

# Switch on Gas

Draft Work Plan for 2005/6 to 2007/8

**FOR PUBLIC COMMENT**

GAS APPLIANCE AND EQUIPMENT ENERGY  
EFFICIENCY PROGRAM

AN INITIATIVE OF THE MINISTERIAL COUNCIL  
ON ENERGY FORMING PART OF THE NATIONAL  
FRAMEWORK ON ENERGY EFFICIENCY

**April 2005**



**Australian Government**  

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**Department of the Environment and Heritage**  
**Australian Greenhouse Office**

Dear stakeholder

The Australian and New Zealand Appliance and Equipment Energy Efficiency Program has released the inaugural work plan for *Switch on Gas*, the long term strategy to improve the energy efficiency of gas powered products. This document is the first in a series of rolling plans. It reports on products targeted for potential regulation in both countries for the three year period, 2005/06 to 2007/08.

On 27 April 2005, the content of the *Switch on Gas* work plan will be workshopped by consultants at a forum in Melbourne to explain the future priorities of the program.

The National Appliance and Equipment Energy Efficiency Committee (NAEEEC), the committee comprising representatives of government agencies in both Australia and New Zealand responsible for developing and implementing the work plan, would appreciate comments on the work plan from stakeholders.

Stakeholders have a period of several months to consider the work plan prior to regulators completing their planning processes. Any comments received before 30 June 2005 will be taken into consideration by the committee prior to finalising this plan.

Please forward written comments to [energyefficiency@deh.gov.au](mailto:energyefficiency@deh.gov.au) or contact the Secretary of the Gas Appliance and Equipment Energy Efficiency Committee (GAEEEC), Richard Goldsmith on (02) 6274 1367.

I look forward to working with you in implementing *Switch on Gas*.

A handwritten signature in black ink, appearing to read 'SHANE HOLT'.

Shane Holt  
Chair  
National Appliance and Equipment  
Energy Efficiency Committee  
21 April 2005

## Abbreviations

<b>AGO</b>	Australian Greenhouse Office
<b>BaU</b>	Business as usual
<b>EECA</b>	Energy Efficiency and Conservation Authority (NZ)
<b>GAEEEC</b>	Gas Appliance and Equipment Energy Efficiency Committee
<b>GAEEEP</b>	Gas Appliance and Equipment Energy Efficiency Program
<b>CO<sub>2</sub>-e</b>	Carbon dioxide equivalent units
<b>GTRC</b>	Gas Technical Regulators Committee
<b>MCE</b>	Ministerial Council on Energy
<b>MEPS</b>	Minimum Energy Performance Standards
<b>Mt</b>	Megatonne (i.e. million tonnes)
<b>NAEEEC</b>	National Appliance and Equipment Energy Efficiency Committee
<b>NAEEEP</b>	National Appliance and Equipment Energy Efficiency Program
<b>NFEE</b>	National Framework on Energy Efficiency
<b>RIS</b>	Regulatory Impact Statement
<b>TTMRA</b>	Trans Tasman Mutual Recognition Agreement



Australian Government

Department of the Environment and Heritage  
Australian Greenhouse Office

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The *Switch on Gas* Work Plan for 2005/6 to 2007/8 is available online at [www.energyrating.gov.au](http://www.energyrating.gov.au)

**April 2005**

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# 1 Introduction

The *Switch on Gas* strategy is a blueprint jointly endorsed by government and industry outlining the actions to enhance energy efficiency for gas appliances and equipment over the next 10 years. The launch of the strategy commits:

- Governments to incorporating gas end-use product efficiency into a similar regulatory environment that already exists for electrical products; and
- Industry to providing world-class products within a legislative scheme, with formal responsibilities stipulated in state and territory laws.

The partnership that already characterises the electrical product program will extend to include a range of gas powered appliances and equipment.

*Switch on Gas*, which was released in December 2004, is supported by the Ministerial Council on Energy and therefore by all relevant jurisdictions in Australia. It represents the agreed parameters for the scheme that will improve the efficiency of and reduce greenhouse gas emissions from gas appliances and equipment over the next decade from 2005-2015.

*Switch on Gas* sets the strategic direction for what will come to be known as the Gas Appliance and Equipment Energy Efficiency Program (GAEEEP). It will be an element within the National Appliance and Equipment Energy Efficiency Program (NAEEEP). This will be the first time that both the efficiency of electrical and gas products will be addressed by the one national scheme in Australia New Zealand. The gas elements of the scheme also have the potential to be extended to.

