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

Name of Organisation:	Azure Energy Ltd
Name of Author:	**Jason Hopkins**
Phone Number:	02 9520 1154
Email:	jhopkins@azureenergy.com.au
Website:	www.azureenergy.com.au
Date:	13-10-09

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** **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**.

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

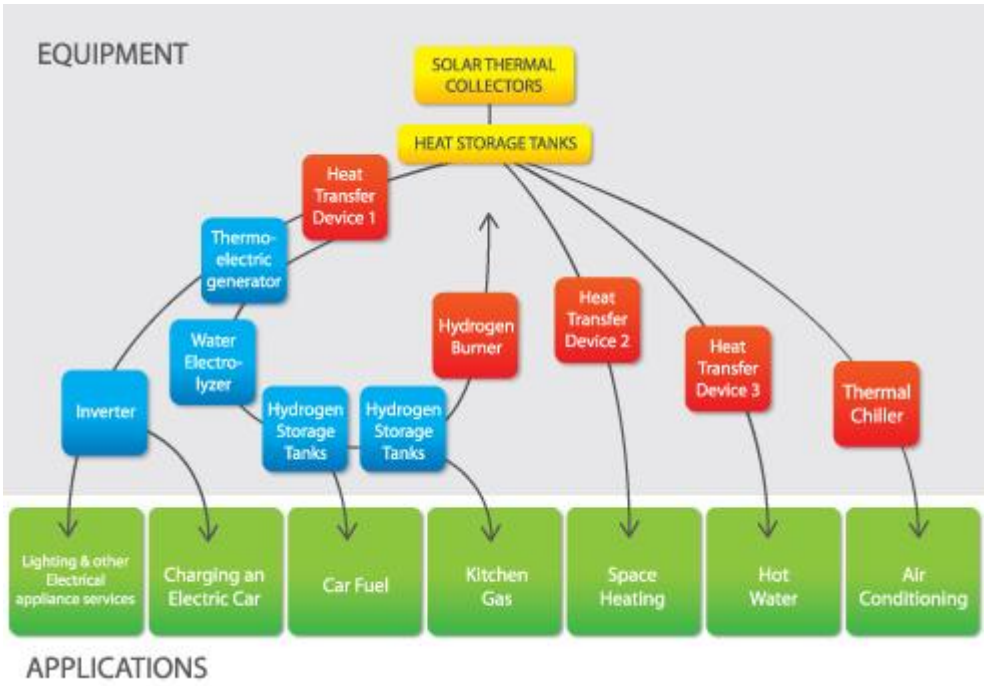
For more information phone: 02 6159 7428

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.

We have a new technology system we call the Azure Light Intelligence (ALI) system. It produces electricity from sunlight and displaces the need to use electricity with solar hot water, space heating and air-conditioning integrated into one unit. It also includes a hydrogen storage system as well as a thermal storage system.



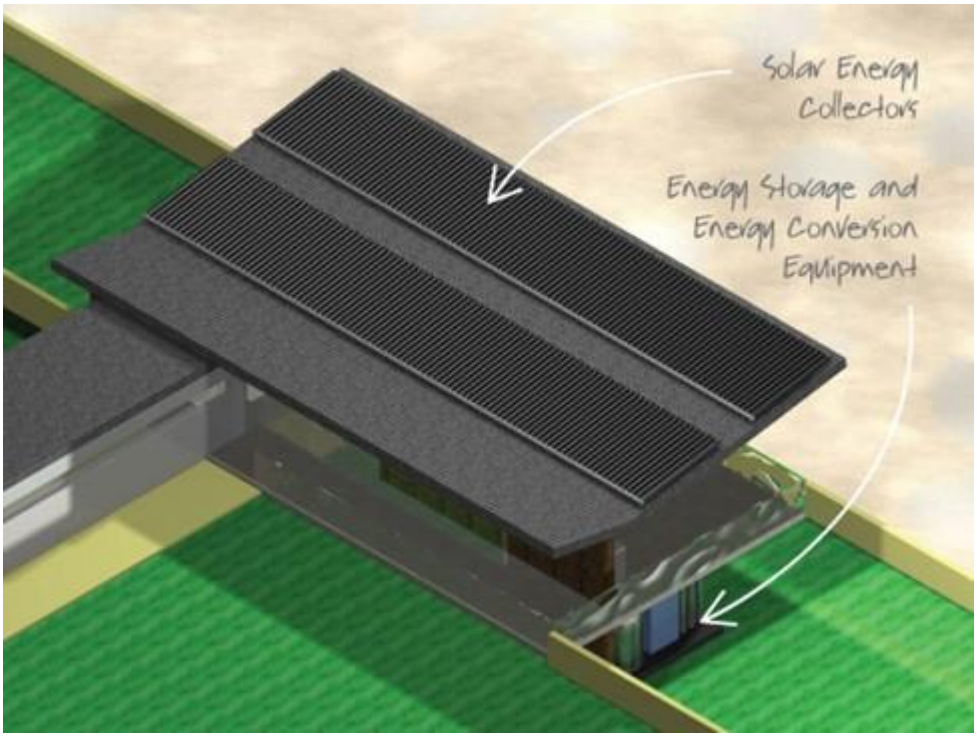
Above is a system diagram.

1) The system works by converting sunlight into heat.
2) The heat is then stored in thermal storage tanks.
3) The heat from the thermal storage tanks is then used for four applications.
   a) To make electricity
   b) To heat air for space heating in winter
   c) To heat water
   d) To drive thermal chillers
4) The electricity can by used to produce hydrogen from water. The hydrogen is stored long term.
5) The Hydrogen can be burned to reheat the system in bad weather and in winter.
6) There are 7 forms of energy produced.
   i) Electricity for domestic use
   ii) Electricity for car charging
   iii) Hydrogen for car refuelling
   iv) Hydrogen for cooking
   v) Space heating
   vi) Hot water
   vii) Air-conditioning

The technology should be on the market in two years with a production capacity of 500 house size units/year. We expect the production capacity to double every year.

