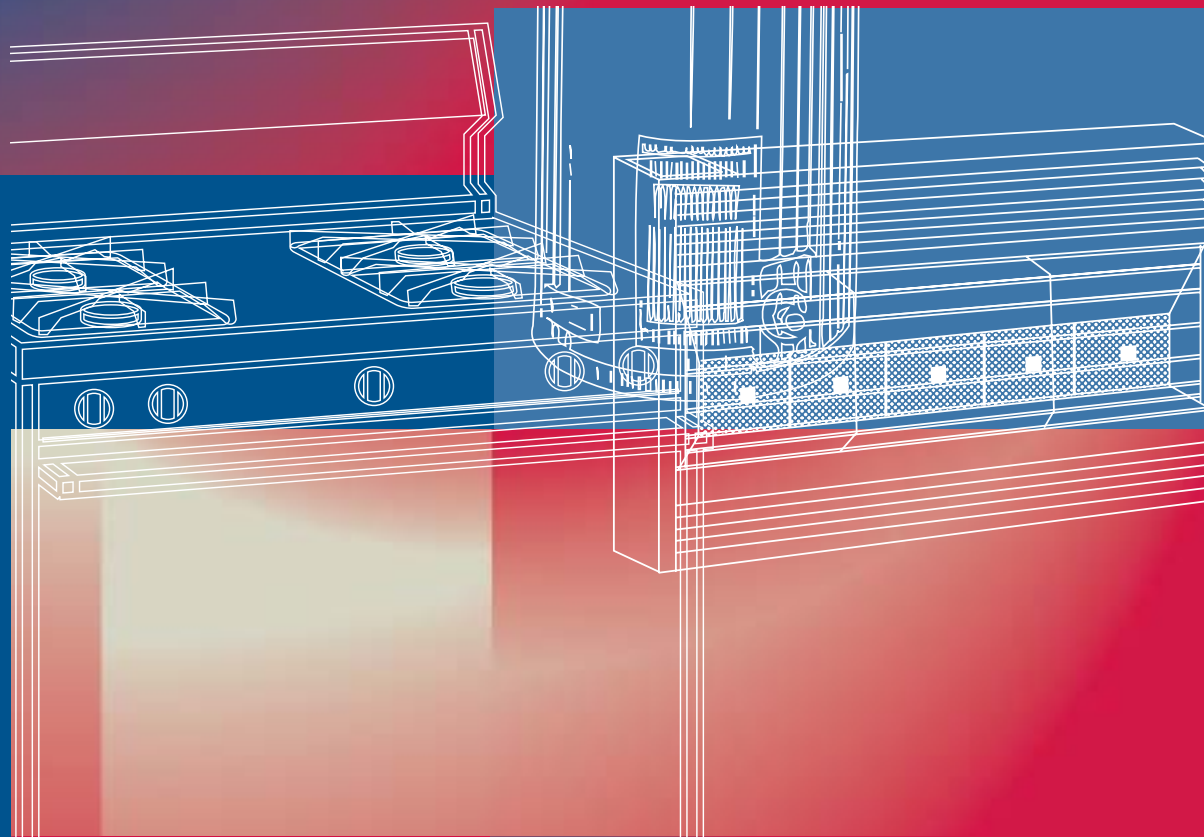


Driving Energy Efficiency Improvements to **Domestic Gas** Appliances



Discussion Paper July 2003

DISCUSSION PAPER

The aim of this Discussion Paper is to stimulate debate on the future directions of the gas appliance efficiency program, and to canvas views from a broad spectrum of industry and other stakeholders. It has been published by Sustainable Energy Authority Victoria on behalf of the organisations represented on a joint industry-government working group comprising: Australian Gas Association; Australian Greenhouse Office; Gas Appliance Manufacturers' Association of Australia; Sustainable Energy Authority Victoria; and Victorian Office of Gas Safety

COMMENTS

Comments on the proposals outlined in this Discussion Paper are sought from any interested person or organisations, and can be sent to:

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Comments received before 15 November will assist in determining the final form of a proposal to government concerning the future directions of the gas appliance efficiency program.

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**SUSTAINABLE
ENERGY AUTHORITY
VICTORIA** >

Published by:
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July 2003

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An electronic version of this Discussion Paper can be obtained from Sustainable Energy Authority's web site (www.seav.vic.gov.au/news/Gas_MEPS).

FOREWORD

It is with great pleasure that I introduce the Discussion Paper Driving Energy Efficiency Improvements to Domestic Gas Appliances, prepared by a joint government-industry working group to stimulate discussion on the future directions of the gas appliance efficiency program.

Gas is an important domestic fuel throughout Australia, and the market share of gas heating and water heating has been gradually increasing as gas supply networks expand. This trend has been encouraged by governments, in recognition of the economic and environmental benefits which can be achieved.

Since the early 1990s, governments throughout Australia have worked cooperatively with industry to put in place the National Appliance & Equipment Energy Efficiency Program (NAEEEP). This program is making significant progress in increasing the efficiency of electrical appliances sold in Australia, through progressive upgrading of energy labelling and Minimum Energy Performance Standards (MEPS).

The important contribution that the industry-run gas labelling and MEPS scheme has made to promoting the development and sale of energy efficient gas appliances is recognised by Governments. However, it is important that gas appliances continue to match the energy efficiency gains being achieved for electrical appliances, to ensure that this important non-renewable resource is used economically and sustainably.

Recent research has shown that Australia's energy consumption is increasing at a faster rate than population growth, a situation which needs to be urgently addressed through a substantial improvement in energy efficiency. With this aim in mind, Victoria is coordinating the development of a National Framework for Energy Efficiency on behalf of the Ministerial Council on Energy, in conjunction with the Commonwealth, State and Territory governments.

Under the National Framework for Energy Efficiency it is likely that NAEEEP will be expanded to cover a wider range of appliances and equipment. This Discussion Paper provides an opportunity for industry to signal its support for the inclusion of gas appliances and equipment in this important national initiative.

I am pleased to note that the peak bodies representing the gas appliance industry—the Gas Appliance Manufacturers' Association of Australia and the Australian Gas Association—are working cooperatively with Victorian and Commonwealth Government agencies to explore options for enhancing the effectiveness of the existing industry-run scheme at driving efficiency improvements to gas appliances.

The publication of this Discussion Paper is an important first step in this process.

I encourage all stakeholders to read the Discussion Paper and make a constructive contribution to the debates that will take place over the coming months.

Hon Theo Theophanous MP
Minister for Energy Industries and Resources



STATEMENTS OF SUPPORT



The Gas Appliance Manufacturers Association of Australia (GAMAA) has worked closely with the Australian Greenhouse Office and the Sustainable Energy Authority of Victoria in completing their projects for many years. We have also worked with other State and Commonwealth Government agencies on matters affecting the environment in Australia.

GAMAA is committed to working with its members in producing the most energy efficient appliances in Australia. We also support their commitment to increase that efficiency in the years ahead with appliances that are affordable. We would also like to acknowledge that natural gas is one of the most greenhouse friendly sources of energy available to Australians.

The Discussion Paper Driving Energy Efficiency Improvements to Domestic Gas Appliances signals another step in the continuing efforts by Australian governments to further reduce greenhouse gas emissions. Once again, GAMAA is pleased to work with Commonwealth and State Government agencies to establish reasonable minimum energy performance standards for gas appliances, and energy labelling programs that assist Australian consumers to make informed decisions when purchasing appliances.

We encourage our members to provide input to this effort, and will work to establish truly effective programs to accomplish the goals set out in the Discussion Paper.

Andrew Creek
President
**Gas Appliance Manufacturers Association
of Australia**



The Australian Gas Association is happy to work with State and Federal Government agencies to improve upon the already strong gas appliance energy labelling and MEPS program in Australia.

Gas plays an increasingly important role across all sectors of the economy. It is the fuel of choice for millions of Australian households and has numerous flexible commercial and industrial applications, including power generation. The economic and environmental benefits that gas provides continue to gain recognition by governments and wider community. The promotion and use of high efficiency gas appliances further enhances this benefit.

The gas industry is committed to energy efficient appliances and includes appropriate energy performance assessments in a number of its gas standards. The star rating results shown on the gas appliance energy labels assist consumers in comparing the efficiency of similar gas products and encourage manufacturers to design appliances with even greater energy efficiencies.

Bill Nagle
Chief Executive
Australian Gas Association

STATEMENTS OF SUPPORT



AUSTRALIAN
Greenhouse
Office

This is an exciting time to be involved in the appliance industry: the challenge being to deliver products that are technologically sophisticated, energy efficient and still affordable. The Australian energy industry has changed considerably over recent years with the focus now on providing the most suitable mix of fuel and appliances to do the job. We are beginning to see convergence between historically separate industries, with some retailers now offering both electricity and natural gas. And furthermore, the marketplace for appliances is increasingly cosmopolitan, giving manufacturers access to world's best practice technologies to deliver highly efficient products, suitable for discerning, environmentally responsible consumers.

Natural gas is an important and growing fuel source in Australia, and plays an important part in Australia's commitment to addressing global climate change issues. This role is recognised in the 1998 National Greenhouse Strategy (NGS), which defines Australia's commitment to reducing greenhouse gas emissions. One component of the Strategy is the recommendation that Government agencies work with industry to improve gas appliance MEPS (Minimum Energy Performance Standards) and labelling programs to further minimise emissions.

Regulation of gas appliances has been managed successfully by the Australian Gas Association for many years. While changes in the industry structure pose challenges for the future, the success of the electrical appliance program shows the benefits of greater cooperation between Government and industry. The National Appliance & Equipment Energy Efficiency Program for electrical appliance efficiency is now recognised worldwide and it is now time to use this experience for the benefit of the gas appliance industry and its customers.

This Discussion Paper publicly signals the commitment of the AGO to work with the gas appliance industry, and builds on relationships established since 1999 with the Australian Gas Association and the Victorian Office of Gas Safety over the development of test methods.

With the release of this Discussion Paper, we now have a strong foundation for effectively reviewing regulation of the Australian gas appliance industry. This gives all key stakeholders a chance to have their say, and to have a role in making the gas industry an outstanding role model for the international community. This is our chance to demonstrate our commitment not only to reducing emissions, but to providing the best products for Australian consumers.

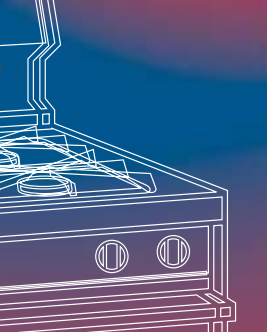
Dr Tony Marker

Chair

**National Appliance and Equipment
Energy Efficiency Committee**

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EXECUTIVE SUMMARY

WHY ARE GOVERNMENTS GETTING INVOLVED IN GAS APPLIANCE EFFICIENCY?

Historically, governments have left the regulation of gas appliance efficiency standards to the capable management of the gas industry through the Australian Gas Association (AGA). The AGA used its role as the writer of gas standards, and conditions of membership, to create a system that demonstrably has improved gas appliance efficiency.

The current gas appliance efficiency scheme was built on State Government requirements to obtain AGA certification before any mass-produced domestic gas appliance could be manufactured, sold or installed. The relevant gas appliance standard prescribes minimum energy performance standard (MEPS) levels, the methodology for the energy tests and how the results must be displayed to show the relative efficiency on an energy rating label. The industry-run gas labelling program has both 'pulled' and 'pushed' product development. The label sought to identify more efficient products to potential customers, and to provide an incentive to manufacturers to market more efficient products.

Gas appliances are popular amongst Australian consumers, with some types gaining market share at the expense of electrical competitors. Analysis indicates that there is a significant variation in the energy efficiency of appliances within each gas appliance category, which is reflected in both the running costs to consumers and greenhouse gas emissions.

International obligations

In recent years, the international community has embraced the concept of greenhouse gas abatement to combat global climate change. The collective commitments of Australian Governments are identified in the National Greenhouse Strategy (NGS), which details actions for reducing national greenhouse gas emissions while protecting jobs and maintaining the competitiveness of Australian industry. In particular, the NGS emphasises the importance of partnerships between governments, industry and the community in delivering an effective greenhouse response.

In recognition of the low greenhouse intensity of natural gas, the NGS endorses existing energy sector reforms which have led to growth in the industry and the emergence of many new players. This change in the structure of the gas industry has led to challenges for existing management structures, signaling that it is time that these were reviewed. The NGS also calls for

Commonwealth, State and Territory agencies to work with industry to improve gas appliance labelling and minimum energy performance standards (MEPS) programs.

In August 2002, the Commonwealth Government announced that Australia would aim to meet its Kyoto target, though Australia would not sign the Protocol. Improving gas appliance efficiency is one measure that can assist in meeting Australia's greenhouse targets.

Further improvements are possible

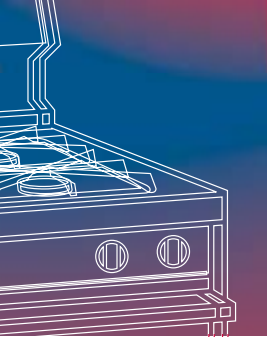
Since the early 1990s, governments throughout Australia have worked cooperatively with industry to put in place the National Appliance & Equipment Energy Efficiency Program (NAEEEP), which has been successful in driving energy efficiency improvements to electrical appliances, through progressive upgrading of energy labelling and MEPS.