*Switch on Gas* strategy and the preceding Discussion Paper and Issues Paper are available from [www.energyrating.gov.au](http://www.energyrating.gov.au) in the electronic library.

## 2 Tasks & Projects

### 2.1 Work Plan 2005 to 2007

The initial focus of the work plan is the formal establishment of the new national Gas Appliance and Equipment Energy Efficiency Program (GAEEEP) as an element of the NAEEEP. Work on the

introduction of upgraded or new MEPS &/ or labelling requirements for gas products will proceed in parallel with those for electrical products.

The key elements to be progressed under the 2005 to 2007 Work Plan are

set out in the table below. It is important to note that some elements of the plan – increased focus on industrial products and the development of a strategy for commercial catering equipment – will be common to the electrical products program.

**Table 1 Tasks and Milestones**

2005		
TASK	MILESTONES	TARGET
<b>Establish the Gas Appliance and Equipment Energy Efficiency Program</b>	GAEEEP work plan finalized	Feb 05
	Inform industry stakeholders	Apr 05
	Establish administrative and legislative framework <ul style="list-style-type: none"> <li>• Committee operating</li> <li>• National legislative framework agreed</li> <li>• Model legislation finalized, Victoria</li> <li>• Registration process agreed</li> </ul>	Jul 05 Sept 05 Nov 05 Dec 05
<b>MEPS and energy labelling – residential / commercial</b>	New domestic water heater test method developed	Nov 05
	New domestic water heater MEPS and labelling proposal developed	Jan 06
	Product profile for commercial heaters and water heaters completed	Mar 06
<b>Identify and pursue opportunities for increasing industrial sector coverage</b>	Discussion Paper and workshop on additional opportunities in the industrial sectors completed	July 05
	Decision on additional industrial products to be targeted	Dec 05
<b>Information and awareness</b>	Gas products on national high efficiency database	Jun 05
	Communication strategy developed	Jul 05
	Information on national web site	Jul 05
	National promotional campaign targeting retail stores	Aug 06
<b>Monitoring and evaluation</b>	Projections prepared	Dec 05
	Develop methodology for tracking sales weighted efficiency and consumer attitudes	Dec 05

2006		
TASK	MILESTONES	TARGET
MEPS and labelling	RIS process for domestic water heater MEPS and labelling proposal completed, implementation date agreed	July 06
	Review of room heater test method and standard completed	Jul 06
	Product profile for industrial gas boilers completed	Jul 06
	Review of commercial heater and water heater test method and standard completed	Dec 06
MEPS and labelling	Strategy for commercial catering equipment completed	Dec 06
Information and awareness	Gas products on national energy rating web site	Jun 06
	Consumer promotional campaign – media and retail stores	Jun – Sept 06
Monitoring and evaluation	Targeted check-testing program commenced	Sept 06
	Retail compliance survey undertaken	06
	Track sales weighted efficiency and consumer attitudes	On-going
2007		
TASK	MILESTONES	TARGET
MEPS and labelling	New MEPS and labelling proposal for gas ducted heaters developed	Jan 07
	Review of room heater test method and standard completed	Jul 07
	RIS process for ducted heater MEPS and labelling proposal completed, implementation date agreed	Jul 07
	Product profile for domestic cookers developed	Jul 07
	New MEPS and/or labelling proposal for gas room heaters developed	Dec 07
	MEPS and/or labelling proposal for commercial heaters and water heaters developed	Dec 07
Information and awareness	Gas product listings on national energy rating web site maintained	Ongoing
	Gas products included in national promotional campaign targeting retail stores	Ongoing
Monitoring and evaluation	Targeted check-testing program	Ongoing
	Retail compliance survey undertaken	Ongoing
	Track sales weighted efficiency and consumer attitudes	On-going

### 3 Product Coverage of GAEEEP

From its commencement, GAEEEP will cover those products already subject to energy labelling under the existing AGA scheme, specifically domestic gas water heaters, ducted heaters and room heaters. The scheme will include products that consume natural gas, LPG and other gas-types.

