas supply utilities lost as those industries were restructured and in some cases privatised over the past decade.

The formal Closer Economic Relations treaty between Australia and New Zealand imposes a further layer of complexity. Under the Trans Tasman Mutual Recognition Act (TTMRA) any product that is lawfully manufactured in or imported into one country can be lawfully exported and sold in the other, including products that do not carry labels that would otherwise be mandatory in the country of destination.

This complex decision making structure makes coordination a high priority, and even then means that many decision-makers are involved, progress can be slow and critical opportunities – such as those presented now by the convergence of the labelling programs – can be lost.

3.2 Elements of a Coordinated Strategy

Addressing a Common Audience

Resource labelling programs ultimately succeed or fail through their impact on consumers and (more subtly) on the suppliers' perception of those impacts. In the early days of energy labelling the suppliers actually over-anticipated the consumer response, and improved their products at a faster rate than expected. However, now that the NAEEEC collects and publishes extensive market data, government and industry have access to much the same information and the gap between actual and expected consumer response has narrowed.

NAEEEC has recently completed a large scale review of consumer perceptions of and responses to resource labelling, including the label types in Table 3 (Artcraft 2003).

A number of design options for revised gas and water labels have been tested, as well as new designs for endorsement and warning labels. The outcomes of the study form an important input into the development of an integrated labelling strategy.

Each of the label types in Table 3 originally developed independently, but in effect the "audience" for all the labels is the same. Buyers need to quickly ascertain the meaning of each label and the relevance to their purchase decision, and one way of doing this is to harmonise the visual language of the three comparative labels with regard to shape, layout and efficiency scales.

The arch shape of the electric appliance energy label is now widely recognised in Australia, and is used in the gas appliance and (by coincidence) *Energy Star* labels as well as some non-appliance labelling schemes such as a window energy rating. The arch shape is a quick visual cue that the label has something useful to say about resource efficiency. By contrast, the water droplet shape of the current water efficiency label has very low recognition, even though it is intended to communicate its relationship to water.

The three main visual elements of the energy label are the title, the comparative scale indicating efficiency and the informative value indicating energy consumption. The secondary elements include the model number, the model capacity, the scheme authentication message ("A joint government and industry program"), the scale interpretation message ("the more stars the more energy efficient"), the address of the internet site listing all labelled models, the relevant Australian standard and, for some products, the program or setting on which the test was carried out. Consumer research has confirmed that different categories of buyer respond to different elements of the label, so all need to be present. The arrangement of main and secondary elements is very similar in the present electrical and gas labels, but quite different in the current water label, which has far fewer elements.

Consumer research has found that the label element with the greatest influence on decision-making is the efficiency scale. On the electrical and gas energy label the symbols or "icons" on the scale are stars, and the range is from one to six stars in half-star increments, progressing from left to right in a single band. On the current water label the icons are "As" and the range is from A to AAAAA, with no half steps, progressing from left to right but in two bands – an arrangement that makes the 4A and 5A positions less visually prominent than the 3A (Figure 5). The reason for this is that the scale originally went to 3A only, and the 4A and 5A ratings were added later.

Figure 4 illustrates the three label formats as they were before the revision of the electric appliance energy label in 2000 (Figure 5 illustrates the revised electric appliance energy label).

The reviews of the gas and water labelling programs now under way offer an opportunity to harmonise the visual language of all three comparative labels, using as a model the electrical appliance energy label, which has by far the highest recognition

and comprehension. In effect this would allow the gas and water rating labels to build on the strength of the electrical appliance energy label, but care would be required to ensure that there was no confusion. Figure 5 illustrates how this could be done using different titles, colours and icons within a consistent format (it is emphasised that the gas and water label designs shown are among a number of designs being tested, and have no official status at present). The Energy and Gas Ratings would never appear together, but the Energy and Water ratings would appear together on clothes washers and dishwashers.