Governments recognise the important contribution made by the industry-run gas labelling and MEPS scheme to promoting the development and sale of energy efficient gas appliances. However, it is important that gas appliances continue to match the energy efficiency gains being achieved for electrical appliances, to ensure that this important non-renewable resource is used economically and sustainably.

The very success of the gas appliance labelling program over time suggests that further energy efficiency improvements are possible. A comparative energy efficiency label works best when the rating system reflects the spread of efficiencies available in the marketplace. Although effective since its introduction, the current energy rating labels for some appliance categories show considerable bunching towards the upper end of the rating scale. It is time for these labels to be re-scaled in order to provide consumers with the opportunity to select the highest efficiency models, and to encourage manufacturers to invest in further efficiency improvements.

The policy tool of banning the sale of inefficient products through MEPS drives the success of the national electrical appliance efficiency program by forcing that market to deliver more efficient products than would otherwise have occurred. This policy tool has not been used to the same extent in the gas appliance sector.

Energy efficiency is an important issue in Australia and there are increasing national and international issues to consider. While the AGA and the Gas Appliance Manufacturers' Association of Australia (GAMAA) are well-placed to continue



EXECUTIVE SUMMARY

administering aspects of the gas appliance efficiency program, the involvement of Australian governments will ensure that the program is developed in a manner which is consistent with national policy goals, and developments in other industries and in other countries.

WHY DOES INDUSTRY WANT GOVERNMENT INVOLVEMENT?

Australian consumers are increasingly aware of issues like energy efficiency and greenhouse gas abatement, and are demanding products which provide the most suitable and efficient energy services. Consumers have more choice than ever before and this trend will continue as gas supplies become available to a larger number of households.

The Australian gas appliance industry is committed to providing world class products, and recognises the need to continuously change to meet the needs of the Australian community and environment by providing more energy efficient appliances.

Industry supports the transition to a regulatory regime that meets world's best practice—whereby Australia seeks to match, but does not lead, the introduction of MEPS levels—as long as this transition is suitably stage managed so that industry has adequate time to plan for change, that any changes to MEPS levels or energy labelling are technically defensible, measurable, auditable, and ultimately underpinned by an Australia-wide regulatory and enforcement system.

Fair to all industry participants

Competition in the appliance market occurs not only between appliances that use a common fuel source, such as different types of gas water heater, but also between different types of appliances, such as gas and electric water heaters. In this context, Governments can help industry by establishing a consistent framework that does not provide an unfair advantage to any company or appliance type.

Mindful of the times required by industry to develop and commercialise new, more efficient, products, governments can also commit to sensible timeframes for the implementation of regulations, providing the certainty needed for all to prepare adequately. Government involvement, especially now when the industry itself has identified the need to review its MEPS and labelling scheme, is particularly important to ensure that any changes are competitively neutral and are taken in the interests of the entire community.

National programs involving Australian governments must demonstrate that any changes are in the community interest, and that all stakeholders are consulted at key decision points. Any move by governments to regulate gas appliance efficiency by law (as is done for electrical appliances) will be subjected to a Regulatory Impact Statement, and must demonstrate net benefits for the community. These processes ensure all views are considered and regulation is only imposed if cost effective for Australia.

Holistic approach

For domestic electrical appliances, where a government and industry partnership has existed for 10 years, a complete program driving appliance efficiency is in place. That program uses a range of other voluntary and mandatory tools to complement energy labelling and MEPS, to deliver improved energy efficiency outcomes. It is the role for governments to ensure that the strategic direction of such programs is coordinated and effective, allow for pooling of industry resources and include tools that might not otherwise be possible.

Government funding for complementary 'best practice' programs or actions to improve sales of more energy efficient products are envisaged to be part of the compact where the gas appliance efficiency program is co-managed by the gas appliance industry and Government.

WHAT BENEFIT WILL CONSUMERS OBTAIN?

Confidence in the system

The growth in sales of energy efficient products demonstrates that today's consumers want products that are cheaper to run and more environmentally friendly. The maintenance of credible and accurate information on energy performance has therefore become an important aspect of product marketing for gas and electric appliances. The involvement of government in energy labelling and other information programs enhances consumer confidence in the accuracy of the information provided.

In addition to energy rating labels, there is a range of other information and education material that can assist consumers with their purchasing decision. In an industry-run scheme, some of these tools may not be made available because of the limits of corporate funding or other competitive pressures. With government support, tools like an internet-based product comparison database can be better utilised.

Governments are committed to providing easy access for consumers and industry to a range of program material including strategic plans, draft standards and up-to-date information about products and the efficiency standards and labels that apply to them.

Demonstrations of the scheme's benefits

Industry players tend to concentrate on those aspects that assist them to sell their products. Governments focus on longer-term goals and seek to evaluate the entire scheme using criteria other than sales. The greater involvement of government will improve the monitoring the effectiveness of the gas appliance efficiency scheme, and particular aspects such as promotional and communication strategies.

In short, consumers will benefit greatly from a coordinated national approach to managing gas appliance efficiency, resulting in easier access to information and the opportunity to select the most cost-effective appliances which delivers the energy services they require.

WHAT ARE THE KEY FINDINGS OF RECENT STUDIES OF THE GAS APPLIANCE SECTOR?

There has been a gradual increase in the market share of gas appliances, with gas water heaters and gas heaters taking sales from electrical appliances, combined with a general improvement in the average efficiency of models sold. However, the long-term effectiveness of the gas appliance efficiency scheme will be eroded unless it is updated to drive the development of even more energy efficient products, and the energy rating labels updated so that they can adequately reflect these efficiency gains.

Most gas appliances now comfortably exceed existing MEPS levels, and energy labelling has become less meaningful for some appliance categories, with certified gas water heater and gas ducted heater models bunching at the top end of the star rating scales.

In very recent times, the gas appliance efficiency scheme does not seem to have kept pace with technological improvements available in some overseas countries for some appliance categories. Given that there is a significant variation in the energy performance of appliances within each appliance category, there is scope for real reductions in greenhouse gas emissions by ensuring that the best performing products gain market recognition.

Storage water heaters

Key industry players and government officials believe Australia should adopt the target of a new MEPS level broadly equivalent to world's best regulatory practice—the level due to come into force in the US in January 2004—possibly to come into effect in Australia no later than October 2007. With government help, industry propose to change the existing test standard so that overall efficiency is defined as a function of energy and volume, thereby allowing manufacturers to balance improvements in burner efficiency and maintenance rate in order to meet MEPS in the most cost effective manner.

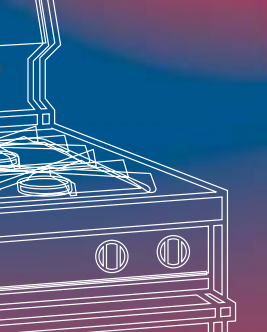
Recent analysis shows that over 60% of certified water heater models are rated four-stars or more. To provide greater differentiation in the marketplace, key industry officials and government officials advocate developing a revised rating scale to better reflect the efficiency spread of gas water heaters on the market. The revised energy label would take into account any revisions to the existing MEPS and change to the test method.

Gas heaters

Most non-ducted gas heaters exceed MEPS levels by some margin, and this may also be the case for ducted gas heaters. Due to the difficulties of making international comparisons, industry and government representatives advocate that a realistic increase to the existing MEPS levels should be considered, with the aim of withdrawing the worst performing products from the market.

Given the growth in central heating systems, defining an appropriate test standard and MEPS level for hydronic (wet central) heating systems is considered a priority.

Based on recent studies, the lack of non-ducted gas heaters labelled to the current (1998) test standard seems to be hindering consumer choice. Rescaling the energy rating labels may be warranted, if bunching of star ratings at the top end of the scale is evident, once up-to-date data is available for all models on the market. Rescaling should be considered for ducted gas heaters, because of bunching at the higher end of the star rating band, driven by energy efficiency improvements over recent times.



Gas cookers

Australia is one of few places that sets MEPS levels for gas cooking appliances, but as with other countries there is no energy labelling scheme. There is little evidence to suggest that improvements to the existing MEPS levels or the introduction of energy labels are warranted.

WHAT WILL THE NEW SCHEME LOOK LIKE?

The existing industry-run gas appliance efficiency program already shares many similarities with the national electrical appliance efficiency program. With the introduction of a national gas appliance efficiency program sponsored by both industry and government, as set out in this Discussion Paper, the existing program will be enhanced.

Key components of a joint government-industry national gas appliance efficiency program will include:

- > The development of a comprehensive Strategic Plan detailing the objectives and future directions of the program for gas appliances.
- > The introduction of Work Plans similar to the three-year work plans produced for electrical appliances, including plans for new regulations and changes to existing regulations.
- > The progressive review of test methods, and possible updating of test standards for gas appliances.
- > The establishment of a new check-testing and enforcement framework applying to new and current models.
- > The review of MEPS levels to ensure consistency with world's best regulatory practice and to include any changes in test methods.
- > The review of gas appliance labelling following changes to test methods, with rescaling carried out where needed.
- > The improvement of consumer and industry access to information through an appropriate website and promotional/best practice programs.
- > The introduction of a cohesive monitoring and evaluation program to assess improvements in appliance efficiency and the influence of appliance labelling on consumer behaviour.

WHAT IS THE PROPOSED TIMELINE FOR THE INDUSTRY REVIEW?

This Discussion Paper is the first stage in exposing the proposal of greater government involvement in the gas appliance efficiency scheme.

Following consultation with all stakeholders on the ideas promoted in this paper, the next stage will be a proposal to the Ministerial Council on Energy to consider committing all jurisdictions to a joint industry-government gas appliance efficiency program. With that consideration targeted for late 2003, the development of a Strategic Plan for gas appliances is targeted for completion by March 2003.

The proposed timeline for the development of the Strategic Plan is:

- > Publication and circulation of the Discussion Paper Jul 2003.
 - > Consultation on the Discussion Paper Jul–Nov 2003.
 - > Proposal to Ministerial Council on Energy for in-principle decision Dec 2003.
 - > Publication of Strategic Plan for gas appliances Mar 2004.
- Concurrently, a review of test methods and standards for gas water heaters appliances will start, with the assistance of government funding, based on the proposed timetable shown below:
- > Independent testing of water heater test methods Jun–Dec 2003.
 - > Revised MEPS and labelling provision Jun 2005.
 - > Consultation on an RIS Oct 2005.

It is proposed that test methods, proposed MEPS and a revised label for gas heaters will be progressively reviewed in 2005, culminating in the publication of Regulatory Impact Statements and new standards by around October 2007.

The target commencement dates for the new gas appliance energy efficiency standards have still to be negotiated with industry, but possible commencement could be October 2006 for water heaters and October 2008 for gas heaters.

PROCESS FOR PUBLIC COMMENTS

HOW CAN YOU INFLUENCE THIS PROCESS?

The aim of this Discussion Paper is to stimulate discussion on the future directions of the gas appliance efficiency program, and to canvas views from a broad spectrum of industry and other stakeholders. Therefore, this document should be viewed as a framework providing a useful starting point for discussion.

While the government has initiated the review process, this Discussion Paper has been developed cooperatively by a joint industry-government working group, and the Strategic Plan resulting from this paper will encapsulate the needs of all stakeholders.

The joint industry-government working group comprised representatives from the following organisations:

- > Australian Gas Association.
- > Australian Greenhouse Office.
- > Gas Appliance Manufacturers' Association of Australia.
- > Sustainable Energy Authority Victoria.
- > Victorian Office of Gas Safety.

There will be ample opportunity to participate in discussions about the future of the gas appliance efficiency program. A series of stakeholder workshops will be held around Australia during August in the following locations:

- | | |
|-------------|---|
| > Melbourne | Tuesday 5 August
2 pm to 5 pm |
| > Adelaide | Thursday 21 August
9.30 am to 12.30 pm |
| > Sydney | To be announced |

For further information on the dates and locations of the stakeholder workshops, please contact:

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Telephone: (03) 9655 3282
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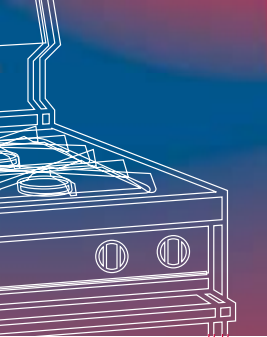
This Discussion Paper will be in circulation until November 2003 to ensure that it is thoroughly reviewed by all stakeholders and interested parties. There will be substantial consultation with key stakeholders during that time.

Interested parties should send their views to:

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Sustainable Energy Authority Victoria
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E-mail: ian.mcnicol@seav.vic.gov.au

Comments received before 15 November will be reported to the MCE.

After completion of the initial consultation process, interested parties will have further opportunities to provide input during the development of the Strategic Plan for gas appliances, and subsequently as the proposals for individual product types are released.



1 INTRODUCTION—THE GAS APPLIANCE MARKET

1.1 OVERVIEW OF THE AUSTRALIAN GAS APPLIANCE MARKET

1.1.1 Introduction

Gas is an important domestic fuel source in Australian households, and there has been a gradual increase in the market share of many gas appliances over recent years.

The number of gas water heaters and gas heaters installed is growing, and this trend is likely to continue given the expanding network for reticulated gas supplies.