Over the life of this Work Plan and the *Switch on Gas* strategy, additional domestic, commercial and industrial gas product types will be considered for inclusion in the GAEEEP and therefore possibly subjected to mandatory MEPS and/or energy labelling. The following criteria will be taken into consideration when products are evaluated for inclusion in the program:

1. Magnitude of gas consumption by that product type (current or projected), and the potential for national energy savings;
2. Greenhouse gas emission reduction potential;
3. Environmental impact of the fuel type;
4. Existence of a suitable test standard, or reasonable prospect of development of such a standard;
5. Opportunity to influence purchase decisions:
  - For products considered for mandatory labelling the likelihood that purchasers will see and make use of the energy label in purchase decisions;

- For products considered for mandatory registration of energy efficiency, with optional physical energy labelling (typically commercial and industrial products), the likelihood that specifiers will seek out and use the information in selection decisions;
  - For products considered for MEPS, the likelihood of setting a MEPS level which will impact on the market.
6. Administrative complexity of the project.

The process for developing and implementing regulatory actions will include the preparation of specific product profiles, regulatory proposals based on cost-effective options with net economic benefits, the CoAG regulation impact statement (RIS) process, and involvement of all stakeholders in key standards development and consultation processes. This will ensure that the energy savings exceed any costs from implementing the regulation and that there are net national benefits.

The initial priority will be to include domestic gas water heaters, room and ducted heaters within the scope of the current program, and to progressively review methods of test, MEPS levels and energy labelling requirements for these product types, and upgrade these where necessary. During the life of this Strategic Plan, the following product types will also be *evaluated* for inclusion in the program.

**Table 2: Product Types**

<b>Residential</b>
<ul style="list-style-type: none"> <li>• Gas boilers/hydronic heating systems</li> <li>• Gas ovens and cooktops</li> </ul>
<b>Commercial</b>
<ul style="list-style-type: none"> <li>• Commercial water heaters</li> <li>• Commercial gas heaters</li> <li>• Commercial catering equipment</li> <li>• Commercial gas clothes dryers</li> </ul>
<b>Industrial</b>
<ul style="list-style-type: none"> <li>• Industrial boilers</li> </ul>

Commercial gas catering equipment will be investigated as part of a 10-year product strategy covering both electrical and gas equipment. This strategy will identify products that are suitable for MEPS and/or labelling, in addition to any training or best practice programs.

A key element of the NFEES Stage One *Appliance and Equipment Energy Efficiency* package is an increased focus on industrial products, to improve coverage of this sector. Initially, this will involve the preparation of a strategic report, in consultation with industry, and with input from international experts. Industrial gas boilers, and other industrial gas products, will be included in the scope of this work.

The table below from *Switch on Gas* lists the proposed projects (listed in the *Switch on Gas* strategy document approved by the MCE in December 2004) to be addressed over the next 10 years:

**Table 3: GAEEEP – 10 Year Timeline of Priorities**

**High Priority – 2005 to 2007**

**Formally establish GAEEEP:**

- Form the Gas Appliance and Equipment Energy Efficiency Committee
- Finalize first GAEEEP 3-year work plan, in consultation with stakeholders
- Prepare forward estimates of energy and greenhouse savings for 1<sup>st</sup> 3-year work plan
- Establish nationally consistent administrative and legislative infrastructure

**Projects**

- Undertake a national campaign to communicate the formation of the new scheme to industry stakeholders
- Develop methodology to track efficiency and consumer trends in the sale of gas products
- Review and agree test methods and MEPS and labelling requirements for domestic gas water heaters, room and ducted heaters, and agree on introduction date
- Prepare product profiles for commercial gas heaters and water heaters, industrial gas boilers, and domestic gas ovens and cooktops
- Develop a product strategy for commercial catering equipment, including gas products
- Incorporate gas products into national energy rating and Energy Allstars web sites
- Include gas products into a national promotional campaign targeting appliance retail stores and consumers

**Medium Priority – 2008 to 2011**

- Undertake a national campaign to communicate the new scheme to consumers
- Commence targeted check-testing program for regulated products
- Complete implementation of new MEPS and/or labelling requirements for domestic gas water heaters, room and ducted heaters
- Develop MEPS and/or labelling proposals for commercial gas heaters and water heaters, industrial gas boilers and domestic gas ovens and cooktops, and agree on implementation dates
- Develop product profiles for gas clothes dryers and priority gas catering equipment. Develop MEPS and/or labelling proposals for these products and agree on implementation dates.

