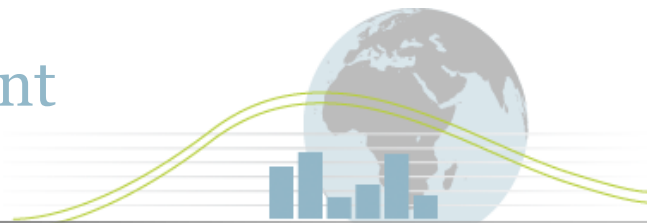


4E

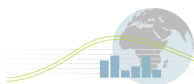
Mapping Document



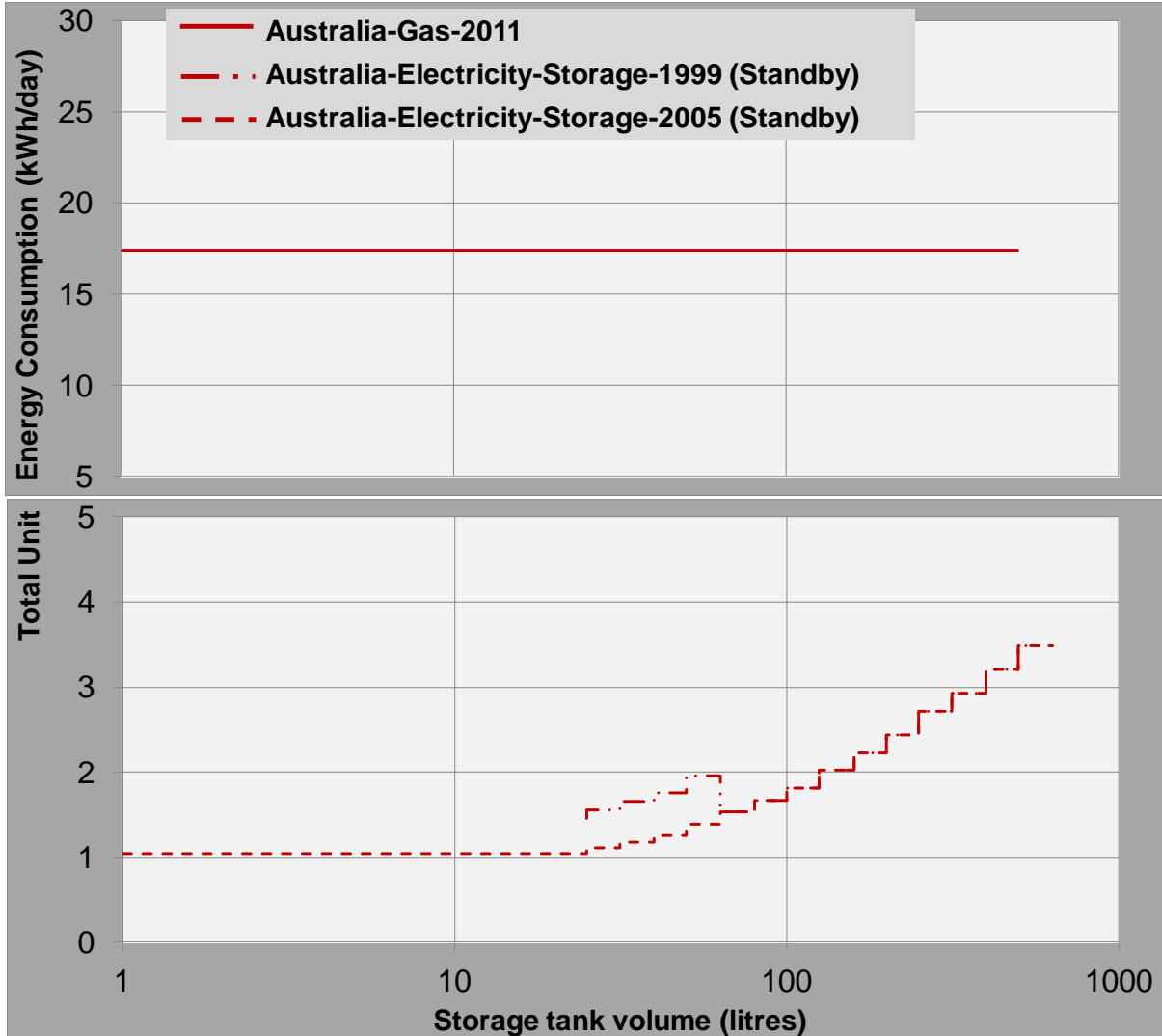
Country:	Australia
Technology:	Water Heaters
Sub Category:	Gas and Electric, Storage, Instantaneous and heat pump.

This Mapping Document is one of a number which present the recent and historical energy performance of gas and electric storage, instantaneous and heat pump water heaters for a number of individual countries. The performance of products at the national level will subsequently be compared against products from other countries in a Benchmarking Document.

These comparisons of product performance made in this Mapping Document are based on both a delivered energy and on primary energy basis. The generic methodology used for product comparisons is detailed in “*Water Heaters - Overall Approach to the Analysis - IEA 4E*” and the methodology used for delivered to primary energy conversions is detailed in “*Water Heater Energy and Fuel Conversion Factors*”. All documents related to water heaters developed under the 4E Mapping and Benchmarking activities can be found at <http://mappingandbenchmarking.iea-4e.org/matrix?type=product&id=18>.



