

**Victorian Energy Efficiency Target Act 2007  
Proposed Victorian Energy Efficiency Target  
Amendment Regulations**

**Position Paper  
May 2010**

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# 1 Overview

The key proposed changes to the Victorian Energy Efficiency Target (VEET) Regulations 2008 include the following.

1. Revisions to lighting activities (Schedule 16) to:
  - i. clarify that lighting activities under VEET must require the replacement of existing incandescent lamps
  - ii. simplify General Lighting Service (GLS) lamp replacements by combining both large (16A) and small (16B) GLS lamp replacements into one measure;
  - iii. split measure 16D (downlight replacement) into two categories; one relating to their conversion into a low energy mains voltage fitting and one relating to their replacement with a 12 volt low energy lamp;
  - iv. include performance requirements, based on the new standards for compact fluorescent lamps, to ensure that only good quality products are installed;
  - v. remove the 6,000 hour life category and addition of 20,000+ hour life category for all lighting measures;
  - vi. include an additional high efficiency band for all lighting measure; and
  - vii. include a multiplication factor to reward high power factor lamps for all lighting measures.
2. Updating fridge/freezer activity (Schedule 18) to align with the new energy labelling requirements which came into effect in April 2010;
3. Inclusion of the following additional prescribed activities under VEET:
  - i. installation of high efficiency ducted gas heaters in new homes (new Schedule 5.1);
  - ii. upgrade of existing gas heating ductwork to a high quality new installation (new Schedule 5.2);
  - iii. replacement of an existing refrigerative airconditioner with a ducted evaporative cooler (new Schedule 20);
  - iv. purchase of a high efficiency television (new Schedule 21);
  - v. purchase of an energy efficient (low greenhouse intensity) clothes dryer (new Schedule 22);
  - vi. installation of a high efficiency pool pump (new Schedule 23); and
  - vii. installation of a stand-by power controller (new Schedule 24);
4. Miscellaneous amendments of an administrative and technical nature, including:
  - i. clarification on requirements for Essential Services Commission (ESC) – the administrator of VEET – to publish a product register;
  - ii. clarification of the application of discount factors.

All installations or works under the VEET must comply with any other applicable legislation.

## 2 Changes to existing activities

### 2.1 Lighting

For all lighting measures the proposed changes will:

- clarify that lighting activities under VEET must require the replacement of existing incandescent lamps;
- require that all low energy lamps installed under VEET meet performance requirements consistent with the mandatory standards for self-ballasted compact fluorescent lamps set out in Table 1 of AS/NZS 4847.2 (Int): 2008;
- remove the 6,000 to 8,000 hour life category (as no products have been listed under this category to date); and
- add a 20,000 + hour life category and an additional high efficiency band, to help ensure that new lighting technologies are adequately rewarded under VEET.
- recognise power factor as a contributor to increased abatement and inclusion of an additional term relating to power factor in the abatement calculation methodology for lighting activities. Accordingly, it is proposed that the abatement methodology for all lighting activities be modified as follows:

$$\text{abatement} = \text{number of lamps replaced} \times \text{abatement factor} \times \text{PF factor}$$

Where the “PF Factor” is determined based on the power factor of the lamp as follows:

Power Factor <sup>1</sup> of lamp	PF Factor <sup>2</sup>
Standard (0.55 to < 0.9)	1
High (0.9 to 1.0)	1.05

#### 2.1.1 GLS replacement:

- Large GLS (item 16A) and small GLS (item 16B) lamp categories will be consolidated into a single GLS lamp replacement activity;
- Additional higher efficiency band included to recognise additional abatement attributable to higher performing products; and
- Recalibrating rated life time hours, to raise the minimum from 6,000 to 8,000 rated life time hours and include a new 20,000+ rated life time hours category included.