The growth in gas water heaters is currently driven largely by storage types, although there is evidence that instantaneous water heaters are gradually gaining market share. The trend for increased sales of both ducted and non-ducted gas heaters is also expected to continue.

While the overall market share for gas cookers is decreasing, there is growth in sales of gas cooktops, reflecting a consumer preference for use of gas cooktops combined with electric ovens.

1.1.2 Gas water heaters

1.1.2.1 Types of gas water heaters

The most common types of gas water heater in Australia are storage and instantaneous (continuous flow) units, and to a far lesser extent gas-boosted solar units and gas boilers.

> *Gas storage water heaters*

Gas storage water heaters consist of an insulated tank with typical storage capacities ranging from 90 to 260 litres, a gas burner at the base of the tank to heat the water, and a heat exchanger/flue which usually rises through the centre of the storage tank. When a hot water tap is turned on, cold water enters the bottom of the tank, displacing hot water through an outlet at the top of the tank. Re-heating of the water inside the tank is controlled by a thermostat.

Domestic storage units typically consume between 20 MJ/hour and 50 MJ/hour during re-heat, and are usually designed to heat a full tank of water in less than one hour. Most units have a continuously burning pilot light to ignite the main burner.

Gas storage water heaters waste energy through incomplete combustion in the main burner, flue losses during combustion due to incomplete heat exchange, and heat losses through the walls of the storage tank and the flue. Small quantities of gas are also usually consumed by a continuously burning pilot.

> *Gas instantaneous water heaters*

Gas instantaneous water heaters do not have a tank to store heated water and so are more compact than storage systems. Instead, they have a high-powered gas burner which may consume up to 250MJ/hour, which heats cold water on demand as it passes through a heat exchanger. The units currently available have rated hot water deliveries of up to 32 litres/minute (based on a 25°C temperature rise), depending upon their intended application.

When cold water flows through the unit the main gas burner is ignited, generally by a continuously burning pilot or by electronic ignition (battery or mains powered).

Unlike gas storage systems, instantaneous gas water heaters do not have standing losses. These systems waste energy through inefficient heat exchange and flue losses during combustion. They also generally either consume gas for a continuously burning pilot or use power in electronic ignition units.

> *Gas-boosted solar water heaters*

Gas-boosted solar water heaters consist of solar collector panels, insulated storage tank, gas burner and heat exchanger. Storage tank sizes range from 180 litres to 440 litres, which may either be adjacent to the collector ('close-coupled'), on the ground, or in the roof cavity. Tanks mounted below the solar panels commonly have small electric powered pumps for circulating water through the collectors, while those mounted above the solar panels circulate water naturally according to the 'thermosyphon' principle.

Because the effectiveness of solar water heating varies both by location and time of year, most solar storage tanks 'boost' the hot water temperature when required with a gas burner. The burner is usually internal, however some hybrid systems use an instantaneous gas water heater. Gas-boosted solar water heaters are generally considered to be a type of storage water heater.

> *Boilers*

The primary function of domestic gas-fired boilers in Australia is to provide heating, and they are therefore discussed in that section. However, some boilers are also used to provide domestic hot water, and in Australia certification of gas boilers is covered under Australian Standard AS4552 (AG 102) for water heaters, although this standard does not require the energy labelling of boilers.

1.1.2.2 Installed stock of gas water heaters

Current estimates of the penetration of gas water heating vary from 35% to 39% of households. Table 1 shows BIS Shrapnel's estimates of the installed stock of gas water heaters in 1999/2000 (as a percentage of all types of water heater).

Table 1: Estimates of the installed stock of gas water heaters in 1999/2000 [BIS, 2000]

Australia	NSW	Vic	Qld	SA	WA
39%	25%	65%	13%	58%	56%

It is estimated that in 1999/2000, 74% of the installed gas water heaters were storage types with the remaining 26% being instantaneous gas water heaters [BIS, 2000]. Figure 1 shows the estimated split between storage and instantaneous gas water heaters for each State in 1999/2000.

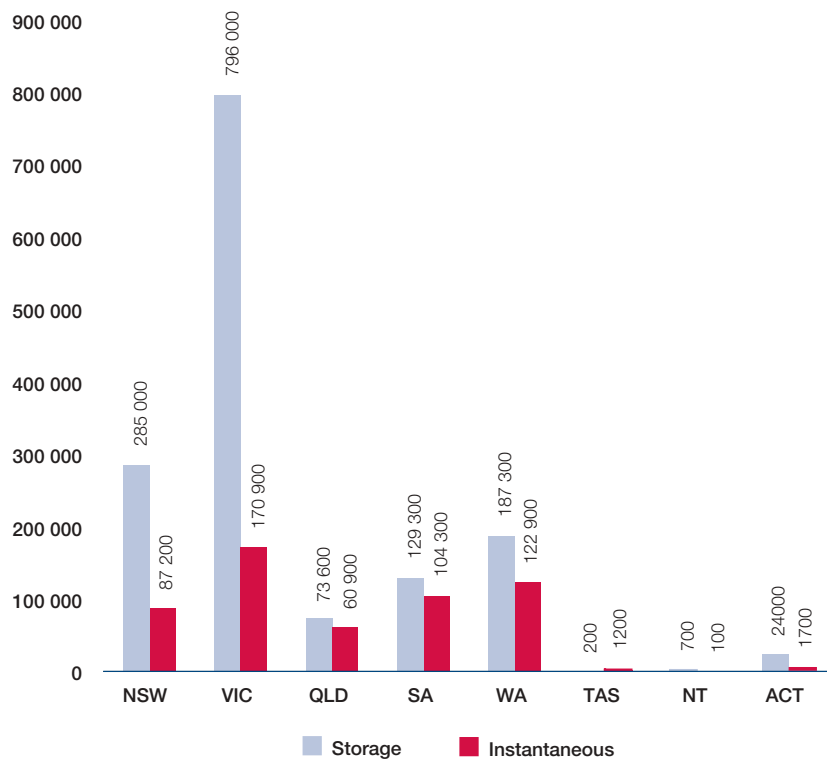
1.1.2.3 Annual sales of gas water heaters

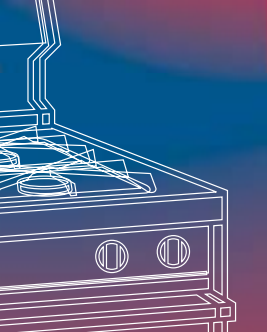
In 1999/2000, approximately 746,000 water heaters were sold, of which 47% were gas water heaters [BIS, 2000]. Given the uncertainty of data and volatility from year to year, typical estimates of annual sales of gas water heaters tend to lie between 286,000 and 350,000. Some 62% of these are estimated to be storage units, with instantaneous units accounting for the remaining 38% of sales. The estimated distribution of sales in 1999/2000 by State is shown in Table 2 below.

Table 2: Market share of gas water heaters in 2000, as % of total water heater market in Australia [BIS, 2000]

	Australia	NSW	Vic	Qld	SA	WA
Gas storage	29%	19%	57%	9%	18%	29%
Gas instant	18%	16%	19%	4%	35%	34%
Total	47%	35%	76%	13%	53%	63%

Figure 1: Installed stock of gas water heaters, by type and state [BIS, 2000]





1.1.2.4 Market trends

Based on the BIS Shrapnel data, the penetration rate of gas water heaters between 1997–98 and 1999–2000 appears steady at around 39%. With a growth in housing during this period, the installed stock of gas water heaters has actually increased, driven largely by storage water heaters, while the penetration of instantaneous types has remained steady. There is evidence, however, that instantaneous water heaters are gaining market share, and this should gradually have an impact on the mix of instantaneous and storage units in the installed stock.

It seems likely that the number of gas water heaters in Australian households will continue to grow, given the expanding network for reticulated gas supplies and the growth in housing.

1.1.3 Gas heaters

1.1.3.1 Main types of gas heaters

There are three main types of domestic gas heaters—non-ducted (room) heaters, ducted (central) heaters and hydronic (wet central) heating.

> *Non-ducted heaters*

Non-ducted (room) heaters are gas heating appliances with natural draught or fan assisted combustion. They consist primarily of gas burner(s), ignition componentry and thermostat, and in some units heat exchanger, fan(s), flue(s), air ducting and dampers to control air flow. There is enormous variation in the design and functionality of non-ducted heaters, which can either be flued or unflued.

- > **Flued heaters** expel the products of combustion to the outside air, with a range of types available: space heaters which produce radiated or convected heat or a combination of both; wall furnaces; room sealed appliances; and balanced flue appliances.
- > **Unflued heaters** expel the products of combustion to the inside air. They include radiant, radiant/convection and convection models. Regulations prevent or restrict the operation of unflued heaters on natural gas in some states.

> *Ducted central heaters*

Ducted central heaters are indirect fired ducted air heaters consisting primarily of burner(s), air inlet ducting, flue(s), ignition componentry, thermostat, heat exchanger, fan(s), warm air ducting and dampers to control airflow. The gas furnaces can be located either outside (external) or inside (internal), and the heating systems can be either be un-zoned, and heat large areas of a home, or zoned so that specific areas of a home can be heated at a given time.

> *Wet central heating/boilers*

Hydronic (wet central) heating uses hot water to provide whole home heating. In most hydronic systems, the water is heated in a gas boiler, and then pumped through piping to panel radiators or convectors positioned in each room. Heating capacities generally range from 4kW to 60kW for single residences, and up to 350kW for multi-residential applications.

Some boilers are used to provide both space heating and domestic hot water, particularly in the European market. These systems are often referred to as combination or 'combi' boilers.

> *Other categories of gas space heaters*

Fuel effect gas heaters, sometimes referred to as 'decorative' or 'log effect' heaters, may be flued or unflued.

Patio heaters are radiant heaters used for outdoor heating of residential patio areas, and increasingly for heating external eating areas associated with restaurants, pubs, hotels, etc.

1.1.3.2 Installed stock of gas heaters

Approximately 40% of Australian households use some form of gas heating, with 6% of these having more than one unit per household. The great majority of gas heaters are fired by natural gas (94%) with less than 6% using LPG. [BIS, 2000]

The total installed stock of gas heaters is estimated to be 2.74 million units in 1999–2000. The stock appears to have grown considerably over the recent period, increasing by 320,000 units (13%) since 1997–98 [BIS, 2000].

Table 3: Households with gas heating appliances, by state, 1999/2000 [BIS, 2000]

1999–2000	Australia	NSW	Vic	Qld	SA	WA
Penetration	40%	28%	78%	4%	49%	45%
Mean number per household	0.46	0.35	0.89	0.05	0.55	0.50

Non-ducted gas heaters are installed in more than twice as many households (68%) than ducted systems (29%). The exception is Victoria, where around 49% of gas heaters are ducted. A small proportion of households, have both ducted and non-ducted systems. [BIS, 2000]

1.1.3.3 Annual sales of gas heaters

The total sales of gas heaters in Australia in 1999–2000 are estimated to be 277,800 units [MEA et al, 2002]. Although non-ducted, unflued convection heaters have the largest market share, internal and external ducted heating have significant sales, as do flued wall heaters and unflued radiant heaters. Table 4 shows the approximate market share of all major types of gas heaters in Australia.

1.1.3.4 Market trends

There has been a small growth in the penetration of gas heaters over the past three years, despite minor annual fluctuations, and it is likely that this trend will extend beyond this period. Growth has occurred in both the ducted and non-ducted heater markets [BIS, 2000].

Table 5 below illustrates the following trends in the non-ducted heater market:

- > Growth in the non-ducted market since 1997–98 has been mainly driven by increased sales of convection heaters—unflued convection and flued wall furnaces. Sales of radiant heaters have declined considerably.
- > Although the market share of the flued heater sector has declined since 1997–98, sales of wall furnaces have risen considerably.

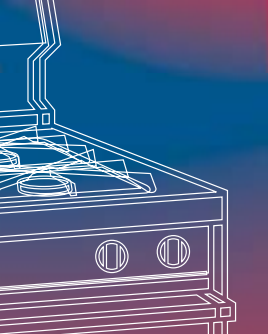
Table 4: Estimated market share and sales of gas heaters in Australia, 1999/2000 [BIS, 2000], [MEA et al, 2002]

System	Appliance type	Market share	Quantity
Non-Ducted	Unflued: Convection	31.3%	86 869
	Unflued: Radiant	10.4%	28 956
	Unflued: Gas Log	3.5%	9 652
	Flued: Wall Furnace	15.3%	42 469
	Flued: Convection	3.5%	9 652
	Flued: Gas Log	5.6%	15 443
Ducted ¹	Internal	16.8%	46 594
	External	13.7%	38 122
Total		100%	277 757

¹ Estimate from [MEA et al, 2002], derived from BIS Shrapnel data. Industry sources suggest that this may be an overestimate, with total sales of gas ducted heaters closer to 50,000 units per year.

Table 5: Market share of non-ducted gas heaters, by appliance type and year [BIS, 2000]

System	Appliance type	1997–98	1999–2000
Unflued	Convection	36%	45%
	Radiant	23%	15%
	Gas Log	3%	5%
Subtotal		62%	65%
Flued	Wall Furnace	11%	22%
	Convection	6%	5%
	Radiant	9%	0%
	Gas Log	12%	8%
Subtotal		38%	35%



1.1.4 Gas cookers

Gas cookers include the following types of appliances:

> Cooktops

Cooktops are also known as hobs, smooth-top cooking surfaces or built-in cooktops. Cooktops comprise one or more hotplates or internal heating components. Some models also incorporate electronic or piezo ignition.