Water Heater Regulations



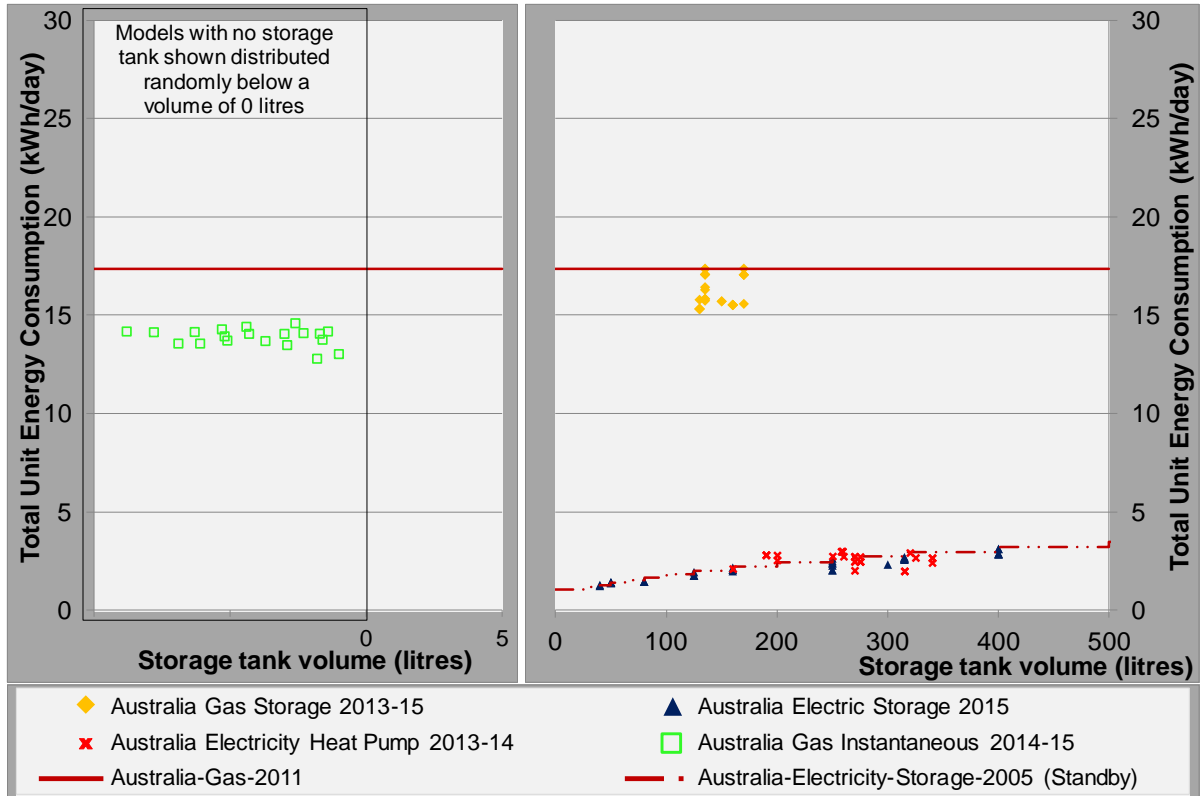
Key notes on Graph (see notes section 1)

- Currently Australian Minimum Energy Performance Standards apply *only* to:
 - The Standby Heat Losses from Electric Storage Water Heaters as shown
 - The overall (gas) energy consumption of Gas Water Heaters is set against a defined daily hot water demand profile.
- Gas standards apply to both instantaneous and storage water heaters and are therefore shown down to a storage tank volume of 1 litre even though storage heaters with a nominal storage capacity of less than 30l are excluded.

Water Heater Daily Energy Consumption (as declared)

Comparison of the energy performance of all types of water heaters registered in 2013-2015 against national regulatory and voluntary performance requirements.

(Basis: delivered energy as declared under local test conditions.)

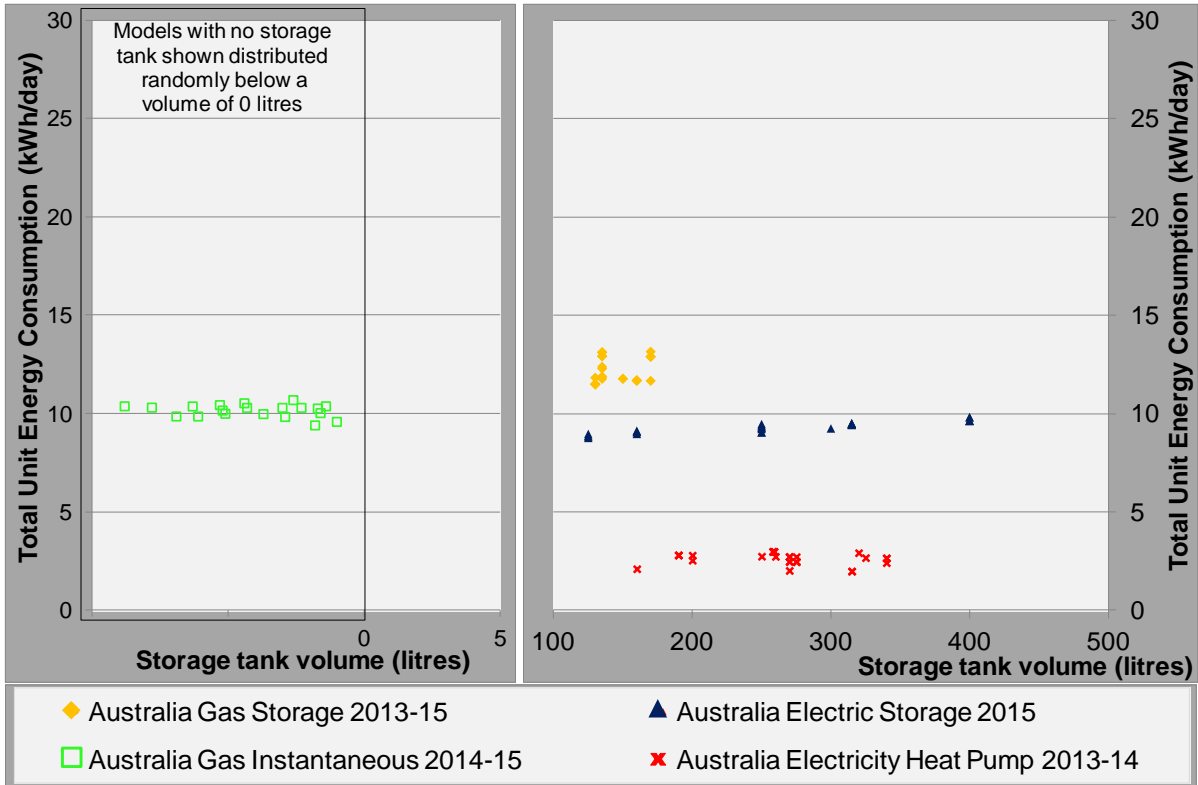


Key notes on Graph (see notes sections 1 & 2)

- The scales of the x-axes (volume) are different on the two sides of the graph.
- Electric storage water heaters are regulated based on Standby Heat Loss only, and hence individual model performance is shown against this requirement.
- Gas water heaters performance requirements are defined against a defined daily hot water demand profile. Product performance is shown against this profile.
- Gas standards apply to both instantaneous and storage water heaters and are therefore shown down to a storage tank volume of 1 litre even though storage heaters with a nominal storage capacity of less than 30l are excluded.

