

## ATTACHMENT 2: REGIONAL IMPACT ASSESSMENT STATEMENT

**DEPARTMENT: ENERGY DIVISION, DEPARTMENT FOR TRANSPORT,  
ENERGY AND INFRASTRUCTURE**

**1. Title: GREENHOUSE GAS AND FLOW RATE PERFORMANCE STANDARD  
FOR WATER HEATER INSTALLATIONS IN DWELLINGS**

**2. Issue:**

South Australia's Strategic Plan (SASP) target 3.14 relates to the energy efficiency of dwellings. The target is:

*To improve the energy efficiency of dwellings by 10 per cent by 2014.*

Energy efficiency projections for the South Australian Residential Sector indicate that, without intervention, the average South Australian dwelling will become less energy efficient over the 10 years to 2014, the end-year of this target.

Water heating accounts for around 30 per cent of residential energy use, which is the single largest component of household energy use. It is also the largest contributor to greenhouse gas emissions in the residential sector.

Water used in the shower and bath accounts for 20 per cent of domestic water use. The only larger domestic use of water is for gardens and outdoor.

Electric water heaters result in very high greenhouse gas emissions. Other options such as solar and high efficiency gas water heaters can result in over 60 per cent less greenhouse gas emissions.

Accordingly, a key strategy to attain T3.14 is to significantly improve the energy efficiency of residential water heaters. It is therefore proposed to:

- a) Adopt a requirement, commencing 1 July 2008, for hot water systems installed into dwellings to meet greenhouse gas emission performance standards; and
- b) To adopt a complementary shower flow rate performance standard for water heater installations to reduce domestic water use and maximise greenhouse gas emissions reductions by further improving overall energy efficiency; and
- c) To recast the Solar Hot Water Rebate Scheme to (i) assist low income households meet the full performance standard and (ii) effectively operate within the available funds.

The proposed greenhouse gas performance standard will require water heater installations in dwellings to have designed greenhouse gas emissions below a certain level. A reduced performance standard will be available for certain classes of installations that would result in unacceptable costs in meeting the full standard.

Based on commonly used technology, the proposed full standard will limit water heater installations to high efficiency gas storage, high efficiency gas instantaneous, electric-boosted solar, gas-boosted solar or electric heat pumps.

The reduced performance standard will allow the installation of electric water heaters with low standing losses and low-efficiency gas water heaters.

In all cases, water heater installations will be required to deliver shower flow rates not exceeding 9 litres per minute. For mains pressure water heaters, this is easily achieved by installing a Water Efficiency Labelling Scheme (WELS) showerhead of 3 stars or better. Low pressure and gravity fed water heaters may not require a reduced flow showerhead for compliance.

Efficient flow rates in showers reduce energy consumption and related greenhouse gas emissions as well as domestic water consumption. For many homes, reductions in shower water consumption of around 25 per cent will be achievable, compared with standard showerheads.

The proposal is projected to offer the following energy and water savings:

- a) Approximately 1.44 PJ per annum of domestic energy consumption (the equivalent of the annual energy consumption of over 25,000 households and 31 per cent to 35 per cent of the energy reductions required to achieve SASP T3.14) by 2014, rising to 3.23 PJ per annum by 2020;
- b) Approximately 260 ktCO<sub>2</sub>-e per annum of residential sector greenhouse gas emissions (the equivalent of removing approximately 100,000 electric water heaters) by 2014, rising to 530 ktCO<sub>2</sub>-e per annum by 2020; and
- c) 1,700 megalitres per annum of domestic water consumption (the equivalent of the annual water consumption of up to 7,000 households) by 2014, rising to 3,400 megalitres per annum by 2020.

### **3. Summary Description of the Requirements for the Standard**

Whilst the details of the performance standard will be developed in consultation with SA Water's Customer Council and other key stakeholders, it is the Government's intention that the full performance standard will apply to:

- New homes and homes purchased since the commencement of the standards;
- Homes that are replacing a gas, solar or heat pump water heater;
- Homes that have a connection to reticulated gas (or can gain connection at no cost) and where installing a reticulated gas water heater is straightforward; or
- Homes where the installation of a solar water heater is straightforward.