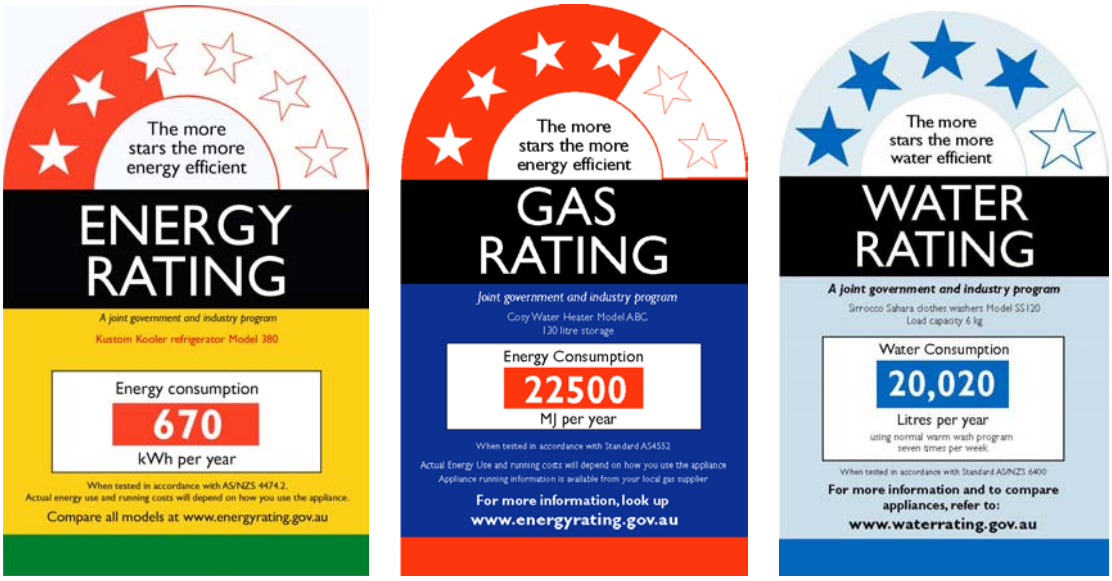
A further point for coordination is the frequency distribution of ratings. When a new labelling system is introduced, or the scaling of an existing system is revised, it is advisable to have some models at the two thirds point immediately (say at 4 stars on a 6 star scale or 3 stars on a 5 star scale), but to have most of the market at less than half way on the scale. This visually differentiates the most efficient of the existing models, while still giving incentive for suppliers to introduce more efficient ones and for consumers to seek them out.

The average ratings will eventually increase – which is after all the objective of all resource labelling programs – and there will again be crowding at the top of the scale, but if the algorithms have been well designed this will not occur for some years. It also helps if there is some similarity in model distributions and rating scales across the different labelling systems, so the consumers who use the ratings as shorthand decision criteria can apply consistent decision rules: eg 1 to 2 star acceptable, 3 or 4 stars good, 5 or 6 stars excellent.

The informative values (eg kWh per year, MJ/hr, litres/min) tend to be used by a different, more numerate consumer segment, so uniformity across resource labelling systems or products is not as important – except when more than one label appears on the one product, in which case consistency is essential. For example, there would be confusion if the water use values for dishwashers and clothes washers were not on the same basis as the kWh energy value, ie per year for the prescribed number of uses.

Figure 4 Original energy (electricity), gas and water labels

Figure 5 Revised energy (electricity) label, and possible revised gas and water labels



Coordinated Regulation and Management

Regulation

The regulation of the various resource labelling programs is also converging. A Regulation Impact Statement (RIS) is required for all mandatory programs, whether initiated by Ministerial Councils or by the Commonwealth. In the former case the RIS must follow guidelines of the Council of Australian Governments (COAG 1997) and in the latter case the guidelines of the Office of Regulation Review (ORR 1998).

All significant changes such as a revision of label format or an extension of labelling to a new product are also subject to RIS. The RIS must take into account costs, benefits and effects on main stakeholders including consumers and suppliers. A number of RISs relating to electrical appliance energy labelling water efficiency labelling have been carried out (GWA 1999, 1999a, 2003). An RIS would also be required if Governments considered making gas appliance labelling mandatory.

The main monetary benefit taken into account in RISs is the net present value of the resources saved. The greenhouse gas emissions avoided through energy saving are also estimated but not (for the time being) given a monetary value.

The main costs are:

- The costs to government of programs development and administration;
- The costs to product suppliers of any additional product testing, registration, production and fixing of labels, and administration;
- The costs to consumers of any increases in average product price due to greater consumer preference for the more efficient models on the market.

Once the labelling and MEPS framework is in place, the cost of program changes to suppliers and to Governments tends to be very small, and in most cases the projected increase in average product prices represents the great majority of the total cost.

No RIS is required for the introduction of optional elements such as endorsement labels, because suppliers are free to make their own judgements about the cost-effectiveness to them of using the label, and opt not to do so if they wish.

When further changes to resource labelling programs are contemplated in future, all classes of costs and benefits should be taken into account. For example the labelling of water using products such as shower heads and washing machines leads not only to a reduction in water demand, but also a reduction in electricity and gas use for water heating and in the associated greenhouse gas emissions. These can all be modelled at the same time, along with other benefits such as reductions in detergent use.

Administration

The administration, management and support functions of resource labelling programs can also be integrated. The product registration procedures already established for electric appliance energy labelling and MEPS can be cost-effectively extended to gas- and water-using products. Indeed, for clothes washers and dishwashers the same test is used to determine both energy consumption and water consumption, so registration for the energy label could automatically mean registration for the water label.