#### New Abatement Factors

Rated Life of Low Energy Lamp (Hrs)	Abatement Factor		
	Standard Efficiency	HE 1	HE 2
8,000 to < 10,000	0.25	0.27	0.29

<sup>1</sup> Power Factor is the ratio of the measured active input power to the product of the supply voltage (R.M.S) and the supply current (R.M.S)

<sup>2</sup> PF Factor is the multiplication factor related to the power factor of the lamp

10,000 to < 12,000	0.32	0.34	0.36
12,000 to < 15,000	0.38	0.41	0.43
15,000 + to < 20,000	0.47	0.51	0.54
20,000 +	0.63	0.69	0.72

To be eligible to claim emissions reductions against a particular efficiency band, the lamp must achieve minimum lighting source efficacy levels as follows:

Light output of lamp (lumens)	Minimum lighting source efficacy		
	Standard Efficiency	HE 1	HE 2
≤ 350	40	48	58
>350 to 650	45	54	65
>650 to 850	52	62	75
>850	55	66	79

#### Additional eligibility criteria

- lamp to be replaced must be a mains voltage incandescent GLS lamp of at least 25 watts (if old technology tungsten filament type) or of at least 18 Watts (if new technology tungsten-halogen type);
- new lamp must have a minimum manufacturer's rated lifetime of 8,000 hours;
- the light output of the new low energy lamp must be equivalent to or greater than the light output of the lamp replaced;
- where the installed product is:
  - a compact fluorescent lamp (CFL), the product must comply with all requirements of AS/NZS 4847.2 (Int):2008 and be registered for MEPS;
  - other low energy lamp types (eg other than CFL) must meet the minimum performance requirements for Attributes set out in Table 1 of AS/NZS4847.2 (Int):2008;
- new lamp must have a colour temperature - Warm white, (2700 to 3,500K) or cool white (3,500 to 4,000K); and
- certified as being suitable for dimmable circuits where lamp is placed in a dimmable circuit.

#### **2.1.2 Incandescent reflector lamp replacement:**

- It will be made clear that this activity relates to the replacement of mains voltage incandescent reflector lamps
- For consistency with changes made to GLS lighting categories, it is proposed that the efficiency bands for reflector lamp replacement under item 16C will also be revised to:
  - remove the 6,000 to 8,000 rated lifetime hours band;
  - addition of a 20,000 + hours band; and
  - addition of a second high efficiency tier. Proposed changes shown in shaded cells.

Manufacturer's rated Lifetime (Hrs)	Abatement Factor		
	Standard Efficiency (a)	HE 1 (b)	HE 2 (c)
6,000 to < 8,000	Delete	Delete	N/A
8,000 to < 10,000	0.32	0.33	0.34
10,000 to < 12,000	0.40	0.42	0.43
12,000 to < 15,000	0.48	0.50	0.51
15,000 to < 20,000	0.60	0.62	0.64
20,000 +	0.80	0.83	0.86

Where the minimum lighting source efficacy bands are defined as follows:

	Standard Efficiency	HE 1	HE 2
Minimum lighting source efficacy (lumens/watt)	25	30	36

Additional eligibility criteria:

- a minimum manufacturer's rated lifetime of 8,000 hours;
- new lamp has a light output equivalent to or greater than the replaced lamp;
- meets the minimum performance requirements for the Attributes set out in Table 1 of AS/NZS 4847.2 (Int): 2008 for reflector lamps;
- new lamp has a colour temperature that is warm white (2700K to 3500K) or cool white (3500K to 4000K); and
- if the new lamp is to be installed in a dimmable circuit, is approved by the manufacturer as suitable for such circuit.

### 2.1.3 Downlight<sup>3</sup> replacement

- It is proposed that Item 16D be replaced by two new categories to better reflect the different options currently available for downlight lamp replacement, whereby:
  - existing 12 V halogen downlight lamp and fitting is replaced by a registered electrician with a mains voltage low energy lamp and fitting; and
  - existing 12 V halogen downlight lamp is replaced with a 12 V low energy lamp in the existing fitting
- For consistency with changes made to GLS lighting categories, it is proposed that the efficiency bands for downlight replacement under item 16D will also be revised to:
  - remove the 6,000 to 8,000 rated lifetime hours band,
  - addition of a 20,000 + hours band
  - addition of a second high efficiency tier.