**Lower Priority – 2012 to 2015**

- Complete implementation of agreed new MEPS and/or labelling requirements for commercial gas heaters and water heaters, industrial gas boilers, and domestic gas ovens and cooktops
- Commence implementation of agreed new MEPS and/or labelling requirements for gas clothes dryers and priority commercial catering equipment;
- Develop MEPS and/or labelling proposals for gas clothes dryers and priority gas catering, and agree on implementation date;
- Develop product profiles for lower priority commercial gas catering equipment;
- Review MEPS and/or labelling for domestic gas water heaters and domestic room and ducted heaters

## 4 Administrative & Regulatory Framework

### 4.1 Administrative framework

The on-going development and implementation of GAEEEP will be overseen by the Gas Appliance and Equipment Energy Efficiency Committee (GAEEEC), comprising representatives from Commonwealth, State, Territory and New Zealand government energy agencies and gas technical regulators.

The Australian Greenhouse Office (within the Department of the Environment and Heritage) will provide both the Chair for GAEEEC and a secretariat to support its activities.

GAEEEC's specific responsibilities will be to:

- oversee and coordinate the implementation of GAEEEP work plans;
- coordinate involvement with and input to standards processes relating to methods of test, MEPS levels and energy labelling algorithms for gas products;
- provide assistance to all jurisdictions, as required, in the development and implementation of regulatory and non-regulatory aspects of the program;
- administer an effective, *targeted* check-testing regime and provide a forum to exchange information on enforcement and compliance issues;
- monitor program performance and achievements;
- coordinate broad consultative processes relating to the

development and implementation of GAEEEP and its specific initiatives.

During the initial establishment phase the government agencies represented on GAEEEC will work closely with a Reference Group of key industry stakeholders to ensure that the new national regulatory scheme meets the requirements of both government and industry.

### 4.2 Regulatory framework

A requirement for gas appliances to be certified for safety compliance (and by default with MEPS and labelling), as set out in the relevant Australian Standard, are contained in Gas Safety, Gas or Gas Supply Acts in most Australian jurisdictions. However, only the Victorian *Gas Safety Act 1997* contains specific provisions for making regulations relating to MEPS or labelling of proclaimed gas products, and as yet there are no such regulations or scheduled products under the Act

A nationally consistent legislative framework, including penalties for non-compliance, will put in place before the formal commencement of the GAEEEP. This will be based on legislation and model regulations developed by Victoria, which will be replicated in all jurisdictions from an agreed date to ensure national consistency.

There are two possible models for introducing this legal framework:

**Phased approach** – legislative framework established, but products only formally included in GAEEEP when new mandatory MEPS & or

labelling requirements are introduced, commencing with domestic gas water heaters. This option is preferred by government energy agencies. It is the simplest pathway to introducing the new regulatory scheme, but would mean that in the first few years the new scheme would operate in parallel with the existing industry run scheme.

**Block approach** – legislative framework established, commencement date agreed and all existing energy labelled products regulated under the new scheme from this date. From this time the gas products covered by the scheme would need to meet the MEPS and/or labelling requirements mandated under GAEEEP and be registered through the GAEEEP process.

GAEEEP's regulatory framework is modelled on the national electrical appliance and equipment program (NAEEEP). However, there are a number of key differences that require some modifications for the gas scheme:

1. The New Zealand gas appliance safety regime is significantly different from the Australian safety regime, and is also significantly different from the New Zealand and Australian regimes for gas or electric energy efficiency. While the Australian gas safety regime enforces a single Australian Standard for each appliance class, New Zealand has a self-declaration regime requiring that gas appliances comply with one of a number of overseas safety standards. Due to these differences most gas appliances are currently subject to a special exemption under the TTMRA.

2. Gas products are currently certified through a third-party scheme, while electrical products are registered for MEPS and/or energy labelling directly with one of the government registering authorities. Initially the Australian Gas Association was the sole product certifier but other organisations are now entering this market. The gas appliance industry has signalled a clear preference for the continuation of third-party certification as the basis of the new national energy efficiency scheme. It is critical that certification bodies continue to meet the requirements of governments for both energy efficiency and safety. Consideration may be given to accreditation and recognition of certification bodies operating within the gas energy and safety schemes.
3. For each category of special exemption a "Five Year Co-operation Program" was established with the objective of resolving the issues which prevent that product category from becoming part of the general TTMRA regime. This program has not been completed for gas appliances, so the special exemption remains in place.
4. The development of the new GAEEEP will obviously become another factor to be resolved within the Co-Operation Program before the special exemption status of gas appliances can be reviewed. The Strategic Plan should identify links between GAEEEP and the TTMRA Co-Operation Program via process, stakeholders and milestones.