The integration of registration procedures would lead naturally to linked registers for electric, gas and water-using products. This would assist both program administrators and public users of the register. Most of the data on the electrical appliance register is publicly available as searchable lists on an internet site (www.energyrating.gov.au). The products registered for water labelling are available as searchable lists on a separate site (www.wsaa.asn.au). The products registered for gas labelling are at yet another site (www.gas.asn.au), but in the technical part of the site, not searchable and not easily accessible to the public. A priority for linking the data would be to adopt a similar "look and feel" so that users encounter similar layouts and search procedures. It would also help users if easy to remember website addresses were adopted (eg www.gasrating.gov.au and www.waterrating.gov.au).

Integrating the way in which website data are presented to the public also allows users to be guided through the wider decision-making process rather than just the final selection between products that are all essentially interchangeable (in that they all meet the buyer's essential criteria) and differentiated only by their efficiency. For example, when the choice of a water heater is unconstrained by replacement urgency or by pre-existing energy type, it usually commences with a comparison of energy/technology types (eg conventional electric, conventional gas, solar/electric, solar/gas, electric heat pump), then choice within types (eg gas storage vs gas instantaneous) and only at the last level a choice based on the appliance efficiency rating (eg a 5 star gas storage unit rather than a 3 star). A well integrated website can offer users information relevant to the entire decision process, eg comparative running costs and environmental impacts such as greenhouse gas emissions, irrespective of whether they commence searching by a gas water heater ratings or electric water heater ratings.

Decisions about Tests, Algorithms and Labels

At present the key decisions about the tests, algorithms and labels underlying each of the three resource labelling programs are taken by different groups of stakeholders, with different levels of familiarity with the issues and different perspectives and commercial interests.

Stakeholders' views on label formats are often informed by their own commercial interests and preconceptions, rather than by actual research on how the labels might impact on the target audience.

The consumer research carried out over the past year has clearly identified the principles necessary for the effectiveness of resource labelling for an audience that is now so tuned to the electrical appliance energy label. If these principles were formally incorporated into a coordinated resource labelling strategy it would reduce the risk that stakeholder groups could take key decisions that conflicted with them.

Clarity and Credibility

One of the main strengths of the Australian electrical appliance energy label has been its clarity of scope. It is intended to convey information about electricity use and nothing else. Where additional information has been included (as in the case of water consumption on the clothes washers and dishwasher labels) it is in small print. The gas and water labels also benefit from this clarity of scope.[8] The Australian resource labels are authoritative because they do *not* say anything that is not about that product's use of the stated resource. This clarity should not be compromised by either of the following.

"Eco-Labelling" vs Resource Labelling

It may be argued that the proliferation of resource labels could be avoided by the development of a single indicator that reflects all resource and environmental impacts. However, there is no greed basis for weighting the relative impacts of the three resources, or even of electricity and gas. The most commonly suggested indicator - greenhouse emissions – varies significantly from State to State, and over time.

There is even less agreement on the measurement or weighting of other environmental consequences of product manufacture, use and disposal. Consequently, any move toward "eco-labelling" would undermine rather than increase the credibility, and hence the impact of resource labelling.

Products vs Services and Organisations

Another key to maintaining clarity and credibility is restricting labelling to statements that can, ultimately, be verified by testing a product in a laboratory or (in the case of endorsement labels) by collecting data on appliance sales. This excludes the use of the resource label (or of other labels visually linked to the resource label) to certify services, plants, methods of design, organisations or any other thing.

[8] It is not, however, necessary to have a label shaped like a water doplet or a gas flame to convey this clarity of scope.

3.3 Costs and Benefits of an Integrated Strategy

Indicative Benefits

The benefits of a coordinated resource strategy labelling can be roughly estimated by reference to the cost/benefit studies of the existing labelling programs. The following analysis draws on the RISs for mandatory energy labelling (GWA 1999, 1999a), the RIS for mandatory water labelling (GWA 2003), a study of the potential for increasing the impact of the gas water heater labelling program (GWA 2000) and, for gas space heating, Ellis et al (2002). The impacts of these three resource labelling programs have not previously combined in this way before, ie using common time scales (2004-2020), gas, electricity, freshwater and wastewater prices and greenhouse gas intensities.

The effectiveness of each resource labelling program would certainly be increased by a coordinated strategy covering the following enhancements:

- Adoption of a full range of labels (informative, comparative, endorsement and warning) to address all segments of the target audience of product buyers;
- Designing the label formats to communicate as effectively as possible;
- Supporting the buyer search process with easy to use linked websites;
- Ensuring that label scaling retains incentives for buyers to seek out, and suppliers to provide, increasingly efficient appliances (ie bunching at the top end of the scale is regularly corrected);
- The appearance of labels on a high proportion of products displayed for sale.

