

National Hot Water Strategic Framework

12 December 2008

Background

At the 13 December 2007 meeting, MCE agreed to the development of measures for a national hot water strategy under Stage 2 of the National Framework for Energy Efficiency.

The COAG Working Group on Climate Change and Water has established a sub-group to focus specifically on energy efficiency. Given this renewed focus on energy efficiency, and the Federal Government's election commitment to a phase-out of electric resistance hot water systems in gas reticulated areas from 2010, further expanded to non gas reticulated areas in 2012, there are strong indications from governments that measures to reduce greenhouse gas emissions from water heaters are needed.

Jurisdictions already have a range of measures in place relating to the installation of low-emission hot water systems in new homes and during replacements, including both incentive programs and mandated requirements.

The National Hot Water Strategy will seek, where possible, to build on and complement these existing measures.

Case for action

High-emission water heater systems typically cost more to operate and have three to seven times the greenhouse gas intensity of low-emission systems. Although the greenhouse intensity of the grid is expected to fall over time in response to measures such as the Carbon Pollution Reduction Scheme and the Mandatory Renewable Energy Target, it is expected the emissions gap between high and low-emission water heating systems would not close for some time without action.

Measures currently implemented (ie, excluding committed future measures by jurisdictions) have stimulated, to varying degrees, a transition towards lower-emission water heaters. This current level of activity, however, is unlikely to be sufficient to enable an accelerated transformation of the market. The key opportunities for accelerated activity are:

- > strengthened regulatory measures targeting installations in new homes and major renovations;
- > new regulatory measures targeting replacements;
- > enhanced incentive programs; and
- > industry capacity-building.

It is recognised that a national approach can contribute by setting new minimum benchmarks for low-emission water heating and driving consumer awareness and market transformation.

Many jurisdictions have performance requirements for water heaters installed into new homes. The key gap is in improving the energy efficiency and associated greenhouse gas performance of water heaters in established dwellings. The most effective time to bring about such an improvement is at the time of replacement, which represents around 69 per cent of water heater installations across Australia (source: BIS Shrapnel, 2008).

A range of market failures and other non-price barriers relating to the new home, replacement and rental markets inhibit the uptake of low-emission hot water technologies and justify Government intervention. A key barrier is that energy bills account for only around 2 to 3% of total household expenses; hot water energy bills account for only a fraction of this (perhaps 20 to 30%). Energy bills are received every 2 to 3 months, providing a very muted price signal, especially since it is impossible for the majority of consumers to determine what their

water heating energy costs are. The fact the water heating energy costs are only a very small percentage of total household expenses (perhaps 1%), and that people are time poor, means that very little, if any, attention is given to energy efficiency when a new water heater is installed. This is compounded by split incentives (either landlord-tenant, plumber-consumer or builder - purchaser), the emergency nature of many water heater installations and information failures.

The replacement market is characterised by a sudden unit failure and an urgent requirement to have a replacement installed to maintain hot water supply. In the majority of cases, the householder relies on the plumber to select the replacement unit, which usually results in like being replaced with like. This creates failures in terms of an unanticipated high up front capital cost coupled with limited information and time to procure the water heater. This can result in maintenance of the status quo for the full life of the replacement heater.

Consumers also face a range of information failures even when they are the party who controls the selection of the water heater. Water heaters are an infrequent purchase, which means that most consumers do not obtain a significant amount of expertise or experience in water heater selection. With the exception of gas water heaters (which are labelled) it is difficult for consumers to obtain any information on comparative performance, and it is almost impossible for consumers to compare the relative greenhouse performance of different types and efficiencies of water heaters for their situation.

The installation of high-emission water heaters where low-emission alternatives exists in high rise developments (class 2 buildings), particularly in gas reticulated areas, is an emerging issue warranting intervention. The rental market is characterised by landlords who do not pay electricity or gas operating costs and whose aim is to minimise capital expenditure. This creates the market failure of split incentives. A split incentive can also occur in the new home market, where the builder's goal is often to minimise the up-front cost of building without consideration of the ongoing operating costs of the dwelling.

