

## **Energy Savings Scheme Rule of 2009**

### **1 Name and commencement**

1.1 This Rule is the *Energy Savings Scheme Rule of 2009* and commences on 22 December 2011.

1.2 Without limiting the circumstances in which this Rule applies, this Rule applies to:

- (a) the accreditation of Accredited Certificate Providers after the commencement of this Rule (regardless of the date of application for accreditation);
- (b) the calculation and creation of Energy Savings Certificates registered after the commencement of this Rule (regardless of the date of accreditation of the Accredited Certificate Provider); and
- (c) the ongoing eligibility of a person to remain accredited as an Accredited Certificate Provider accredited for the purpose of the Scheme Administrator exercising its powers under the Act and Regulations, after the commencement of this Rule, to vary, suspend or cancel a person's accreditation as an Accredited Certificate Provider

### **2 Objects of the Rule**

The object of this Rule is to provide specific arrangements for the creation and calculation of Energy Savings Certificates where energy is saved through increased efficiency of electricity consumption, or reduction in electricity consumption where there is no negative effect on production or service levels. The Rule aims to save energy through measures that improve electricity end-use efficiency.

### **3 Application of the Rule**

Without limiting the persons to whom this Rule applies, this Rule applies to Accredited Certificate Providers accredited to create Energy Savings Certificates in respect of Recognised Energy Savings Activities in accordance with Part 9 Division 8 of the Act, the Regulations and this Rule.

### **4 Status and Operation of the Rule**

This Rule is an Energy Savings Scheme Rule made under Part 9 Division 13 of the Act.

### **5 Eligibility to be an Accredited Certificate Provider**

5.1 A person is eligible to be accredited as an Accredited Certificate Provider under this Rule if:

- (a) the person is an Energy Saver, and
- (b) the accreditation is in respect of one or more Recognised Energy Savings Activities.

**Note:** Under the Regulations, a person must also have record keeping arrangements with respect to the Recognised Energy Savings Activity approved by the Scheme Administrator. Further matters must also be satisfied under the Regulations if the accreditation is in respect of a proposed (rather than existing) Recognised Energy Savings Activity.

5.2 An Energy Saver is:

- (a) the person who is contractually liable (or otherwise liable if there is no contract) to pay for the energy consumed by the End-User Equipment at the Site that is the subject of a Recognised Energy Savings Activity at the relevant Implementation Date; or

Note: Where confusion exists, the Energy Saver in (a) above is the retail or wholesale customer that is named in the contract, or if no contract exists is liable (by statute, convention or otherwise) to pay the electricity charges derived from a meter with a National Meter Identifier (NMI) in the National Electricity Market.

- (b) where the method used to quantify the Energy Savings is the NABERS Method under clause 8.8 of this Rule, the person who is the NABERS Rating Holder during the period for which the Energy Savings Certificates are being claimed; or
- (c) where the End-User Equipment forms part of the NSW Electricity Network, the person who owns that End-User Equipment; or
- (d) a person nominated (“nominee”), to the satisfaction of the Scheme Administrator, to be the Energy Saver in respect of the Recognised Energy Savings Activity by one of the following persons (“nominator”):
  - (i) the person in (a) or (b) or (c); or
  - (ii) a person previously nominated to be the Energy Saver,provided that:
  - (iii) the nominator has not previously nominated another person to be the Energy Saver, or if the nominator has done so, that previous nomination is not still effective;
  - (iv) the nomination is in writing in a form approved by the Scheme Administrator and signed by the nominator via a process approved by the Scheme Administrator; and
  - (v) the nominee consents to the nomination; or
- (e) a person whom the Scheme Administrator is satisfied will be a person in (a) or (b) or (c), provided that the person will not be entitled to create Energy Savings Certificates unless that person:
  - (i) satisfies the criteria in clause 5.2 (a) or (c) at the relevant Implementation Date, or
  - (ii) satisfies the criteria in clause 5.2(b) at the time of Energy Savings Certificate creation.
- (f) Without limiting clause 5.2 (d), in relation to a Recognised Energy Savings Activity in which the person seeking accreditation proposes to be nominated by multiple persons to be the Energy Saver in relation to multiple End-User Equipment at multiple Sites, the person is eligible to be accredited in respect of that Recognised Energy Savings Activity even if not all of the nominations have been made as at the date of accreditation, provided that:
  - (i) the Scheme Administrator approves the form of the nomination and the process by which nomination forms are signed; and

- (ii) the accreditation in relation to each End-User Equipment does not come into effect until each respective nomination has been made.

**Note:** Section 143(1) in Division 9 of the Act provides that the creation of an Energy Savings Certificate must be registered with the Scheme Administrator for the Energy Savings Certificate to have effect. Section 143(4) provides that the person creating the Energy Savings Certificates and registered in the register as the owner is the owner.

5.3 A Recognised Energy Savings Activity is defined as:

- (a) Specific activities implemented by an Energy Saver that increase the efficiency of electricity consumption or reduce electricity consumption, by:
  - (i) modifying End-User Equipment or usage of End-User Equipment (including installing additional components) resulting in a reduction in the consumption of electricity compared to what would have otherwise been consumed;
  - (ii) replacing End-User Equipment with other End-User Equipment that consumes less electricity;
  - (iii) installing New End-User Equipment that consumes less electricity than other End-User Equipment of the same type, function, output or service; or
  - (iv) removing End-User Equipment that results in reduced electricity consumption, where there is no negative effect on production or service levels,and where those activities have no negative effect on production or service levels
- (b) The activities specified in clause 5.3(a) must have been implemented on or after 1 July 2008 (subject to section 53 of Schedule 6 Part 9 of the Act) at a Site or Sites in New South Wales or another jurisdiction in which an *Approved Corresponding Scheme* is in operation.

5.4 Recognised Energy Savings Activities do not include:

- (a) any activity undertaken in order to comply with any Statutory Requirement;

**Note:** This is intended to exclude from this Rule the creation of Energy Savings Certificates for Energy Savings undertaken for the purpose of meeting any mandatory legal requirement imposed through a statutory or regulatory instrument of any originating jurisdiction, including but not limited to compliance with BASIX and Building Code of Australia requirements.