It is impossible to estimate the impacts of any of these actions individually, let alone of strategic coordination as such, but the latter would increase the probability that the actions occurred in a timely way. The following estimates are based on an assumption that the impact of gas space heater labelling could be increased by 50% over what it would be if the program remains in its present form. The corresponding estimates for gas water heater labelling are 30%, and for electrical appliance energy labelling 20%, and water efficiency labelling (which has only recently been agreed, and not yet introduced) by only 10%. These "enhancement factors" are illustrated in Figure 6.

The projected impact of enhancements on the estimated benefits of the resource labelling programs are illustrated in Figure 7 for electricity savings, Figure 8 for gas savings, Figure 9 for water savings, Figure 10 for greenhouse savings and Figure 11 for savings in electricity, gas, water and wastewater costs to householders. The additional savings in each of these are summarised in Table 4.

Over the period 2004-2020, enhancing the impact of the three resource labelling programs through a range of measures *could* lead to further electricity savings of nearly 3,000 GWh, further gas savings of nearly 14 PJ, further water savings of over

40,000 Ml, further greenhouse savings of more than 3 million tonnes CO_2-e, and further monetary savings of nearly $M 670 (undiscounted).

Table 4 Summary of projected benefits of resource labelling program enhancement

	Projected savings over period 2004-2020			
	BAU label	Enhanced	Difference	Difference
Electricity savings - GWh	19024	21950	2927	15%
Gas savings - PJ	44.2	57.9	13.7	31%
Water savings - ML	451627	495762	44135	10%
Greenhouse savings - kt	18912	22218	3305	17%
Resource cost savings - $M	$M 4,001	$M 4,669	$M 668	16%

Source: Figure 7 to Figure 11

Table 5 Estimated monetary benefits of resource labelling program enhancement (10% discount rate)

	Projected savings over period 2004-2020				Share of Difference
	BAU label	Enhanced	Difference	Difference	
Electricity savings - energy labelling	$870	$995	$125	14%	57%
Gas savings - gas labelling	$144	$197	$53	37%	24%
Electricity savings - water labelling	$142	$155	$13	9%	6%
Gas savings - water labelling	$47	$52	$4	10%	2%
Water savings - water labelling	$245	$268	$24	10%	11%
All resource labelling programs	**$1,448**	**$1,667**	**$219**	**15%**	**100%**
Total water labelling	$434	$476	$41	10%	19%

Figure 6 Indicative enhancement potential for the three resource labelling programs

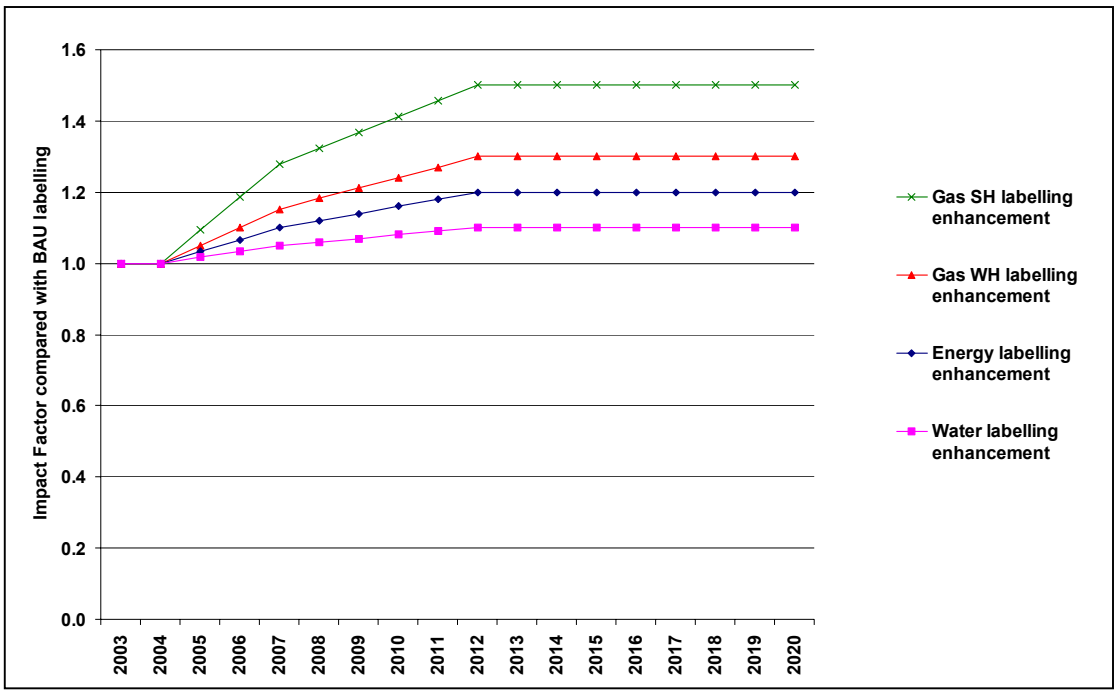


Figure 7 Projected electricity savings from energy and water labelling – BAU and with enhancement