The above criteria will be moderated by regional factors such as the availability of reticulated gas and the typical trade cost premiums and availability experienced in the regions. The reduced requirements will apply for all installations not captured by the full standard.

In addition, a transitional arrangement will be provided to Housing SA for the period 1 July 2008 to 30 June 2012. This will require installations in established dwellings owned within Housing SA's portfolio to only meet the reduced standard, irrespective of location or existing water heater type. From 1 July 2012 onwards, Housing SA installations will be subject to the full or reduced standard, as indicated in Table 2. The transitional arrangement will not be provided for installations into new dwellings owned within Housing SA's portfolio.

### **4. Region(s)**

As the proposal is to be implemented through the Building Code of Australia (following an interim Minister's Specification under the *Development Regulations 1993*) and an amendment to the *Waterworks Regulations 1996*, it will apply to all new homes and alterations state-wide and all established homes within SA Water's gazetted zones. This effectively applies to all established South Australian homes except remote locations such as Roxby Downs and Coober Pedy.

New homes outside of SA Water's gazetted zones are currently required to meet the performance standard for water heater installations as outlined in the SA variation to the Building Code of Australia. A continuation and expansion of this requirement will ensure that all new and renovated homes water heater installations are subject to appropriate greenhouse performance standards.

Regions most affected will be those with limited reticulated gas access, limited availability of plumbing trade skills and relatively high costs of dwelling construction and works.

There is a general plumbing skills shortage outside of cities and major towns in South Australia, which is generally problematic for installation of water heaters. The skills shortage is an issue independent of this proposal.

A summary and description of the current reticulated gas access and costs of construction and works are presented below for each region in South Australia. The reticulated gas network in South Australia will be extended over the next few years.

*Table 1: Summary of Reticulated Gas Availability and Construction Cost Premiums by Region*

<b>Region</b>	<b>Reticulated Gas Availability</b>	<b>Cost Premiums of Dwelling Construction and Works</b>
Adelaide Metropolitan	Broad Availability	<i>Base Case</i>
Adelaide Hills	Generally Unavailable	0% cost premium
Barossa Valley	Limited Availability	3% to 5% cost premium
Eyre Peninsula	Essentially Unavailable	15% to 25% cost premium
Fleurieu Peninsula	Very Limited Availability	3% to 5% cost premium
Kangaroo Island	Generally Unavailable	Up to 50% cost premium
Limestone Coast	Limited Availability	10% to 20% cost premium
Mid North	Very Limited Availability	5% to 10% cost premium
Murraylands	Limited Availability	0% to 13% cost premium
Northern SA	Limited Availability	10% to 70% cost premium
Riverland	Limited Availability	10% cost premium
Southern Flinders Ranges	Limited Availability	10% to 20% cost premium
Whyalla	Broad Availability	13% cost premium
Yorke Peninsula	Essentially Unavailable	5% to 15% cost premium

Based on the information presented in Table 1, the following regions have been defined:

Region 1 comprises the Adelaide metropolitan region, the Adelaide Hills, Murray Bridge, Barossa Valley and the Fleurieu Peninsula;

Region 2 comprises the Mid North, Millicent, Mount Gambier, Port Augusta, Port Pirie, Port Lincoln, the Riverland, Whyalla, the Yorke Peninsula and any other region within SA Water's gazetted zones with reticulated gas access; and

Region 3 comprises all other regions within South Australia (i.e. Eyre Peninsula, Kangaroo Island, the Limestone Coast, the Murraylands, Northern SA and the Southern Flinders Ranges, excluding cities or localities already defined as Region 1 or Region 2).

These regional definitions may be changed following consultation.

The proposed scope of the standard is shown in Table 2. The first applicable criterion defines the relevant performance standard for the installation.

Table 2: Summary of the Proposed Scope of the Standard.