- (b) the supply of electricity by a retail supplier, or electricity purchases from a retail supplier by a customer, from the NSW Electricity Network, under a representation by the retail supplier that there is a reduction in greenhouse gas emissions because the electricity supplied is connected with, or represents an amount equal to, the generation of electricity from a particular energy source; or

**Note:** This is intended to exclude from this Rule the creation of Energy Savings Certificates because of the purchase of electricity under “Green Power” accredited or similar schemes that is eligible to create certificates or RECs at the point of generation.

- (c) activities that reduce electricity consumption by reducing the scope or quantity of production or service derived from the use of that electricity.

**Note:** Reduced energy consumption not due to specific actions to improve efficiency does not qualify as a Recognised Energy Savings Activity. Mild weather, lower production, closing down part of a site, or reducing the quality or quantity of service derived from the use of that electricity do not qualify as a Recognised Energy Savings Activity.

Reducing electricity consumption where there is no negative effect on production or service levels (e.g. reduction of excessive lighting, removal of redundant installed capacity or the installation of more energy efficient equipment) is a Recognised Energy Savings Activity and is not excluded by this clause.

(d) the installation of End-User Equipment meeting the definition of a:

i. T5 adaptor kit; or

ii. Retrofit Luminaire-LED Linear Lamp in Table 17 of Schedule A.

5.5 For the purposes of clause 5.3, the Scheme Administrator may in its discretion determine whether a Recognised Energy Savings Activity that involves changes to multiple End-User Equipment or occurs across multiple Sites constitutes one or more Recognised Energy Savings Activities.

5.6 Clause 5.4(d) does not apply to the installation of End-User Equipment referred to in that subclause if:

(a) the Lighting Upgrade was completed on or before 31 May 2014; and

(b) an application to register Energy Savings Certificates in respect of those Energy Savings is made on or before 30 September 2014.

## **6 Creation of Energy Savings Certificates**

6.1 Only Accredited Certificate Providers accredited for the purpose set out in clause 5 may create Energy Savings Certificates under the Act, the Regulation and this Rule.

6.2 Accredited Certificate Providers may not create Energy Savings Certificates in respect of any Energy Savings that occur:

(a) in respect of an application for accreditation - before the date on which the accredited certificate provider lodged with the Scheme Administrator an application for its accreditation (completed to the satisfaction of, and in a form acceptable to, the Scheme Administrator) in respect of a Recognised Energy Savings Activity; and

(b) in respect of a subsequent Recognised Energy Savings Activity after accreditation - before the date on which the Accredited Certificate Provider lodged with the Scheme Administrator an application to amend its accreditation for a subsequent Recognised Energy Savings Activity (completed to the satisfaction of, and in a form acceptable to, the Scheme Administrator)

6.3 Clause retracted on 22 December 2011

6.4 A person may not create Energy Savings Certificates in respect of any Energy Savings if that person or another person has previously validly created Energy Savings Certificates in respect of the same Energy Savings under the Act, the Regulation or this Rule (including previous versions of it).

6.5 The Accredited Certificate Provider may create Energy Savings Certificates for any Energy Savings by using:

- (a) the Project Impact Assessment Method;
- (b) the Metered Baseline Method; or
- (c) the Deemed Energy Savings Method.

to calculate the Number of Certificates provided that:

- (d) the Scheme Administrator approves the method used (being one of the methods in (a) to (c)) before any Energy Savings Certificates are created using that method (which approval may be conditional upon applying the method in a particular manner that is permitted under this Rule);
- (e) the method used must produce a result reasonably reflecting (to the satisfaction of the Scheme Administrator) the extent of the Energy Savings from the relevant Recognised Energy Savings Activity;
- (f) the assumptions used in the calculation of the Number of Certificates are reasonable (to the satisfaction of the Scheme Administrator) and follow common engineering practice;
- (g) those Energy Savings Certificates are reasonably attributable (to the satisfaction of the Scheme Administrator) to the Energy Savings in respect of which the calculation is made;
- (h) in the case of the Project Impact Assessment Method (other than in the case of Energy Savings Certificates brought forward under clause 7.4), or the Metered Baseline Method, the time period over which those Energy Savings Certificates are calculated must reasonably reflect to the satisfaction of the Scheme Administrator the time period for the Energy Savings in respect of which the calculation is made; and
- (i) in the case of Energy Savings Certificates brought forward under clause 7.4, the Scheme Administrator considers that the Energy Savings for which those Energy Savings Certificates are created is reasonably likely to occur during the time period by reference to which those Energy Savings Certificates were calculated.

6.6 Not applicable

**6.7 New End-User Equipment (other than New NABERS Buildings) to be better than existing End-User Equipment**

- (a) For New End-User Equipment (other than New NABERS Buildings), before being entitled to create Energy Savings Certificates under clause 6 using either the Project Impact Assessment Method or the Metered Baseline Method, an Accredited Certificate Provider must demonstrate to the Scheme Administrator's satisfaction that the New End-User Equipment has the lowest energy consumption of any comparable New End-User Equipment by reference to:
  - (i) any benchmarking or performance indicators established and published by a body recognised by the Scheme Administrator, including industry associations;
  - (ii) any Default Savings Factors for New End-User Equipment listed in Tables 5, 6 or 8;

- (iii) the type of equipment, process, or system and level of consumption considered typical for New End-User Equipment, taking into account recent End-User Equipment of this type of equipment, process, or system and Australian and global developments in technology; and
- (iv) the type of improved equipment, process, or system proposed to be installed and the level of energy consumption, taking into account all existing comparable End-User Equipment having the same function, output or service
- (v) in New South Wales or in an *Approved Corresponding Scheme*;
- (vi) if there is no such End-User Equipment in New South Wales or in an *Approved Corresponding Scheme*, in Australia; or
- (vii) if there is no value that can be determined under (v) or (vi), a level of electricity consumption determined by the Scheme Administrator.

## 7 Project Impact Assessment Method

**Note:** The Project Impact Assessment Method determines the number of Energy Savings Certificates an Accredited Certificate Provider is entitled to create on the basis of an engineering assessment of only the equipment, process, or system that is the subject of Energy Savings.

The Project Impact Assessment Method is most appropriate when Energy Savings is small compared to site electricity consumption, unexplained variation in baseline energy consumption is high, or baseline energy consumption data for the site is unavailable.