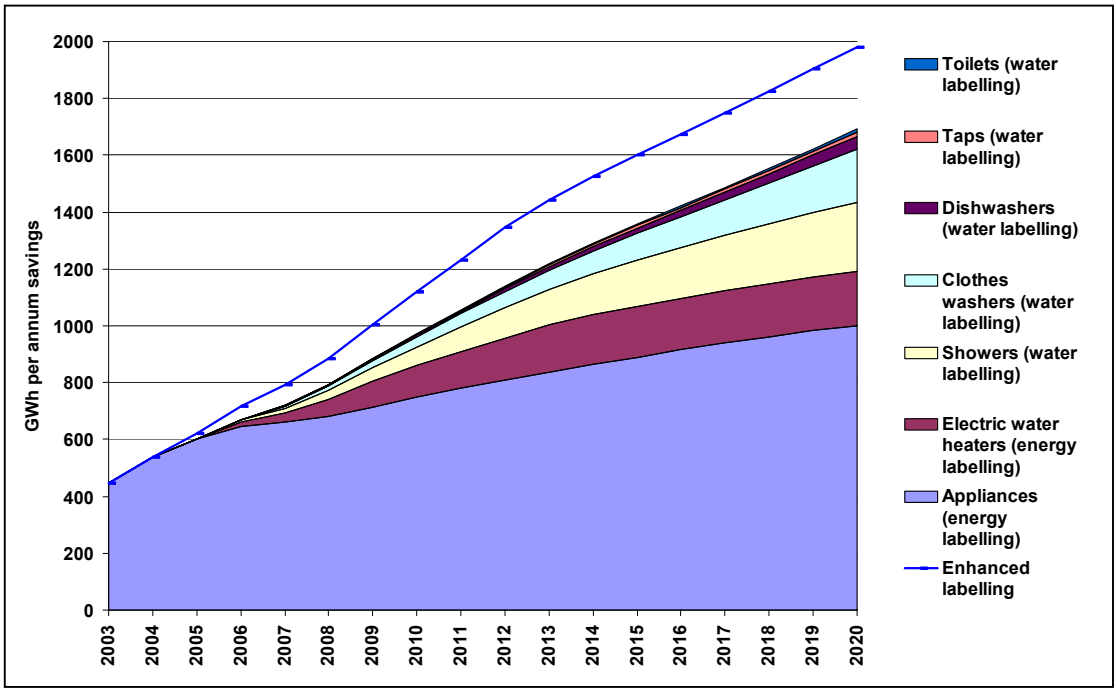


Figure 8 Projected gas savings from gas and water labelling – BAU and with enhancement