> Ovens

An oven is essentially an enclosed heated chamber in which baking or roasting can occur. This category includes wall mounted, fan forced and self-cleaning ovens. Ovens consist of gas burner(s), insulated chamber, ignition componentry and adjustable thermostat. Some models incorporate an electric fan for a fan-forced cooking function, as well as electronic timers and controls.

> Stoves

Stoves are also known as ranges, cookers, or upright cookers. These products combine both a cooktop and one or more ovens. Upright cookers can be elevated with the cooktop and oven adjacent to each other, or free standing with the cooktop above the oven.

1.1.4.1 Installed stock of gas cookers

Table 6 shows the estimated penetration rate of gas cooking in Australia. The 11% of households which use a combination of fuels reflect an increasing preference for the use of electric ovens and gas cooktops.

Table 6: Penetration rate of gas cooking in Australia, 1999–2000 [BIS, 2000]

	Australia	NSW/ACT	Vic	Qld	SA	WA
Gas only	33%	24%	49%	15%	51%	43%
Combination	11%	8%	19%	5%	7%	20%

Table 7: Annual sales of all gas cookers, 1999–2000 [BIS, 2000]

Sales	Australia	NSW/ACT	Vic	Qld	SA	WA
Market share	39%	33%	48%	25%	50%	56%
Numbers	235 170	63 677	104 198	27 135	15 075	30 391

1.1.4.2 Annual sales of gas cookers

In 1999–2000 sales of gas cooking appliances comprised 39% of the market (see Table 7).

The majority (53%) of these sales were cooktops, with uprights (stoves) comprising the next largest quantity of sales (34%).

1.1.4.3 Market trends

Between 1997–98 and 1999–2000, the market share of sales for gas cookers declined by 6% (from 45% in 1997–98). The trend in types of gas cookers sold is towards cooktops and generally away from all other types of gas cooking appliances, ovens in particular. By 1999–2000 gas cooktops had 52% of the market, rising from 38% in 1991 [BIS, 2000].

Bottled gas supplies appear to be static, while there is growth in both combined gas/electric cooking and in all gas cooking.

1.2 MEPS AND ENERGY LABELLING FOR DOMESTIC GAS APPLIANCES

1.2.1 Introduction

Energy labelling and MEPS have separate but complementary functions within an appliance efficiency program.

Mandatory MEPS are designed to remove the worst performing products from the marketplace, by establishing a minimum level of performance for products in any category. Where technological advances progressively increase the efficiency of new appliances, the threshold for MEPS needs to be revised on a regular basis to keep step.

Energy labelling is intended to steer consumers to the more energy efficient products in the marketplace, thereby providing a promotional advantage to manufacturers who supply more efficient products. Labelling works best when there is a range of efficiencies on the market so that labels clearly differentiate between models.

The following sections describe elements of the MEPS and Labelling programs currently implemented for gas appliances in Australia.

1.2.2 Current Australian standards

1.2.2.1 Gas water heaters

> MEPS

The current MEPS level and test method for gas water heaters are contained in AS4552-2000 (AG102-2000). This standard requires a minimum thermal efficiency of 70% for both storage and instantaneous water heaters, and a volume-dependent maximum maintenance rate defined by the following formula:

$$M = 0.42 + 0.2V^{2/3} + 0.006R$$

Where:

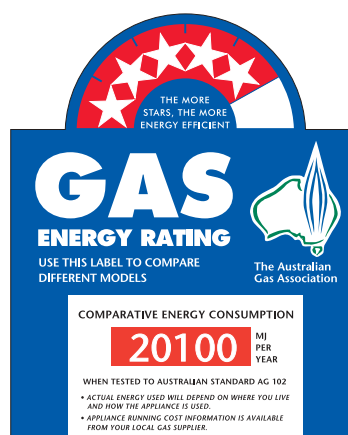
M = Maintenance rate in MJ/h

V = Nominal capacity in litres

R = Nominal gas consumption in MJ/h

> Energy labelling

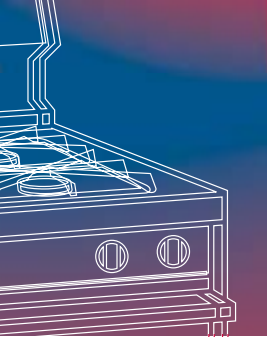
The energy rating label for gas water heaters includes both a star rating to allow comparisons of energy efficiency and an Annual Energy Consumption (in MJ/year) which gives an estimate of the annual gas consumption based on a hot water usage of 200 Litres/day (raised by 45°C above cold water temperature).



Gas water heater label

AS4552/AG102 also provides the methodology for labelling gas water heaters. The star rating is based on comparison with the annual gas consumption of a reference water heater with a storage volume of 140 litres and a burner rating of 30MJ/hr.

The star rating scale is based on 7% intervals, such that units consuming between 100% and 93% of the energy of the reference get one star, those consuming between 86% and 93% get two stars and so on. The formula allows the calculation of fractional (i.e. decimal) stars, but these were not reported before 1999.



1.2.2.2 Gas heaters

> MEPS

MEPS for all types of non-ducted gas heaters are contained in the AS4553-2000 (AG103-2000); and for indirect gas-fired ducted air heaters in AS4556-2000 (AG106-2000).

The following gas heater standards do not include MEPS requirements: AS4558-2000 (AG108-2000) for fuel effect heaters; and AS4565-2001 (AG405-2001) for outdoor radiant gas heaters (patio heaters).

MEPS for **non-ducted heaters** (radiant, convection and room sealed heaters) are as follows:

The Annual Energy Consumption (AEC) of **non-ducted gas heaters** is based on the energy consumption during one heating season (five hours per day for 100 days). The star rating is determined in comparison to a reference heater of identical energy input.

The energy rating label for **ducted gas heaters** includes both a star rating and an Annual Energy Consumption which gives an estimate of the annual gas consumption given in MJ/m³/Year.

The AEC of ducted gas heaters is based on the seasonal operating efficiency of the heating system at a heating load of 600 hours. The star rating represents the seasonal operating efficiency

Table 8: Australian MEPS levels for radiant, convection and room sealed heaters

Type of space heater	Minimum thermal efficiency	Definition
Radiant	30%	Radiant efficiency
Convection and radiant convection		
> natural convection	60%	Total efficiency
> forced convection	70%	Total efficiency
Room sealed	70%	Total efficiency

The requirement for **ducted heaters** set out in AS4556 is a thermal efficiency of not less than 70%.

> Energy labelling

Energy labelling requirements for non-ducted gas heaters are contained in the AS4553-2000 (AG103-2000), and for indirect gas-fired ducted air heaters in AS4556-2000 (AG106-2000).

The energy rating label for non-ducted gas heaters includes both a star rating to allow comparisons of energy efficiency and an Annual Energy Consumption which gives an estimate of the annual gas consumption of the heater in MJ/year.

of the heating system under both heavy load (75% duty) and light load (25% duty). The operating efficiency is determined from the ratio of the heat produced against the total energy consumed, and includes a penalty for appliances with standby energy consumption, e.g. continuously burning pilots.

1.2.2.3 Gas cookers

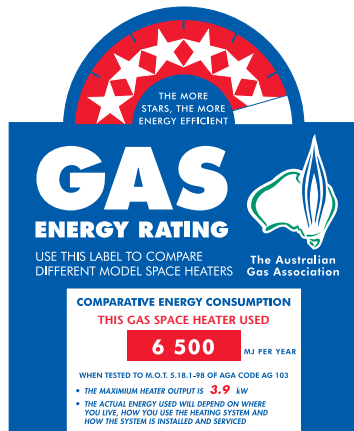
> MEPS

MEPS for gas cookers are contained in AS 4551-2000 (AG101-2000). This standard requires that the thermal efficiency of every hotplate burner, except fish burners, shall not be less than 40% for natural gas (NG), TG and TLP gas, and 45% for LPG.

The requirement for gas ovens is that gas consumption shall not exceed 3 + 50 V MJ/h (for natural draught ovens) and 4.5 + 75 V MJ/h (for fan forced ovens) while maintaining a temperature at 195°C above ambient.

> Energy labelling

There is no energy labelling program for gas cookers in Australia.



Gas space heater label

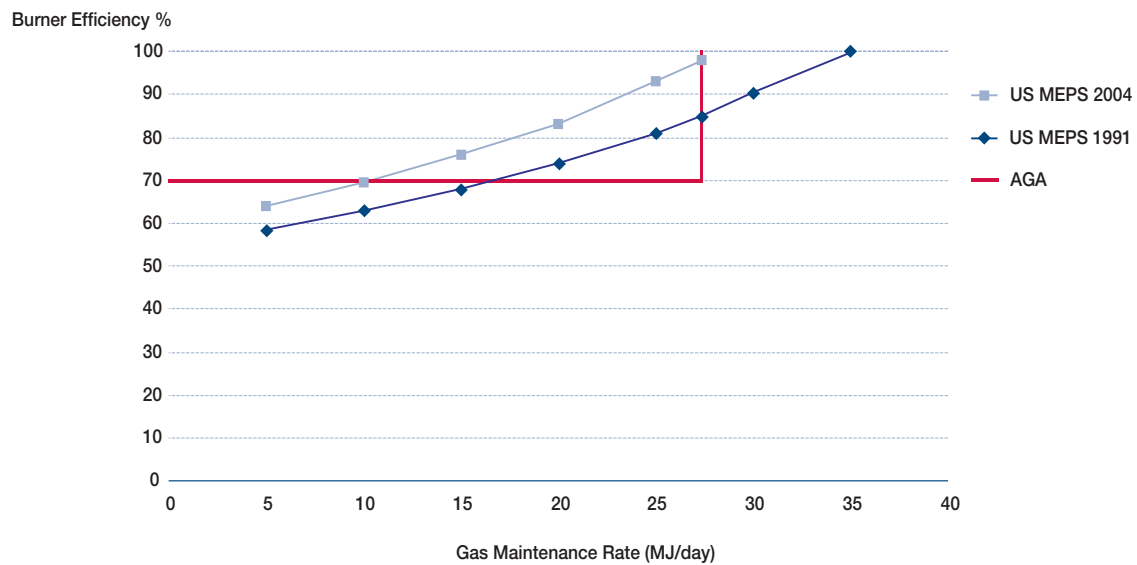
1.2.3 Comparisons with international best practice

1.2.3.1 Gas water heaters

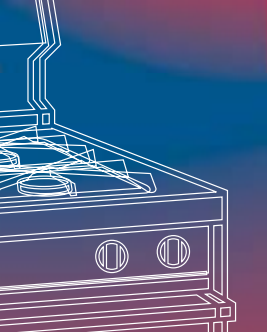
A recent comparison of Australian MEPS levels with levels in North America [MEA et al, 2002], suggests that the current Australian MEPS level for storage water heaters is generally less stringent than the current US and Canadian MEPS level, and considerably less stringent than the level required by January 2004 in the US.

This is illustrated in Figure 2 below, for 140 litre gas storage water heaters, which shows a comparison of the US MEPS levels (expressed in terms of burner efficiency and maintenance rate) with the Australian levels. It should be noted that the majority of storage water heaters on the market in Australia have a maintenance rate in the region of 15 to 30 MJ/day.

Figure 2: Comparison of current AGA standard, current US MEPS and proposed US MEPS for a 140 litre gas storage water heater [MEA et al, 2002]



Note: 'AGA' represents the current Australian MEPS, 'US MEPS 1991' represents the current US level, 'US MEPS 2004' represents the US level in 2004.



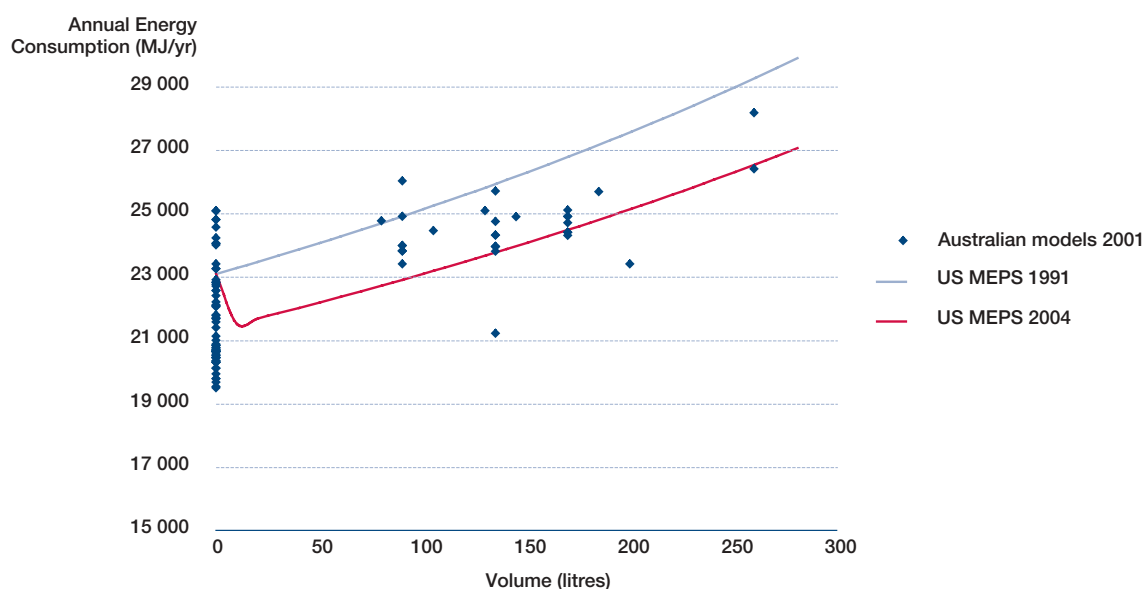
Of storage water heater models currently on the Australian market, most would appear to meet the current US MEPS level, however very few would appear to meet the 2004 level [MEA et al, 2002]. This is shown in Figure 3, where US MEPS levels are plotted, along with data points representing current Australian water heater models.

condensing boilers in Australia is unlikely to be warranted, except perhaps in a few cases.