<sup>3</sup> Downlights refer to lights which provide concentrated light on a limited area (as distinct from GLS, which emits light in all directions). Downlights typically feature a luminaire which is recessed into the ceiling or other overhead space, such as the M16 halogen variety.

### 2.1.3.1 Existing 12 V halogen downlight lamp and fitting replaced with a mains voltage low energy lamp [and fitting].

#### Abatement factors

Manufacturer's rated lifetime (Hrs)	Abatement Factor		
	Standard Efficiency (a)	HE 1 (b)	HE 2 (c)
8,000 to < 10,000	0.30	0.32	0.36
10,000 to < 12,000	0.38	0.40	0.45
12,000 to < 15,000	0.45	0.48	0.54
15,000 + to < 20,000	0.56	0.60	0.67
20,000 +	0.75	0.80	0.90

Where the minimum lighting source efficacy is defined as follows:

	Standard Efficiency	HE 1	HE 2
Minimum lighting source efficacy (lumens/watt)	40	48	58

#### Eligibility criteria revised as follows:

- the lamp to be replaced must be a 12 volt halogen downlight of at least 35 watts;.
- the new lamp has a minimum total light output in the downward direction of 400 Lumens;
- the new lamp meets the minimum performance requirements for the Attributes set out in Table 1 of AS/NZS 4847.2 (Int): 2008 for reflector lamps;
- if the new lamp is to be installed in a dimmable circuit, is approved by the manufacturer as suitable for such circuit;
- the new lamp has a minimum manufacturer's rated lifetime of 8,000 hours; and
- the new lamp has a colour temperature that is warm white (2700K to 3500K) or cool white (3500K to 4000K).

### 2.1.3.2 Existing 12 V halogen downlight lamp replaced with a 12 V low energy lamp in the existing fitting

#### Abatement factors

Manufacturer's Rated Lifetime (Hrs)	Abatement Factor		
	Standard Efficiency (a)	HE 1 (b)	HE 2 (c)
8,000 to < 10,000	0.24	0.27	0.33
10,000 to < 12,000	0.30	0.33	0.41
12,000 to < 15,000	0.35	0.40	0.49
15,000 + to < 20,000	0.44	0.50	0.62
20,000 +	0.59	0.67	0.82

Where the minimum lighting source efficacy is defined as follows:

	Standard Efficiency	HE 1	HE 2
Minimum lighting source efficacy (lumens/watt)	30	36	43

### Eligibility criteria revised as follows

The eligibility criteria for installation of low energy lamp in place of an existing 12 volt halogen lamp used in a downlight fitting, are to be as follows:

- the lamp to be replaced must be a 12 volt halogen downlight of at least 35 watts or more;
- the new lamp has a minimum total light output in the downward direction of 400 Lumens;
- the new lamp meets the minimum performance requirements for the Attributes set out in Table 1 of AS/NZS 4847.2 (Int): 2008 for reflector lamps
- if the new lamp is to be installed in a dimmable circuit, it is approved by the manufacturer as suitable for such circuit;
- new lamp has a minimum manufacturer's rated lifetime of 8,000 hours; and
- new lamp has a colour temperature that is warm white (2700K to 3500K) or cool white (3500K to 4000K).

## **2.2 Fridges**

In April 2009, a new MEPS and energy labelling standard was published for refrigerators and freezers. The new standard is AS/NZS 4474.2:2009 and replaces the old MEPS and energy labelling standard AS/NZS 4474.2:2001.

The new labelling requirements set out in AS/NZS 4474.2: 2009 became mandatory from 1 April 2010, requiring all fridges and freezers that carried a label based on the old standard to be re-labelled in accordance with the new standard. Under the new labelling standards all refrigerators and freezers will get a lower star rating.