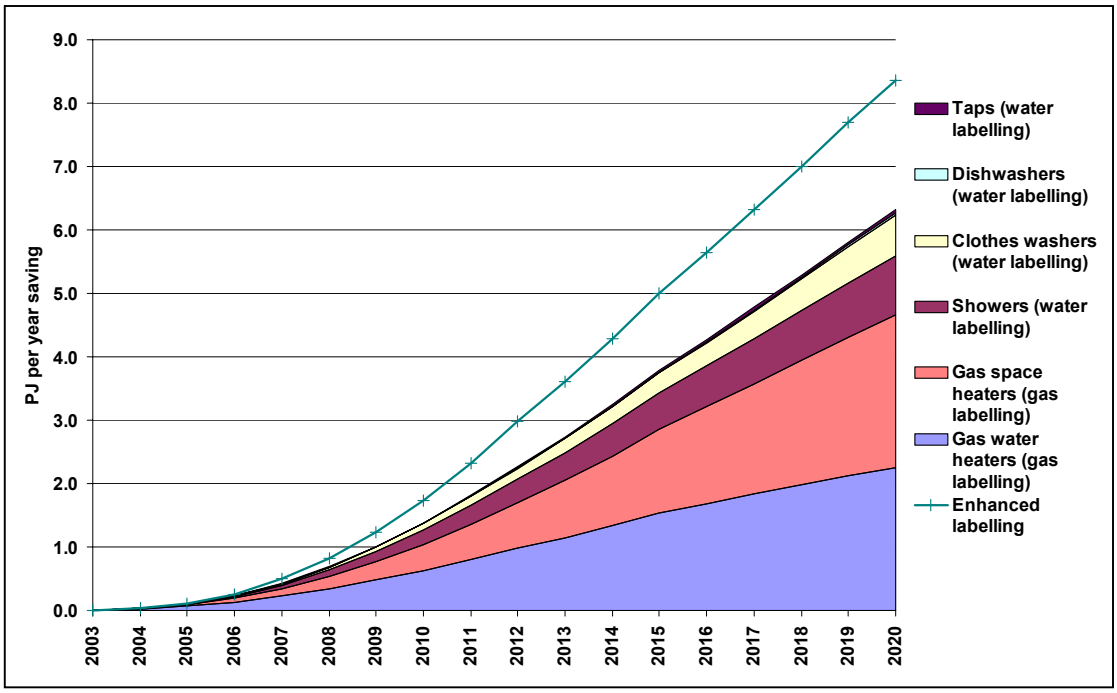


Figure 9 Projected water savings from water labelling – BAU and with enhancement

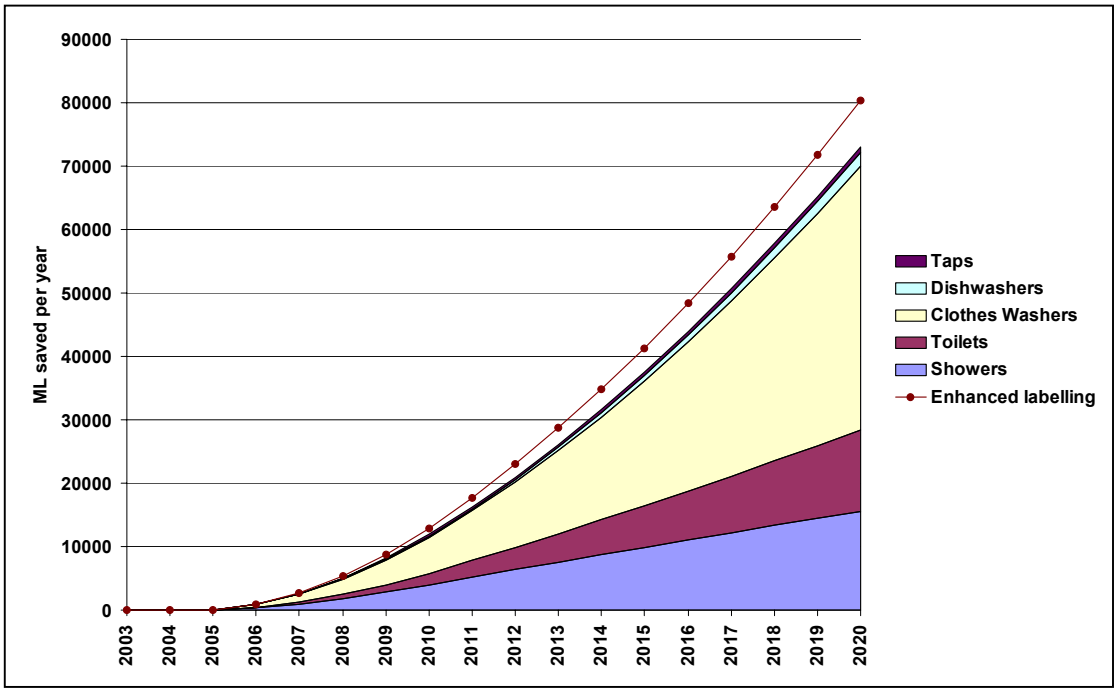


Figure 10 Projected greenhouse savings from energy, gas and water labelling – BAU and with enhancement