1.2.3.3 Gas cookers

Australia appears to be the only country with a system of MEPS for gas cooking appliances, and as a result no international comparison of MEPS levels is feasible at this stage.

Figure 3: Australian water heaters with US MEPS levels [MEA et al, 2002]



Note: Instantaneous water heaters are shown as zero volume in this figure.

For instantaneous water heaters, the current Australian standard appears more stringent than US or Canadian MEPS levels, however the differing treatment of electrical energy input for electronic ignition and 'start-up' energy in the respective test methodologies means that a thorough comparison has not been possible.

1.2.3.2 Gas heaters

There is considerable difficulty in undertaking international comparisons of MEPS levels for gas heaters, due to the different test methodologies used in each country. The benefit of such comparisons is, anyway, limited for gas heaters because some technologies would not be viable in the Australian environment. For example, in Europe and North America, condensing boilers clearly dominate at the high efficiency end of the market. The cold climates and long heating seasons in these countries mean that investment in such technologies are viable, although even there, market penetration has been aided by government intervention. The additional cost of

1.2.4 Changes to standards planned or in progress

The Australian Gas Association (AGA) have recently revised, or are currently reviewing, the following gas appliance standards:

- > The methodology for calculating the Annual Energy Consumption for instantaneous gas water heaters (effective from 21 March 2003), which now includes electrical energy consumption.
- > Non-ducted gas heater labels are under review, and new proposals are due to be released by June 2003.
- > Gas water heater labels are under review and new proposals are due to be released later in 2003.
- > The MEPS levels for gas water heaters are currently being reviewed and new proposals are due to be released later in 2003.

2 AUSTRALIAN MEPS AND ENERGY LABELLING SCHEMES

2.1 INTRODUCTION

Historically there have been considerable differences between the energy efficiency programs for electric and gas appliances in Australia, however these have diminished over recent years, so that there are now many similarities.

Both the gas and electrical industries have undergone considerable restructuring in recent years, and in many respects the structures of the gas and electricity industries are converging. Several companies that were originally purely gas utilities now hold electricity retail licenses as well, and vice versa.

The changes taking place in the gas industry are being reflected in changes to the structure of industry organisations. By 2004, key sections of the AGA and the Electrical Suppliers Association of Australia plan to have amalgamated to form two new organisations representing energy retailers and energy networks, and in July 2003 the AGA will transfer responsibility for gas technical standards to Standards Australia. By 2004, the AGA is likely to consist mainly of the current Certification Services Division.

A fundamental difference between the gas and electrical appliance energy efficiency programs is that the electrical program has always been administered by governments in partnership with industry, whereas the gas program has always been administered by a gas-industry body. The changes taking place in the industry suggest that the gas appliance efficiency program would benefit from being modelled more closely on the national electrical appliance efficiency program.

Although the range of common electric appliance types is much wider than the range of common gas appliance types covered, both efficiency programs should provide an effective management framework. It is this framework and the processes employed which are highlighted below.

2.2 HISTORICAL OVERVIEW

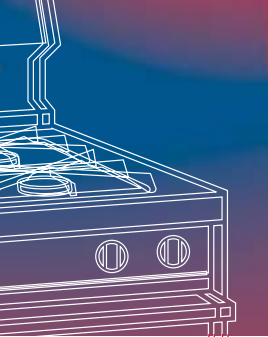
The first energy rating labels for electrical appliances were introduced by the NSW (1986) and Victorian (1987) State Governments, and covered domestic refrigerators and freezers. In 1988 both states extended energy labelling to dishwashers and air conditioners, and in 1989 Victoria alone added clothes dryers and clothes washers. South Australia mandated energy labelling for all six products in 1990. Other states and territories progressively introduced regulations through the 1990s. In 1992 the Council of Australian Governments (COAG) designated the task of coordinating a nationally-consistent program to the Australian Minerals and Energy Council of Ministers (AMEC)—the National Appliance & Equipment Energy Efficiency Program (NAEEEP)—although legislation was not passed in all jurisdictions until 2000.

In 2000, the labelling scales for all electrical products were revised so that most products received a lower star-rating, and the label design was modernised, including the introduction of half stars. This was intended to renew the incentive for suppliers to continue energy efficiency improvements, as the star ratings for many product types were starting to group at the higher end of the rating scales.

MEPS were introduced for domestic refrigerators, freezers and electric storage water heaters in October 1999. Several reviews have taken place subsequently, resulting in plans to introduce more stringent MEPS levels during 2005. MEPS for further domestic appliance categories are in the pipeline.

In October 2001, MEPS for commercial and industrial electrical equipment were first introduced including three-phase packaged air conditioners and electric motors. MEPS for fluorescent lamp ballasts were introduced in March 2003. Products for which MEPS levels are under development include distribution transformers (to take effect in 2003), linear fluorescent lamps, and commercial refrigerators.

Gas appliance labelling was first introduced in Australia in 1981 by the Gas and Fuel Corporation of Victoria for gas water heaters. In 1985 the Australian Gas Association (AGA) took over control of the program, and devised a scheme whereby gas water heaters could carry labels to indicate the extent to which they consumed less gas than the maximum specified in Australian Gas Standard AG102. In 1988 the AGA adopted the current 6 star rating label design, largely for visual consistency with the electrical appliance label. Labelling for non-ducted gas heaters was introduced in 1993 and for ducted heaters in 1994.



Gas heater labels were reviewed in 1998, leading to a major change in the method of test and a change in format of the label, including revealing part stars. Water heater labels underwent a minor review of the star presentation in 1999. Both non-ducted gas heater and water heater labels are currently under review, and new proposals are due to be released for space heaters by June 2003 and for water heaters later in 2003.

The first MEPS for gas appliances were introduced into standards during the 1960s, and the MEPS levels last updated in 1983. The MEPS levels for gas water heaters are currently being reviewed, and it may be proposed that the minimum thermal efficiency be upgraded from its current level of 70%.

2.3 STRATEGIC PLANNING

The objectives of the National Appliance & Equipment Energy Efficiency Program (NAEEEP) which covers electrical appliance MEPS & Labelling are public, and have the endorsement of all State and Territory heads of Government and Energy Ministers. The measures to be used in the NAEEEP, mandatory MEPS and labelling, and others, are set out in the NAEEEP work program, together with the criteria to be used in selecting and applying those measures. These, and other relevant documents are freely accessible on the national energy rating website (www.energyrating.gov.au), and are promoted and discussed at annual public forums.

The general objectives of the gas appliance efficiency program are included in the Industry Development Strategy 2000–2005, downloadable from the AGA website (www.gas.asn.au). The AGA does not have a stand-alone public statement of its strategy for the gas appliance program, although the website highlights recent work of the technical committees.

2.4 STANDARDS SETTING PROCESS

The electrical appliance program is now led by the Ministerial Council on Energy (MCE). Management of the program is provided by the National Appliance and Equipment Energy Efficiency Committee (NAEEEC), which is chaired by the Commonwealth, and has representation from electrical appliance regulators and energy agency officials in all States and Territories and New Zealand.

NAEEEC works closely with Standards Australia to develop appropriate test standards, MEPS and labelling standards for electrical appliances. These are generally clearly delineated into a test methodology (Part 1) and performance requirements (Part 2). Once they have come into force, these Standards are called up in State or Territory Regulations.

In addition, NAEEEC co-ordinates the day-to-day management of appliance registrations, manages a check testing program, undertakes regular progress reviews, and establishes working groups for new or revised MEPS levels or labelling algorithms. These working groups comprise a wide range of stakeholders including manufacturers, regulators, end-users and other relevant organisations.

The program for gas appliances is currently run by the AGA. Because of the high degree of integration in the gas industry, the testing and performance standards for gas appliances were set by AGA committees until 2000, when the AGA became a Standards Development Organisation, accredited to write Australian Standards under similar committee structures to Standards Australia. Subsequently the standards relating to the energy performance of gas appliances have been issued as joint AGA and Australian Standards.

The AGA acts similarly to NAEEEC in overseeing the development and improvement of gas appliance efficiency standards. In the case of gas appliances, these processes are overseen by the Gas Technical Standards Council which has representation from the gas industry and the State Government Gas Technical Regulators. Standards for particular appliance types are dealt with through a number of working groups, which also have representation from the gas industry and Gas Technical Regulators.

The AGA section responsible for coordinating the development of gas appliance standards will, from July 2003, formally become part of Standards Australia.

Although there are some differences in the methods used to develop standards, and the composition of drafting committees, the publication and consultation process for draft Australian Standards are now common to both the electric and gas appliance programs. In addition, both programs actively alert interested parties to any proposed changes to standards.

Before the adoption of a regulatory standard, NAEEEC is required to undertake a Regulatory Impact Statement (RIS) to demonstrate the net benefit of implementing new legislation. A further public consultation process is required on the RIS before final Ministerial approval is provided.

In the case of an AGA Standard, the development procedures provide for equivalent transparency and public review processes to those of Standards Australia. Details are provided on the AGA website. There is currently no requirement to undertake a cost-benefit analysis (RIS) prior to MEPS levels, labelling algorithms or formats being changed.

2.5 MEPS SCHEME

Australian governments, through COAG, have had a policy since 1999 that MEPS levels for appliances should match world's best regulatory practice. This has been the principle used to develop new and revised MEPS levels for all electric appliances since that date.

MEPS for refrigerators, freezers and mains pressure electric storage water heaters came into force on 1 October 1999. MEPS for three phase air conditioners (up to 65kW) and three phase electric motors (0.73kW to < 185kW) came into force on 1 October 2001. MEPS for linear fluorescent lamp ballasts came into force on 1 March 2003.

A number of other products are being considered for new or revised MEPS criteria, as follows:

- > Introduction of MEPS for electrical distribution transformers in 2003.
- > Introduction of MEPS for single phase air conditioners in 2004.
- > Revised MEPS levels for refrigerators and freezer in January 2005.
- > Revision of MEPS levels for mains pressure electric storage water heaters (<80L) in 2005/6.
- > Revision of MEPS for three phase electric motors in 2006.
- > Revision of MEPS for single and three phase air conditioners in 2007.
- > Introduction of MEPS for commercial refrigeration equipment.
- > Introduction of MEPS for linear fluorescent lamps.

The first MEPS for gas appliances were introduced during the 1960s, and were last updated in 1983. The MEPS levels for gas water heaters are currently being reviewed, and it may be proposed that the minimum thermal efficiency be upgraded from its current level of 70%.

Under standard committee processes, the committee responsible for gas appliances now includes comparison with relevant international levels as part of its review process when considering revisions to energy labelling and MEPS requirements. This is very similar to the process undertaken for electrical appliances.

2.6 LABELLING SCHEME

Labelling requirements (and MEPS) for electrical appliances are enacted through legislation in each jurisdiction which call up relevant Australian Standards. All electrical products sold are required to be registered with state-based regulators and to provide product details and performance characteristics information as required by the legislation.

The last major change to electrical appliance labels occurred in 2000, by which time continuous improvements in appliance performance had caused star ratings to cluster at the top of the range for most appliance categories. At the same more stringent standards for calculating star ratings were introduced. Labels are currently mandatory on refrigerators, freezers, dishwashers, washing machines, clothes dryers and air conditioners. The possible inclusion of standby power consumption on the label for white goods is presently under discussion as part of the National Standby Power Strategy.

Energy labelling is a mandatory part of appliance certification by the AGA. All states require AGA certification before any mass-produced domestic appliance can be made available for sale or installation, therefore energy labelling (and compliance with MEPS) of nominated gas appliances is mandatory. The Standards require the label to be affixed in a prominent position on the appliance, but this does not extend to point-of-sale display.

The gas water heater label scales were revised in 1988, and the label underwent a minor review of star presentation in 1999 to allow display of part star ratings. A recent revision of the test methodology for instantaneous water heaters is effective from 21 March 2003.

Space heater labels were last reviewed in 1998, leading to a major change in the method of test, which resulted in changes to the energy ratings and the introduction of part star ratings. These have been reviewed again in 2003 and a proposal will be issued for public comment soon.

2.7 APPLIANCE TESTING AND CHECK-TESTING

In order to receive an energy rating label, electrical appliances are required to submit a complying test report on three products tested to the relevant standard. For MEPS, one test report is required initially.