Installation Scenario	Region 1	Region 2	Region 3
Class 1 Dwellings <sup>a</sup> Approved for Development after the Commencement Date	Full Standard	Full Standard	Full Standard
Dwellings Replacing Solar, Heat Pump or Reticulated Gas Water Heaters	Full Standard	Full Standard	Reduced Standard
Class 1 Dwellings with Reticulated Gas Connection and/or where Reticulated Gas Water Heater Installation is Technically Simple	Full Standard	Full Standard	N/A
Class 1 Dwellings Purchased after the Commencement Date	Full Standard	Full Standard	Reduced Standard
Class 1 Dwellings where Solar Installation is Technically Simple	Full Standard	Reduced Standard	Reduced Standard
All Other Dwellings	Reduced Standard	Reduced Standard	Reduced Standard

As shown by Table 2, the standard will be applied in a way that takes account of regional impacts and seeks to mitigate significant adverse outcomes that would otherwise occur in areas facing reduced opportunities to install low emission water heaters.

## 5. Stakeholders

The key stakeholders affected by the proposed greenhouse gas performance standard for water heater installations in dwellings are:

- a) Owners of dwellings, including owner-occupiers, private landlords and Housing SA;
- b) Private and public housing tenants;
- c) The plumbing industry;
- d) The gas and electricity supply industries; and
- e) The water heater manufacturing industry.

### Owners Building New Homes

Owners building new homes will be required to comply with the full standard. For owners building in areas without reticulated gas access, the time of building presents the most cost-effective opportunity to incorporate a compliant water heater.

### Owners Purchasing Established Homes

Owners purchasing established homes in most parts of South Australia will be required to meet the full standard. Potential purchasers of dwellings can be informed of their obligations prior to committing to purchase, and may elect to adjust their offer or maximum bid according to the potential cost implications of the full standard.

### Private Landlords and Tenants

Energy bill reductions are realised by the dwelling occupier, while the dwelling owner pays any cost premium that may be associated with a compliant water heater. This creates a split incentive for landlords and tenants.

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<sup>a</sup> Class 1 dwellings include Class 1A and Class 1B dwellings, as defined in the Building Code of Australia. A Class 1A dwelling is a single dwelling being a detached house or one or more attached dwellings, and a Class 1B dwelling is a boarding/guest house or hostel not exceeding 300 square metres and in which no more than 12 people reside.

It is expected that, across the market, there will be a response of an increase in average rent by an amount comparable to the cost premium experienced by the landlord.

#### Public Housing and Tenants

A transitional arrangement will be provided for installations into existing dwellings owned within Housing SA's portfolio, as described in Section 3 above.

#### Owner Occupiers of Established Dwellings

Owner occupiers of established dwellings do not have the same opportunity to mitigate or prepare for potential costs of the full standard. The proposed scope of the standards recognises this issue, and only imposes the full standard on classes of installations that are highly likely to deliver lifetime benefits to the householder.

#### The Plumbing Industry

The proposed standard will change the proportion of water heater technologies being installed, however, it will not change the overall number of water heater installations. The increased proportion of solar water heater installations, which are more labour intensive, is likely to encourage plumbers to hire a labourer or apprentice to aid with the increased workload.

The proposed standard will not drive a change to non-standard technologies. Though some plumbers may wish to refresh skills through some training, there will not be a need for new skills acquisition.

#### Gas and Electricity Supply Businesses

The proposed standard will affect the proportions of water heater installation technology types. It is projected that the move to low emission water heaters will result in reduced sales of overnight electricity, affecting electricity retailers and the electricity distributor, ETSA Utilities. The impact on electricity generators is likely to be small. Gas sales are unlikely to be significantly affected.

#### Energy Consumers

As a result of the proposed standard, households will experience reduced operating costs, increased unit price for electricity and from 2010 reduced exposure to price impacts of the proposed States and Territories National Emissions Trading Scheme. The net result of the proposed standard will be to deliver significantly lower energy bills for most consumers than if it were not implemented.

#### Water Heater Manufacturing Industry

There are two water heater manufacturers located in South Australia.

The larger company has a metropolitan manufacturing facility and exports water heaters around Australia and internationally. This manufacturer and its parent company produce low emission water heaters that will be compliant with the proposed standard.

