



The Secretary
Senate Economics Legislation Committee
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30 July 2009

Dear Senators

**Subject: Senate Economics Committee Inquiry into the Renewable Energy
(Electricity) Amendment Bill 2009**

Thank you for the opportunity to make a submission on the above bill.

Rheem has operated in Australia for over 70 years and our water heaters can be found in approximately 1 in 2 Australian homes. We have a strong commitment to the Australian hot water industry through the manufacture of our market leading Rheem, Solahart, Edwards, Aquamax & Vulcan water heaters at a number of Australian factories.

We manufacture solar water heaters at sites in NSW and Western Australia, and estimate that our products represent over 50% of the solar water heaters sold in Australia each year. We have a substantial solar dealer network, each with its own employees including installers, administrators and call centre operatives. We sell solar and heat pump products to builders and plumbers via the plumbing merchant channel. We are investing heavily in the training of the solar installation industry. We are investing heavily in solar and heat pump water heater research and development. We export to over 70 countries and our products and brands are well regarded throughout the world, with Solahart the market leading brand in several major European countries, as it is here in Australia.

The current MRET scheme, introduced by the previous government, has been a triumph in encouraging the adoption of solar water heaters by Australian households, with Rheem's internal estimates suggesting the annual sales of solar water heaters nationally have increased from 20,000 to 160,000 – an 800% increase during the life of the scheme. An annual market of 160,000 solar and heat pump water heater equates to reducing household CO₂ emissions by nearly half a million tonnes per annum.

The scheme has also given surety to solar water heater manufacturers, and has underwritten the growth of the local manufacturing industry – an industry that delivers on



Solahart Paloma



the government's desire for new businesses that are sustainable in a carbon constrained economy. This surety has allowed the industry to invest, and the increased competition in the sector, together with the increased availability of lower cost solar systems, is the dividend that this investment is repaying. The industry in general has regularly delivered to the market lower cost models such as single collector split systems and heat pumps to meet the growing demand for less expensive products

We are therefore concerned regarding a push seeking to unilaterally exclude solar water heaters from the expanded RET, with a particular focus on the role that heat pump water heaters are playing.

To assist the inquiry we will therefore deal with the issues that should be central to any decision on the ongoing inclusion solar and heat pumps in the RET:

1. All solar water heaters, including heat pumps, use renewable energy.

Claims have been made that solar, and to a greater extent, heat pump water heaters, do not use renewable energy and therefore should not be included in the RET. These claims demonstrate a misunderstanding as to how these technologies operate.

As a starting point it is important to understand that it takes the same amount of energy to heat a given volume of water, regardless of the energy source. To demonstrate how solar and heat pump water heaters use renewable energy, consider a heat pump heating 200L of water:

Do heat pumps use renewable energy?

The energy to heat 200 L of water from 20°C to 60°C during one day can be calculated at:

$$Q_H \text{ (energy out)} = C_P \text{ (heat capacity of water)} \times \Delta T \text{ (} 836 \times 40 \text{ MJ)} = 33.4 \text{ MJ/day}$$

In an electric water heater, the conversion of electrical energy to heat energy occurs with an efficiency approaching 100%, however heat loss (Q_L) is 8.8 MJ/day Hence energy required is

$$Q_E \text{ (energy in)} = Q_H \text{ (energy out)} 33.4 \text{ MJ} + Q_L \text{ (heat losses)} 8.8 \text{ MJ} = 42.2 \text{ MJ/day}$$

In a heat pump the measured electrical input power (Q_M) is 14.6 MJ/day, however we know from the above equation that required Q_E is 42.2MJ/day. This means the renewable energy component (Q_R) is the difference:

$$Q_R \text{ (renewable energy)} = Q_E 42.2 \text{ MJ/day} - Q_M 14.6 \text{ MJ/day} = 27.6 \text{ MJ/day}$$

Or an annual renewable energy use of 10,074 MJ or 2.8 RECs pa

We can therefore see from the above calculation that 10,074 MJ of energy per year, or 65% of a heat pump's energy usage, comes from renewable sources. The renewable component for roof mounted solar water heaters is even greater.

No technology "creates" renewable energy. In fact, all renewable technologies instead capture renewable energy and transform it to useable energy. Just as wind

and hydro turbines capture kinetic energy and transform it to electricity, solar and heat pumps capture their energy from renewable sources and use it to heat water. In the case of solar thermal water heaters, the renewable energy is extracted via the heating by the sun of water in roof mounted collectors. For heat pumps, this renewable energy is extracted from the heat in the air.

Worldwide, heat pumps are recognised as a renewable technology, with the European Union recently recognising heat pumps (airo-thermal solar) as renewable energy technology, alongside windmills and solar panels

2. Ongoing inclusion of solar and heat pump water heaters in the RET is necessary for the survival of Australian manufacturing

The water heater market is the last large appliance market in the country still dominated by locally made products. Local manufacturers employ over 1500 people and the industry contributes several billion dollars to the local economy.