To accommodate these differences GAEEEP will take the following approach:

1. the energy efficiency regime will be separated from the gas appliance safety regime operating in each country (Australia and New Zealand);
2. the current third-party certification scheme for gas appliances and equipment will be continued, but GAEEEP will require registration of products for MEPS and/or energy labelling with state-based gas technical regulators (or listing with EECA in New Zealand).

The key elements of the legislative framework for GAEEEP are:

1. Mandatory requirements will be implemented through State and Territory (and New Zealand) legislation which call up the relevant standards for each product class to prescribe MEPS levels and energy labelling requirements for proclaimed gas equipment, and set out penalties for non-compliance;
2. Methods of Test (MoT), MEPS levels and labelling algorithms and formats will be defined in Australian or joint Australian/New Zealand standards, and based on international or regional standards where possible.
  - a. If no international standards exist or are suitable for regulation, Australia will develop regional standards with New Zealand and endeavour to have this adopted as an international standard. Current published standards for gas products in Australia are

likely to form a basis for this approach.

- b. Subject to MCE approval in Australia and Cabinet approval in New Zealand, both Australia and New Zealand will use the same Standard, MEPS levels and labelling criteria for each gas product class, as the basis of their energy efficiency regimes.
3. Proclaimed gas equipment is to be tested to the relevant standard and approved and registered for MEPS and/or energy labelling by state-based regulators (or EECA in New Zealand). This process will allow for the existing third-party certification scheme to operate, with data generated by this process used as the basis for product energy efficiency registrations.

## 5 MEPS and Labelling

### 5.1 Structure and content of standards

The structure of the Australian Standards supporting the electrical appliance program has evolved in parallel with the regulatory requirements, and this approach may be appropriate for gas product standards as well. In general, different parts of each electrical appliance standard describe the energy and performance tests (the same parts usually contain minimum performance criteria, eg for washing or drying). The MEPS levels, physical energy labelling requirements, algorithms (the formulae which translate the raw test results into the energy ratings on the label) and criteria for describing products as "high efficiency" are usually in another part, which is under the control of the regulatory bodies.

The advantage of this modular structure is that different parts can be updated independently. For gas appliances there may also be a case for having the safety requirements separated in a different part. Existing State gas technical regulations focus on safety approvals and certification, and retaining these elements in a distinct part could increase the flexibility of the regulatory regime if, for example, the energy efficiency requirements were to be contained in different regulations under the same State legislation, in different State legislation or, indeed, in Commonwealth legislation.

However, there are a range of issues related to safety and energy efficiency that need to be considered. The efficiency, performance and "appliance safety" attributes of most gas appliances are inter-related. That is, a simple

means of increasing efficiency (without introducing significant changes to the heat exchanger or gas control components of an appliance) is by reduction or restriction of excess combustion air which in turn may result in a reduction in the "safety margin" which is incorporated into the combustion system (that is, there may be an accompanying increase in the amount of carbon monoxide (a poisonous gas) that is produced in the flue products). Alternatively, reduction of the gas input rate (for a given heat exchanger) may result in increased efficiency but is also likely to result in an accompanying drop in heating performance, sometimes to the extent where the prime function of the appliance may be compromised.

Consequently it is essential that the requirements of energy labelling and/or MEPS and the related test methods be such that they encourage advances in energy efficiency through innovation and product design without compromising appliance performance or safety.

During the existing appliance Approval / Certification process, appliance samples are assessed against a relevant Standard which ensures that efficiency tests are performed concurrently with combustion and performance tests.

If there is a separation of safety and energy/performance standards into separate parts or sections in the future, it will be critical that fundamental safety/performance benchmarking tests (eg combustion tests, heat up time etc) be confirmed at the time of an efficiency assessment (and on the same appliance sample) as a pre-requisite for the measurement of efficiency.

In addition to the issues above, normal manufacturing tolerances which apply to key appliance components within has appliances often have a significant impact on energy efficiency, consequently it is essential that a detailed engineering specification for the appliance and its subassemblies is available for review when the initial safety and efficiency testing assessment is performed. This enables adjustments to be made that coincide with either the most or the least advantageous condition. It is important that these settings be maintained for all subsequent performance and efficiency tests.

