



# APPLICATION FORM FOR NEW ENERGY EFFICIENCY ACTIVITIES UNDER THE RESIDENTIAL ENERGY EFFICIENCY SCHEME

**June 2010**

The Essential Services Commission of South Australia  
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## **INFORMATION FOR APPLICANTS BEFORE FILLING OUT THIS FORM**

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### ***Purpose of this form***

This form is to be completed by persons making application to the Essential Services Commission of South Australia (“the Commission”) to add to the approved energy efficiency activities available under the Residential Energy Efficiency Scheme (“REES”). In accordance with clause 7.2.1 of the Residential Energy Efficiency Scheme Code (“REES Code”), a person may make an application to the Commission seeking the Commission’s determination that a new energy efficiency activity should be approved.

### ***Prior reading***

It is essential that applicants read the Commission’s Residential Energy Efficiency Scheme Code (in particular “Schedule 7 – Ministerial Protocol”) before they fill out this form. This Code is available on the Commission’s website [www.escosa.sa.gov.au](http://www.escosa.sa.gov.au).

### ***Basis for this form***

The *Electricity (General) Regulations 1997* and *Gas Regulations 1997* (“the Regulations”) provide in sections 7AN(3) and 8DK(3) respectively that an application for a proposed new energy efficiency activity must be made to the Commission in a manner and form determined by the Commission. This is the form approved by the Commission.

### ***No representation or warranty***

By accepting an application, the Commission makes no representation or warranty that it will approve a new or varied energy efficiency activity for the purposes of the REES.

### ***Cost of preparing applications***

Applicants are responsible for the cost of preparing and submitting an application and all other costs arising out of the preparation process, including independent testing and the costs of any third parties engaged by the applicant.

### ***Independent testing***

In submitting an application, applicants acknowledge the Commission’s rights to engage consultants and contractors to assist it in the assessment process, including the Commission’s rights under the Essential Services Commission Act to disclose confidential information to such persons for those purposes.



## ***Public consultation***

Applicants should be aware that the Commission will ordinarily publish an application and associated relevant information in relation to it in either printed or electronic form generally to the public for the purposes of consultation.

The Commission understands the need to keep commercial matters confidential in appropriate circumstances, but reserves the right to disclose some or all of the contents of an application to its contractors and consultants (as set out above) and, where circumstances require, to the public (in accordance with the provisions of the Essential Services Commission Act).

If any elements of an application or associated information are considered to be confidential to the applicant, that information should be clearly identified to the Commission.

## ***Use of this form***

Applicants should list the information requested in the spaces provided in this form, and enclose additional information when required.

### **Activity specification**

Applicants must include information to demonstrate how the specification for the proposed new energy efficiency activity has incorporated each of the specific principles outlined in the Ministerial Protocol. Applicants should provide the Commission with information sufficient to demonstrate how each principle has been considered in relation to the application being made. Applicants should include any additional documentation and/or modelling to support its application.

### **Deemed value (expressed in tCO<sub>2</sub>-e)**

Applicants must include information to demonstrate how the estimation of the greenhouse gas savings for the proposed new energy efficiency activity has given regard to each of the specific principles in the Ministerial Protocol. Applicants must provide the information used to calculate the energy savings from the implementation of the proposed energy efficiency activity. Applicants should include any other documentation and/or modelling to support its application.

## ***Further information***

Applicants should note that the Commission may ask applicants who have submitted a completed application form to provide further information to the Commission, or to clarify the information that they have already provided.

### ***How to lodge an application***

Applicants should send a hard copy of their completed application form to:

Energy Efficiency Activity Application  
Essential Services Commission of SA  
GPO Box 2605  
Adelaide SA 5001

An electronic copy must also be provided to the Commission via email at [rees@escosa.sa.gov.au](mailto:rees@escosa.sa.gov.au).



## REES ACTIVITY APPLICATION FORM

### 1. THE APPLICANT

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#### 1.1 Identity of Applicant

**Name:** Andrew Tune .....

.....

**Company Name (if applicable):**

Power Eco Solutions Pty Ltd .....

.....

**ABN/ACN (if applicable):** ACN 156381707 .....

#### 1.2 Address and Contact Details of Applicant

**Business Address:**

Level 7, 160 Queen Street Melbourne .....

.....

**State:** VIC..... **Post Code:** 3000.....

**Postal Address (if different to Business Address):**

.....

.....

**State:** ..... **Post Code:** .....

**Telephone:** 03 9670 2122.....

**Facsimile:** .....

**Email:** andrew.tune@powerecosolutions.com.....



### 1.3 Contact Person on behalf of Applicant

*The full name of a person to whom the Commission can direct enquiries and correspondence about the application. If the contact details of this person are different to the contact details for the applicant provided above, please also list the contact details for this person.*

**Name:** Andrew Tune.....

**Address:** .....

.....