Objectives

The objectives of the National Hot Water Strategy are to:

- Progressively transform the market for residential water heaters towards low-emission alternatives via a clear policy signal that will stimulate a positive industry response
- Provide a pathway for adoption of low-emission residential water heaters
- Improve the performance of low-emission water heaters
- Build market capability to support the effective transition by industry and consumers to low-emission domestic water heaters
- Build community awareness of the benefits of low-emission water heating to support the roll-out of new standards and uptake of best practice technologies for domestic water heating
- Deliver lifetime cost savings to households, at times of rising energy costs.

Pathway

Aim

To provide the water heater industry with a transition pathway over the period 2010 to 2020 to the supply of low-emission water heaters.

A key element of the transition pathway will be to set progressive benchmarks for low-emission water heaters. The initial performance standard, based on current technologies, would define high efficiency gas, solar and heat pump water heaters as meeting the proposed performance benchmark for low-emission water heaters. Given that Australia's electricity supply to 2020 and beyond is likely to be dominated by sources with high greenhouse gas

emissions, conventional electric water heaters are considered as high-emission technologies. As such, they would not meet the performance benchmark.

Milestones

It is proposed that the national strategy towards low-emission water heaters will be progressed through a staged approach.

A timeline to 2020 with milestones is provided in Appendix 1 and Appendix 2 for the proposed regulatory and supporting measures respectively. The measures are discussed in detail below.

It should be noted that individual jurisdictions may opt to bring forward the program including introducing more stringent requirements.

Regulatory measures

The key features of the framework's regulatory elements are:

- Phased development and introduction of regulations proposed for different building types (Class 1 and 2) and for areas depending on access to reticulated gas;
- Potential for differential standards for systems in new and existing homes;
- MEPS for water heater types that will continue to be available; and
- Regular (5 yearly) review and strengthening of minimum performance standards through the Building Code of Australia (BCA) and plumbing regulations and three-yearly reviews of MEPS.

The regulatory measures proposed to progress this pathway are:

- National performance requirements in the BCA for new dwellings and for alterations and additions to Class 1 and, if viable, Class 2 dwellings
- Model plumbing regulations for installations into established dwellings
- Minimum energy performance standards and labelling for a range of water heater types

The above measures will be subject to regulatory impact assessment.

Relationship between BCA, plumbing regulations and MEPS standards

The BCA and model plumbing regulations will be used to phase out the *installation* of high-emission water heaters.

To complement these requirements, a suite of MEPS are proposed to prevent, where appropriate, the *sale* of inefficient models of those types of water heater types that will continue to be available. In particular:

- The various technology types of low-emission water heaters; and
- Those types of high-emission water heaters that will continue to be installed for a reasonable period of time, such as small electric water heaters in Class 2 dwellings.

Appendix 1 outlines the timing and relationship of the BCA, plumbing regulations and MEPS standards.

BCA and Plumbing Regulations

The BCA and Plumbing Regulations will be based on performance requirements that will be initially set in 2009 and strengthened on a periodic basis. Commencing in 2010, the regulations will be rolled out to different classes of dwellings over the 10-year period.

The performance requirements will need to recognise differences between jurisdictions which affect the relative greenhouse emissions of different types of water heating systems.

There is scope for the minimum performance requirements for installations into new homes, alterations and additions (implemented via the BCA) to be more stringent than those for installations into established homes (implemented via plumbing regulations). This recognises that installation costs can be lower for new installations than for replacements.

The initial performance requirements are to be determined in 2009 for introduction in 2010. They will be set to exclude high-emission water heaters such as conventional electric resistance water heaters and permit low-emission technologies. They will be set in a way that does not preclude new low-emission water heater technologies entering the market.

Whilst the detail of these performance requirements are yet to be determined, with regards to gas water heaters, a preference is for a performance requirement for new homes that only allows gas water heaters with ratings of 5-stars or better in addition to solar and heat pump systems.

For gas water heaters installed in established homes, the preference is to rely on MEPS to improve performance.

As such, with regards to gas water heaters it is proposed that the initial performance standard for implementation in 2010 - 2012 be set such that:

- For gas water heaters installed in new houses, the units must be 5-star or better; and
- No specific requirements, beyond MEPS, are provided for gas water heaters installed into established homes. This will allow MCE's decision on the MEPS levels for gas water heaters to, in effect, set the initial standard.

