

## Submission Template

### COAG Review Discussion Paper 1 – Eligibility of new small-scale technologies and heat pumps

#### Overview

This submission template should be used to provide comments on:

#### **COAG Review Discussion Paper 1 – Eligibility of new small-scale technologies and heat pumps**

The purpose of this discussion paper is to provide an introduction to the key issues relating to the eligibility of new small-scale technologies and heat pumps within the RET, and to encourage input on these issues from individuals, businesses and organisations to inform the review process.

Stakeholders are asked to use the template provided to answer the questions posed in the discussion paper. The Department will also accept any other documents, further information, costing tables etc that are attached to the submission template.

#### Contact Details

<b>Name of Organisation:</b>	Energy Management Solutions Australia
<b>Name of Author:</b>	David Anderson
<b>Phone Number:</b>	0412 654060
<b>Email:</b>	david@energym.com.au
<b>Website:</b>	www.energym.com.au
<b>Date:</b>	24.10.2009

#### Confidentiality

All submissions will be treated as public documents, unless the author of the submission clearly indicates the contrary by marking all or part of the submission as 'confidential'. Public submissions may be published in full on the Department of Climate Change website, including any personal information of authors and/or other third parties contained in the submission. If any part of the submission should be treated as confidential then please provide two versions of the submission, one with the confidential information removed for publication.

A request made under the *Freedom of Information Act 1982* for access to a submission marked confidential will be determined in accordance with that Act.

**Do you want this submission to be treated as confidential?**       Yes       No

#### Submission Instructions

Submissions should be made by **close of business 30 October 2009**. The Department reserves the right not to consider late submissions.

Where possible, submissions should be lodged electronically, preferably in Microsoft Word or other text based formats, via the email address - [RET@climatechange.gov.au](mailto:RET@climatechange.gov.au).

Submissions may alternatively be sent to the postal address below to arrive by the due date.

Renewable Energy Sub Group Secretariat  
Department of Climate Change  
GPO Box 854, Canberra ACT 2601

For more information phone: 02 6159 7428

## Existing eligibility of small-scale technologies under the RET

**Question 1:** Are there any new small-scale renewable energy technologies not currently eligible under the RET which may be considered for eligibility to participate in the scheme? Details are sought on:

- a description of the technology and how it works (including how it uses renewable energy to generate or displace electricity); and
- the extent to which the technology has been or is ready to be deployed to the market, such as industry size, capacity and market penetration.

**Question 2:** Where possible, provide examples of the amount of renewable energy produced by a system in a particular application, noting: geographic location; size; and the amount of fossil fuel based energy also used in producing the total energy output (if any).

## Eligibility of heat pumps

**Question 3:** Should heat pumps continue to be eligible under the RET? How cost-effective are heat pumps compared to solar hot water systems and conventional systems such as gas and electric systems? In particular, details are sought on:

- the capital cost, including installation;
- annual running costs, including maintenance;
- the effective life of the system; and
- annual savings compared to using fossil fuel based energy such as gas or electricity.

**Q.** Should heat pumps continue to be eligible under the RET?

**A.** NO.

**Q.** How cost-effective are heat pumps compared to solar hot water systems and conventional systems such as gas and electric systems?

**A.** The cost to install a standard off peak 315 litre unit is around \$1,200 compared to \$3,600 for a heat pump. This is three times the cost.

**A.** The major manufacturers (Dux and Rheem) recommend that heat pumps be connected to continuous supply. Based on figures supplied by Rheem technical department information supplied Feb. 2009.

315 litre off peak unit costs \$302.17/year

315 litre heat pump costs \$294.34/year

315 litre heat pump on off peak 2 costs \$143.67/year

Note: There is no cost saving if the manufacturer's recommendations are followed.

**A.** Maintenance and repair costs will be significantly more than existing off peak units. These units have been simple and generally very reliable. The parts cost \$15 for a thermostat, \$25 for an element and \$60 for a relief valve. To replace a compressor in a heat pump unit will require a specialised technician or a complete replacement of the heating unit. This cost will be significant. To that there are many smaller parts, that when exposed to harsh environments, such as in the coastal regions will require greater maintenance and replacement due to these extra components.