This competitiveness has been built on the industry's highly cost effective "tank" or cylinder manufacturing capability. These cylinders are used in all forms of storage water heaters, from traditional electric and 3 star gas water heaters, through to solar and heat pump products.

In 2007 significant regulatory moves were announced that will result in the banning of 70% of locally made products (electric and low efficiency gas units) via state and federal regulation¹.

When these bans were first announced it was generally assumed that this change would create a windfall benefit for the importers of high efficiency gas water heaters, and those supplying gas to households. This assumption was made on the basis that the only other remaining compliant water heating solution, solar, would be too costly to be competitive.

This situation has changed in the last two years as solar and heat pump sales have grown as a result of the MRET and the solar water heating component of the Federal Government's February 2009 stimulus package.

This package has been extremely successful, with a doubling of solar and heat pump installations in the last 6 months alone, the creation of hundreds of manufacturing and installation jobs in the industry, and the investment of millions of dollars in increased production capacity by local manufacturers.

¹ Electrics and low efficiency gas products now banned from installation in new homes in all mainland Australian states. Queensland to introduce ban on less than 5 star gas and electric water heaters as replacement products in class 1 homes in gas reticulated areas from January 2010. South Australian ban on less than 5 star gas as replacement products in class 1 homes effective from 1 July 2008, ban on electric water heaters a replacement products in Class1 homes in South Australian Metropolitan areas effective 1 July 2009. Commonwealth plan to ban electric water heaters as replacement products in class 1 homes in gas reticulated areas from 2010, and in non reticulated areas from 2012. National MEPS banning 3 star gas water heaters to be introduced in October 2010. Plans for ban on electric water heaters in class 2 homes flagged by DEWHA and NFEE within next 5 years.

With traditional cylinder based products now facing a very limited life, solar and heat pumps are acting as natural replacement to fill what would otherwise be surplus local cylinder production facilities.

3. Heat pumps offer a low cost solution for Australian households

The growth of heat pump sales has attracted particular attention because they are playing a major role in substituting greenhouse intensive electric storage water heaters in non reticulated areas.

Certainly in areas without access to natural gas, we believe that heat pumps offer the simplest low emission and low cost solution for plumbers and householders. If electric and heat pump water heaters are eliminated then the only alternatives in these situations are a higher up-front cost roof based solar installation or the significantly higher running cost of an LPG gas solution.

For example, using the latest South East Queensland Energy tariffs and applying them to the energy usage of various appliances, the high incremental cost of LPG water heating is obvious. Table 1 indicates the likely annual running cost of various types of water heaters, using both natural gas (column 2) and LPG tariffs (column3).

TABLE 1: SE Queensland Running Costs²

Water Heater Type	Qld Running Costs	LPG Running Cost
Small Electric	\$ 484.45	
Large Electric	\$ 340.39	
3 Star Gas	\$ 440.86	\$ 1,086.51
5 Star Gas Storage	\$ 373.15	\$ 919.63
5 Star Gas Instant	\$ 382.05	\$ 928.53
Heat Pump	\$ 281.14	
Electric Solar	\$ 231.39	
Gas Boosted Solar	\$ 111.78	\$ 255.88

Whilst solar water heaters deliver the best running cost outcome, heat pumps offer the lowest running cost solution in non gas reticulated areas for those not able or willing to undertake a roof mounted solar installation.

Approximately 80% of water heater sales are emergency replacements for breakdowns and consequently impose an unexpected financial burden on

² Source: Ergon Energy, Origin Energy, Elgas tariffs as at 1 July 2009 allocated against energy use of appliances according to Australian Standards and TRNSYS modelling. Excludes \$265 fixed annual fee for access to gas network. Large electric water heaters have a lower running cost than small versions due to use of the off peak Tariff 33, available for connection to large water heaters.

householders. Inclusion of these appliances in the RET is critical in ensuring they remain affordable options for householders replacing electric water heaters in emergency situations.