It is proposed that the performance standards will be strengthened in 2015 and 2020. This will enable a progressive shift to low-emission water heaters including responding to improvements in the energy efficiency of water heater technologies.

The BCA and plumbing regulations will call up performance requirements and specify the installation situations in which they apply. A phased approach will be used, over the 10-year period, to strengthen performance requirements and to apply to an ever-increasing set of situations. This phased implementation is described in the table below.

It will be at the discretion of individual jurisdictions as to whether they adopt these requirements and/or set requirements that are more stringent.

Timetable for phasing in of BCA and Plumbing Regulations*.

Dwelling type	Situation	Implementation path	Year in which requirements are established
Class 1 – ie attached and detached houses.	All new dwellings, alterations and additions requiring building approval (with and without access to reticulated gas).	BCA†	2010
	Established dwellings that have reticulated gas available in the street	Plumbing regs	

	All, or a targeted group, of established dwellings that do not have reticulated gas available in the street (see discussion below)	Plumbing regs	2012
	Strengthened standards introduced	BCA and Plumbing regs	2015
	Strengthened standards introduced	BCA and Plumbing regs	2020
All other classes of residential dwellings (including Class 2 – ie, flats and apartments)	New dwellings that have reticulated gas available in the street	BCA	2012
	New dwellings that do not have reticulated gas available in the street	BCA	2012-2015 (Indicative dates, see discussion below)
	Established dwellings	Plumbing regs	2018-2020 (Indicative dates, noting feasibility to bring forward will be investigated)
	Strengthened standards introduced	BCA and Plumbing regs	2020

† Whilst the BCA is the preferred approach for national building standards, it is noted that some jurisdictions have not adopted current BCA requirements for energy efficiency.

*Except in regions where the emissions intensity factor of the public electricity supply is low.

The BCA requirements and model plumbing regulations may include exemptions, based on availability of suitable low-emission technologies in specific defined circumstances. It is expected, though, that these will cover only a small proportion of installations.

Initially, the performance requirements will apply to all new Class 1 dwellings and established Class 1 dwellings that have reticulated gas available in the street.

The preference is for the requirements also to apply from 2012 to all Class 1 dwellings without access to reticulated gas. Such an arrangement would see, by 2012, requirements apply to all established Class 1 dwellings. It is recognised, though, that there is the potential for perverse outcomes in situations, such as in rental properties, where split incentives can lead to installation of water heaters that have high running costs. Further work will be undertaken to assess the extent of this issue and, if necessary, means to address this. Consideration will be given to options such as only targeting the requirements to specific groups such as rental properties, purchased homes, or some other target group.

A firm date of 2012 is proposed for setting requirements for new Class 2 buildings with reticulated gas available in the street. In these situations, the provision of low-emission water heating systems can be incorporated into the building design. Also, there are a wider range of options available for buildings with reticulated gas available than for those without.

The dates for setting requirements for new Class 2 buildings in areas without reticulated gas and for established Class 2 buildings are indicative only as for many such buildings the options for low-emission water heating systems are either limited or non-existent. Further investigation into options for Class 2 will be pursued by the working group.

The use of the Class 1 and Class 2 categories to determine when requirements will be set will be further considered by the working group as there can be many situations, such as in low-rise flats, where Class 2 dwellings have similar water heating situations to Class 1 dwellings.

MEPS

The following table outlines indicative introduction dates for the various MEPS.

Technology Type	Indicative year for MEPS
Gas water heaters	First MEPS in 2009, Second MEPS in 2013
Gas-boosted solar water heaters	First MEPS in 2013
Electric-boosted solar water heaters	First MEPS in 2013
Heat pump water heaters	First MEPS in 2013
Small electric water heaters	Next MEPS from 2012

As a first step, product profiles for these technology types will be developed in 2008/09.

It is envisaged that MEPS for each water heater type will be considered for updating on a 3-yearly cycle.