The revised energy ratings for refrigerators and freezers require the following two changes to this activity:

- the minimum eligibility criteria, based on star rating, needs to be adjusted to recognise that all units will now have a lower star rating. As far as possible, the revised minimum criteria are equivalent to the criteria in the existing regulations in terms of the energy performance of the fridge/freezer;
- minimum eligibility criteria are now based on the Star Rating Index (SRI) (the number that the Star Rating of refrigerators and freezers is based on);
- the abatement factor algorithms have been adjusted to recognise that all units will now have a lower star rating.

The revised minimum eligibility criteria and certificate algorithms are as follows:

Single door refrigerators (18 A):

Minimum SRI of 2.0

Abatement factor =  $\{[0.9126 \times (200 + 4 \times (V_{ff})^{0.67})] - CEC\} \times 0.01392$

Two door refrigerators (18B):

Minimum SRI of 2.7

Abatement factor =  $\{[0.6954 \times (150 + 8.8 \times (V_{ff} + 1.6 \times V_{fr})^{0.67})] - CEC\} \times 0.01392$

Chest freezer (18C)

Minimum SRI of 3.3

Abatement factor =  $\{[0.6329 \times (150 + 7.5 \times (1.6 \times V_{fr})^{0.67})] - CEC\} \times 0.01719$

Vertical freezer (18D)

Minimum SRI of 2.5

Abatement factor =  $\{[0.77 \times (150 + 7.5 \times (1.6 \times V_{fr})^{0.67})] - CEC\} \times 0.01719$

### 3 Addition of new prescribed activities

#### 3.1 Installation of high efficiency ducted gas heater in a new home (New Schedule 5.1)

The installation of a high efficiency ducted gas heater in a new home, shall involve the installation of a product that fulfils the following criteria:

- certified by an accredited body to achieve a minimum 5 star rating when tested and rated to AS 4556-2000;
- must comply with relevant legislation relating to installations or work of this type;
- have a minimum rated output heating capacity of 10 kW as determined in accordance with AS 4556-2000;
- installed in newly constructed residential premises; and
- must be listed on the ESC register.

The formula used to calculate the abatement attributable to this activity will be calculated as follows:

$$\text{Emissions reduced} = \text{Abatement factor} \times \text{regional factor}$$

The applicable abatement factors shall be determined by reference to the rated output heating capacity of the product (as determined in accordance with AS 4556-2000) and its star rating (determined in accordance with AS 4556-2000) as per the following table:

Rated output heating capacity	Abatement Factor	
	5.0 to 5.49 Stars	5.5 Stars +
Small (10 to 18 kW)	4.12	4.99
Medium (more than 18 to 28 kW)	4.30	5.20
Large (> 28 kW)	5.92	7.16

The applicable regional factors are to be determined by the location of the installation as follows:

Location / Climate	Regional factor
Melbourne / Mild	1.00
Regional Victoria / Mild	1.00
Regional Victoria / Cold	1.61
Regional Victoria / Hot	0.71

**Calculation Assumption – Information only.**

The greenhouse saving which is used as the basis for calculating the abatement factor is based on the difference in annual energy consumption between a high efficiency gas ducted heater (5 or 5.5 stars) and the average new gas ducted heater sold into the new home market (around 3.2 stars) when heating a five star house which matches the size range for the new gas ducted heater. The relationship between heater size range and floor area is based on typical sizing approaches used by industry. The savings are also based on the climate zone. The savings are lower than when high efficiency heaters are installed in existing homes as a replacement unit, as the heat load of new five star homes is considerably less than existing homes.

Assume a 14 year life for the saving, based on BIS Shrapnel data on average replacement age.

### **3.2 Upgrade of existing gas heating ductwork**

Upgrading existing gas heating ductwork, shall involve removal of old ductwork from an existing gas ducted heating system, and replacing it with ductwork that meets minimum eligibility criteria agreed between ESC and the Australian Duct Manufacturer's Alliance (ADMA).