**State:** ..... **Post Code:** .....

**Postal Address (if different to above):**

.....

.....

**State:** ..... **Post Code:** .....

**Telephone:** .....

**Facsimile:** .....

**Email:** .....



## **2. PROPOSED NEW ENERGY EFFICIENCY ACTIVITY**

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### **2.1 Description of the proposed new energy efficiency activity**

*Identify the energy efficiency activity and provide a description of the nature of the activity. This is typically a brief statement describing the activity e.g. Lighting – Remove a reflector or non-reflector incandescent lamp and replace it with a compact fluorescent lamp (CFL).*

Voltage optimisation: install an approved voltage optimiser at or near the switchboard of a house or apartment.

This application has been framed in anticipation of the approval of voltage optimisation in general (subject, perhaps to some criteria to be applied in respect of the approval of specific voltage optimisation devices) but in response to device-specific questions, the answers given are all specific to the VPhase VX-1, VX-2 and VX-5 units that are manufactured by VPhase plc in the UK and distributed in Australia by the applicant.

A voltage optimiser is a piece of electronic equipment that reduces the incoming mains power from whatever the power utility provides (which varies, but can be up to 265V) to a lower quantity. The VPhase VX-1, VX-2 and VX-5 units that the applicant distributes produce a regulated output that is adjustable, but by default is 220V.

### **2.2 Specification of the proposed new energy efficiency activity**

*Applicants must provide the specification of the proposed new energy efficiency activity. This should include, for example, any requirements for compliance with applicable Australian/New Zealand Standards; wherever appropriate, expressly exclude the potential for the activity to be undertaken as otherwise required by law; have regard to health and safety implications for undertaking the activity; and encourage recycling and best practice. Applicants should include any additional documentation and/or modelling to support its application.*

Installation of Voltage Optimization units (such as the VPhase VX-1 and VX-5) at or near the switchboard of domestic installations.

These units are sometimes installed to optimise the voltage to the entire house; in other cases they are connected to the bulk of circuits, with specific circuits excluded. As an example, a hot water service or an electric stove will often be excluded as voltage optimisation provides no savings on these thermostatically controlled resistive circuits.

Such an installation typically delivers a power saving of 8-12% of the entire power bill, and does not require changes in consumer behaviour.

Applicable standards. Units would have to be certified to EN60730-1:2000+A2:2008. Units would require C-tick approval. Installation would have to be conducted to AS/NZS 3000:2007.

## 2.3 Deemed value/s (expressed in tCO<sub>2</sub>-e) for the proposed new energy efficiency activity

Applicants must provide the deemed value/s for tCO<sub>2</sub>-e calculated to be saved through the proposed new energy efficiency activity. If there are a number of different deemed values to be achieved through the proposed new energy efficiency activity, details of each should be provided. Applicants should include any other documentation and/or modelling to support its application.

**Deemed value:** The carbon dioxide equivalents (in tonnes) to be attributed to each activity is:

Activity	tCO <sub>2</sub> -e
Installation of a VPhase VX-1, VX-2 or VPhase VX-5 in a domestic situation	12.2 over the full 36-year life

### Specific principles for calculating deeming values

#### 2.3.1 Base case

Applicants must provide evidence of current typical energy use where an inefficient product is required or where no efficient product is installed, using recognised benchmarks where available.

Because power savings figures that have been obtained from field testing of the VPhase VX-1 unit are total electricity bill savings, it is appropriate to use full household electricity consumption.

Figures for Adelaide provided by the [www.energymadeeasy.gov.au](http://www.energymadeeasy.gov.au) website suggest an average electricity usage for South Australia of 6051 kWh/household<sup>1</sup>.

#### 2.3.2 Improvement on the base case

Applicants must provide evidence of what, typically, would be the difference in energy use by installing or using an efficient product.

Benefits will vary from product to product, but experience in the UK by VPhase plc has shown savings between 8% and 12% across the entire electricity bill. For the purposes of deeming provisions it has been assumed that a figure of 8% is used.

At an assumed saving of 8% of this figure (based on UK test results or, if required, an alternative figure based on Australian test results, which would likely be higher given the larger size of Australian houses vis-à-vis UK houses) this would translate to a saving of 484.08kWh/annum.

<sup>1</sup> See <http://www.energymadeeasy.gov.au/bill-benchmark/results/5000/2> and <http://www.energymadeeasy.gov.au/bill-benchmark/results/5000/3>

### 2.3.3 Lifetime

*Applicants must provide evidence of the typical period of time the activity can realistically be expected to result in energy savings which are additional. To account for future uncertainties a maximum lifetime of 20 years should apply, although a longer lifetime may apply if substantiated through appropriate research findings.*

There are two factors to consider in examining the question of how long an activity can realistically be expected to deliver savings. The first is how long the change in consumer behaviour required to make use of the device can be expected to last. The second is how long the technology will last for – the lifetime of the device (or devices).