Supporting measures

The regulatory measures described above will be supported by the following measures:

- Information and education
- Compliance activities
- Innovation support

Information and education

Nationally coordinated and integrated information and education programs will be developed for delivery by jurisdictions. These will include:

- The investigation, in 2010, of labelling for solar and heat pump water heaters for introduction, if warranted, in 2012. It is noted that there are plans by the Clean Energy Council to develop an energy rating method for solar hot water systems and heat pumps which may be completed by end of 2009. This could in effect bring forward the introduction of labelling for both solar water heaters and heat pumps.
- Information on the full life cycle costs (capital and running) and impacts of various hot water systems to assist suppliers and installers to provide informed advice and households to make an informed decision, rolled out in 2010.
- Scoping of training and education campaigns, in 2009, for builders and plumbers for roll-out commencing 2009.

Compliance activities

Jurisdictions will be encouraged to establish well-resourced compliance activities from 2010 targeting the building and plumbing industries to support the desired outcomes of the national hot water strategy and any jurisdiction-specific measures aimed at increasing the uptake of low-emission hot water systems.

Innovation support

Areas for innovation will be identified during 2009. Priorities are expected to be where there are currently no readily available alternatives to high-emission water heaters, eg small electric water heaters in flats and apartments.

From 2010, opportunities for support for such innovations will be progressed in collaboration with industry.

Harmonisation

Harmonisation of jurisdiction-specific measures (both regulatory and supporting) will be pursued where it has the potential to increase the effectiveness of implementation and program delivery and to assist in industry development and transition. In addition, recognition will be given to the differences across jurisdictions, such as fuel sources, climate, and population densities.

It is proposed that a review will be undertaken in 2011 to identify opportunities to harmonise jurisdictions' water heater measures, including regulations, incentives, education, and compliance activities. The intent is that jurisdictions would, by 2012, have taken steps to improve such harmonisation.

Incentives

In addition, there are a range of incentive measures already in place that aim to drive the uptake of low-emission hot water systems. The strategy does not propose new incentive measures. Supporting measures developed as part of this strategy will need to take account of existing and new incentive measures for low-emission hot water.

In particular, pursuing opportunities to better harmonise jurisdictional programs, attention will be given to better aligning incentive programs across jurisdictions, with particular attention to eligibility criteria and the targeting of incentive schemes to best complement other measures.

Opportunities to overcome disincentives to the uptake of low-emission water heaters will also be investigated.

As part of its proposed Carbon Pollution Reduction Scheme, the Commonwealth has identified scope for assisting households through energy efficiency measures. The Commonwealth will be encouraged to consider assisting households to install low-emission water heaters.

Recognising that the Mandatory Renewable Energy Target (MRET) has been an important incentive for the uptake of solar and heat pump water heater, the Commonwealth will also be encouraged to develop the future implementation of the MRET in a way that complements this 10-year pathway.

Appendix 1: Indicative Regulatory Measures Milestones

Year	Class 1		Class 2		MEPS				
	New homes	Replacements	New homes	Replacements	Solar gas	Solar elec	Heat pump	Gas	Electric
2008					Product profiles commenced				
2009	Minimum performance standards established								
								MEPS commences	
2010	Requirements for all new homes	Requirements for reticulated gas areas							
2011									
2012		Requirements for areas without reticulated gas	Requirements for reticulated gas areas (2012)						Updated MEPS for small units
			Indicative date for areas without reticulated gas (2012-2015)		MEPS commences if not earlier (if appropriate)	MEPS commences if not earlier (if appropriate)	MEPS commences if not earlier (if appropriate)	Updated MEPS commences	
2013									
2014									
2015	Minimum performance standards strengthened								Updated MEPS (if needed)
2016					Updated MEPS (if needed)				
2017									
2018				Indicative requirement for all areas (2018-2020)					Updated MEPS (if needed)
2019					Updated MEPS (if needed)				
2020	Minimum performance standards strengthened								

Appendix 2: Supporting Measures Milestones

Year	Harmonisation	Information and education			Compliance	Innovation support
		Labelling	Consumer information	Builders and Plumbers		
2008						
2009				Education campaign scoped		Priorities for innovation identified
2010		Investigate solar and heat pump labeling (if not completed earlier)	Information on life-cycle costs of water heater options rolled out	Education rolled out	Jurisdictions establish compliance activities	Facilitate support in collaboration with industry
2011	Review opportunities					
2012	Jurisdictions improve harmonisation	Solar and heat pump labelling				
2013						
2014						
2015						
2016						
2017						
2018						
2019						
2020						