Abatement factors for replacing the ductwork are allocated based on the output heating capacity of the ducted gas heater if the heater unit is also replaced as part of the upgrade. The output capacity of the new heater unit is used as a proxy for the scale of the ductwork replacement as it will be relatively simple to audit and verify the heating capacity of the new heater. Where only a ductwork upgrade is undertaken only the lowest default number of certificates are allocated, as it will not be possible to verify the heating capacity of the existing heater. Similarly, where the output heating capacity of the new heater unit cannot be verified, only the default number of certificates are allocated.

If the gas ducted heater is replaced with a heater that has a star rating of at least 5 stars, the heater replacement may be independently eligible for the creation of certificates under the existing gas ducted heater replacement activity.

The replacement ductwork must meet the following minimum criteria:

- meets all the requirements for insulated flexible ductwork set out in the Australian Duct Manufacturers' Alliance document *Victorian Energy Efficiency Target Scheme: Guidelines for retrofit of ductwork for gas ducted heating systems*. Key requirements are a minimum thermal resistance (R-value) of the insulation blanket used in the ductwork of R1.5, and clear labelling of the outer sleeve of the ductwork with this R-value;
- the ductwork must be installed by an accredited installer<sup>4</sup> in accordance with Australian Duct Manufacturers Alliance (ADMA) *Victorian Energy Efficiency Target Scheme: Guidelines for retrofit of ductwork for gas ducted heating systems*. A key requirement here is that special attention is provided to adequately sealing the ductwork at all joints.

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<sup>4</sup> Installer has successfully undertaken ADMA installation training

The formula used to calculate the abatement attributable to this activity will be calculated as follows:

$$\text{Emissions reduced} = \text{Abatement factor} \times \text{regional factor}$$

The applicable abatement factors will be determined based on whether the existing gas heater is also replaced. Where the heating unit is itself replaced, the abatement factor will be determined based on the output capacity of the new heater. If the heating unit is not replaced, then the default abatement factor will be applied.

The abatement factors are to be described according to the following table:

System size*	Abatement Factor
	R1.5 Ductwork
Ductwork and heater upgraded at same time	
Small (10 – 18 kW)	12.13
Medium (18.1 – 28 kW)	15.40
Large (> 28 kW)	18.86
Only ductwork upgraded or not possible to verify output heating capacity of heater	
Default	12.13

**Where:**

- system size relates to the rated output heating capacity of new gas ducted heater as determined in accordance with AS 4556-2000, if this is installed at the same time as the ductwork upgrade; and
- if the gas heating unit is replaced, it is assumed that the replacement unit is equivalent to a standard ducted gas heating unit. If the replacement ducted gas heating unit has a star rating of 5 or more, certificates could be claimed for both the heater replacement activity under Regulation 6(e), and the ductwork upgrade.

The applicable regional factors are to be determined by the location of the installation as follows:

Location / Climate	Regional factor
Melbourne / Mild	1.00
Regional Victoria / Mild	1.00
Regional Victoria / Cold	1.61
Regional Victoria / Hot	0.71

**Calculation Assumption – Information only. Not for drafting.**

The greenhouse saving which is used as the basis for calculating the abatement factor is based on the difference in energy consumption between the average gas ducted heater sold (3.5 stars) with existing ductwork compared to one with good quality new ductwork, when heating the standard house within three size ranges.

The data which has been used is based on a field study funded by Sustainability Victoria, and is based on duct loss measurements before and after retrofit. Each house size range is linked to a gas ducted heating system with a heat output capacity based on standard approaches to heater sizing. The savings are also based on the climate zone, and take into account the differences in the marginal coefficient for electricity between Melbourne and Regional Victoria.

Assumes a life for the savings of 14 years, eg the same as for installing a high efficiency gas ducted heater.