Water Heater Daily Energy Consumption (equivalent service)

Comparison of energy performance of all types of water heaters registered in 2013-15.
 (Basis: Delivered energy use with identical local daily draw-off profiles.)

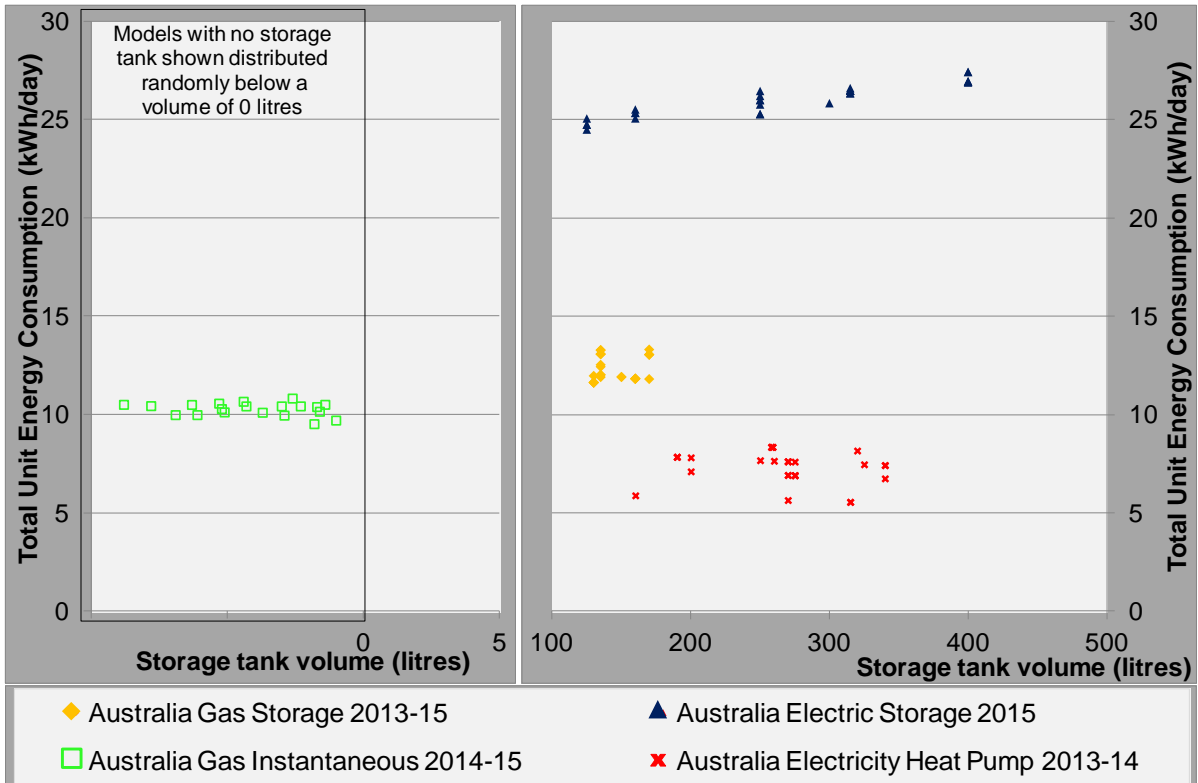


Key notes on Graph (see notes sections 1 & 2)

- Australian regulations for electric storage water heaters are based on standby consumption only. Other test conditions also vary between technology types. The product consumptions shown here are all based on the following standardised conditions:
 - A daily draw-off demand of 7.525 kWh, and
 - Hot water temperature: 60°C; cold water Temperature: 22.2°C; ambient temperature 21.8°C.
- The scales of the x-axes (volume) are different on the two sides of the graph.

Water Heater Daily Consumption (equivalent service – primary energy)

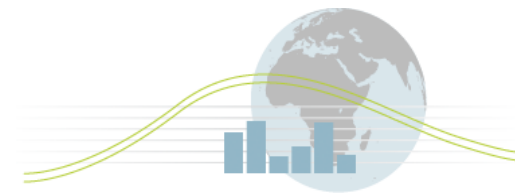
Comparison of energy performance of all types of water heaters registered in 2013-15.
(Basis: Primary energy use with identical local daily draw-off profiles.)



Key notes on Graph (see notes sections 1 & 2)