The technical design of the tests will need to anticipate what type of data may be required for both regulatory purposes and consumer information.

### 5.2 Gas Water Heater Issues

MEA (2002) identified a number of issues related to the testing of gas water heaters, including the maintenance rate test, recovery efficiency for storage water heaters and treatment of start-up energy for instantaneous water heaters. The relevant subcommittees of Standards Australia are now addressing some of these. AGO is currently funding some work on the water heater test standards to assist Standards Committee AG-001. The steps needed to resolve the test and method of test issues for water heaters and other products needs to be part of the first Work Plan.

Currently energy label testing only applies to appliances with less than 50MJ/h nominal input for storage appliances and for less than 250MJ/h for continuous flow types. Consideration may also be given to assessment of the

efficiency characteristics of some “small commercial” water heaters which are marginally above the threshold values but which may be used in larger households with higher demand requirements or in situations where spa baths are used in a “fill and drain” manner with no reheating of the water.

### 5.2.1 Continuous Flow Water Heaters

Current labelling tests require separate start up energy and steady state efficiency tests. When the energy label test methods were first developed, appliances generally had mechanical type controls with slow response times (i.e. It took a relatively “long” time to get the hot water up to temperature). The current range of appliances on the market includes a vast number of electronically controlled appliances with a wide range of temperature selection options. These appliances have much faster responses resulting in hot water being available in a relatively “short” period of time. Due to this fast response, the measurement of the start-up efficiency becomes more uncertain and may no longer be as relevant to the overall operating efficiency for these types of appliances.

The current test method requires efficiency testing at a single temperature setting (nominally 45°C above cold water inlet) operating at maximum gas input, whereas the majority of current appliances have a wide range of temperature control settings (typically between 37 to 60°C) and can also operate over a wide range of gas inputs (over a wide range of water flow-rates). There are conflicting requirements with AS3498, which require a maximum hot water delivery temperature of 50°C to some parts of residential buildings (e.g. bathrooms).

Test work is currently being performed on a range of products to investigate start

up energy and steady state operating characteristics at various water flow-rates, and thermostat temperature settings. Revised test requirements need to be relevant to all current continuous flow technologies.

### 5.2.2 Storage Water Heaters

Current labelling tests require a maintenance rate test (performed without draw off, similar to a heat loss test performed on electric units) and a separate recovery efficiency test (measuring the energy content of a full tank of water). These tests aim to measure the generic performance parameters of the water heater, but there are some areas where refinements are required.

Areas where investigations are currently under way are set out below.

Areas which can affect the maintenance rate result are thermostat setting and thermostat bandwidth. Test work is currently being undertaken on a range of products to investigate maintenance rate of appliances under various thermostat conditions and various thermostat bandwidths.

Other considerations may be the minimum storage temperature for prevention of Legionella since the current approval standards do not require a check of or limit for the minimum calibration setting of a thermostat (this is also covered by AS3498).

Since the majority of storage water heaters are installed outdoors, they are exposed to the effects of “wind” which may have an affect on maintenance rate and appliance efficiency (due to imbalance of delicate buoyancy forces in the flue system). Consequently the current investigation may need to be expanded to ensure that efficiency assessments are relevant to real

operating conditions encountered in real life.

Another important performance parameter for storage water heaters is the recovery efficiency. The current method requires testing at a single thermostat setting of 60 °C, whereas some appliances operate at much higher storage temperatures (eg. 75°C). It also measures the energy content of a full tank of hot water without any cold water mixing. There are a number of areas under investigation such as stacking (some “overheating” of water at the top of the tank which may lead to increased heat losses and lower efficiency) and whether in-use efficiency over a range of drawoff depths can be characterised adequately by a slightly revised method.

Test work is currently being undertaken on a range of appliance to investigate recovery efficiency and delivery characteristics under various operating conditions including draining hot water from the hot water outlet connection under various draw-off profiles.

### 5.3 Research on appliance selection and use – water heaters

There are several areas of controversy with regard to the use of gas water heaters. The task efficiency of a water heater varies with both daily hot water consumption and the pattern of use (i.e. frequency of drawoffs and the magnitude of each drawoff). Also, if the user discards the initial flow before it reaches the desired temperature, the energy in that water and the water itself are both wasted.