In respect of VO (voltage optimisation) the former question (consumer behaviour) is a non-issue, since VO is a “set and forget” activity that requires no change in consumer behaviour once installed.

The answer to the second question will vary from device to device. In respect of the VPhase products from VPhase plc in the UK, extensive independent testing predicts a lifespan of 36 years. Copies of this testing are attached.

### 2.3.4 Adjustment factors

*Applicants must provide evidence of any relevant adjustment factors: Energy savings may need to be adjusted where it is necessary to adjust for, for example, the extent to which the energy savings will be taken as improved thermal comfort, likelihood of performance changes over time; changing business as usual, or planned future regulation.*

Since the installation of a voltage optimisation unit requires no change in customer behaviour – it is essentially invisible to the customer, except for the reduction in power bills, it is not anticipated that any adjustment factors are required to take account of “soft factors”. Where adjustment factors **are** required is to take into account the gradual improvement in the efficiency of appliances as they are replaced.

For the purposes of this submission it has been assumed (in the absence of hard evidence) that a household will replace 10% of its appliances in a given year, and that each appliance will be on average 10% more efficient than the one it replaces.

This translates to a de-rating factor that increases with the lifespan as per the following table:

Lifespan	De-rating Factor
1 year	0.99
10 years	0.913
20 years	0.826
30 years	0.747
36 years	0.703

### 2.3.5 Climate zones

*Applicants must provide evidence as to whether there is a material difference between the savings achieved when the activity is implemented in different South Australian climate zones.*

Variations in the performance of the technology from installation to installation **do** occur. However, these variations are a reflection of a number of factors other than climate.

Specifically, these factors are as follows:

- the blend of electrical appliances in a house (savings on some appliances are larger than on others);
- the presence of electrical versus gas hot water (households with gas hot water see larger proportional reductions in their electricity bills);
- the presence of electric versus gas stove (households with gas stoves see larger proportional reductions in their electricity bills);
- the age and quality of appliances (as a general rule, newer appliances and better quality appliances provide a smaller opportunity for savings)

However, the savings achieved across the variation in all these factors is, in the vast majority of cases, in the range of 8%-12%. For this reason it is suggested that a conservative approach be adopted (using 8%) and that this figure be used for deeming purposes across all houses.

### 2.3.6 Greenhouse gas coefficients

*Applicants must provide evidence of greenhouse gas co-efficients, both current and projected over the life of the activity - these are as published by the Commonwealth Department of Climate Change.*

The relevant figure (Full Fuel Cycle EF, latest figures, South Australia) has been taken from National Greenhouse Account Factors, July 2012, Department of Climate Change and Energy Efficiency. It is 0.79kg CO<sub>2</sub>/kWh.

## 2.4 Application of activity

*In considering applications for new energy efficiency activities, the Commission's general guiding principle is that all energy efficiency activities will have general application. If the applicant is seeking limited application for the proposed new energy efficiency activity, the applicant must provide details of the nature of the limitation sought including the period of time for which limited application is sought.*

Not applicable.

### 3. GENERAL PRINCIPLES FOR ASSESSMENT OF NEW ENERGY EFFICIENCY ACTIVITIES

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*In considering the application for new energy efficiency activities, the Commission will have regard to how the proposal addresses each of the following key principles as set out in the Ministerial Protocol. Applicants must provide the Commission with information sufficient to demonstrate how each principle has been considered in relation to the application being made. Applicants should include any additional documentation required to support its application.*

#### 3.1 Additionality

*Applicants must provide evidence that the proposed energy efficiency activity will encourage energy savings which are additional to that which would otherwise be achieved under current and planned regulatory requirements; and/or which is otherwise occurring through business as usual or consumer behaviour. This includes consideration of what barriers or market failures prevent further uptake of the activity.*

The use of a voltage optimisation technology is an activity orthogonal to other energy-efficiency activities. It is complementary to other activities (many of which require or encourage changes in consumer behaviour, e.g. in-house displays). It works with distributed generation activities (e.g. solar) and its use does not obviate the need for (or benefit of) other energy efficiency activities.

#### 3.2 Verifiability

*Applicants must provide evidence that the potential energy and greenhouse savings from the proposed energy efficiency activity have been robustly determined and are verifiable, based on sound research applicable to the South Australia climate zone/s.*

Results of extensive independent UK testing are attached.

It must be noted that this testing is not SA testing. However, put simply the principles upon which voltage optimisation is based do not vary by geography. The savings that result from the operation of the VPhase are location-independent.

In essence, 240V power is 240V power. The electrons work the same way.