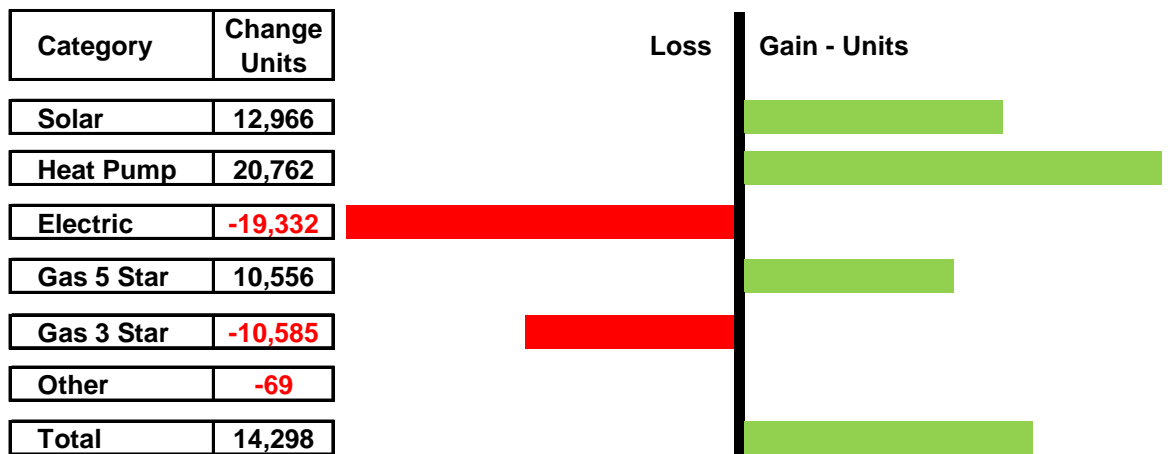
4. Solar and heat pumps are not replacing natural gas water heaters in domestic situation

One of the assertions made against the lowering of installed cost of solar and heat pump water heaters through rebates and the RET scheme, is that this is encouraging householders to take out gas water heaters and substitute them with solar, or more frequently, heat pumps.

Rheem’s sales figures refute this claim.

Rheem, as a supplier of all forms of water heaters, has a unique insight into how different segments of the water heater market are interacting. Rheem sells electric storage, gas storage, instantaneous, solar and heat pump products. Table 2 shows the change in Rheem’s sales for these different water heater types over the last 12 months.

TABLE 2: Annual Change in Rheem Domestic Water Heater Unit Volume Sales By Water Heater Type



As can be seen from the table, Heat Pumps sales growth has been largely sourced from electric water heater sales, whilst 3 star gas and 5 star gas have basically substituted each other. Solar growth has been incremental to normal sales, driven by the Federal Government rebate scheme. As this scheme is only applicable to the replacement of electric water heaters, it is Rheem’s belief that increased solar sales are a result of the bringing forward decisions to replace electric water heaters.

As Rheem holds a competitive market position in all segments, we believe that our sales results would be indicative of that experienced by the entire domestic industry. This being the case, it would seem clear that heat pumps and solar are not growing through the elimination of gas products.

5. The industry is attempting to overcome perceived market distortion issues.

Rheem is aware of an ongoing concern with regard to the growth of heat pump installations in commercial situations.

Commercial heat pump installations attract a significant number of RECS because they are allocated on the basis of the capacity that is installed, rather than on an average expected water usage, as is the case for domestic heat pumps. The validity of this system is therefore dependent on responsible sizing of the system by the plumber and the installation of the appropriate heat pump capacity to meet the needs of the business in question.

The generous REC allocation that commercial heat pumps receive makes it possible for the cost of a commercial installation to be offset entirely by the RECS that the installation generates. It is understood that many businesses have taken advantage of this situation.

The significant growth of RECS associated with heat pumps is therefore in a large part associated with the growth of heat pump installations in commercial applications.

Rheem's internal estimates of the market for the Jan – June 2009 period is that heat pump sales have grown to about 35-40,000 installations. Cross referencing this with REC creation data supplied by the Office of Renewable Energy Regulator (ORER) Rheem believe the split between commercial heat pump RECS and domestic heat pump RECS is approximately as follows:

30,000 Domestic Heat Pump Installations @ 30 RECS = 900,000 RECS
2,500 Commercial Installations * 3 units @ 320 RECS = 800,000 RECS

These figures are approximate only and Rheem is not aware of how to further validate the numbers, as no third party data on installations and market size is available. However, if these estimates are close to correct it would indicate that 5%-10% of the heat pump installations are responsible for approximately 50% of heat pump RECS.

The solution to this imbalance will require changes to the regulations underlying the RET, with potentially a need to make changes to commercial measurement standards.

Rheem believes strongly that there should however be no change to the treatment under the RET of heat pump or solar water heaters installed in domestic/residential situations, as this perceived market distortion issue is not associated with these installations.

Rheem's belief is that there could be ongoing inclusion of Heat Pumps in the RET for commercial installations but with modifications to the measurement developed with regulators to better reflect actual usage in commercial applications. However, if the Committee do not accept that the commercial measurement standards can be changed in a reasonable time then it would be a tragedy to remove all Heat Pumps from the RET as a response.

We would also like to point out that the heat pump water heaters depicted in other submissions to the committee as representative of commercial installations are not Rheem units.

6. The RET Scheme is not making the cost of solar and heat pump water heaters “too cheap”.

Advocates of the elimination of solar and heat pump water heaters claim that the combined discount offered on solar and heat pump water heaters to householders through the RET, federal and state rebate schemes has “oversubsidised” the industry, to the disadvantage of gas water heater sales.