### 7.1 Number of Certificates under the Project Impact Assessment Method

Using the Project Impact Assessment Method, Number of Certificates is calculated using **Equation 1**.

#### Equation 1

Number of Certificates = Energy Savings x Certificate Conversion Factor

Where:

- *Number of Certificates* is in tCO<sub>2</sub>-e
- *Energy Savings* (in MWh) is calculated in **Equation 2** for Energy Savings calculated on an annual basis and **Equation 3** for Energy Savings brought forward using clause 7.4.

#### Equation 2

*Energy Savings* = *Reduced Electricity Consumption* x *Confidence Factor*

Where:

- *Reduced Electricity Consumption* is the extent to which the electricity consumption of the equipment, process, or system is as a consequence of the Recognised Energy Savings Activity is different to what it otherwise would have been and is to be calculated in accordance with the engineering assessment in clause 7.2.
- *Confidence Factor* depends on the type of engineering assessment performed under

clause 7.2 and is assigned to the calculation according to clause 7.3

## **7.2 Engineering assessment of reduced electricity consumption**

Accredited Certificate Providers choosing to use the Project Impact Assessment Method in respect of any Recognised Energy Savings Activity, are to calculate the reduced electricity consumption of only the equipment, process, or system that is the subject of the Recognised Energy Savings Activity using an engineering assessment or model:

- (a) that uses reasonable assumptions and generally accepted engineering methods, models, and formulae;
- (b) in which the methods, models and formulae used to assess the Recognised Energy Savings Activity are chosen by the Accredited Certificate Provider, but the assessment is assigned a Confidence Factor under clause 7.3 reflecting the accuracy of the engineering assessment conducted;
- (c) that takes account of:
  - (i) the consumption of the existing equipment, systems or processes, or for the purposes of clause 6.7 a typical New End-User Equipment thereof that represents better than recent existing End-User Equipment of that type as described in that section, compared with its replacement;
  - (ii) the performance of the equipment, systems or processes, including degradation over time;
  - (iii) the operating characteristics of the equipment, systems or processes, including hours of use, degree of loading, usage, operating patterns and behaviour, ambient conditions and any other relevant factors; and
  - (iv) any of the Default Savings Factors set out in Tables 1 to 15 of Schedule A to this Rule if the variable that the value represents is relevant to the assessment or, if the Accredited Certificate Provider proposes to use a different value for the same purpose, that value is acceptable to the Scheme Administrator.

## **7.3 Confidence Factor**

The *Confidence Factor* is:

- (a) 1.0, if the engineering assessment determines energy consumption to a high level of accuracy based on logged or equivalent data from the End-User Equipment such as:
  - (i) hours of operation for the End-User Equipment determined from measurements taken over time or other logged data, or a simpler method where this yields an equivalent level of accuracy;
  - (ii) allowances for any variance in input characteristics and usage, degree of loading, or output characteristics for the End-User Equipment over time determined from measurements or other logged data, or a simpler method where this yields an equivalent level of accuracy;
  - (iii) operating environment and ambient conditions over time for the End-User Equipment determined from measurements or other logged data, or a simpler method where this yields an equivalent level of accuracy;



- (iv) End-User Equipment characteristics using a full performance curve from manufacturers' or measured data, or a simpler method where this yields an equivalent level of accuracy; and
- (v) performance degradation of the End-User Equipment over time using detailed calculations and manufacturers' or measured degradation characteristics, or a simpler method where this yields an equivalent level of accuracy,  
  
(including where the engineering assessment relies upon default factors from any of Tables 1 to 15 of Schedule A to this Rule),

or,

- (b) 0.9, if the engineering assessment determines energy consumption to a lesser level of accuracy from that described in clause 7.3(a), based on estimations from logged data, records or equivalent data such as:
  - (i) hours of operation for the End-User Equipment estimated from records, or a simpler method where this yields an equivalent level of accuracy;
  - (ii) allowances for any variance in input characteristics and usage, degree of loading, or output characteristics for the End-User Equipment over time estimated from records, or a simpler method where this yields an equivalent level of accuracy;
  - (iii) operating environment and ambient conditions over time estimated for the End-User Equipment from records or average measurements, or a simpler method where this yields an equivalent level of accuracy;
  - (iv) End-User Equipment characteristics taking account of performance at full and part load or discrete operating modes, or a simpler method where this yields an equivalent level of accuracy; and
  - (v) estimates of performance degradation of the End-User Equipment over time using manufacturers' or other representative degradation characteristics, or a simpler method where this yields an equivalent level of accuracy,

or,

- (c) 0.8, or another value approved by the Scheme Administrator, if the engineering assessment does not meet the level of accuracy set out in clause 7.3 (a) or (b).

#### **7.4 Creation of Certificates able to be brought forward using the Project Impact Assessment Method**

**Note:** Section 131(1) of Division 7 of the Act provides that Energy Savings Certificates may be created in respect of the Energy Savings arising from a Recognised Energy Savings Activity immediately after those Energy Savings occur. Therefore each Energy Savings Certificate may be created immediately after the occurrence of the Energy Savings.

However, section 131(4) and (5) provides that in certain circumstances the date Energy Savings are deemed to have occurred (for the purpose of Energy Savings Certificate creation) can be brought forward. To reduce transaction costs associated with creating Energy Savings Certificates the Regulations or the Rule may allow Energy Savings Certificates to be created in respect of an activity that has ongoing Energy Saving effects, as soon as the activity is commenced.

If the creation of Energy Savings Certificates is brought forward due to the deemed Energy Savings from future Energy Savings, the Number of Certificates will be subject to discount factors. This is to mitigate the risks of some of the future Energy Savings not being realised. This may occur due to the End-User Equipment being removed or replaced, or the facility closing down.

This section does not prevent claims for Energy Savings Certificates for Energy Savings that have already occurred.