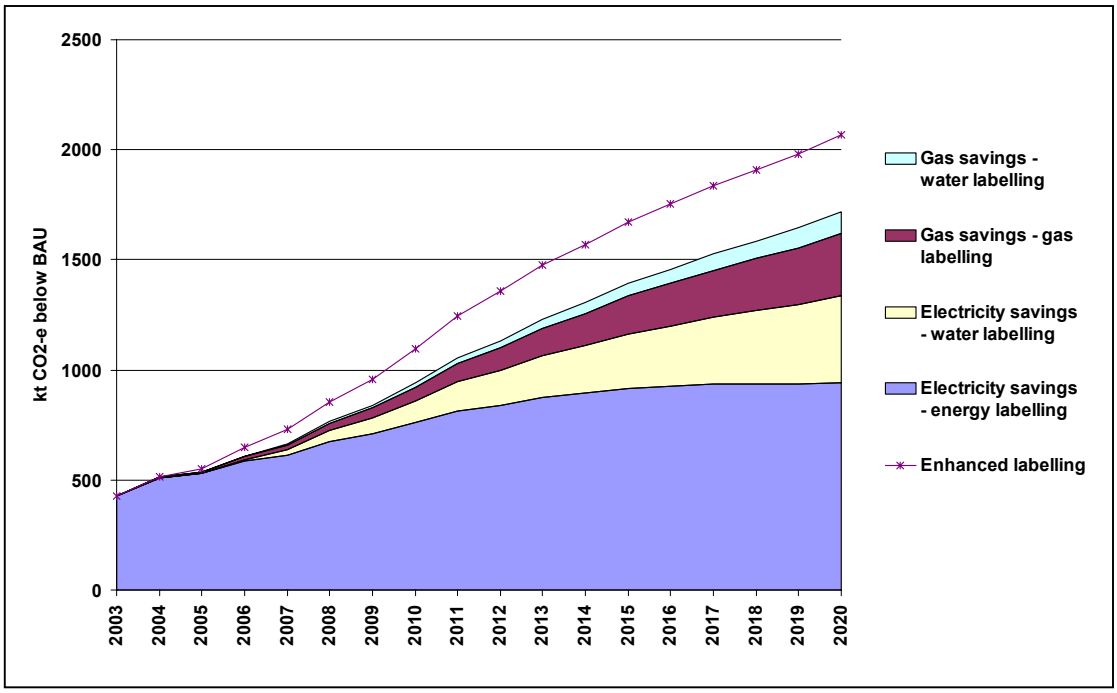
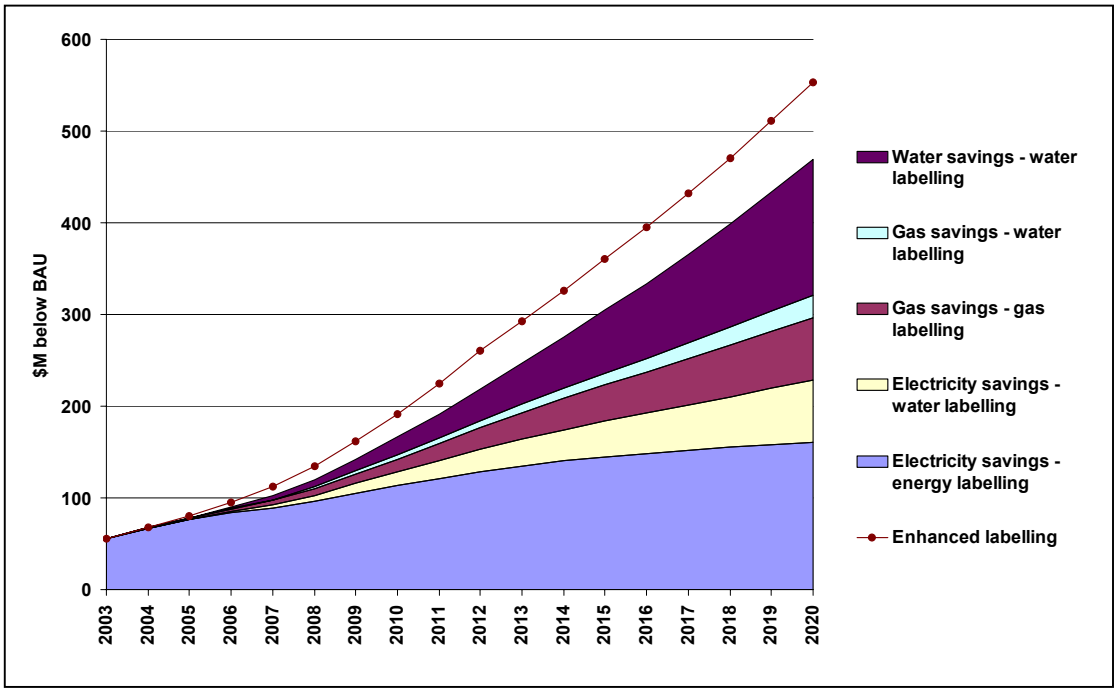


Figure 11 Projected monetary greenhouse savings from energy, gas and water labelling – BAU and with enhancement



Costs

Government costs

The costs of developing and implementing an integrated resource labelling strategy are insignificant in comparison with the potential benefits, and minor in comparison with current expenditure by Commonwealth and State governments on electric appliance energy labelling. For example, coordinated product labelling proposals for all three resource labelling programs have been developed and consumer researched for less than $100,000. The required budget for the introduction of the TESAW label is estimated at $ 100,000.

In nearly all cases the implementation of a strategy involves minor redirection of resources already committed or cost-free measures such as design decisions, rather than any additional costs.

Supplier Costs

The main costs of resource labelling to suppliers are product testing, product registration (which is actually a transfer payment which meet some of the Government's administration costs) and the production and fixing of labels.

These costs have been estimated for each labelling program separately in the various RISs and other analyses. The costs are determined largely by whether a product is subject to mandatory labelling and the takeup of optional program elements such as endorsement labels), rather than the physical form or configuration of the labels. If anything, these costs can be reduced through better coordination, which might allow the required information to be conveyed with fewer physical labels.

Consumer Costs

Strategic coordination is likely to be cost-neutral for Governments, possibly lower the costs to suppliers, but may slightly increase costs to consumers. If the effectiveness of resource labelling increases, consumer preference for more efficient models would also increase. There is some link between product cost and resource efficiency, albeit a weak one (GWA et al 2001) so consumer expenditure on labelled products will increase. An indicative estimate of additional cost savings though enhanced labelling is about $M 670 over 17 years (Table 4), equivalent to about $M 39 per year. In other words, consumers would be better off if their additional expenditure on household products as a response to more effective labelling did not exceed $M 39 per year (about $5 per household).