It may be possible to incorporate these factors into the method of rating gas water heaters, possibly at relatively low cost, using simulation techniques that build on information that is collected in physical standard tests. Simulation will

enable better information to be provided to consumers under a range of alternative usage scenarios. This information would most likely be conveyed through interactive website listings.

Research on hot water use in households of various size (eg 1-2 person, 3-4 person etc), layouts and appliance mixes may be of interest when reviewing the gas water heater tests and rating algorithms. It is understood that there is some existing research, but it is not recent and its geographic coverage is limited.

#### 5.4 Space Heaters and Ducted Heaters

While all water heaters provide a comparable service, this is not necessarily the case with ducted heaters and space and room heaters. There is a very wide range of gas heaters on the market, and the categorisation is not entirely consistent, as Table 4 indicates.

The AGA has historically used a system based on its technical standards, whereas GAMAA uses a categorisation that more closely corresponds to the way that gas heaters are marketed. Another approach to classification is from the consumer's perspective – to group the products that are likely to be within the consumer's search criteria, so that the potential buyers can more easily compare the energy efficiency of alternatives, and understand the energy consequences of features such as flame or log effects. Again, such an approach needs the support of all parties to the standards development process, and should be backed by consumer research on the gas space heating market.

##### 5.4.1 Ducted Heaters

Current labelling tests require measurement of heat output in the outlet air duct across 2 operating cycles at 2 gas input settings (if more than a single

**Table 4 Alternative categorisations of gas space heater types**

GAMAA Categories (a)	AGA Categories (b)	Possible GAEEP Categories (c)
Central Heaters	Ducted air heaters	Ducted
Flame fires	Flued radiant/convection	Flued – radiant/effect
Flued radiant		
Portable convection	Flueless convection	Unflued
Portable radiant	Flueless radiant/convection	
Portable radiant convection		
Power flued	Balanced flue convection	Flued – convection only
Wall furnaces	Wall furnaces	

(a) GAMAA website (b) AG 103, AG 106 (c) GWA 2004

rate is available).

The current method determines heat delivery characteristics at 2 discrete load conditions (based on a 75% and 25% duty cycle). Equal weighting is applied to each test condition. The energy saving potential of “zoning” (i.e. not heating un-occupied areas) through the “heat load reduction factor” allow for a bonus of up to 1 star in the energy label determination.

##### 5.4.2 Space Heaters

Current labelling tests require measurement of heat output in the flue pipe across maximum and minimum gas input settings. The current method assumes whatever energy does not escape from the flue pipe is useful (except for unflued appliances which are assumed to be 90.4% efficient - no measurement is performed). The method is performed with the flue pipe length set at the worst-case condition for efficiency (whereas installations vary). All electrical consumption to the appliance (eg used by room air fans, controls etc) is assumed to contribute to the efficiency calculations.

Unflued heaters which have greater electrical consumption achieve a higher star rating. No account of the different

ventilation requirements (which increase the heating load requirements of a room) for different appliance types is included (eg. room sealed). Appliances can be installed without additional ventilation whereas open flued and unflued appliances require additional minimum ventilation, which necessarily increases heating load.

##### 5.4.3 Proposed Investigations

A range of possible investigations are proposed for both ducted heaters and space heaters as follows:

- Assess relevant overseas standards.
- Assess adequacy of current test method.
- Determine a range of appliances to select for standards development tests.
- Perform efficiency measurements under various operating conditions on selected test samples.
- Develop improved test methods.

## 6 Process for changing energy efficiency

The process for developing and implementing new or upgraded MEPS and/or energy labelling requirements for gas products will be the same as that used for electrical products, and is set out in the table below. The proposed timeframe will be flexible enough to take into account specific circumstances that may arise.