### ***3.3 Replacement of an existing refrigerative airconditioner with a ducted evaporative cooler***

This activity involves the replacement of an existing fixed room refrigerative air conditioner or a ducted refrigerative air conditioner with a ducted evaporative cooler.

The existing system must be a refrigerative air conditioner operating as a "space cooler" for main living areas. Replacement of refrigerative air conditioners located in a bedroom will not be eligible.

The ducted evaporative cooler to be installed must comply with the following criteria:

- the unit must be built and tested in accordance with AS2913: 2000;
- the effective Energy Efficiency Ratio (EER) of the unit should be a minimum of 14, where the EER is based on measurements of Nominal Rating (kW) and Electricity Consumption (kW) undertaken according to AS2913: 2000 and is calculated according to the following formula:

$$EER = 0.2 \times EER_{FL} + 0.3 \times EER_{50\%} + 0.5 \times EER_{20\%}$$

Where:

- $EER_{FL}$  = (Nominal Rating (kW) / Electricity Consumption (kW)) at rated air flow
- $EER_{50\%}$  = (Nominal Rating (kW) / Electricity Consumption (kW) at 50% rated air flow
- $EER_{20\%}$  = (Nominal Rating (kW) / Electricity Consumption (kW)) at 20% rated air flow

The formula used to calculate the abatement attributable to this activity will be calculated as follows:

$$Emissions\ reduced = Abatement\ factor \times regional\ factor$$

### 3.3.1 Replacement of non-ducted refrigerative system

#### Abatement factors

For an activity involving the replacement of a non-ducted refrigerative unit, the applicable abatement factor shall be determined according to the system size and effective EER of the evaporative cooler that is to be installed as follows:

System size*	Evaporative cooler efficiency Band			
	Effective EER (14 <20)	Effective EER (20 <30)	Effective EER (30 <40)	Effective EER (40 +)
Small (7 to 10 kW)	2.6	3.0	3.4	3.5
Medium (>10 to 13 kW)	4.3	5.1	5.6	5.9
Large (> 13 kW)	6.5	7.6	8.4	8.8

Where:

- system size is the nominal rating at full load (eg rated cooling output) as determined in accordance with AS2913-2000;
- the Effective EER for the purposes of VEET is based on measurements of nominal rating (kW) and electricity consumption (kW) undertaken according to AS2913-2000 at Full/rated, 50% and 20% air flow and calculated in accordance with the weighted formula above.

Effective EER and nominal rating should be based on the average of the results obtained from testing three commercially available models to Australian Standard AS2913-2001. The ESC can request the provision of the original test reports to verify the claimed performance if necessary.

#### Regional Factors

For an activity involving the replacement of a non-ducted refrigerative system, the applicable regional factor is to be determined as follows:

Location / Climate	Regional factor
Melbourne / Mild	1.00
Regional Victoria / Mild	1.06
Regional Victoria / Cold	0.64
Regional Victoria / Hot	2.40

### 3.3.2 Replacement of ducted refrigerative system

#### Abatement factors

For an activity involving the replacement of a ducted refrigerative system, the applicable abatement factor shall be determined according to the system size and effective EER of the evaporative cooler that is to be installed as follows:

Evaporative cooler "Nominal Rating"	Evaporative cooler efficiency Band			
	Effective EER (14 <20)	Effective EER (20 <30)	Effective EER (30 <40)	Effective EER (40 +)
Small (7 to 10 kW)	5.7	6.2	6.5	6.7
Medium (10 to 13 kW)	9.6	10.3	10.8	11.1
Large (> 13 kW)	14.4	15.4	16.3	16.7

### Regional Factors

For an activity involving the replacement of a ducted refrigerative system, the applicable regional factor is to be determined as follows:

Region / climate	Reg Factor
Melbourne - Mild	1
Regional - Mild	1.06
Regional - Cold	0.86
Regional Hot	2.35

#### **Calculation Assumption**

The greenhouse saving which is used as the basis for calculating certificates is based on the difference in energy consumption between a refrigerative air conditioner and a new evaporative cooler (with or without inverter technology), where a whole-of-house ducted evaporative cooler replaces a refrigerative air conditioner operating as (1) a "space cooler" for main living areas or (2) a ducted refrigerative air conditioner.