NAEEEC coordinates a targeted check testing program, and ensures that state-based Regulators monitor whether the label is being correctly used in retail outlets. Regular check testing is undertaken by an independent test laboratory to ensure compliance, and should a product fail, further tests are required at the manufacturer's expense. Failure to comply with MEPS or labelling legislation will result in appropriate action, which may include sanctions from product deregistration, or prosecution by the ACCC.

The AGA requires one product to be tested for labelling purposes, and undertakes a yearly Product Verification Audit which includes checking that the correct label is affixed by the manufacturer. State-based gas regulators are empowered to check that correct labels are displayed on appliances as the affixing of a label is part of the certification process. In practice this is carried out on behalf of the regulators by AGA's annual Product Verification Audits. For the purpose of these audits, appliances are chosen for checking from the manufacturer or importer's warehouse, and not from point of sale in retail outlets.

As part of the Product Verification Audit product specifications are checked to make sure that they do not vary from the certified product. In the event of a variation, AGA may require the product to be re-tested.



Energy rating website

2.8 CONSUMER INFORMATION

Full details of the national electric appliance efficiency program, products registered for labelling or MEPS, award winning products, and performance criteria are now available through the NAEEEC-sponsored website www.energyrating.gov.au. Other supporting information is also available on this site. The AGO and state-based sustainable energy agencies have over a number of years also published and disseminated brochures for each category of labelled appliance, which identify the performance of registered products.

The AGA web site (www.gas.asn.au) carries the directory of certified gas appliances, which includes star rating and energy consumption details for labelled appliances. However, this is not as consumer-friendly as the national energy rating web site for electrical appliances, and does not provide important consumer information such as gas input and output ratings. Also, AGA worked with Sustainable Energy Authority Victoria over a number of years to produce a series of brochures for energy labelled gas appliances, which included lists of the most efficient appliances on the market.

The electric appliance program has been underpinned by regular qualitative surveys of consumer comprehension and understanding of the label. This information has been used by NAEEEP to develop and refine the electric appliance program communications strategy and, more recently, in the redesign and re-launch of the label. No equivalent consumer research for the gas appliance labelling program has been undertaken since the GFCV discontinued its surveys in the mid 1990s.

Recent surveys of NSW and Victorian householders across a range of labelled appliances showed that consumer awareness for gas appliance labelling is generally substantially lower (approximately half) than that for equivalent electric appliances. While this seems to correlate with the number of appliances sold and the importance of market intermediaries in the purchase decision, it also suggests that the gas appliance label has not been as effectively promoted to consumers.

2.9 BEST PRACTICE/PROMOTIONAL PROGRAMS

As part of promoting greenhouse gas abatement the NAEEEEC identifies courses of action, in addition or instead of MEPS or labelling programs, for appropriate product categories. This may comprise programs which aim to promote 'best practice' through the declaration of 'high efficiency' levels of performance within a standard, such as in the case of motors and distribution transformers. Alternatively, funding is available through the Department of Industry, Tourism and Resources' Energy Efficiency Best Practice Program (EEBP) for innovation, training and benchmarking.

An example of the collaboration between the AGO and the EEBP is the Motor Solutions Online website which provides a comprehensive support package on the energy efficient motors and compliments the MEPS requirements for three-phase motors. The site contains a reference manual, system optimisation information, technical guides, case studies, a self assessment survey and motor selection software (www.isr.gov.au/motors).

High efficiency gas appliances have been promoted through the now discontinued Galaxy Energy Awards (AGA was a sponsor of the Gas Product Award category), as were electrical appliances, however there is no inclusion of high efficiency criteria in gas standards nor an overt best practice program for gas appliances coordinated by the AGA. NAEEEEC is currently working on the development of a new national appliance efficiency award, to replace the Galaxy Energy Awards.

The GreenPlumbers initiative, developed by the Master Plumbers' and Mechanical Services Association of Australia (MPMSAA), is a series of training programs designed to enhance plumbers' skills and knowledge about the environmental considerations of their work, including gas heating and water heating. The program is supported by the Australian Greenhouse Office and some elements of the gas industry.

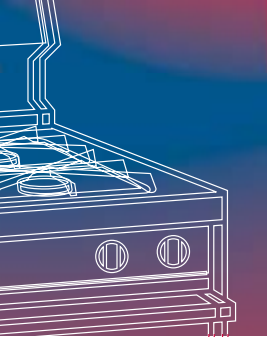
2.10 PROGRAM MONITORING AND EVALUATION

NAEEEEC funds the collection, analysis and publication of market data linked to energy labelling data so that sales-weighted trends in the efficiency of most labelled electric appliances sold can be accurately monitored. NAEEEEC also publishes regular reports which include the results of program evaluation and future targets for individual programs.

The equivalent data has not been collected by the AGA. The result is that no analysis has been undertaken to determine the effectiveness of the gas appliance program in driving energy efficiency improvements.



Possible logos for new national appliance efficiency award



3 RATIONALE AND OPTIONS FOR ENHANCING THE GAS INDUSTRY RUN SCHEME

3.1 INTRODUCTION

Gas is an important national fuel source and gas appliances are popular amongst Australian consumers, with some appliance types gaining market share rapidly. This is driving an expected increase in greenhouse emissions from gas appliances (see Table 9).

In recognition of the high level of greenhouse gas emissions that are generated by electrical appliance use in the residential sector governments, through NAEERP, are seeking to significantly increase the energy efficiency of domestic electrical appliances using MEPS, energy labelling and best practice programs,

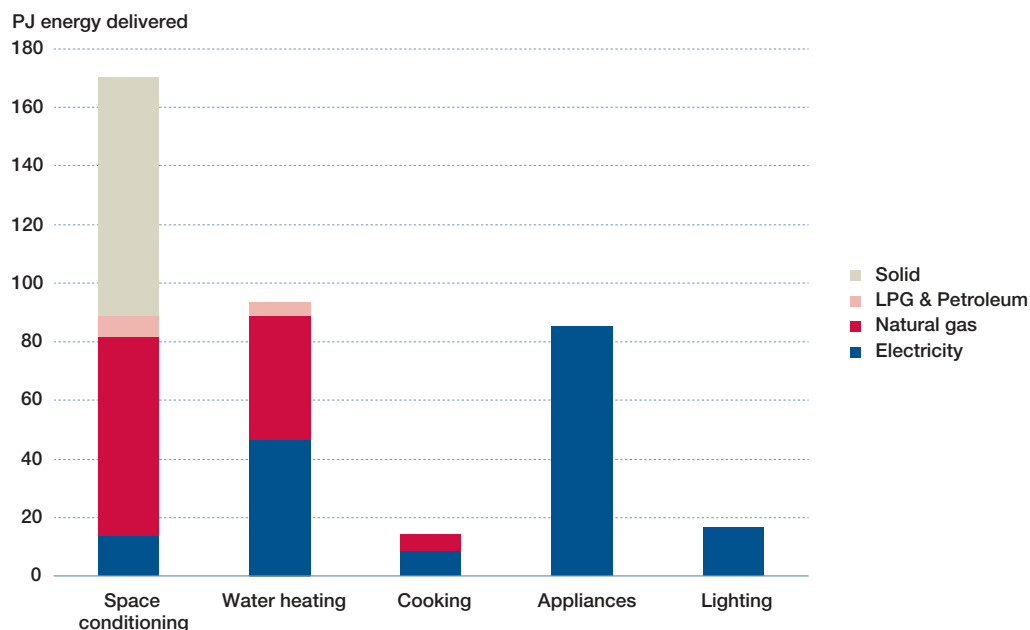
Table 9: Estimated greenhouse gas emissions, 2000 and 2015 [MEA et al, 2002]

Appliance type	2000 emissions		2015 emissions	
	Mt CO ₂ -e	%	Mt CO ₂ -e	%
Gas water heaters	3.0	38%	4.0	35%
Gas heaters	4.3	54%	6.4	58%
Gas cookers	0.7	8%	0.6	6%
Total	8.0	100%	11.0	100%

While greenhouse gas emissions from gas appliances are expected to increase, it is evident from Figures 4 and 5 that, while an important fuel source, gas appliances, on average, generate less greenhouse gas emissions when providing a specific energy service (such as heating or water heating) compared to electrical appliances. For this reason, the replacement of electric resistive heating and water heating, with efficient gas appliances, contributes to national efforts to reduce greenhouse gas emissions.

as well as programs to reduce standby power usage. It is important that gas appliances are also included in these efforts, so that national greenhouse abatement programs are comprehensive across all fuel types, and to ensure that the increasing stock of gas appliances are as energy efficient as possible.

Figure 4: Residential sector 1999—energy use by end-use and energy type [GWA et al, 2002]



Analysis indicates that there is a significant variation in the energy performance of gas appliances within each appliance category, which is reflected in both the running costs to consumers and greenhouse gas emissions.

To make informed decisions, consumers need access to up-to-date, reliable and comprehensive information about the products they purchase. It is the responsibility of industry to provide consumers with this information, and of the government to ensure that industry are informed about national energy efficiency targets and world's best regulatory practice. It is therefore essential that the gas industry and the government work together to ensure that consumers have access to the most energy efficient gas appliances possible.

The Australian gas appliance industry is committed to providing world class products, and recognises the need to continuously change to meet the needs of the Australian community and environment by providing more energy efficient appliances.

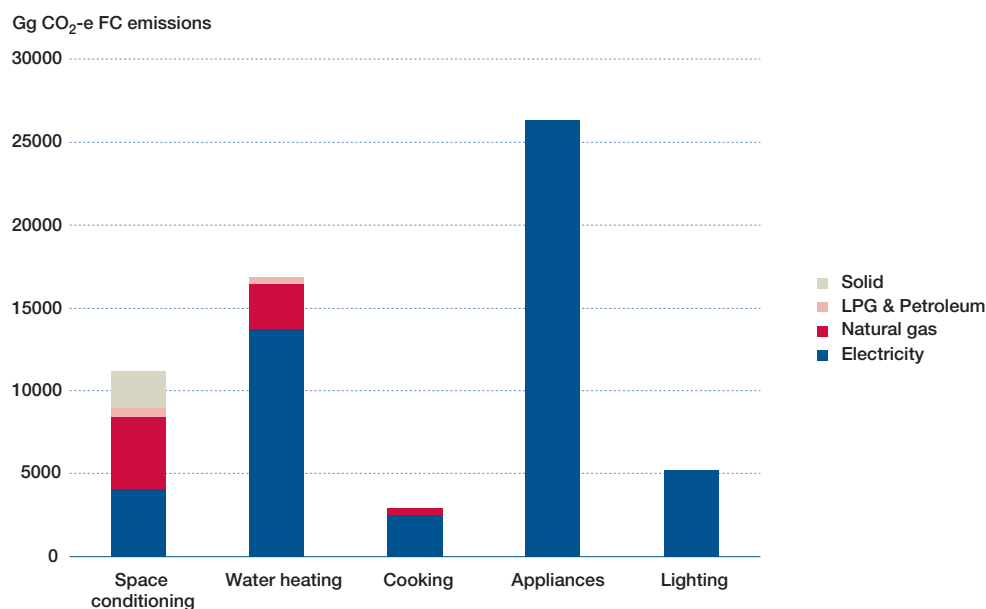
Industry supports the transition to a regulatory regime that meets world's best practice—whereby Australia seeks to match, but does not lead, the introduction of MEPS levels—as long as this transition is suitably stage managed so that industry has adequate time to plan for change, that any changes to MEPS levels or energy

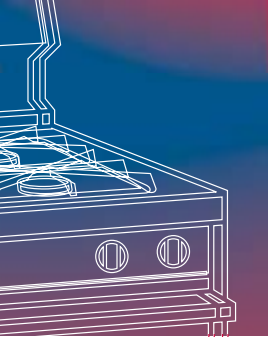
labelling are technically defensible, measurable, auditable, and ultimately underpinned by an Australia-wide regulatory and enforcement system.

While gas appliances are generally increasing in efficiency, regulatory and incentive measures such as MEPS and energy labelling have not always kept pace these improvements. Under a review of gas appliance efficiency by Governments [MEA et al, 2002] a number of potential improvements have been identified.

A range of measures, which have been generally agreed to by gas industry representatives on the joint industry-government working group, are summarised below, with a view to stimulating wider discussion of the future directions of the gas appliance efficiency program.

Figure 5: Residential sector 1999—greenhouse emissions by end-use and energy type [GWA et al, 2002]





3.2 STRATEGIC DIRECTION AND OVERALL COORDINATION

To deliver world class products, it is important that the gas industry keeps pace with energy efficiency developments in comparable industries, not only in Australia, but throughout the world. While the AGA is well-placed to continue administering aspects of the gas appliance efficiency program, with essential input provided by gas appliance manufacturers, there would be substantial benefits in including a greater role for Australian governments, and harmonising the gas program with the national electrical appliance efficiency program.

Under a national gas appliance efficiency program, developed as a partnership between industry and government, there is scope for the pooling of greater resources to ensure that the strategic direction of all appliance efficiency programs are coordinated and increasingly effective.

After consultation with stakeholders following the release of this Discussion Paper, the focus will be to develop a Strategic Plan for a national gas appliance efficiency program, similar to that produced by NAEEEEC. Components of the plan would include:

- > The objectives and future directions of the program for gas appliances, including the scope of appliances and equipment covered.
- > The structures in place to oversee and administer the program, including how responsibilities are shared between governments and industry, and representation on relevant standards bodies and committees.
- > Any targets to be achieved and how progress towards these will be monitored.
- > Work plans similar to the three-year work plans produced by NAEEEEC for electrical appliances and equipment, including plans for new and changes to existing regulations.