- 7.4.1 For the purposes of section 131 of Division 7 of the Act, the Accredited Certificate Provider may, subject to clause 6.5, elect for the Energy Savings that give rise to the entitlement to create Energy Savings Certificates under the Project Impact Assessment Method determined in accordance with clause 7.4.2 to be deemed to have occurred (for the purpose of the entitlement to create Energy Savings Certificates but not for any other purpose) on a date determined in accordance with clause 7.4.3, and subject to the application of the discount factor in accordance with clause 7.4.4.
- 7.4.2 The maximum time period for which Energy Savings Certificate creation can be brought forward as a result of future Energy Savings being deemed to have occurred on a date determined under clause 7.4.3 is the lesser of:
- (a) 5 years; or
  - (b) the life of the Recognised Energy Savings Activity (in years) determined by the Accredited Certificate Provider, to the satisfaction of the Scheme Administrator, with reference to:
    - (i) the number of Energy Savings Certificates that are otherwise eligible to be created over a given period, determined in accordance with this Rule and to the satisfaction of the Scheme Administrator; and
    - (ii) any likely performance degradation of the End-User Equipment that will tend to result in Energy Savings in one period being lower than Energy Savings in preceding periods of equal duration; and
    - (iii) the expected lifetime of the End-User Equipment, taking into account its characteristics, its usage, typical frequency of replacement, and the use of the Site and End-User Equipment remaining the same.
- 7.4.3 The date on which the Energy Savings are deemed to occur under clause 7.4.1 is the later of:
- (a) 1 July 2009;
  - (b) the Implementation Date; or
  - (c) the first date by which all the Energy Savings previously brought forward under clause 7.4.1 to create Energy Savings Certificates in respect of the same Recognised Energy Savings Activity has actually occurred.
- 7.4.4 The number of Energy Savings Certificates able to be brought forward must be calculated by applying the Discount Factor to the Number of Certificates entitled to be created for each future year as set out in **Equation 3**.

**Equation 3**

$$\text{Energy Savings} = \sum_n \frac{\text{Reduced Electricity Consumption}_n \times \text{Confidence Factor} \times \text{Discount Factor}_n}{\text{Factor}_n}$$

Where:

- *Reduced Electricity Consumption* is the extent to which the electricity consumption of the equipment, process, or system is, as a consequence of the Recognised Energy Savings Activity, different to what it otherwise would have been in year *n*;
- *Confidence Factor* depends on the type of engineering assessment performed under clause 7.2 and is assigned to the calculation according to clause 7.3
- *Discount Factor* is set out in Table 16 of Schedule A of this Rule in year *n*;
- *n* is the year from 1 (the first year of Energy Savings claimed) to 5.

7.4.5 At the end of the maximum time period as determined in clause 7.4.2, the Accredited Certificate Provider may create an additional Number of Certificates equal to:

- (a) the Energy Savings for each year in the maximum time period other than the first year as calculated using **Equation 2**, less
- (b) the Energy Savings for each year in the maximum time period other than the first year as calculated for the relevant year in **Equation 3**, and
- (c) multiplied by the Certificate Conversion Factor,

provided the Accredited Certificate Provider establishes, to the satisfaction of the Scheme Administrator, that the Energy Savings calculated in clause 7.4.5(a) have actually occurred.

7.4.6 For the purposes of section 131(4) of Division 7 of the Act, the Energy Savings in respect to the Number of Certificates are to be created in accordance with clause 7.4.5 are deemed to occur on the date on which the maximum time period as determined in clause 7.4.2 ends.

## 8 Metered Baseline Method

**Note:** The Metered Baseline Method uses measurements of electricity consumption “before” the Recognised Energy Savings Activity takes place to establish a “baseline” electricity consumption standard for the Site being considered. The same measurements performed “after” the Recognised Energy Savings Activity has commenced will establish new levels of electricity consumption, with the difference representing the impact of the Recognised Energy Savings Activity.

Energy Savings are adjusted by a confidence factor that is calculated based on the size of the Energy Savings relative to the unexplained variance in the baseline.

The Metered Baseline Method relies on the remainder of the Site operating as it did before the Recognised Energy Savings Activity was implemented. Where changes at the Site, other than those that constitute the Recognised Energy Savings Activity will affect metered consumption per unit of output or service, the results will not reasonably reflect the Energy Savings due to

the Recognised Energy Savings Activity, and Energy Savings Certificates cannot be created using the Metered Baseline Method.

Consequently, the Metered Baseline Method should not be used where changes other than the Recognised Energy Savings Activity have taken place during the baseline period, or are anticipated during the life of the Recognised Energy Savings Activity for which Energy Savings Certificates will be claimed.

This also does not prevent additional Recognised Energy Savings Activities at the same Site from being implemented and assessed against the original baseline.

8.1 The Metered Baseline Method in this clause 8 may only be used to calculate Number of Certificates if measurements made pursuant to this clause 8 are of a standard and duration enabling the Number of Certificates to be determined to a level of accuracy satisfactory to the Scheme Administrator.

8.2 Using the Metered Baseline Method, Number of Certificates is calculated under:

- (a) clause 8.5, using a baseline per unit of output;
- (b) clause 8.6, using a baseline unaffected by output;
- (c) clause 8.7, using a normalised baseline; or
- (d) clause 8.8, using a baseline normalised by means of a methodology adapted from the National Australian Built Environment Rating System,

provided that all Energy Savings Certificates that the Accredited Certificate Provider seeks to create for the Energy Savings can reasonably (to the satisfaction of the Scheme Administrator) be attributed to the corresponding Recognised Energy Savings Activity.

8.3 The period over which any baseline is determined under this clause 8, using electricity measurements before the Implementation Date of the Recognised Energy Savings Activity, must include one or more periods preceding the Implementation Date, excluding any time periods that are not representative of normal operating Site consumption due to factors including plant shutdown or major maintenance. The time periods used to determine the baseline must be acceptable to the Scheme Administrator.

8.4 The Accredited Certificate Provider must use utility meters or other metering equipment acceptable to the Scheme Administrator.

**Note:** Sub-metering may be used to effectively reduce the size of the Site considered for baseline calculations, thereby increasing Energy Savings relative to the baseline and hence the Confidence Factor.

#### 8.5 Baseline per unit of output

**Note:** This Metered Baseline Method is most appropriate where electricity consumption is strongly linked to output (for example, in aluminium smelting). Where the relationship is non-linear, or there are multiple products or changes in raw materials affecting consumption, another method of normalising the baseline should be used.