The calculation is based on the typical annual cooling load of existing houses located in mild, cold and hot climate zones, with energy consumption of the refrigerative and evaporative systems calculated by applying the Energy Efficiency Ratio (EER) to the cooling load.

The EER of the evaporative cooler is based on a weighted average of EERs measured over the operating range of the system (100%, 50% and 20% rated airflow). This recognises that most ducted evaporative coolers operate for the majority of the time at a low fan speed (where they are more efficient), and also helps to account for the characteristics of inverter technology evaporative coolers.

Assumed 14 years for life of the savings, based on BIS Shrapnel data on average age of replacement of air conditioners

### **3.4 Purchase of high efficiency television**

This activity involves the purchase of a high efficiency television.

To be eligible under this activity, the television must meet the following requirements:

- must have a current energy labelling registration based on testing to AS/NZS 62087.2.2: 2010;
- must have a minimum star rating of 5.5-Stars as determined in accordance with AS/NZS 62087.2.2: 2010;
- must have Comparative Energy Consumption on the energy rating label of not more than 450 kWh/yr;
- must be listed on the ESC register.

The formula used to calculate the abatement attributable to this activity will be calculated as follows:

$$\text{Emissions reduced} = \text{Abatement factor} \times \text{regional factor}$$

#### Abatement factor

The abatement factor for this activity is to be determined by the following formula:

$$\text{Abatement factor} = [0.512 \times (\text{Screen Area} \times 0.1825 + 127.5) - \text{CEC}] \times 0.01079$$

Where:

Screen area = Area of screen (cm<sup>2</sup>) as per AS/NZS 62087.2.2: 2010

CEC = Comparative Energy Consumption (kWh/yr) from energy rating label as defined by AS/NZS 62087.2.2: 2010

#### Regional factor

The regional factors for this activity are to be determined as follows:

Location	Regional Factor
Melbourne	0.98
Regional Victoria	1.04

#### **Calculation Assumption**

The greenhouse abatement is based on the energy saving between the high efficiency (5.5 star +) television and the (estimated) market average (4 star) television of the same screen size, based on average usage of 7 hours per day. Assumed 16 year life for savings.

### ***3.5 Purchase of an energy efficient (low greenhouse intensity) clothes dryer***

This activity involves the purchase of an energy efficient (low greenhouse intensity) clothes dryer.

To be eligible under this activity, the clothes dryer must meet the following requirements:

- a) must be a stand-alone clothes dryer – the dryer of a combination washer-dryer will not be eligible;
- b) if the dryer is an electric clothes dryer, it must have a current valid energy labelling registration based on AS/NZS 2442.2: 2000 and achieve a minimum star rating of 5-Stars;
- c) if the dryer is a gas clothes dryer, it must be certified by an accredited body (ie Australian Gas Association (AGA) or other recognised certifying body).;
- d) must be listed on the ESC register.

The formula used to calculate the abatement attributable to this activity will be calculated as follows:

$$\text{Emissions reduced} = \text{Abatement factor} \times \text{regional factor}$$

#### Abatement factor

The abatement factors for this activity shall be determined as follows

Type of new clothes dryer	Abatement Factor
Electric	= (48.08*rated capacity - CEC)*0.01733
Gas	= rated capacity * 0.5864

Where:

CEC = Comparative Energy Consumption (kWh/yr) of the electric clothes dryer listed on the energy rating label

Rated capacity = rated load capacity of the clothes dryer (in kg) as defined by AS2442.1: 1996

### Regional factors

The regional factors for this activity shall be determined as follows:

Location	Regional factor	
	Elec dryer	Gas dryer
Melbourne	0.98	0.98
Regional Victoria	1.04	1.05

#### **Calculation Assumption**

The greenhouse abatement is based on the difference in greenhouse emissions between high efficiency electric clothes dryer (5 star plus) or a certified gas clothes dryer and the market average electric clothes dryer (1.6 stars) of the same load capacity. The saving is based on the average Victorian useage of 78 loads per year. Assumed 12 year life for savings.