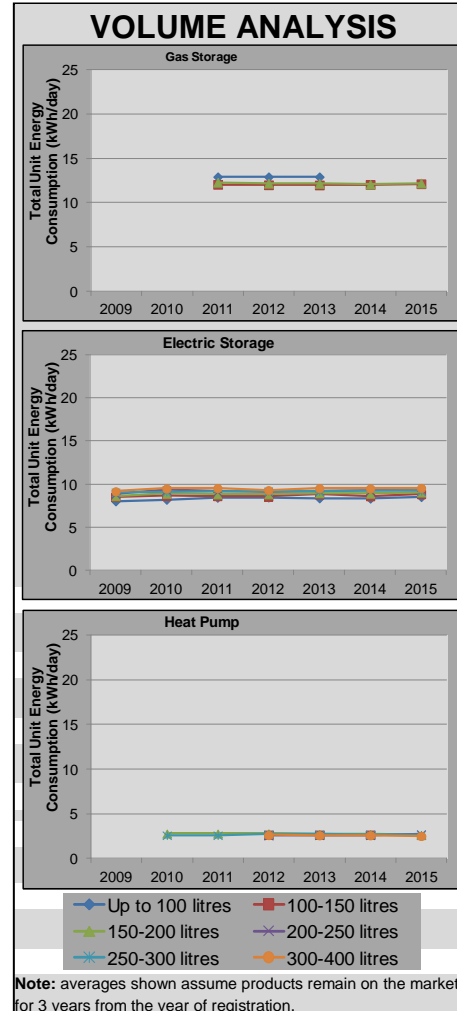
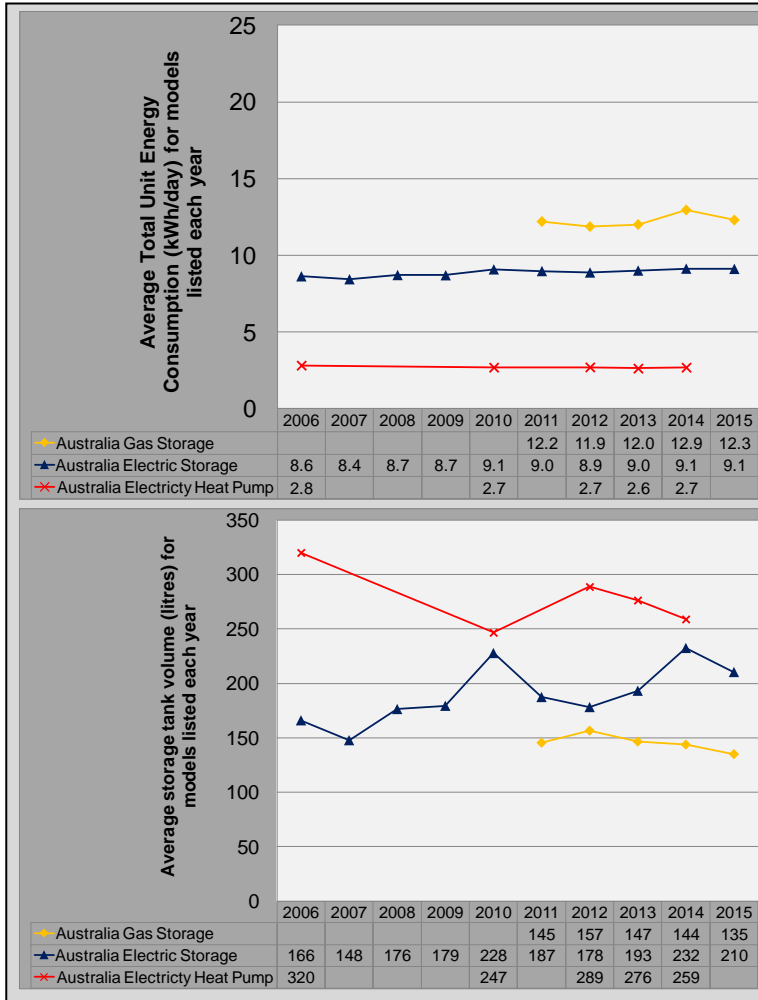
- Australian regulations for electric storage water heaters are based on standby consumption only. Other test conditions also vary between technology types. The product consumptions shown here are all based on the following standardised conditions:
 - a daily draw-off demand of 7.525 kWh, and
 - Hot water temperature: 60°C; cold water Temperature: 22.2°C; ambient temperature 21.8°C.
- The energy consumption of models shown are converted to equivalent primary energy values using estimated total losses (as listed in the 2012 IEA World Energy Balance data) of: gas: 1.2%, electricity: 64.2%¹.
- The scales of the x-axes (volume) are different on the two sides of the graph.

¹ For details and methodology, refer to “Water Heater Energy and Fuel Conversion Factors” available at <http://mappingandbenchmarking.iea-4e.org/matrix?type=product&id=18>.



Storage and Heat-pump Water Heater Daily Energy Consumption over time

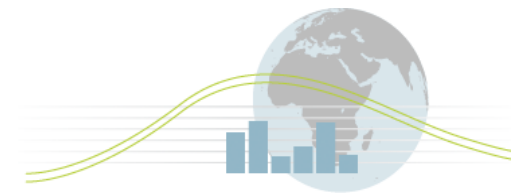
Comparison of energy performance of storage and heat pump water heaters over time.



Key notes on Graph

(see notes sections 1 & 2)

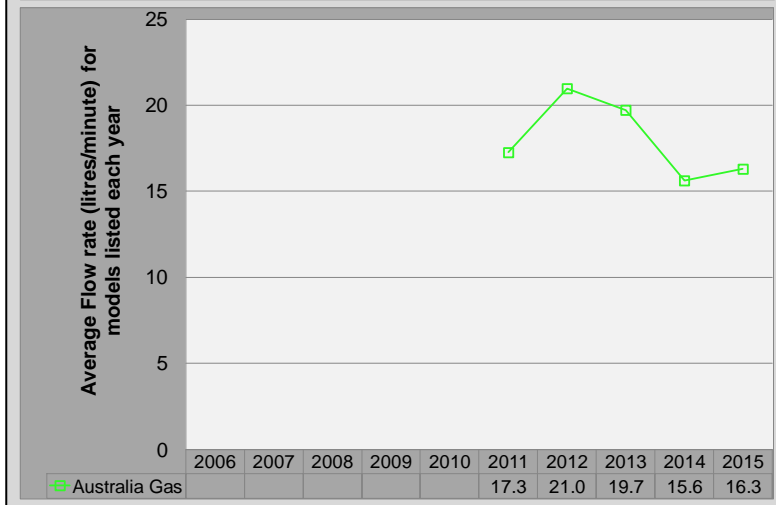
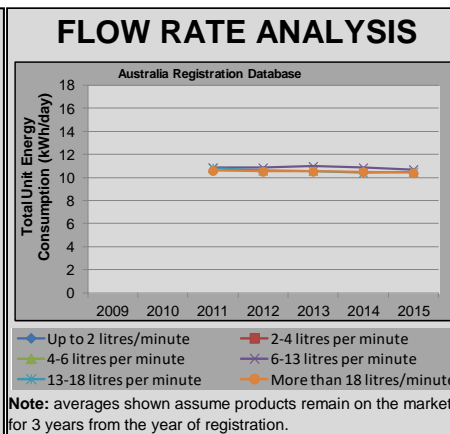
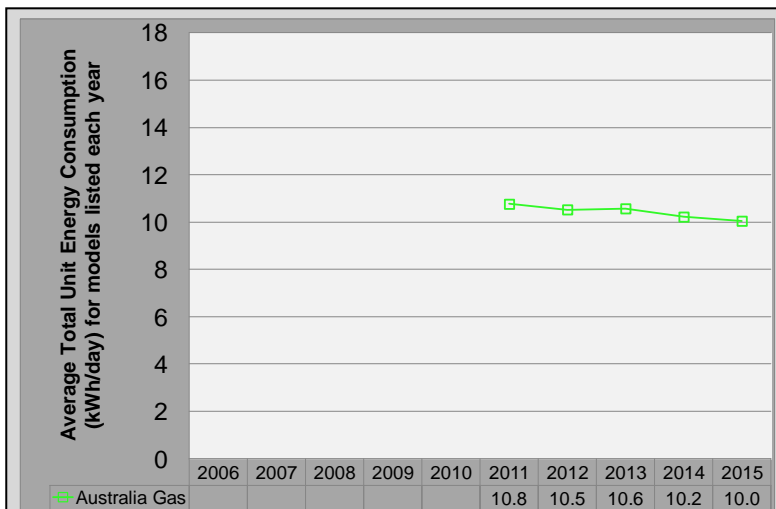
- Australian regulations for electric storage water heaters are based on standby consumption only. Other test conditions also vary between technology types. The product consumptions shown here are all based on the following standardised conditions:
 - a daily draw-off demand of 7.525 kWh, and
 - Hot water temperature: 60°C; cold water Temperature: 22.2°C; ambient temperature 21.8°C.
- For volume analysis, results show averages by volume ranges and assume products remain on the market for 3 years from the year of registration.