The smaller manufacturer is a specialist manufacturer of low pressure water heaters. These include gas, electric and solar water heaters. For several decades the market share of low pressure water heaters has been in gradual decline, such that only a very small portion of water heaters now fit this category. The main reasons for decline are believed to be:

- a) The difficulty and costs associated with replacement, which typically involve removing roof sheets; and
- b) The market's preference for mains pressure hot water delivery.

Electric water heater manufacturers will have many years of opportunity to sell electric water heaters to be installed in homes exempted from the full standard (provided the

standing losses of their electric water heaters are compliant with the reduced standard), as well as commercial premises which are not targeted by the standard. It is projected that a complete elimination of the electric water heater market in dwellings, as a result of this standard, will take over twenty years.

## **6. Consulted**

The following Government agencies have been consulted:

- Planning SA;
- SA Water;
- Department for Premier and Cabinet (DPC);
- Department for Trade and Economic Development (DTED);
- Department for Families and Communities (Affordable Housing Innovation Unit and Housing SA); and
- Electricity Supply Industry Planning Council (ESIPC).

In addition, the Energy Consumers' Council has been consulted on the proposal.

Other non-government stakeholder representatives will be consulted to develop the standard following Cabinet approval.

## **7. Consultation**

Consultation on the proposed standard within government has been achieved by means of meetings with key agencies and review of draft documents. The Energy Consumer's Council feedback was obtained during regular council meetings.

Details of the proposed standard will be finalised following thorough consultation with SA Water's Customer Council and other key stakeholders. SA Water's Customer Council includes consumer, government, regional industry representatives.

## **8. Summary of Impacts and Analysis**

For many owner-occupied dwellings, privately cost-effective and compliant water heater technologies will be available. For others there may be a small private cost associated with compliance.

It is expected that the measure will encourage the reticulation of gas in new residential developments in regional areas in a similar manner to the current Building Code of Australia requirement for low emission water heaters.

The measure is likely to encourage training and employment in the plumbing sector, particularly in regional areas of the state.

The proposed standard will deliver substantial environmental benefits. Annual greenhouse gas emissions reductions of approximately 260 ktCO<sub>2</sub>-e and water savings of 1,700 ML can be expected by 2014 if the standard commences in July 2008.

### **8.1. Economic Factors**

The proposed standard will not affect the total number of water heater installations in South Australia or in any specific region, however, it will change the relative proportions of each technology type.

In regions with broad availability of reticulated gas it is expected that there will be increases in the installation rate of high efficiency gas water heaters, solar water heaters and heat pump water heaters, with decreases in the installation rate of electric water heaters.

Regions without broad availability of reticulated gas are likely to experience increases in solar and heat pump installations, and also in bottled gas installations. For those regions targeted for a reticulated gas network rollout, property owners may elect to install bottled gas water heaters in anticipation of conversion when reticulated gas becomes available.

Across the state, accelerated reduction of market share of electric water heaters is expected as a result of this proposed standard.

For homes that currently use a compliant type of water heater, no technology churn is expected. For areas without reticulated gas access, the overall churn rate will be higher, due to the currently high rates of electric water heater penetration.

Property owners who are not required to change from their preferred technology types by this standard will face minimal compliance cost premiums to ensure that the specific water heater selected is of sufficiently high efficiency and, in some cases, to upgrade shower rose performance (generally less than a few hundred dollars). Paybacks on this cost premium of two to three years can be expected for even very modest hot water users. Larger households would experience paybacks of several months.

It should be noted that solar water heater manufacturers and financial institutions promoting green loans have strived to deliver finance products to meet the needs of households electing to install a solar water heater but have difficulty in overcoming the capital cost hurdle. For many households, capital costs can be delayed over part of the life of the system, such that ongoing energy savings can contribute to loan repayment.

For many property owners, a redraw on their home loan, where available, will offer the most cost-effective finance option. For low to moderate income households buying or building a home, HomeStart Finance offer innovative finance products designed to overcome housing affordability barriers.

#### Employment and Job Creation

It is not expected that there will be a larger number of water heater installations as a result of the proposed standard, however, electric boosted solar water heater installations have a higher degree of complexity.