### **3.6 Installation of a high efficiency pool pump**

This activity involves the installation of a high efficiency pool pump.

To be eligible under this activity, the pool pump must be a Single-phase, Single-speed, dual-speed, multiple-speed and variable-speed pumps units with an input power between 500 Watts and 1,500 Watts [when tested in accordance with AS/NZS 5102.1:2009], for use with domestic pool or spas and must either be:

- a) listed as part of the new voluntary labelling scheme and carry the appropriate energy rating label as set out under the Equipment Energy Efficiency Committee's *Voluntary Energy Rating Labelling Program for Swimming Pool-Pumps, Rules for Participation, April 2010* and achieve a minimum 3 star rating; or
- b) registered for energy labelling (when this becomes mandatory in 2011) and achieve a minimum 3 star rating when determined in accordance with AS 5102.2:2009

The formula used to calculate the abatement attributable to this activity will be calculated as follows:

$$\text{Emissions reduced} = \text{Abatement factor} \times \text{regional factor}$$

The abatement factor shall be determined as follows:

$$\text{Abatement factor} = 0.00003 \times Q \times (1,622 - \text{PAEC})$$

Where:

PAEC = Projected Annual Energy Consumption (kWh/yr) listed on the energy rating label

Q = Flow rate (Litres/min) listed on the energy rating label

The regional factors shall be as follows:

Location	Regional Factor
Melbourne	0.98
Regional Victoria	1.04

#### Calculation Assumption

The greenhouse abatement is based on the difference in greenhouse emissions between high efficiency pool pump and the market average (taken to be 2 stars) pump of the same rated flow rate. Average pump use is taken to be 3.7 hours per day. Assumed 7 year life for savings.

### **3.7 Installation of a standby power controller**

This activity involves the installation of a Standby Power Controller, a device which is intended to reduce the energy consumption of nests of home entertainment equipment and nest of computer and related IT equipment attached to it, by *automatically* reducing the amount of time controlled appliances spend in passive and active standby mode.

To be eligible under this activity, the device must meet the following requirements:

- device must be capable of controlling the power consumption of at least [four] appliances;
- the device is installed to control either a television and related home entertainment equipment linked to it or a computer and related computer peripherals linked to it;
- devices must comply with requirements to be specified in the ESC guidelines;
- laboratory test reports on devices must be submitted to the ESC to verify whether the devices comply with, or exceed the functionality requirements specified in the ESC's guidelines;
- the product supplier must provide to ESC such supporting evidence as is required under the ESC's guidelines to support the claimed level of energy saving performance in real life installations in Australian homes;
- must be suited for installation in an IT or an Audio Visual environment; and
- VEECs may only be created for a maximum of 4 devices per household.

The calculation methodology and variables used to calculate the tonnes of carbon dioxide equivalent of greenhouse gases to be reduced by this activity is to be described according to the following formula

$$\text{Emissions reduction} = \text{abatement value} \times \text{regional factor}$$

The abatement values shall be as follows:

Based on the data submitted by the product proponent on the performance of the proposed device, the ESC will determine the abatement band in respect of which the product is eligible to claim emissions abatement under the scheme.

***Default for compliant standby power controller***

Class	Abatement value
Band 1 – Meets minimum functionality specification	0.50
Band 2	1.00
Band 3	2.00
Band 4	3.00
Band 5	4.00

**Calculation Assumption**

The level of annual energy savings which could be achieved by the device installed in a real life situation will be determined by ESC based on the evidence provided. Assumed 10 year life for savings.