Number of Certificates may be calculated using Method 1, provided that:

- (a) the electricity consumption for the Site is a linear function of output;
- (b) fixed electricity consumption, which is the electricity consumption of the Site that does not vary with variations in output, can be measured or estimated;
- (c) output has not changed by more than 50% from the average output over the period during which the variable electricity baseline was measured, and
- (d) the variable electricity baseline is calculated using data from periods immediately preceding the Implementation Date, up to a maximum of 5 years, excluding any periods that are not representative of the long term Site consumption due to factors including plant shutdown or major maintenance. Where this is not possible, due to data unavailability or other reasons, a baseline may be set using other periods acceptable to the Scheme Administrator.

### **Method 1**

Step (1) Select a *measurement period* acceptable to the Scheme Administrator, that will be the duration of time over which all measurements in this Method will be taken and that is:

- (a) a minimum of one day and a maximum of one year; and
- (b) if there is a regular cycle to the consumption of electricity on the Site, an integer multiple of the period of that cycle.

Step (2) Determine Energy Savings by completing steps (2A) to (2G), and for each time period  $T_a$  by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates by repeating Steps (2E) to (3) for each such period.

#### Step (2A)

The *fixed electricity consumption* (in MWh) is the consumption of electricity for the Site that does not vary with variations in output, and is:

- determined by estimating or extrapolating from measurements taken during plant downtime or estimated or determined mathematically from multiple periods;
- a reasonable reflection of the consumption unaffected by output, and will lead to Energy Savings calculations that are reasonable, and
- over a period  $T_b$  before Energy Savings commences and the duration of which is equal to the measurement period.

#### Step (2B)

Calculate *variable consumption* $_{T_b}$  (in MWh / unit of output) for  $n$  time periods  $T_b$ :

$$\text{variable consumption}_{T_b} = (\text{total consumption}_{T_b} - \text{fixed electricity consumption}) / \text{output}_{T_b}$$

Where:

- $T_b$  denotes a time period, before the Implementation Date, the duration of which is equal to the measurement period, and where each time period is mutually exclusive with each other such time period
- *Total consumption* $_{T_b}$  (in MWh) is the consumption of electricity for the Site measured by metering that consumption over each time period  $T_b$

- $Output_{T_b}$  is the number of units of output during each time period  $T_b$
- $n$  is the number of time periods,  $T_b$ , where  $n$  must be at least 1

Step (2C) Calculate *variable electricity baseline* (in MWh / unit of output):

$$\text{Variable electricity baseline} = \left\{ \sum_{T=1}^n \text{Variable consumption}_{T_b} \right\} / n$$

Step (2D) Calculate *Baseline variability* (in MWh / unit of output), which is the unexplained variance in the baseline, as:

- where  $n > 2$ :

$$\text{Baseline variability} = (\text{Maximum variable consumption}_{T_b} - \text{Minimum variable consumption}_{T_b}) / 2$$

Where:

- *Maximum variable consumption<sub>T<sub>b</sub></sub>* is the maximum value of variable consumption<sub>T<sub>b</sub></sub> over  $n$  time periods  $T_b$
- *Minimum variable consumption<sub>T<sub>b</sub></sub>* is the least value of variable consumption<sub>T<sub>b</sub></sub> over  $n$  time periods  $T_b$

- where  $n \leq 2$ :

$$\text{Baseline variability} = 10\% \text{ of Variable electricity baseline}$$

Step (2E) Calculate *reduced electricity consumption* (in MWh) for each time period  $T_a$  (after the Implementation Date) by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates:

$$\text{reduced electricity consumption} = (\text{Output}_{T_a} \times \text{Variable electricity baseline} + \text{fixed electricity consumption}) - \text{Total consumption}_{T_a}$$

Where:

- $T_a$  denotes a time period, after the Implementation Date, the duration of which is equal to the *Measurement Period*
- *Total consumption<sub>T<sub>a</sub></sub>* (in MWh) is the consumption of electricity for the Site measured by metering that consumption over a time period  $T_a$
- $Output_{T_a}$  is the number of units of output during the time period  $T_a$ .

Step (2F) Calculate *Confidence Factor*:

$$\text{Confidence Factor} = 1 - (\text{Baseline variability} / \text{Variable electricity baseline})$$

Step (2G) Calculate *Energy Savings* (in MWh) for each time period  $T_a$  by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates:

$$\text{Energy Savings} = \text{Reduced electricity consumption} \times \text{confidence factor}$$

Step (3) Calculate *Number of Certificates* (in t CO<sub>2</sub>-e) for each time period  $T_a$  by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates:

If Energy Savings  $\geq 0$ :

$$\text{Number of Certificates} = \text{Energy Savings} \times \text{Certificate Conversion Factor}$$

or

If Energy Savings < 0:

$$\text{Number of Certificates} = 0$$

## 8.6 Baseline unaffected by output

**Note:** This Metered Baseline Method is most appropriate where consumption is not linked to output. For example, schools and swimming pools.

Number of Certificates may be calculated using **Method 2**, provided that

- (a) the consumption of all energy sources for the Site is independent of output; and
- (b) the *Electricity Baseline* is calculated using data from periods immediately preceding the Implementation Date of the Recognised Energy Saving Activity, to a maximum duration of 5 years, and excluding any periods that are not representative of long term Site consumption due to factors including plant shutdown or major maintenance. Where this is not possible, due to data unavailability or other reasons, a baseline may be set using other periods acceptable to the Scheme Administrator.

### Method 2

Step (1) Select a *measurement period* acceptable to the Scheme Administrator, that will be the duration of time over which all measurements in this Method will be taken and that is:

- (a) a minimum of one day and a maximum of one year; and
- (b) if there is a regular cycle to the consumption of electricity on the Site, an integer multiple of the period of that cycle.

Step (2) Determine *Energy Savings* by completing steps (2A) to (2E), and for each time period  $T_a$  by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates by repeating Steps (2C) to (3) for each such period.