Instantaneous Water Heater Daily Energy Consumption over time

Comparison of energy performance of instantaneous water heaters over time.

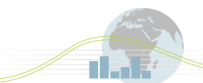
(Basis: Product weighted averages of values with identical local daily draw-off profiles.)



Key notes on Graph (see notes section 1 & 2)

- Australian regulations for electric storage water heaters are based on standby consumption only. Other test conditions also vary between technology types. The product consumptions shown here are all based on the following standardised conditions:
 - a daily draw-off demand of 7.525 kWh, and
 - Hot water temperature: 60°C; cold water Temperature: 22.2°C; ambient temperature 21.8°C.
- For flow rate analysis, results show averages by flow rate ranges and assume products remain on the market for 3 years from the year of registration.

Issue date: 14 February 2017



Major Policy Interventions (See notes Section 3)

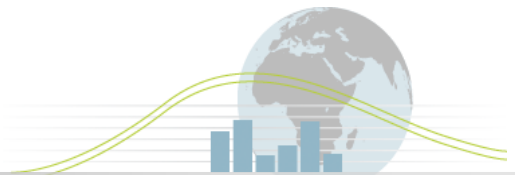
Mandatory Minimum Performance Standards (MEPS) and Product Registration are in place for:

- Electric storage water heaters (introduced in 1999 and revised in 2005, heat loss only).
- Gas instantaneous and storage water heaters (mandate from 2010 but pre-existing industry scheme from the 1980's)

Mandatory labelling is not required for any water heater product, although industry based labelling is in place for gas instantaneous and gas storage water heaters.

In addition to the mandatory requirements, there has been significant additional policy intervention to encourage adoption of efficient water heating products:

- Summary details of regulatory building policy impacting State and Territory building regulations;
- The Australian Government Renewable Energy Target and Small-scale Renewable Energy Scheme;
- Rebates and white certificate schemes.



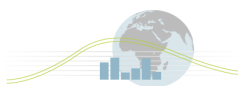
Cultural Issues (See Notes Section 4)

The water heater market in Australia is relatively small, with approximately 700,000 units sold each year. Historically the market was primarily electric or gas storage water heaters. However, there has been an effort in recent years to reduce the amount of electricity used to heat water at both the state and federal levels, particularly through the incentives for solar units. Solar water heaters and instantaneous gas water heaters are now the fastest growing segment of the market and accounted for 50% of the market in 2014². However the stock is still dominated by electric storage water heaters which made up 36% of the residential water heater stock in 2014². Gas storage made up 24%, instantaneous gas made up 21%, solar made up 13% heat pump water heaters made up 3%, and electric instant make up 2%².

There is a mixture of continuous and off-peak tariff electric storage water heaters. Off-peak units are generally larger than continuous systems, both in terms of capacity and insulation. As a result, whilst they cost less to operate, they may consume more energy in total but have lower energy costs due to the lower tariffs at off peak times. They tend to more popular in the detached house and townhouse market. Continuous electric storage water heaters tend to be preferred for flats and apartments.

Gas instantaneous has become popular in both apartments and detached homes. Solar is presently more restricted to detached homes.

² BIS Shrapnel Data, 2014



Key notes on data, analysis and additional information

1 Regulatory Framework

1.1 Electric storage water heaters

Summary of Required Test

Standards: AS1056.1 or AS/NZS4692.1

Two different test methods are still permitted for the measurement of heat loss. The main difference between the two test methods is the use of a single point temperature sensor at the tank centroid for AS1056.1 versus a vertical array of 6 sensors in AS/NZS4692.1. For energy purposes, the assumed element efficiency is 98% (almost all units use a fully immersed resistance element). The efficiency is not measured directly.

Summary of test procedure

Under this standard, the hot water delivery capacity (for a 12°C temperature drop) is determined. Pre-defined hot water delivery capacities are specified in the standard.

Table 1: The rated hot water delivery of an unvented displacement electric water heater, expressed in litres, shall be one of the following values:

25	31.5	40	50	60
80	100	125	160	200
250	315	400	500	630

Notes: The measured hot water delivery shall be not less than the rated value.

The standing heat loss is determined under static conditions for an air-hot water temperature differential of 55K. Declared values are based on measured values that are corrected back to this nominal temperature difference.

Test Conditions

Air temperature – during the test, the ambient temperature shall be maintained within the range of 20°C ±3 K. In addition, for the duration of the test, the ambient air temperature shall be controlled such that the difference between the maximum and minimum temperature is less than or equal to 3 K.

Cold water temperature – during the draw-off tests, the cold water inlet temperature shall be maintained at 20°C ±2 K. In the case of test on displacement water heaters that are used as the basis of the manufacturer declaration for rated delivery, the temperature shall be less than 22°C throughout the test. Water is not drawn off during the heat loss test.

Equipment and set-up

Container hot water or heat exchange fluid temperature measurement positions – the stored water shall be divided into 6 equal volume segments by horizontal planes. Six temperature

measurement sensors shall be installed inside the water heater tank such that each temperature sensor is positioned at the centroid of each of the six equal volume segments within the container (the older AS1056.1 used two temperature sensors at the storage volume centroid).