Accordingly, employment is likely to be increased in regions that have a high proportion of electric water heaters; i.e. those areas with limited reticulated gas access. Plumbers will be installing a larger number of electric solar water heaters, which is likely to encourage sole operators to employ a labourer or take on an apprentice to provide assistance with installations.

There is also likely to be net job creation in the South Australian water heater manufacturing industry, as noted below.

#### Business Investment

The most significant business investment in South Australia in response to this proposed standard is likely to be the ramping up of operations at South Australia's major water heating manufacturing facility. There may be some minor investment required by plumbers and water heater retail outlets across South Australia.

#### Regional Population

It is not expected that the proposed standard will have a discernable effect on regional population over the short, medium or long term.

#### Infrastructure

A greenhouse performance standard for water heaters will encourage owners of properties in areas serviced by reticulated gas to consider replacing a failed electric

water heater with a compliant gas water heater. Increased use of gas for water heating would be offset by the improved efficiency of the average gas water heater.

For green-field development sites located some distance from current reticulation infrastructure, the proposal may encourage localised reticulation of LPG. Already, requirements for greenhouse performance standards for water heaters in new homes have encouraged such LPG reticulation.

Generally, newly installed reticulated gas networks will have either unaffected or improved viability as a result of this standard. A certain proportion of households will pursue a reticulated gas connection, thereby increasing the gas penetration compared to current requirements.

## **8.2. Social Factors**

Cost premiums, where applicable, associated with installing a compliant water heater, will be borne by the owner of the dwelling, whereas the benefits of reduced energy costs, where applicable, will be realised by the householder. In the case of owner-occupiers, the costs and benefits will usually deliver positive lifetime benefits, or at least small lifetime costs. In the case of rental properties, the landlord will bear the cost while the tenant realises the benefit from reduced energy costs.

Housing SA will be in a similar position to private landlords, following its transitional arrangement.

The Solar Hot Water Rebate Scheme will be recast to assist low income households meet the full performance standard.

## **8.3. Environmental Factors**

Given that approximately 45 per cent of water heaters installed in dwellings in South Australia are electric, there is very significant opportunity to improve the efficiency of domestic water heating by installing solar and heat pump systems and to reduce water heating greenhouse gas emissions from these dwellings by 65 per cent to 90 per cent. About 50 per cent of water heaters in South Australian dwellings are gas, and tighter efficiency standard for gas water heaters will deliver energy savings and corresponding greenhouse gas reductions of around 15 per cent to 26 per cent per dwelling.

Overall, it is expected that the measure will deliver annual energy savings of 1.44 PJ per annum by 2014 (which is 31 to 35 per cent of the energy reductions required to achieve T3.14) and annual greenhouse gas emissions reductions of about 260 ktCO<sub>2</sub>-e.

By 2014, it is expected that 1,700 megalitres per annum of potable water use can be averted as a result of the proposed standard, which will help to alleviate domestic demand for water from the River Murray. The reduction in demand is projected to double by 2020.

## **9. Solutions**

The key impacts of this proposal are the potential for high upfront and lifetime costs of water heaters for homeowners. The benefits will be reduced energy costs.

To mitigate these costs, the proposal includes a reduced performance standard for some classes of installations and rebates to assist low income households meet the full performance standard. These measures are designed to mitigate any significant adverse impact in regional areas of the State.

## **10. Coordination**

DTEI will consult with Planning SA and SA Water for the purposes of defining and implementing the standard. SA Water will enforce the standard for water heater installations in dwellings not subject to development approvals and local government will enforce the standard in new and renovated dwellings as part of Development Act and the Building Code of Australia.

Finally, DTEI will work with the Office of Consumer and Business Affairs to develop an appropriate disclosure for persons buying homes, such that they are aware of the requirement to install a water heater that meets the full standard. In the case of homebuyers, the compliant installation will not be needed until the current water heater fails.

## **11. Preferred Option**

While details are to be determined through stakeholder consultation, the proposed standard will apply as shown in Table 2. A transitional arrangement will be provided for installations into existing dwellings owned within Housing SA's portfolio.

The Solar Water Heater Rebate Scheme will be recast to assist low income households meet the full performance standard.

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