Step (2A) Calculate *Electricity Baseline* (in MWh or GJ):

$$\text{Electricity Baseline} = \left\{ \sum_{T=1}^n \text{Total Consumption}_{Tb} \right\} / n$$

Where:

- $Tb$  denotes a time period, before the Implementation Date, the duration of which is equal to the Measurement Period, and where each time period is mutually exclusive with each other such time period
- $\text{Total Consumption}_{Tb}$  (in MWh) is the consumption of electricity for the Site measured by metering that consumption over each time periods  $Tb$
- $n$  is the number of time periods,  $Tb$ , where  $n$  must be at least 1

Step (2B) Calculate *Baseline Variability* (in MWh or GJ), which is the variance in

the baseline, as:

where  $n > 1$ :

*Baseline Variability* = (maximum total consumption<sub>Tb</sub> – minimum total consumption<sub>Tb</sub>) / 2

Where:

- *Maximum total consumption<sub>Tb</sub>* is the maximum value of *total consumption<sub>Tb</sub>* over *n* time periods *Tb*
- *Minimum total consumption<sub>Tb</sub>* is the least value of *total consumption<sub>Tb</sub>* over *n* time periods *Tb*

where  $n = 1$ :

*Baseline variability* = 10% of electricity baseline

Step (2C) Calculate *reduced electricity consumption* (in MWh) for each time period  $T_a$  by reference to which the energy saver seeks to create Certificates:

*Reduced electricity consumption* = *Electricity Baseline* – *Total consumption<sub>Ta</sub>*

Where:

- $T_a$  denotes a time period, after the Implementation Date of the Energy Saving project, the duration of which is equal to the measurement period
- *Total consumption<sub>Ta</sub>* (in MWh) is the consumption of electricity for the Site measured by metering that consumption over a time period  $T_a$

Step (2D) Calculate *Confidence factor*:

*Confidence factor* = 1 - (*Baseline Variability* / *Electricity Baseline*)

Step (2E) Calculate *Energy Savings* (in MWh) for each time period  $T_a$  by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates:

- *Energy Savings* = *Reduced electricity consumption* x *Confidence Factor*

Step (3) Calculate *Number of Certificates* (in t CO<sub>2</sub>-e) for each time period  $T_a$  by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates:

If *Energy Savings*  $\geq 0$ :

*Number of Certificates* = *Energy Savings* x *Certificate Conversion Factor*

or

If *Energy Savings*  $< 0$ :

*Number of Certificates* = 0



## 8.7 Normalised baselines

**Note:** This Metered Baseline Method normalises energy consumption for a Site to remove explainable variation from the baseline, for example, adjusting for variations in ambient conditions or variations in input characteristics. The factors chosen for the normalisation must cause the variability that is removed and not be the result of spurious correlations.

Option C of the International Performance Measurement and Verification Protocol can be used for guidance as to the normalisation of baselines, particularly for complex cases.

Number of Certificates may be calculated using Method 3, provided that

- (a) the *Normalisation Variables* in respect of which the *Total Consumption* is normalised are variables corresponding to the specific activities that are a reason for change in *Total Consumption*; and
- (b) the *Normalised Energy Baseline* is calculated using data from periods immediately preceding the Implementation Date, to a maximum duration of 5 years, and excluding any periods that are not representative of long term Site consumption due to circumstances such as plant shutdown or major maintenance. Where this is not possible, due to data unavailability or other reasons, a baseline may be set using other periods acceptable to the Scheme Administrator.

### Method 3

Step (1) Select a *Measurement Period* acceptable to the Scheme Administrator, that will be the duration of time over which all measurements in this Method will be taken and that is:

- (a) a minimum of one day and a maximum of one year; and
- (b) if there is a regular cycle to the consumption of electricity on the Site, an integer multiple of the period of that cycle.

Step (2) Determine Energy Savings resulting from the Recognised Energy Savings Activity by completing Steps (2A) to (2F) for each time period  $T_a$  by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates by repeating Steps (2D) to (3) for each such period.

Step (2A) Calculate *Normalised consumption* $_{T_b}$  (in MWh) for  $n$  time periods  $T_b$  by normalising the *total consumption* $_{T_b}$  to determine the consumption that would have occurred for period  $T_b$  had the conditions at time  $T_a$  existed, using:

- (a) a set of normalisation coefficients, which are one or more coefficients calculated to account for the variation in *total consumption* $_{T_b}$  per unit of change for each corresponding normalisation variable used in (b); and
- (b) a set of values, which are the difference between the values of the normalisation variables for each time period  $T_b$ , and the values of the normalisation variables for one time period  $T_a$ , determined by measurements or other data sources.

Where:

- $T_b$  denotes a time period, before the Implementation Date, the duration of which is equal to the Measurement Period, and where each time period is

- mutually exclusive with each other such time period
- $T_a$  denotes a time period, after the Implementation Date, the duration of which is equal to the Measurement Period
- $Total\ consumption_{T_b}$  (in MWh) is the consumption of electricity for the Site measured by metering that consumption over each time period  $T_b$
- $n$  is the number of time periods,  $T_b$ , where  $n$  must be at least 1
- *Normalisation Variables* are the variables in respect of which the *Total Consumption<sub>T<sub>b</sub></sub>* is normalised and must correspond to factors that are a reason for change in *Total Consumption<sub>T<sub>b</sub></sub>*

Step (2B) Calculate *Normalised Energy Baseline*(in MWh):

$$Normalised\ Energy\ Baseline = \left\{ \sum_{T=1}^n Normalised\ Consumption_{T_b} \right\} / n$$

Step (2C) Calculate *Baseline Variability* (in MWh), which is the unexplained variance in the baseline, as:

where  $n > 1$ :

$$Baseline\ Variability = (Maximum\ Normalised\ Consumption_{T_b} - Minimum\ Normalised\ Consumption_{T_b}) / 2$$

Where:

- Maximum *Normalised Consumption<sub>T<sub>b</sub></sub>* is the maximum value of *Normalised Consumption<sub>T<sub>b</sub></sub>* over  $n$  time periods  $T_b$
- Minimum *Normalised Consumption<sub>T<sub>b</sub></sub>* is the least value of *Normalised Consumption<sub>T<sub>b</sub></sub>* over  $n$  time periods  $T_b$

where  $n = 1$ :

$$Baseline\ Variability = 10\% \text{ of } Normalised\ Energy\ Baseline$$

Step (2D) Calculate *reduced electricity consumption* (in MWh for each time period  $T_a$  by reference to which the energy saver seeks to create Certificates:

$$Reduced\ electricity\ consumption = normalised\ electricity\ baseline - total\ consumption_{T_a}$$

Where:

- $T_a$  denotes a time period, after the Implementation Date, the duration of which is equal to the Measurement Period
- $Total\ Consumption_{T_a}$  (in MWh) is the consumption of electricity for the Site measured by metering that consumption over a time period  $T_a$

Step (2E) Calculate *Confidence Factor*:

$$Confidence\ Factor = 1 - (Baseline\ Variability / Normalised\ electricity\ baseline)$$

Step (2F) Calculate *Energy Savings* (in MWh) for each time period  $T_a$  by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates:

Energy Savings = reduced electricity consumption x confidence factor

Step (3) Calculate *Number of Certificates* (in t CO<sub>2</sub>-e) for each time period T<sub>a</sub> by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates:

If Energy Savings ≥ 0:

Number of Certificates = Energy Savings x Certificate Conversion Factor

or

If Energy Savings < 0:

Number of Certificates = 0

## 8.8 National Australian Built Environment Rating System baseline

**Note:** This Metered Baseline Method is one acceptable method for normalising baselines for New NABERS Buildings or Existing NABERS Buildings – which use the National Australian Built Environment Rating System (NABERS) for measuring building energy performance.

8.8.1 Number of Certificates may be calculated using **Method 4a** only for Existing NABERS Buildings or **Method 4b** New NABERS Buildings.

**Method 4a – Existing Buildings**

Step (1) The *Measurement Period* is the duration of time over which all measurements in this Method will be taken and is twelve months.

The *Abatement period Ta* denotes a time period, after the Implementation Date, the duration of which is equal to the Measurement Period.

The *Baseline period Tb* denotes a time period, before the Implementation Date, the duration of which is equal to the Measurement Period.

Step (2) *Emissions Baseline EB<sub>Ta</sub>* for the *Abatement Period Ta* (in kg CO<sub>2</sub>-e / Common Unit) is calculated as

$$EB_{Ta} = GE_{Tb} * (GE_{Ta} / NE_{Ta}) / (GE_{Tb} / NE_{Tb}) \text{ – for offices}$$

$$EB_{Ta} = GE_{Tb} * (PM_{Ta} / PM_{Tb}) \text{ – for other building types}$$

Where:

The *Common Unit CU<sub>Tx</sub>* in *Measurement Period Tx* is:

- For Offices: Area (m<sup>2</sup>) of rated floor area as assessed under NABERS Energy for Offices, based on Net Lettable Area, in *Measurement Period Tx*;
- For Hotels: Number of guest rooms as assessed under NABERS Energy for Hotels in *Measurement Period Tx*;

- For Shopping Centres: Area (m<sup>2</sup>) of the shopping centre as assessed under NABERS Energy for Shopping Centres, based on Gross Lettable Area, in *Measurement Period Tx*

The *Gross Emissions GE<sub>Tx</sub>* is the gross emissions per common unit in *Measurement Period Tx* calculated using the relevant NABERS calculator with all electricity counted as grid electricity corrected to use the *Certificate Conversion Factor* instead of the NABERS default emission factor and with no discount for GreenPower and all other fuel uses included using the applicable NABERS default emissions factors.

The *Normalised Emissions NE<sub>Tx</sub>* is the normalised emissions per common unit in *Measurement Period Tx* calculated using the relevant NABERS Office calculator with all electricity counted as grid electricity corrected to use the *Certificate Conversion Factor* instead of the NABERS default emission factor and with no discount for GreenPower and all other fuel uses included using the applicable NABERS default emissions factors.

The *Predicted Mean Emissions PM<sub>Tx</sub>* is the predicted mean emissions for the site from the NABERS Calculator with all electricity counted as grid electricity corrected to use the *Certificate Conversion Factor* instead of the NABERS default emission factor and all other fuel uses included using the applicable NABERS default emissions factors, using the input data relevant to *Measurement Period Tx*.

Step (3) Calculate the Energy Savings  $ES_{Ta}$  in MWh the *Abatement Period Ta* as:

$$ES_{Ta} = (EB_{Ta} - GE_{Ta}) / (1000 * \text{Certificate Conversion Factor})$$

Step (4) Set *Confidence Factor CF* = 0.95

Step (5) Calculate *Number of Certificates* (in t CO<sub>2</sub>-e):

If Energy Savings  $\geq 0$ :

$$\text{Number of Certificates} = ES_{Ta} \cdot CU_{Ta} \cdot CF \cdot (\text{Certificate Conversion Factor})$$

**or**

If Energy Savings  $< 0$ :

$$\text{Number of Certificates} = 0$$

#### **Method 4b New Buildings**

Step (1) The *Measurement Period* is the duration of time over which all measurements in this Method will be taken and is twelve months.

The *Abatement period Ta* denotes a time period, after the Implementation Date, the duration of which is equal to the Measurement Period, and where each time period is mutually exclusive with each other such time period

Step (2) *Emissions Baseline EB<sub>Ta</sub>* for the *Abatement Period Ta* (in kg CO<sub>2</sub>-e / Common Unit) is

- For offices:  $EB_{Ta} = NE_{\text{target}} * (GE_{Ta} / NE_{Ta}) * (GE_{Ta} / GED_{Ta})$

- For other building types:  $EB_{Ta} = GE_{target}$

Where the *target* star rating is the higher of:

- NABERS 4 star; or
- The NABERS rating required for the building by a consent authority, as that term is defined in the *Environmental Planning and Assessment Act 1979*,

Where:

The *Common Unit*  $CU_{Tx}$  in *Measurement Period Tx* is:

- For Offices: Area (m<sup>2</sup>) of rated floor area as assessed under NABERS Energy for Offices, based on Net Lettable Area, in *Measurement Period Tx*;
- For Hotels: Number of guest rooms as assessed under NABERS Energy for Hotels in *Measurement Period Tx*;
- For Shopping Centres: Area (m<sup>2</sup>) of the shopping centre as assessed under NABERS Energy for Shopping Centres, based on Gross Lettable Area, in *Measurement Period Tx*

The *Gross Emissions*  $GE_{Tx}$  is the gross emissions per common unit in *Measurement Period Tx* calculated using the relevant NABERS calculator with all electricity counted as grid electricity corrected to use the *Certificate Conversion Factor* instead of the NABERS default emission factor and with no discount for GreenPower and all other fuel uses included using the applicable NABERS default emissions factors.