Container temperature determination

Average temperature – the average hot water or heat exchange fluid temperature over a specified period (usually over a whole temperature control cycle for determination of heat loss) shall be the average of all six temperature sensors (or equivalent sensors) for that period.

Temperature at cut-out – the hot water or heat exchange fluid temperature at a temperature control cut-out (for determination of energy corrections at the start and end of a temperature control cycle) shall be the average temperature of all six temperature sensors (or equivalent sensors) over a 5 min period starting 3 min after the temperature control cut-out.

Average core temperature – the core hot water or heat exchange fluid temperature at a temperature control cut-out (usually over a whole temperature control cycle for determination of heat loss) is defined as the average temperature of the middle two sensors (or equivalent sensors) for that period.

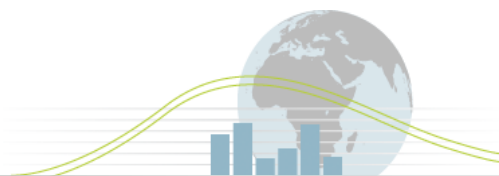
Core temperature cut-out – the core hot water temperature over a specified period (for the control of the container heat source during the heat loss test) is defined as the average temperature of the middle two sensors (or equivalent sensors to give the container centroid temperature) over a 5 min period starting 3 min after the temperature control cut-out.

Determination of standing heat loss

The standing heat loss principle is defined as the heat lost from the water heater when its container is filled with hot water. The water heater is installed with all normal fittings connected, insulated, and operated at a nominal storage temperature of 75°C for not less than 24 hours without hot water being drawn off so that the unit reaches thermal equilibrium. The heat loss is determined from the measured energy input over a period of not less than 48 hours, corrected to specified conditions of temperature and time, and is expressed in kilowatt hours per 24 hours. The measured value is corrected back to a nominal water-air temperature difference of 55K.

Determination of hot water delivery

The hot water delivery principle is defined as starting at a pre-defined storage temperature, then hot water is supplied at a specified flow rate until the outlet water delivery temperature drops by the specified amount. The water heater is in thermal equilibrium prior to the commencement of the draw-off to achieve a repeatable result. This test is not intended to be part of a draw-off and recovery test for the water heater.



Mixed hot water delivery

The mixed hot water delivery principle is defined as the temperature control of the unit is set to its maximum setting (maximum energy storage capacity) and hot water is supplied to achieve a nominal mixed outlet temperature of 45°C at a specified flow rate until the outlet water temperature drops to below 40°C. The hot water flow rate is adjusted so that, if mixed with cold water at 20°C, a stream of water at 45°C at flow rate of 9 L to 10 L per min would be created. The water heater is in thermal equilibrium prior to the commencement of the draw-off to achieve a repeatable result. This test is not intended to be part of a draw-off and recovery test for the water heater.

Mandatory Performance Requirements

Minimum Performance of Electric Storage Water Heaters were originally introduced in Australia in 1999 and updated in 2005 with the publication of the regulatory standard AS/NZS4692.2. The standards covers the energy, consumption, performance, and general requirements of electric storage water heaters of storage water heaters of nominal capacity up to 710 L

The standard mandates MEPS only for the heat loss from the tank with maximum allowable heat loss values for both the 1999 and 2005 MEPS shown in Figure 1.

Figure 1: MEPS: Maximum Heat Loss for Electric Unvented Storage Water Heaters

Rated hot water delivery, L	MEPS—Maximum allowable heat loss (kWh/24 h), AS/NZS 4692.1	MEPS—Maximum allowable heat loss (kWh/24 h), AS/NZS 4692.1
	From 1 Oct 1999	From 1 Oct 2005
< 25	N/A	1.04
25	1.46	1.04
31.5	1.56	1.11
40	1.66	1.18
50	1.76	1.25
63	1.96	1.39
80	1.53	1.53
100	1.67	1.67
125	1.81	1.81
160	2.02	2.02
200	2.23	2.23
250	2.44	2.44
315	2.72	2.72
400	2.93	2.93
500	3.21	3.21
630	3.49	3.49

NOTES:

1 Values in Figure 1 shall apply to water heaters with a single heating unit and shall be increased by 0.2 kWh/24 h for each additional heating unit.

2 The values shall be increased by 0.2 kWh/24 hours for each temperature or temperature/pressure relief valve mounted on a hot part of the tank, but not for any valve mounted on a cold water fitting.



Mandatory and Voluntary Labelling Requirements

There are no labelling requirements for electric storage water heaters.

1.2 Electric instantaneous water heaters

There is no mandatory (energy) regulation of labelling requirement for electric instantaneous water heaters

1.3 Gas storage water heaters

Summary of Required Test

Standard: AS4552

Gas fired water heaters for hot water supply and/or central heating, AS4552-2000 was the original electric storage water heater standard for Australia. This was updated in 2005 as AS4552-2005. AS4552-2005 is a standard which applies to gas water heaters and central heating boilers with natural draught or fan assisted combustion systems, intended for use with natural gas, town gas, liquefied petroleum gas (LPG) and tempered liquefied petroleum gas (TLP) with gas consumptions not exceeding 500 MJ/h, and includes types intended for the supply of hot water at a maximum temperature of 99°C for a) sanitary, potable and drinking purposes, b) hydronic space heating or c) a combination of a) and b).

Test Conditions

Preliminary tests (line gases) – the nominal gas consumption in MJ/h as specified by the manufacturer, is the fundamental quantity on which all methods of test are based and is the starting point for all performance requirements.

Performance tests – All tests are to be conducted with an inlet water temperature of 15°C unless otherwise specified.

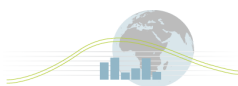
Storage water heaters – shall comply with the following:

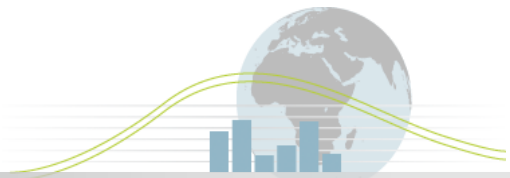
Automatic controls shall reduce the gas consumption to the level of maintenance rate or less within $\pm 5^\circ\text{C}$ of the manufacturer's recommended temperature setting;

Under standby conditions, the temperature of the water at the level of the temperature sensor shall not be more than 14°C below the thermostat setting (maximum temperature control hysteresis);

The maximum water temperature obtainable, if successive small quantities of water are drawn at frequent intervals, shall not exceed 93°C. The temperature relief valve(s) or over-temperature cut-out device(s) shall not operate under these conditions (stacking performance test);

A storage water heater shall deliver, at a continuous draw-off rate as set out below, not less than 70% of its nominal capacity before the outlet water temperature falls 6°C below the temperature measured at the end of the fourth litre;





A unit that has a nominal storage capacity up to and including 25 L is required to have a hot water flow rate of 6.0 ± 0.5 L/min;

A unit that has a nominal storage capacity above 25 L is required to have a hot water flow rate of 9.0 ± 0.5 L/min.