It is Rheem’s view that the current federal and state schemes will be relatively short lived and do not offer the same level of surety of support to manufacturers as is offered by a RET scheme that will be in place for 10 years.

To summarise the complementary schemes:

- The federal government’s \$1600 solar rebate scheme has a limited life and is predicted to conclude in March 2012, after assisting the installation of 300-400,000 solar water heaters. The scheme can be cancelled, or the eligibility varied, by the relevant minister at any time.
- The NSW State Govt solar rebate scheme (\$600-\$1200 depending on the system) is in place until mid 2011 or until the funds are exhausted. Like the federal scheme, this rebate can be changed or cancelled by the minister with no warning.
- The Victorian solar scheme is adjusted to favour gas boosted solar in gas areas, with rebates declining substantially to allow for the impact of the federal rebate. This scheme has yet to secure long term funding.
- The SA solar rebate scheme (\$500) is only available to those on a concession card, and is not funded for the long term.
- The WA solar rebate only applies to gas boosted solar and has recently been extended to 2013.
- No rebate schemes exist at a state level in Queensland and Tasmania.

From the above it is obvious that although there is a plethora of schemes, their eligibility requirements are mixed and, apart from NSW, the schemes are balanced in favour of gas boosted solar or the disadvantaged. In NSW the scheme only applies to householders replacing electric water heaters, so even here it is unlikely to be limiting the uptake of gas products.

It should also be noted that all rebate schemes are expected to conclude within the next 3-4 years, yet the life cycle for water heaters, and therefore the timeframe required for the conversion of the existing installed stock to lower emission products, is 10-15 years. Only the RET will be in place over the timeframe required to help achieve this objective.

Finally it is Rheem's belief that the RET should form a solid underpinning for the affordability of solar and heat pump water heaters, and that sensible levels of state and federal rebates should be introduced, bringing the net cost of renewable down to the equivalent cost of a traditional water heater. Any non RET governmental rebates substantially beyond this level are unnecessary.

7. As Manufacturers We Need Certainty

The long term nature of the RET provides market surety for local manufacturers upgrading or investing in new facilities.

Rheem alone is investing approximately \$2 million in converting electric water heater production capacity to heat pump manufacturing capacity in our Sydney factory. Rheem's heat pump labour has grown fourfold during the same period.

All of this has been undertaken on the basis of the inclusion of heat pumps in the RET.

Given the strong arguments for the ongoing inclusion of solar and heat pump water heaters in the RET scheme, Rheem is deeply concerned and surprised that those not participating in the solar and heat pump market are again canvassing the elimination of solar water heaters from the scheme.

We had taken encouragement in 2007 when the Prime Minister had indicated the expanded scheme would not only have the same eligibility criteria as the old scheme, but would also be expanded to further encourage the uptake of solar water heaters³:

“Under Federal Labor’s scheme, only renewable energy will count towards the target and the eligibility criteria will remain the same as the current scheme. Labor will examine how the use of microgeneration, including rooftop solar panels, solar hot water and small scale generation, can be increased to encourage the development of new technologies.”

We recognise the importance of getting all the regulatory settings right for the new RET, but believe the unilateral exclusion of solar and or heat pump water heaters from the scheme would be contrary to the Prime Minister's commitment.

Any attempt to retreat on this commitment will leave manufacturers, dealers and installers of water heaters with significant stranded investment in a difficult economy. The loss of RECS and the associated increase in net prices will set back the uptake of solar water heaters, with a negative impact on this form of renewable energy adoption by the community.

We would therefore urge you to consider the important role that all solar water heaters, including heat pumps, have to play in Australia's low carbon future, and to reach a conclusion that these technologies are worthy of ongoing inclusion in the RET. If the Committee believes that amendments to the scheme are necessary to overcome perceived inconsistencies, we would urge that no change be made to the eligibility of domestic solar and heat pump water heaters, as the scheme is operating

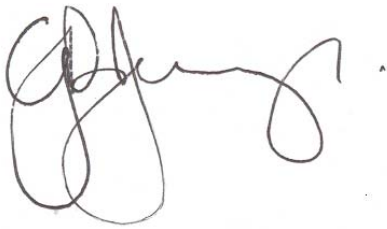
³ Election 07 Policy Document , Labor's 2020 Target for a Renewable Energy Future pg 2

effectively to transition the market from electric to renewable and not to the detriment of gas.

Solar and heat pumps represent an essential part of the future of local manufacturing, and their exclusion from the RET would damage a competitive local industry that is already undergoing radical transformation to address climate change.

We would welcome the opportunity to present this to you for elaboration or challenge.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Gareth Jennings', with a stylized flourish at the end.

**GARETH JENNINGS
CORPORATE AFFAIRS –
RHEEM AUSTRALIA PTY LTD**