**Q.** The effective life of the system

**A.** The basic hot water system we have grown up with has basically five parts. Thermostat, element, pressure relief valve, tank and anode. These are simple and generally very reliable.

**A.** Heat pump has many more parts and a compressor that will be a significant cost when it fails. Also with the many smaller parts that are exposed to the effects of the environment it would be highly unlikely that these units will have a long and reliable life span. The corrosive environments in the coastal regions will no doubt be an issue in reduce life span of heat pumps.

**Q.** Annual savings compared to using fossil fuel based energy such as gas or electricity

**A.** The Green House Emission saving will be approximately 3446kg of CO<sub>2</sub>/year (315 litre OP compared to a 310 litre heat pump). How does this compare to the massive amount of energy consumed to produce these units. They require extra raw materials, transport movements, processing of these materials and assembly and extra land fill when they fail. This comes at a substantial carbon cost. Does it offset the carbon they save?

At present there is no readily available information as to the extra amount carbon used to manufacture these units. I suspect the manufacturers don't want the answer.

**Approximate Carbon Consumption of storage, heat pump and gas hot water systems:**

315 Off Peak	5183kg
310 heat pump	1737kg
3 Star natural gas	1865kg
3 Star natural gas	1584kg
3 Star LPG gas	1526kg
5 Star LPG gas	1526kg

**Conclusion:**

Heat pumps create less CO2 emissions than the existing Off peak units. It is unlikely that the extra greenhouse gas emissions created in the manufacture and replacement parts of heat pumps will ever offset the amount they save over a conventional off peak unit.

Does the extra cost in installation, maintenance and production makes these a sensible option?

**Sources:**

1. *Calculations from Dept. Environment, Water, Heritage & the Arts (Feds) Greenhouse Gas Emissions Calculator*

2. *HWS data supplied by Rheem Australia based on 200l/day based on a 50 degree rise. Sydney prices 2009*

**Question 4:** What is the effectiveness of heat pumps in reducing greenhouse gas emissions in different circumstances?

There is no doubt that heat pumps produce less CO2 emissions as a unit. When installed in different climatic regions the energy used by these units will vary proportionally with that of our existing Off Peak units. If they are connected to continuous supply as recommended, there will be no significant cost savings achieved.

The whole idea of using heat pumps is to reduce CO2 emissions. Are we reducing greenhouse gas emissions? NO

We have to have a holistic approach, and when we consider the extra CO2 emissions involved and raw materials used, it would appear to be a wasted exercise when you consider the installation costs and considerable maintenance costs.

**Factors that will increase greenhouse gas emissions**

- Removing and transporting raw materials
- Manufacturing processes for the raw materials
- Transport of products and workers to manufacture these units.
- Extra replacement parts due to the high number of parts that could potentially fail
- Extra land fill when these part fail

## Cost-effectiveness, reliability and market deployment

**Question 5:** Information is sought on the cost-effectiveness of any new technology identified, in particular:

- the capital cost of the technology, including installation;
- annual running costs, including maintenance;
- the effective life of the system;
- annual savings compared to using fossil fuel based energy such as gas or electricity; and
- for electricity generation, the capacity factor of the system.

**Impact on existing eligible technologies and REC market**

**Question 6:** Would including new small-scale technologies or amending the eligibility of heat pumps have a major impact on the deployment of existing eligible technologies?

### **Any other additional comments**

By having most of these heat pump units on continuous supply, it creates another issue for the NSW Electricity Grid. As we all know the grid has been under pressure in recent years and this will acerbate the problem.

Put simply:

The generation plants are running near capacity at certain times of the year. If we add several thousand hot water systems to this, it will increase the base load required to supply it. In the past the Energy Supplies had the luxury of switching 'on' and 'off' hot water systems to balance their load. They are losing this control.

Hopefully through sensible discussion and due process we can look at the whole scope of global warming. Yes we have saved CO2 emissions by using heat pumps, but we have probably created more by manufacturing these units.

We have created more stress on the NSW Electricity Grid.

And we have spent massive amounts of tax payers money for very little gain

What will happen when consumers get a bill for \$1,000 to replace the heating unit on a heat pump?