Thermal efficiency, heat output and energy labelling of storage water heaters

The efficiency is determined by measuring the heat supplied in the delivered water, by measurement of temperature rise and mass of water delivered, and comparing this with the metered heat input is the gas consumed. The heat output is calculated using the measured efficiency and the hot gas rate.

The annual gas usage is calculated for a daily water usage of 200 litres at 45°C temperature rise (nominally 60°C as the cold water temperature is 15°C), using the measured values of thermal efficiency, maintenance rate and determined gas consumption (nominal hot water energy of 37.7 MJ/day or 10.472 kWh/day).

Maintenance gas consumption (MJ/h) of storage water heaters

The appliance is operated without water flow in an ambient temperature of 20°C and the heat input over an extended period is measured.

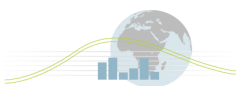
Mandatory and Voluntary Performance Requirements

While energy labelling and a nominal MEPS level have been operating in Australia since the 1980s under an industry based scheme, this was made mandatory by governments in Australia in 2010 (effective 2011). A more stringent MEPS regime was also implemented at this time, with mandatory product registration from early 2011 under the regulatory standard AS/NZS4552.2 released in 2010. The regulation covers both gas instantaneous and storage water heaters as shown in Figure 2³.

Figure 2: Scope of MEPS requirements for Gas Instantaneous and Storage Water Heaters

Product class	Products covered by class
1	Storage water heaters: (i) with a nominal gas consumption of equal to or less than 50 megajoules per hour; (ii) with a capacity of equal to or greater than 30 litres; or (iii) that are not certified only for installation indoors.
2	Instantaneous water heaters: (i) with a nominal gas consumption equal to or less than 250 megajoules per hour; or (ii) with a heat output of equal or greater than 13.1 kilowatts per hour.

³ Section 5.2 from GEMS determination at <https://www.legislation.gov.au/Details/F2013L00729>



The Mandated Maximum Allowable Annual Energy Consumption to heat 200L of water from 15°C to 60°C (37.67 MJ) daily is 22,831 MJ/y.

Mandatory and Voluntary Labelling Requirements

Labels that currently appear on gas water heaters are not endorsed or overseen by governments under the GEMs legislation. The gas labeling scheme is industry led by the Gas Appliance Manufacturers Association of Australia (GAMAA)⁴.

1.4 Gas instantaneous water heaters

Summary of Required Test

Standard: AS4552

Australia also regulates gas instantaneous water heaters. These are covered by the same test method AS4552. The main test elements are burner efficiency (steady state operating efficiency) and the startup heat capacity. The startup heat capacity is essentially the input energy for the water heater output to reach 90% of the steady state output temperature rise for the specific setting. In essence, this is the fixed up front energy that the water heater uses in order to get the appliance up and running at steady state conditions. This energy is consumed each time the product is started and assumes the product starts from cold. In practice, some starts will be at short intervals so the startup energy may be less.

Mandatory and Voluntary Performance and Labelling Requirements

Refer to the Mandatory and Voluntary Performance and Labelling Requirements section of Gas Storage Water Heaters in the previous section.

1.5 Heat pump water heaters

Summary of Required Test

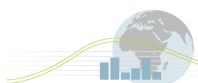
Standard: AS/NZS4234, AS/NZS5125.1

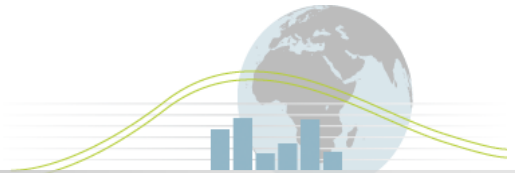
Heat pump water heaters—Performance assessment Part 1: Air source heat pump water heaters, AS/NZS5125.1-2010 is used to characterise the performance of heat pumps under a range of operating conditions. Tests are started at different tank temperatures and marginal COP values are estimated throughout the test. This standard provides data for the simulation standard AS/NZS4234.

Summary of simulation test procedure

AS/NZS4234 is a simulation standard that allows the total energy consumption of a wide range of different water heater types to be calculated under a range of different climatic conditions and hot water demands. Originally designed for solar thermal systems, the standard uses a TRNSYS model to simulate performance of the overall system over a typical year. A range of external test methods are used to determine the key parameters for each water heat model that is to be simulated. The standard covers climates in Australia and

⁴ <http://gamaa.asn.au/index.asp>

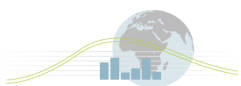




New Zealand, and specifies hot water loads, seasonal patterns and other parameters such as cold water temperatures. The simulation model now covers all conventional water heaters (gas and electric) as well as heat pump systems. The simulation standard is specified as part of the Small-scale Renewable Energy Scheme in Australia.

Mandatory and Voluntary Performance and Labelling Requirements

Heat Pump Water Heaters have no mandatory performance requirements and are not required to be labelled.



2 Data Analysed and Specific Assumptions Made

The overall approach to the analysis undertaken in order to present the results shown in this mapping report is described in “*Water Heaters - Overall Approach to the Analysis - IEA 4E*”⁵. This report also describes in detail a number of general assumptions that were necessary for the dataset analysed. Details of each of the datasets presented in this mapping report and the specific assumptions made in order to process the data are presented below.

2.1 Australian Registration Database

2.1.1 Source

Australian data on all gas and electrical storage products was accessed from the National Product Registration Database⁶ in September 2015. Heat Pump product data was accessed from the Australian Clean Energy Regulator⁷ at the same time. The following data over the period 2007-2015 was accessed.