1. Development stage	Timetable
<ul style="list-style-type: none"> <li>a) Development of Product Profile – market &amp; technology assessment, review of international best practice, assessment of the energy impacts and feasibility of mandatory &amp;/or voluntary measures. Initial stakeholder consultation. (3 – 6 months)</li> <li>b) Development of detailed labelling and/or MEPS proposal, including cost/benefit analysis / RIS of potential legislative proposals. (3 – 6 months)</li> <li>c) Industry consultation of potential legislative proposals. (3 – 6 months)</li> <li>d) Development of Australian &amp; New Zealand standards for inclusion in regulations (9 – 12 months).</li> <li>e) Approval by the Ministerial Council on Energy required before the introduction of any new regulations.</li> </ul>	Up to 2 years
2. Notification stage	
The period of notification will depend on the level of manufacture undertaken in Australia. Longer periods will apply if Australian industry is required to undertake substantial development or re-tooling.	1 – 3 years
3. Implementation stage	
This is the 'stability period' in which no changes to regulations will be made (i.e. MEPS levels or labelling algorithms are unchanged). Periods longer than the minimum will apply if best practice is maintained.	Minimum of 5 years
4. Renegotiation stage	
Once introduced, discussions will commence on the progressive enhancement of MEPS or labelling requirements, in cases where best practice has not been achieved. Otherwise, the international and domestic situation will be monitored by GAEEEC on a regular basis to determine if and when and upgrade will be necessary.	Determined on a case by case basis

## 7 Communications with Stakeholders

Once established, GAEEEC will work with industry and government stakeholders to develop a communications plan covering both the establishment of GAEEEP and its on-going implementation. This plan will be reviewed on a regular basis to ensure that it is achieving its objectives.

The proposed key elements of the communications plan are set out in the table below.

**Table 5: Proposed elements of communications plan**

Target audience	Proposed communication strategy
<b>Establishment of GAEEEP</b>	
Manufacturers / suppliers & retailers	<ul style="list-style-type: none"> <li>• Reference Group to include key industry stakeholders</li> <li>• Distribution of <i>Switch on Gas</i> 10-year strategy and 2005 to 2007 Work Plan</li> <li>• National information 'road show'</li> <li>• Stakeholder e-mail newsletter</li> <li>• Information on energy rating web site &amp; appliance media</li> <li>• Information package prior to formal commencement</li> <li>• Training package &amp; point of sale material for retailers</li> </ul>
Purchasers	<ul style="list-style-type: none"> <li>• Information on national energy rating web site</li> <li>• Information through general &amp; consumer media</li> <li>• Point of sale information for use in retail stores</li> </ul>
<b>On-Going implementation</b>	
Manufacturers / suppliers	<ul style="list-style-type: none"> <li>• Reference Group to include key industry stakeholders</li> <li>• Regular NAEEEP Forums (currently 2 per year)</li> <li>• Distribution of Product Profiles, Proposals &amp; Regulation Impact Statements, supported by consultation workshops for individual measures</li> <li>• Stakeholder e-mail newsletter</li> <li>• Information on energy rating web site &amp; appliance media</li> </ul>
Retailers	<ul style="list-style-type: none"> <li>• Regular NAEEEP Forums (currently 2 per year)</li> <li>• Distribution of Product Profiles, Proposals &amp; Regulation Impact Statements, supported by consultation workshops for individual measures</li> <li>• Information on energy rating web site &amp; appliance media</li> <li>• Stakeholder e-mail newsletter</li> <li>• Point of sale information for use in retail stores</li> </ul>
Purchasers	<ul style="list-style-type: none"> <li>• Information on national energy rating web site</li> <li>• Information through general &amp; consumer media</li> <li>• Point of sale information for use in retail stores</li> </ul>

### References:

AG 103, AG 106 c  
 George Wilkenfeld and Associates 2004 *Implementation Strategic Plan 2004*  
 Paul Orłowski/Peter King, Eneritech Australia Pty Ltd  
 GAMAA Website

## Gas Appliance and Equipment Energy Efficiency Committee

**The Gas Appliance and Equipment Energy Efficiency Committee consists of the following member organisations:**

Australian Greenhouse Office,  
Department of the Environment and  
Heritage

NSW Department of Energy, Utilities  
and Sustainability

Office of the Chief Electrical Inspector  
Victoria

Sustainable Energy Authority Victoria

Electrical Safety Office, Queensland  
Department of Industrial Relations

Queensland Department of Energy

Western Australian Department of  
Consumer and Employment Protection

Western Australian Sustainable Energy  
Development Office

South Australian Office of the  
Technical Regulator

Tasmanian Office of Energy

ACT Department of Treasury

Northern Territory Department of  
Business, Industry and Resource  
Development

New Zealand Energy Efficiency and  
Conservation Authority

With the incorporation of gas appliances and equipment into the wider national program (NAEEEP), other agencies with gas regulatory powers may join to manage GAEEEP from 2005.