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).

There will be no fossil fuel based energy in the mix



The system shown in the picture would produce 30kWh of electricity every day of the year and provide hot water for the home, if it was located in Sydney. An efficient home will only need 10kWh of electricity/day so the home would sell excess energy to the local grid.

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.

na

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

na

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.

The system in the picture that produced 30kWhe everyday would cost $45,000 to $80,000 depending on the quality.

The annual running cost including maintenance would be less then $200 for a service. There are no running costs as it uses solar energy.

Most of the system would last as long as the house at over 30 years. Some parts will need to be upgraded, like computer control systems and bearings etc.

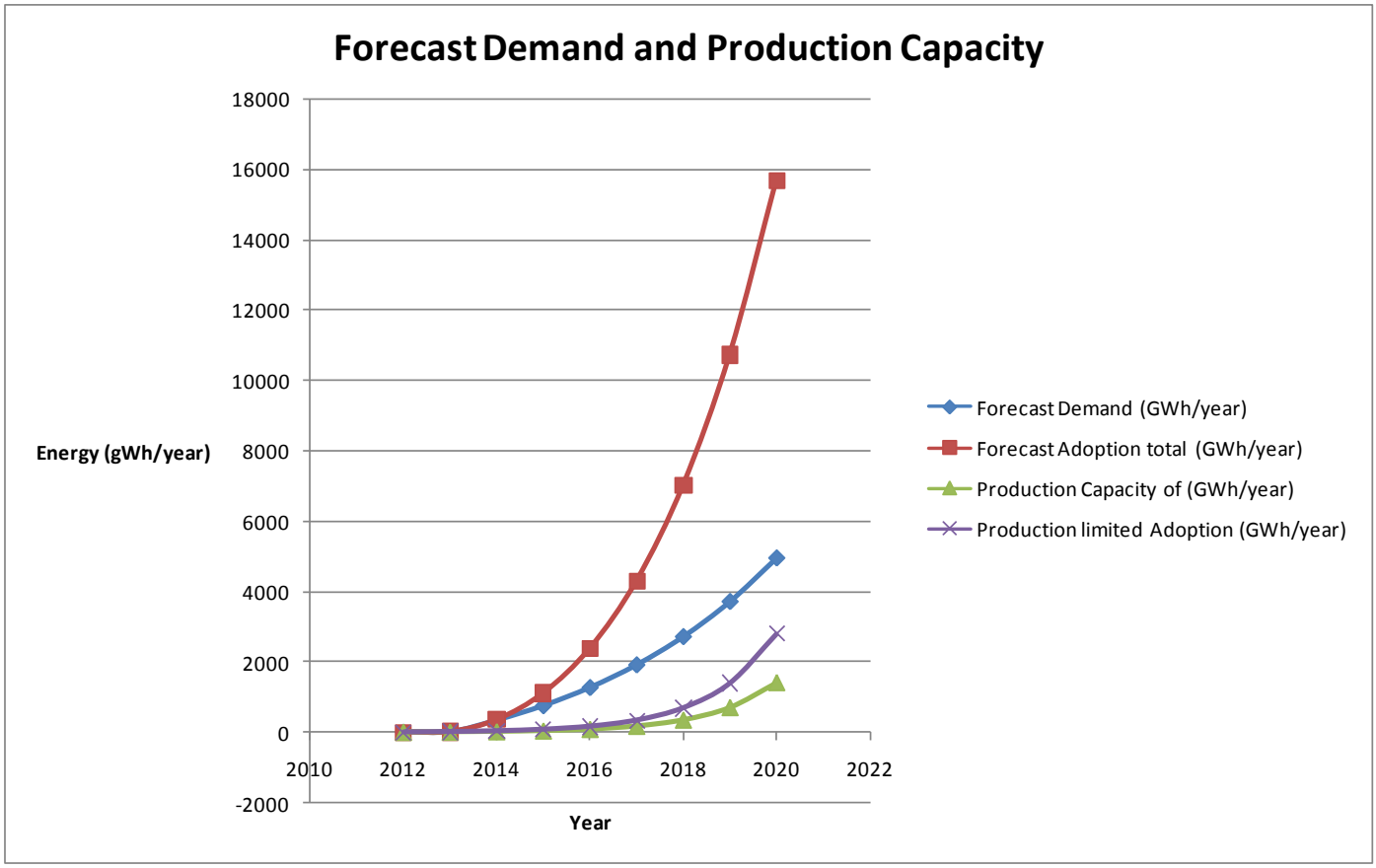
The system would be cost neutral for 10 to 15 years depending on the rec's and quality of the system. After that period of time the energy will be free and the owner may get an income from the system, if it produces more energy then they use.

The capacity factor will be 100%. It can store energy and deliver a fixed amount everyday of the year.

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?

The impact will only be minor



The graph shows that at best we will have the production capacity to have installed 3000GWh of capacity by 2020. After that we may be have a far greater impact though, if we can maintain the production capacity growth rate. The demand data is based on modelling done of the adoption rate of PV in Europe when the same payoff time is achieved. The Bass model was used.

3000GWh is about 6% of the forecast 50,000GWh market for renewable energy in 2020. The forecast demand is much higher then supply. We may not be able to match the demand with production capacity in that time frame but a few years after 2020 we will catch up to demand.

Any other additional comments