As reflected by current government policy, the plan should be consistent with world's best regulatory practice, and include planned reviews, and the process and frequency of these reviews. The Strategic Plan should be made available to the public, both in printed form and through the national energy rating web site.

3.3 STANDARDS SETTING PROCESS

From July 2003, the AGA section responsible for coordinating the development of gas appliance standards will formally become part of Standards Australia. To assist coordination across energy efficiency programs in the future, it is recommended that relevant government energy agencies are represented on the standards committees responsible for gas appliance efficiency standards.

In addition to technical development, the gas standards committees should investigate the potential for making gas appliance standards clearer to follow, perhaps based on the model used for electrical appliances standards where documents are generally divided into sections covering test methodology (Part 1) and performance requirements (Part 2).

In addition to representation on the relevant gas standards committees, government proposes to work with the gas industry and Standards Australia to facilitate greater stakeholder consultation at an early stage of standards development. This would increase the ownership of standards and could take the form of ad hoc steering groups for appliance types, comprising manufacturers and major user groups.

As with regulations for electrical appliances, both industry and government agree that new mandatory gas appliance efficiency standards should demonstrate a net benefit before being adopted. Producing a Regulatory Impact Statement (RIS) prior to implementation not only will provide increased opportunity for consultation, but should also add to the credibility of the program.

The gas appliance industry is happy to work with government to review existing gas appliance efficiency standards, and is prepared to support new standards that are technically defensible, measurable, and auditable, and introduced so that industry can undertake the long term planning to recoup investment made in increasing appliance efficiency. Industry proposes a three year implementation period once a new standard has been published, followed by a five-year period before any further changes are required.

3.4 MEPS

Australian governments, through COAG, have had a policy since 1999 that MEPS levels for appliances should match world's best regulatory practice. This has been the principle used to develop new and revised MEPS levels for electrical appliances, and governments believe that the same principle should be applied to gas appliances. Industry supports this general principle, on the understanding that Australian MEPS levels will seek to match, but not lead, the world.

It is several years since MEPS levels for gas appliances have been reviewed and, considering technological advances, it is not surprising that the majority of models currently on the market appear to exceed current requirements by a comfortable margin. The government review of regulations for gas appliances [MEA et al, 2002] coincided with an AGA initiated review of aspects of the current regulations (e.g. MEPS for water heaters), although the results of the AGA process are not yet public.

As a result, the following issues are largely the result of analysis undertaken for governments, but government is keen to work through these issues with industry and other stakeholders.

3.4.1 Gas water heaters

Australian MEPS for gas water heaters have not changed since 1983, although a review is currently underway and it is likely that some changes will be recommended. This is timely since the majority of current models comfortably exceed current requirements, and modeling suggests that the Australian levels for storage water heaters lag behind those in North America due to come into effect in January 2004.

The current MEPS for gas water heaters are expressed in terms of both thermal efficiency and maintenance rate. An alternative, which is used in the US and Canada, is to define overall efficiency as a function of energy and volume, thereby allowing manufacturers to balance improvements in burner efficiency and maintenance rate in order to meet MEPS in the most cost effective manner. This means that MEPS for gas water heaters would be specified in terms of the minimum overall efficiency to deliver a specified task (e.g. 37.7 MJ/day of hot water) as a function of tank size.

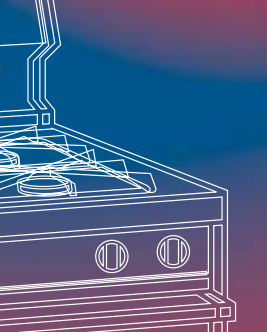
In order to match world's best regulatory practice, governments believe that Australian MEPS levels should be broadly equivalent to US 2004 MEPS levels for storage water heaters, although cooperative work needs to be undertaken with the gas industry to set this in an Australian context. The proposed MEPS level for gas storage water heaters of 50 litres or more is Annual Energy Consumption (AEC) $\leq 21\ 100 + 20.7 \times \text{volume (litres)}$.

The recent changes to M.O.T. 5.3.1 for instantaneous gas water heaters requires the inclusion of electrical energy consumption in the star rating process. Under the proposal to use the AEC as the performance measure for MEPS, electrical energy would also be included. Under Australian test conditions, the equivalent AEC to the US standard for 2004 for instantaneous water heaters would be approximately $\leq 22\ 135$ MJ/year.

In order to enable in-use energy consumption to be estimated for a range of hot water delivery tasks and climates, it is also recommended that the key performance parameters—thermal efficiency, maintenance rate, pilot rate, electrical energy consumption, etc.—of registered models should be generally available, for example on a related web site. Note that the individual parameters might not be publicly accessible, but might be used to allow estimation of annual energy consumption and running costs for a range of different hot water requirements. This would be a significant benefit to consumers when evaluating water heater models.

Review of the test methodology for both storage and instantaneous water heaters has also found that further improvements could be made to increase accuracy or better reflect current usage patterns. These are detailed in the full report [MEA et al, 2002].

To facilitate further consideration of these issues, the Australian Greenhouse Office will work with the gas appliance industry to undertake a specific testing program during 2003 using independent laboratories.



3.4.2 Gas heaters

As with gas water heaters, it appears that the existing MEPS levels for gas heaters have a limited impact on the performance of most non-ducted heaters. While this may also be the case with ducted heaters, there is not enough data currently available to make that judgment.

Due to the heater types commonly used overseas, and particularly differing test methodologies, comparing overseas standards with those in Australia is problematic. For electrical appliances with similar issues, the approach taken has been to establish a MEPS level whereby a fixed proportion of current products pass or fail, with the aim of withdrawing the worst performing products from the market. This approach requires detailed performance data from manufacturers, but would be suitable for gas heating.

Prior to setting MEPS levels, it would be worth reviewing the categories of gas heaters to ensure that technologies are grouped appropriately and allocated MEPS levels.

MEPS levels are currently based on thermal efficiency, which does not take into account standby losses from either a pilot light or electrical ignition system, nor any electrical energy input for the running of fans in forced air systems. This raises the question of whether 'thermal efficiency' is the most appropriate factor to regulate. Two possible options have been proposed to address this issue:

- > A measurement of the 'net efficiency', taking into account losses in flued appliances, running at high and turndown mode, standby energy consumption and consumption by fans, would more closely equate to the true operation of an appliance. This is similar to the calculation already required for the labelling of space heaters.
- > Retain the current MEPS based on thermal efficiency, and set standby targets or mandatory levels to take into account electrical energy losses. (The energy used by a circulating fan is not necessarily a bad thing as it could lead to a more efficient distribution of heated air.)

Given the growth in central heating systems, defining an appropriate test standard and MEPS level for hydronic (wet central) heating systems is a priority. A proposed test method will be released for comment by AGA in the second half of 2003.

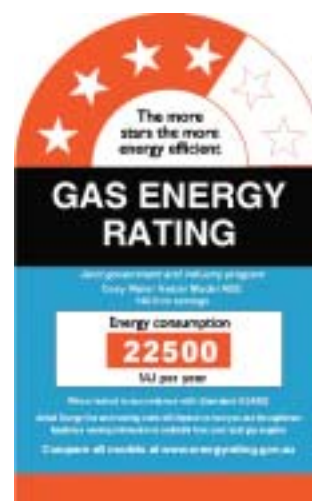
3.4.3 Gas cookers

Given the relatively small greenhouse contribution made by gas cooktops and ovens, and the fact that gas ovens have a declining market share, there is little evidence to suggest that improvements to the existing MEPS levels are currently warranted.

However consideration should be given as to whether the test method for the thermal efficiency of gas ovens due to be adopted in Europe should be used in the Australian standard.

3.5 ENERGY LABELLING

In general the impact of the gas appliance label could be enhanced by altering the presentation and format to be consistent with the electrical appliance label. As an illustration, a mock-up of the possible new label is shown below.



Proposed format for new gas label

It is recognised that reformatting the label would impose some costs on industry, however these can be substantially reduced by scheduling the introduction of the new label to coincide with any recalculation of labels for gas water heaters and heaters, such as would occur through any rescaling or changes to test methods.

3.5.1 Gas water heaters

Currently there are very few one star water heater models, and over 60% of the certified water heater models are rated four stars or more.

This bunching reduces the effectiveness of the labelling system for consumers (this is particularly so for instantaneous water heaters, with 82% of certified models in 2002 having a rating of either 4 or 5 stars). As this gives little marketing advantage to high efficiency models, it also decreases the incentive for suppliers to improve the performance of products.

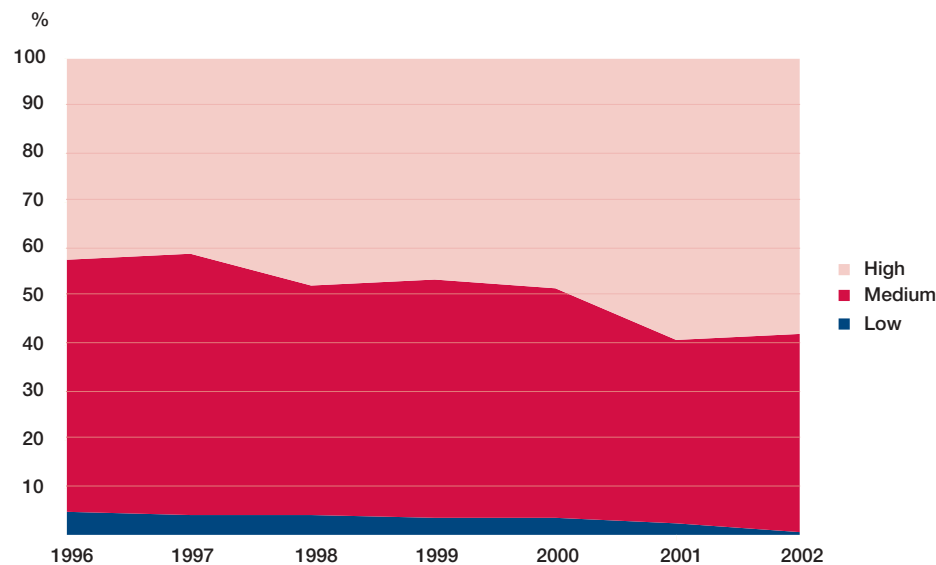
Figure 6 illustrates the share of all certified gas water heater models on the market in each year that fall into the three implied efficiency groups:

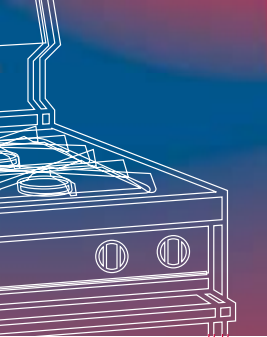
- > High (4 or more stars);
- > Medium (2 or 3 stars); and
- > Low (1 star).

To provide greater differentiation in the marketplace, it is proposed that the rating scale is revised so that it reflects the current spread of gas water heaters. In line with the existing electrical energy rating system, and based on consumer testing, governments propose that half stars replace the current continuous star rating band. The revised label would take into account any revisions to MEPS and test methods.

In line with recommendations for MEPS, gas water heaters should be rated according to the energy consumed for a given task under realistic operating conditions (actual or simulated). Unlike for MEPS, the rating for all gas water heaters should be determined according to gas consumption alone, irrespective of storage volume.

Figure 6: Proportion of certified gas water heater models in 'high, medium and low' efficiency segments





3.5.2 Gas heaters

Gas heating appliances vary widely in their efficiency, not only between types (ducted and non-ducted) but also amongst models within each type (except for unflued non-ducted heaters).

Based on recent studies, the lack of non-ducted gas heaters labelled to the current (1998) test standard seems to be hindering consumer choice. Rescaling the energy rating labels may be warranted, if bunching of star ratings at the top end of the scale is evident, once up-to-date data is available for all models on the market. Ensuring that non-ducted gas heaters on the market are tested and labelled to the current standards is a priority.

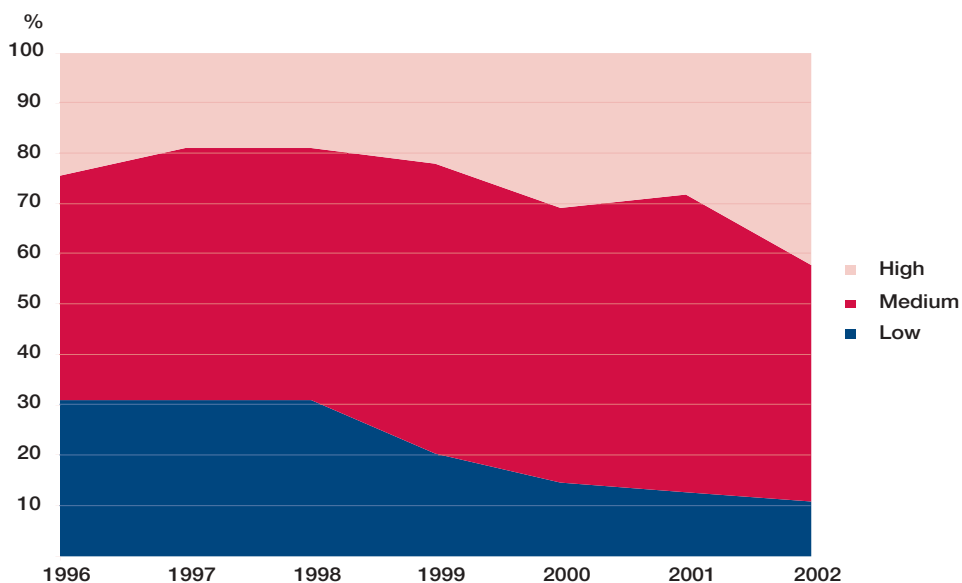
Due to the increasing efficiency of ducted gas heaters, models are bunching into higher star rating bands, and this may soon hinder consumer choice (see Figure 7). Therefore it is proposed that consideration be given to rescaling the energy rating label to reflect these changes. Rescaling will need to take place following any changes to test methods.