What does vary is the configuration of the typical household in terms of energy consumption. The average UK home is 85 m<sup>2</sup>. The average new South Australian home built in 2002-2003<sup>2</sup> was 196.6m<sup>2</sup> (more than twice the size).

Voltage optimisation cannot provide savings for thermostatically-controlled resistive loads. In the normal household context that translates to electric stoves and electric hot water services.

Naturally, a small house will normally have a stove and hot water service. A house that is twice the size will not typically have two stoves and two hot water services: it

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<sup>2</sup> <http://www.abs.gov.au/ausstats/abs@.nsf/0/609e28eb4ba28e14ca256f7200832ff6?OpenDocument>

will have more lighting, more appliances (TVs, lamps, Hi-Fi equipment, etc). In other words, the opportunity for savings through voltage optimisation as a *percentage of the power bill* is higher in Australia than in the UK.

Hence we believe the adoption of the UK figures to be conservative, but we would be more than willing to fund a trial specific to the SA market and SA conditions.

### **3.3 Consistency of the saving**

*Applicants must provide evidence that there is a high level of confidence that the estimated savings could be achieved in the majority of circumstances. For example, the activity does not predominantly rely on variable human behaviour or accurate use by the household; hardware is likely to remain in place rather than be uninstalled by the household; or implementation is the subject of defined standards which underpin quality assurance and consistency of performance.*

The following factors address this issue:

1. Voltage optimisation systems require no change to human behaviour;
2. Voltage optimisation systems must be installed by a licensed electrician and cannot be removed other than by a licensed electrician.

### **3.4 Penetration potential**

*Applicants must provide evidence that the proposed energy efficiency activity will be technically capable of broad implementation and uptake by households within South Australia, within the Priority Group and/or non-Priority Group.*

Voltage optimisation systems are capable of being installed in every home in South Australia, from the smallest apartment to the largest home, whether on-grid or off-grid.

### **3.5 Accessibility and practicality**

*Applicants must provide evidence that the proposed energy efficiency activity will be accessible in the market and able to be practically and relatively easily implemented in the residential sector.*

The only practical implementation issue that will prevent the installation of the VPhase products is lack of a suitable location, which must be out of the weather and within a reasonable distance of the switchboard. This issue will prevent installation in 2-3% of homes.

### **3.6 Cost effectiveness**

*Applicants must provide evidence that the benefits from the implementation of the proposed energy efficiency activity will be capable of cost effectively contributing to achievement of greenhouse gas reduction targets for South Australia (cost per tonne saved). Costs includes consideration of hardware and installation costs; program or administration costs in delivering the activity to households; the type and level of incentive likely to be required to encourage uptake; and access to government or other rebates to reduce costs. Savings*

*include direct financial savings from reduced energy use and associated financial savings, such as water savings from water efficient showerheads.*

The typical installed cost of a VPhase VX-1 is \$1000, incl. GST. **This is on a full commercial basis with all sales, installation, service and administration provided on a commercial basis.**

At an assumed electricity price of 24c/kWh, savings of 484kWh/year will translate to \$116 in the first year. With an assumed growth in power costs of 10% per annum, the unit will pay for itself in year 7, and generate savings of \$34,700 over its lifetime.

Assuming a lower growth figure in electricity costs of 5% per annum, the break-even point will be in year 8, and lifetime savings in excess of \$11,100.

If an incentive of \$200 were provided, the units would pay for themselves in year 6 under both scenarios. This level of ROI would make the unit comparable to a solar PV system or a quality vacuum-tube solar hot water system.

Moreover, a government-supported scheme to distribute payments over electricity bills, funded by savings, would make the system attractive to essentially every consumer.

### **3.7 Other schemes**

*Applicants must provide evidence that the proposed energy efficiency activity has given due regard to activities and specifications eligible in similar schemes in other state jurisdictions, to promote consistency wherever possible.*

There are no comparable schemes of which the applicant is aware.



## 4. DECLARATION

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All information in the Application for a new energy efficiency activity under the REES must be verified by a Statutory Declaration of the applicant (in the form set out below), in accordance with the provisions of the Oaths Act 1936 (South Australia), that the information contained in the application is true and correct to the best of the applicant's knowledge, information and belief.

Where the applicant is a body corporate, evidence of the relevant authority of the declarant to sign on behalf of the body corporate must also be provided to the Commission.

### **Statutory Declaration**

I, Andrew Tune, of Level 7, 160 Queen Street, Melbourne 3000

do solemnly and sincerely declare that the information contained in this Application for a new energy efficiency activity under the REES is true and correct to the best of my knowledge information and belief.

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1936*.

Date 29 April 2013

Signature .....

(Where the applicant is a body corporate, the declaration must be made by a person authorised by body corporate to sign on its behalf)

Declared at: .....this 29th day of April 2013

Before me:.....

(Signature of Justice of the Peace or other authorised person)