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gas storage	0	0	0	0	43	13	23	4	1
Electric Storage	39	24	82	54	53	31	134	31	40
Gas Instantaneous	0	0	0	0	47	40	51	10	10
Heat Pump	0	0	0	3	0	97	22	14	0

2.1.2 Limitations and specific assumptions made for this dataset

For electric storage water heaters, the assumed element efficiency is 98% (almost all units use a fully immersed resistance element). The efficiency is not measured directly.

The following factors should be taken into consideration:

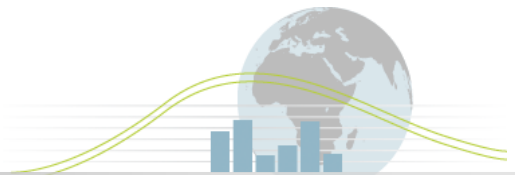
- Only approved records have been examined;
- Tank volume is measured in litres– rated value (see below);
- Declared heat loss is in kWh/24 hours.

Under the AS/NZS standard in Australia, only specified capacities listed in the standard can be claimed by manufacturers. This capacity is defined in terms of the amount of hot water that can be delivered within a temperature drop of 12K (hot water delivery capacity). The actual tank volume is typically 5% to 10% more than the rated value (based on hot water delivery). The gross capacity and hot water delivery capacity are both available for many units (for 123 of the 489 models listed) with an average ratio of 1.08 (capacity over hot water delivery). At least one of these parameters is available for all units. Hot water delivery capacity is the local metric, so this is used where known, or estimated from gross capacity where not known on the basis of a ratio of 1.08. (Note: In the benchmarking the opposite

⁵ Document available at: <http://mappingandbenchmarking.iea-4e.org/matrix?type=product&id=18>

⁶ http://reg.energyrating.gov.au/comparator/product_types/

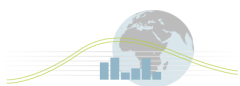
⁷ <http://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/Agents-and-installers/Small-scale-systems-eligible-for-certificates/Register-of-solar-water-heaters>



approach will be taken as gross capacity is the metric used in the majority of regions for this analysis.)

Some products may have a measured standing heat loss value that is lower than the declared value. The declared value is the value assessed for verification tests, with this value required to be lower than the MEPS level. The MEPS level is a function of capacity with several other allowances such as the number of temperature/pressure relief valves required. The measured value has been used for comparative data.

For gas storage water heaters, the maintenance rate (heat loss) has been converted to a standby losses in watts (in terms of raw gas energy input), which will be naturally significantly higher than electric systems (because flued systems generally have some additional convective losses, and also because heat loss includes the thermal efficiency of the combustion system).



3 Notes on Policy

Details of Regulatory MEPS, Labelling and Registration requirements are provided in Notes Section 1

In addition to the mandatory requirements, there has been significant additional policy intervention to encourage adoption of efficient water heating products⁸:

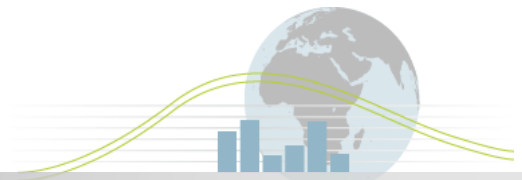
- Regulatory building policy (summarised in Notes Section 5)
- The Australian Government Renewable Energy Target and Small-scale Renewable Energy Scheme;
- Rebates and white certificate schemes

The Small-scale Renewable Energy Scheme, rebates programs and white certificate schemes are separate mechanisms that reduce the effective cost to the consumer of installing low emission water heaters. Regulations in most jurisdictions [States and Territories] also encourage the installation of low emission water heaters. These factors have contributed to the current market trends which suggest that Australians are moving away from conventional Electric Storage Water Heaters. In 2008, 53% of Australian dwellings used conventional Electric Storage Water Heaters and about half of water heater sales were of this type (GWA 2010), but by 2014 the share of sales for these products had dropped to 24%⁹. These factors have resulted in a significant increase in the sales of solar and instantaneous gas over the last few years and are likely to drive an increase in sales in the future, noting that some rebate programs have recently closed and others have either a fixed duration and/or a maximum amount of funding.

Another factor in Australia which may affect the continued use of the conventional Electrical Storage Water Heaters is a shift to time-of-use tariffs. At present approximately 75% of conventional Electrical Storage units are on some form of off-peak tariff.

⁸ The vast majority of this information is drawn from the 2013 *Consultation Regulation Impact Statement – Electric Storage Water Heaters* downloadable from: <http://www.energyrating.gov.au/document/consultation-regulation-impact-statement-electric-storage-water-heaters>

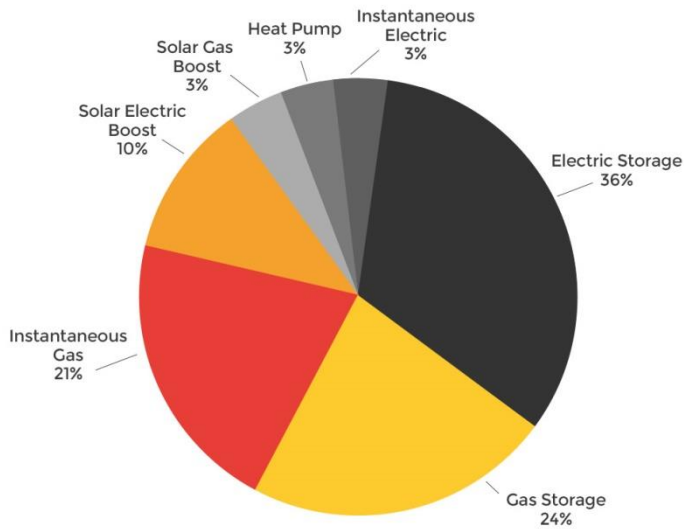
⁹ BIS Shrapnel Data, 2014



4 Notes on Cultural Issues

The chart below shows the estimated penetration (stock) of water heaters in Australian households in 2014¹⁰. There are a number of different technologies used in the market, with different energy sources and differing levels of use.

Penetration of hot water heaters, Australia, 2014



Source: BIS Shrapnel, The Household Appliances Market in Australia, 2014

¹⁰ Graphic is drawn from the BIS Shrapnel Data, 2014, but it is believed the Instantaneous Electric Water Heater penetration is actually slightly lower at 2%.