3.4 Conclusions and Recommendations

Conclusions

The three main household appliance labelling programs – for electricity, gas and water- have converged to the point where it is necessary to manage them jointly to maximise their impact and avoid conflicts.

It is possible to do so because all three programs are based on similar technical elements, employ similar communication modes and are moving towards a common administrative framework. At the same time, the energy label, as the longest-established mandatory program, has such high recognition that it sets a precedent for the other resource labelling programs.

There is a historic opportunity to develop and implement a coordinated resource labelling strategy. However, care is needed to take advantage of this opportunity while preserving the integrity and effectiveness of the labelling programs.

Recommendations

Resource Labelling Program Management

1. Labelling should be considered as a communication system that includes informative, comparative, endorsement and (if necessary) warning modes, to address as many segments of the target audience as possible.

2. Product resource labelling should enable buyers to make their own judgements about the relative value of different resources and environmental impacts – this implies distinct (but coordinated) resource labelling rather than a combined "eco-label".

3. Product resource labelling should be based on and restricted to verifiable estimates of the quantity of resources directly consumed by the product under the stated patterns of usage, and the quantity of waste products, if that can be measured/estimated with a high degree of confidence.

4. To avoid the risk of undermining the credibility of resource labelling, Government-supported endorsement labels should be restricted to products, and should not be available for certifying services, design methods or organisations.

5. Labels themselves should not contain information which is likely to vary geographically or over time in an unpredictable way (eg resource price, greenhouse impacts, embodied resources) but this information could be accessible via websites.

6. The use of the Energy Star label in Australia should be restricted to indicating standby energy only.

7. If the application of comparative labels to a product class is demonstrated to be cost-effective and effective, than the use of such labels should be made mandatory;

8. For product classes where comparative labelling is feasible, but the mandatory application of labels to the product class as a whole cannot be demonstrated to be cost-effective and effective, suppliers should still have the option of using a label, but in doing so should assume obligations as if the label were mandatory

9. The use of endorsement labels should be optional.

10. For product classes where warning labels are necessary, the use of the warning labels should be mandatory

Label Scales and Algorithms

11. Changes in comparative rating scales (eg by rescaling the algorithms) should be considered at intervals of no greater than 10 years, and whenever there is a major change in the market, eg due to introduction of more stringent MEPS.

12. There should be reasonable parity between the scaling of all comparative labels – eg 1 to 2 scale units (stars) for "acceptable" efficiency, 3 to 4 for "good" and 5 to 6 for "excellent".

13. Whenever labels are rescaled, the algorithms should be set such that there are no models at the two highest scale units at the time of introduction of the new label, but achieving the highest scale units should be technically feasible. This will retain incentive for suppliers to continue to improve their products.

14. Major label changes (eg in tests, algorithms or label format) should be phased in over periods no longer than 12 months: after 12 months, all old labels should be deregistered, and there should be no "grandfathering".

Label Formats

15. Major revisions of tests, scales etc in comparative labels should be signalled to consumers by changes in label design, bars of different colour or year markings.

16. All market-based endorsement labels should clearly indicate the year

17. All comparative resource labels for household products (whether indicating electricity, gas, water or boosted solar energy use) should have an arched shape and a scale of either 5 or 6 stars to indicate comparative ratings, in steps of no less than half stars (ie no fractional or decimal stars).

18. All informative resource labels (or the informative elements of comparative labels) for the one product type should indicate the quantity of resources consumed over the same period of operation (eg a year), or the same number of operating cycles.

19. Where there are no reliable data on typical or average operating hours or cycles, or where these vary greatly within Australia, resource us per hour or per operating cycle should be indicated.

20. Both endorsement and warning labels for each resource type should be clearly related to the corresponding comparative label through colour, shape and title, but sufficiently differentiated so that there is no confusion between the three labelling modes.

21. There should be no images of stars on stand-alone warning labels, to reduce the chances of confusion or deliberate misrepresentation.

Supporting Information

22. All resource labels should promote a website address for further information.

23. All websites should have a common look and feel, and should be linked.

24. All websites should have resource cost and greenhouse impact calculators. For products that use both energy and water (eg clothes washers, dishwashers and showers) the cost and greenhouse impact calculators should take into account both the energy and the water use.

Label Placement

25. The placement of resource labels on products or their packaging at points of display for sale should be regulated, so that prospective buyers have a high probability of seeing the labels.

26. Where products must carry more than one label, it should be permissible to print the images on the one physical label, provided that the arrangement of the images follows the regulations.

27. Regulations should control the "information space" around resource labels to prevent other labels confusing or possibly contradicting the message

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