3.5.3 Gas cookers

Gas cookers (ovens and cooktops) are currently not labelled, in Australia or elsewhere. Given the relatively small greenhouse contribution made by these products and the fact that gas ovens have a declining market share, there is little evidence to suggest that labelling is warranted.

There may be scope for defining a high efficiency level for gas ovens in the relevant standard, if there was industry-government support, and once a suitable test method has been developed.

Figure 7: Proportion of certified ducted heater models in 'high, medium and low' efficiency segments



3.6 APPLIANCE TESTING AND CHECK-TESTING

The framework for initial product testing (for MEPS and labelling) and subsequent check-testing is important, as it provides consumers with confidence that performance characteristics are correctly identified and protects the investments made by manufacturers in developing more energy efficient products.

Over recent years, NAEEEEC has placed considerable emphasis on developing a coherent framework for electrical appliances, including a cooperative agreement with the Australian Competition and Consumer Commission (ACCC) regarding sanctions against misleading energy efficiency claims [NAEEEC 2003b].

As a result of the national check testing program for electrical appliances, 12 instances of unsubstantiated claims were discovered in 2002, resulting in the deregulation of six products, and action by the ACCC against two companies.

It is proposed that initial product testing is based on samples of production models, rather than prototypes, and that energy rating labels are based on testing three appliances, as is the case for electrical appliances.

Although the roles of the State-based regulators for electric and gas appliances will remain distinct, there is considerable scope to include gas appliances within the overall framework developed by NAEEEEC for appliance check testing and enforcement. This would mean that check testing, and enforcement actions, would be co-ordinated by the one body, and that arrangements with the ACCC would be extended to cover gas appliances, creating a level playing field for all appliance types and companies.

3.7 CONSUMER INFORMATION

Access to information, by both consumers and members of the gas industry, is a vital part of building the success of the gas appliance efficiency program and maintaining its credibility.

While the AGA web site includes a directory and performance details of certified appliances (which includes energy rating details), a more consumer friendly interface is required, specifically so that users are able to search for products by category, size and star rating, and estimate annual running costs.

In addition, more details on the aims, scope and activities of the energy efficiency program for gas appliances should be available, together with any relevant reports or documentation. Information relating to issues discussed in this report, such as longer term plans, analysis of efficiency trends in gas appliances and surveys of consumer awareness of the label, should all be made available through the website.

It is proposed that this information be included on the national energy rating website sponsored by NAEEEEC: www.energyrating.gov.au. This would mean that this one site could be promoted as a 'one stop shop' for information on energy efficient appliances, and that the gas appliance program could benefit from the considerable effort which has already been invested in promoting this site. Links could be established between the AGA and energy rating web sites, to ensure visitors to each are able to easily navigate between the two.

An advantage of this approach is that it could allow comparisons of running costs and greenhouse gas emissions between gas and equivalent electrical appliances, e.g. gas vs electric water heaters, gas heaters vs reverse-cycle air conditioners.

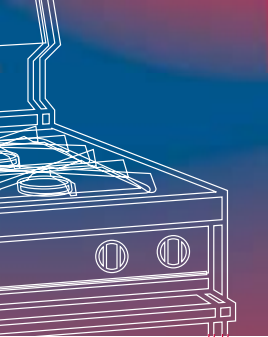
It is further recommended that the energy rating label for gas appliances should carry details of this website, as is the case for electrical appliances.

As with electrical appliances, it is desirable that brochures explaining the gas energy labelling scheme and comparing the performance of registered gas appliances be produced and disseminated, especially at point of sale in appliance stores.

Further specific promotions of the gas appliance labelling program should be designed following the results of consumer research (see section 3.9) as part of strategy to address issues highlighted by this research.



Trial website for gas water heaters



3.8 BEST PRACTICE/PROMOTIONAL PROGRAMS

A credible means of showing product differentiation provides manufacturers with the marketing incentive to develop more efficient products—it is therefore an important component of any energy efficiency program. A comparative labelling program is a very effective means of providing this, and therefore it is recommended that the focus is on making the labelling of gas appliances comprehensive, and well promoted to customers.

In the case of gas products which already carry a label, there may be an advantage in specifying that only those in the highest star rating can be termed 'high efficiency' products. For some electrical products, the relevant standard includes a new category which enables products meeting certain specified criteria to be promoted as 'high efficiency'. Products which fail to meet these criteria are not allowed to be marketed as 'high efficiency'. This is generally appropriate for products which do not have any other means of differentiation but this concept may have industry support following the discontinuation of the Galaxy Energy Awards.

Where the gas industry can see a need for special promotions, for example to target audiences, or the development of generic materials, applications should be made to the Energy Efficiency Best Practice Program (EEBP) for support. Further ideas for such tools should be canvassed during the consultations with stakeholders.

3.9 PROGRAM MONITORING AND EVALUATION

In order to maximise its effectiveness and ensure that program strategies are based on up-to-date information, the gas appliance efficiency program should include a cohesive monitoring and evaluation program. The primary aims of this should be to assess whether the sales-weighted energy efficiency of appliances are improving over time, and the extent to which appliance labelling is influencing consumer behaviour.

Efficiency trends may be monitored through the tracking of model sales and model star rating, in order to produce a sales-weighted average star rating, where this data is available. The aim is to produce information on average market trends, rather than to identify specific products or brands, so that commercially sensitive information is not revealed and the system is supported by industry. Government will work with industry to explore options for establishing such a monitoring and evaluation system.

Repetition over several years will provide a picture of whether the energy efficiency of products within a given category is improving over time. At the same time as collecting this data, it may be useful to collect details on other features, such as retail price and size (e.g. output), where appropriate. In the case of electric appliances, GfK have provided data for analysis for most appliances covered by electrical appliance labelling [NAEEEC 2003].

To have a chance of being effective, energy rating labels need firstly to be understood by customers, then to be credible and finally to be relevant to their decision making process. These issues can be tested by consumer surveys, and the results used to improve the communications program for gas labelling.

4 KEY PRIORITIES FOR ACTION

As set out in this Discussion Paper, there is significant potential for the gas appliance industry and governments to work together to enhance the existing gas appliance efficiency scheme, to ensure that Australian consumers have access to the most energy efficient gas appliances possible.

Both key government agencies and gas industry organisations agree on the need for action, and on the general measures which are required to establish a national gas appliance efficiency scheme. Further consultation with stakeholders is necessary to refine current proposals, to determine priorities and timetables for action, and to ensure that the transition to a new regulatory regime is appropriately stage managed.

The following actions are highlighted as key steps in this process:

- > The gas appliance efficiency scheme should be structured to ensure consistency with the national electrical appliance program where feasible, including the development of a comprehensive Strategic Plan for the forthcoming years. This should include the results of consultation with industry and other stakeholders following the release of this Discussion Paper.
- > The introduction of work plans, similar to the three-year work plans produced for electrical appliances, which include plans for new regulations and changes to existing regulations.
- > Greater involvement of government energy agencies in the gas appliance efficiency standards process through participation in relevant standards committees, to help ensure consistency with national energy efficiency goals.
- > Test methods for gas appliances should be progressively reviewed, beginning with gas water heaters, and then gas heaters, and if necessary changes made to the test standards. To provide information relevant to these reviews on particular aspects of test methodologies, a program of independent product testing should be undertaken, in consultation with the gas appliance industry, beginning with gas water heaters.
- > MEPS levels should be regularly reviewed to ensure consistency with world's best regulatory practice, with appropriate timetables negotiated with industry. Regulatory impact statements would be prepared to ensure net community benefits. New MEPS should be set to reflect any changes in test methods. Water heater MEPS are a priority for review.
- > Gas appliance labelling should be reviewed in the light of changes to test methods, and rescaling carried out where needed, i.e. where there is evidence of bunching. Priorities for rescaling are gas water heaters and gas ducted heaters.
- > The establishment of a new national check-testing and enforcement framework should be investigated, possibly coordinated by NAEEEEC, including requirements for the completion of testing and registration for all current models (e.g. of non-ducted gas heaters).
- > The improvement of consumer and industry access to information through an appropriate channel, such as the national energy rating web site, supported by promotional and best practice programs.
- > The introduction of a cohesive monitoring and evaluation program to assess market trends in gas appliance efficiency, and the influence of appliance labelling on consumer behaviour.

5 PROPOSED TIMETABLE

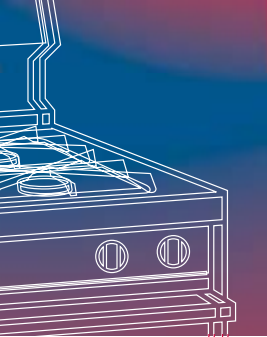
The table below sets out a proposed timetable for the development of a Strategic Plan for a national gas appliance efficiency program, as well as elements of a forward work plan for this program. Considerable consultation will be undertaken with the gas appliance industry and other stakeholders before this timetable is finalised.

Action	Date
Strategic plan	
1 Publication, circulation and consultation on the discussion document	Jul 2003 – Nov 2003
2 Publication of Strategic Plan for gas appliance efficiency	Mar 2004
Gas water heaters	
3 Independent testing program to investigate water heater test methods	Jun 2003 – Dec 2003
4 Review of test method, MEPS and Labelling for gas water heating	Jan 2004 – Sep 2004
5 Publication of draft standards for gas water heaters, and consultation with stakeholders	Oct 2004 – Mar 2005
6 Finalisation of draft standard for gas water heaters	Apr 2005 – Jun 2005
7 Preparation of Regulatory Impact Statement for gas water heaters	Jul 2005 – Sep 2005
8 Publication of new gas water heater standards	Oct 2005
9 Proposed introduction of new water heater MEPS	Oct 2006
Gas heaters	
10 Independent testing program to investigate heater test methods	Jun 2004 – Dec 2004
11 Review of test method, MEPS and Labelling for gas heaters	Jan 2005 – Mar 2006
12 Publication of draft standards for gas heaters, and consultation with stakeholders	Apr 2006 – Sep 2006
13 Finalisation of draft standard for gas heaters	Oct 2006 – Jun 2007
14 Preparation of Regulatory Impact Statement for gas heaters	Jul 2007 – Sep 2007
15 Publication of new gas space standards	Oct 2007
16 Proposed introduction of new gas heater MEPS	Oct 2008

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* Available from the national energy rating website: www.energyrating.gov.au



The following organisations participated in the joint industry-government working group that oversaw the development of this Discussion Paper.

AUSTRALIAN GAS ASSOCIATION

The Australian Gas Association (AGA) is the national representative body for Australia's downstream gas industry. Its principal membership comprises gas distribution, retail and pipeline companies, in addition to gas appliance and equipment manufacturers. The AGA represents its members on energy and regulatory policy issues, and promotes the development of Australia's natural gas industry, given the numerous economic, environmental and regional benefits which an increased use of natural gas could deliver to Australia. The AGA also implements a national gas appliance and component certification scheme.



AUSTRALIAN GREENHOUSE OFFICE

The Australian Greenhouse Office (AGO) is the lead Commonwealth agency for greenhouse matters. The AGO is responsible for monitoring the National Greenhouse Strategy in a cooperative effort with States and Territories and with the input of local Government, industry and the community.



GAS APPLIANCE MANUFACTURER'S ASSOCIATION OF AUSTRALIA

The Gas Appliance Manufacturer's Association of Australia (GAMAA) represents companies involved in manufacturing and distribution of gas appliances and components. GAMAA's mission is to actively and dynamically promote the interests of appliance manufacturers, and suppliers to governments and gas suppliers in the interests of the end user, so that they have safe, reliable and competitively priced products and to promote the growth of gas appliances in the community.



OFFICE OF GAS SAFETY, VICTORIA

The Office of Gas Safety operates under the Gas Safety Act 1997. It regulates the Victorian gas industry, is responsible and accountable for all gas safety functions in Victoria and sets, administers and regulates gas safety standards. The Office also investigates events with implications for gas safety and prosecutes breaches of the Gas Safety Act 1997; educates and informs the gas industry and the community about all aspects of gas safety and promotes awareness of energy efficiency.



SUSTAINABLE ENERGY AUTHORITY VICTORIA

The Sustainable Energy Authority was established in 2000 by the Victorian Government to provide a focus for sustainable energy in Victoria. The Authority's objective is to accelerate progress towards a sustainable energy future by bringing together the best available knowledge and expertise to stimulate innovation and provide Victorians with greater choice in how they can take action to significantly improve energy sustainability.



NOTES

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