The *Gross Emissions (Default)*  $GED_{Tx}$  is the gross emissions per common unit in *Measurement Period Tx* calculated using the relevant NABERS calculator with all other fuel uses included using the applicable NABERS default emissions factors but with no discount for GreenPower and.

The *Normalised Emissions*  $NE_{Tx}$  is the normalised emissions per common unit in *Measurement Period Tx* calculated using the relevant NABERS Office calculator with all electricity counted as grid electricity corrected to use the *Certificate Conversion Factor* instead of the NABERS default emission factor and with no discount for GreenPower and all other fuel uses included using the applicable NABERS default emissions factors.

The *Normalised Emissions Default for “target” stars*  $NE_{target}$  is the threshold (highest normalised emissions per m<sup>2</sup>) for a “target” star rating for an office calculated using the relevant NABERS Office calculator with the applicable NABERS default emissions factors.

The *Gross Emissions for “target” stars*  $GE_{target}$  is the threshold (highest emissions per m<sup>2</sup>) for a “target” star rating for buildings other than offices, calculated using the relevant NABERS calculator with all electricity counted as grid electricity corrected to use the *Certificate Conversion Factor* instead of the NABERS default emission factor and with no discount for GreenPower and all other fuel uses included using the applicable NABERS default emissions factors.

Step (3) Calculate the Energy Savings  $ES_{Ta}$  in MWh the *Abatement Period Ta* as:

$$ES_{Ta} = (EB_{Ta} - GE_{Ta}) / (1000 * \text{Certificate Conversion Factor})$$

Step (4) Calculate *Number of Certificates* (in t CO<sub>2</sub>-e):

If Energy Savings  $\geq 0$ :

$$\text{Number of Certificates} = ES_{Ta} \cdot CU_{Ta} \cdot (\text{Certificate Conversion Factor})$$

**or**

If Energy Savings  $< 0$ :

$$\text{Number of Certificates} = 0$$

- 8.8.2 For the purposes of section 131(4) of Division 7 of the Act, the Energy Savings in respect to the Number of Certificates as calculated in clause 8.8.1 are deemed to have occurred at the time that the Scheme Administrator determines that the relevant NABERS rating was completed.
- 8.8.3 Certificates cannot be created for a NABERS rating more than twelve months after the end of the Measurement Period Tx applicable to that NABERS rating.

## 9 Deemed Energy Savings Method

**Note:** The Deemed Energy Savings Method can be used for the installation of common End-User Equipment such as refrigerators and certain electric motors. A program of installing multiple End-User Equipment of the same type is considered a single Recognised Energy Savings Activity.

The Deemed Energy Savings in Tables 1 to 15 in Schedule A take account of failures or removal of an item after the Implementation Date and before the end of its normal service life.

- 9.1 Using the Deemed Energy Savings Method, Number of Certificates is calculated under:
- clause 9.3, using Default Savings Factors;
  - clause 9.4, using the Commercial Lighting Energy Savings Formula;
  - clause 9.5, using the High Efficiency Motor Energy Savings Formula; or
  - clause 9.6, using the Power Factor Correction Energy Savings Formula;
- provided that all of the Energy Savings Certificates that the Accredited Certificate Provider seeks to create in respect of Recognised Energy Savings Activity can reasonably be attributed to the corresponding Energy Savings.
- 9.2 Where the Number of Certificates is calculated using the Deemed Energy Savings Method in this clause 9, the Energy Savings that is the subject of that calculation is deemed to have taken place (for the purpose of the entitlement to create Certificates but not for any other purpose) on the later of:
- 1 July 2009; and
  - the relevant Implementation Date

### 9.3 Default Savings Factors

**Note:** This default Deemed Energy Savings Method for Recognised Energy Savings Activities that involve the installation or supply of End-User Equipment types listed in Tables 1 to 8d of Schedule A. This includes the replacement of halogen down-lights with energy efficient alternatives; the sale or purchase of energy efficient clothes washers, dishwashers, fridges or freezers and retirement of old spare fridges and freezers.

The Number of Certificates may be calculated using **Equation 4**, provided that:

- (a) the End-User Equipment or activity is of a class of End-User Equipment or activity listed in Tables 4, 5, 6, 7, 8a, 8b, 8c or 8d; and
  - (i) the Scheme Administrator is satisfied that the specific End-User Equipment meets the requirements for the relevant class of End-User Equipment or activity;

or;

- (b) the End-User Equipment or activity is of a class of End-User Equipment or activity listed in Tables 1, 2 or 3; and
  - (i) the Scheme Administrator is satisfied that for any activity involving the replacement of 50W ELV halogen lamps with another type of Lamp or Luminaire, each type of replacement Lamp or Luminaire shall have an initial light output of  $\geq 500$  lumens and minimum Lumen Maintenance of 80% as determined by testing using a method approved by the Scheme Administrator (note that in the case of replacements for 50W ELV halogen reflector Lamps, light output refers only to Downward Light); and
  - (ii) if the activity involves the modification or replacement of electrical wiring, the activity is performed by an electrician.

#### **Equation 4**

Number of Certificates = *Number of End-User Equipment or activities* x *Default Savings Factor* x *Installation Discount Factor* x *Certificate Conversion Factor*

Where:

- *Number of Certificates* is in t CO<sub>2</sub>-e
- *Number of End-User Equipment or activities* is the quantity of a certain type of End-User Equipment that has been installed or activities that have been undertaken
- *Default Savings Factor* is the Default Energy Savings Factor corresponding to that type of End-User Equipment or activity in **Table 1 to 8d** of Schedule A to this Rule
- *Installation Discount Factor* is a factor to be applied to take account of the risk that under a particular program design some End-User Equipment may not be installed, or may not be installed in accordance with clause 5.3(b) and is:
  - 1.0, if the Scheme Administrator is satisfied that the End-User Equipment has been installed or removed, which may be on the basis of contractor invoices or a written statement from an appropriately trained person who performed the installation or removal; or
  - Sales Discount Factor for the activity set out in Tables 1 to 8d, if the Scheme Administrator is satisfied that a person has purchased and has taken possession of the End-User Equipment for the purposes of being

- installed, but does not have sufficient evidence to be satisfied that the End-User Equipment has been installed; or
- 0.0, if the Scheme Administrator is satisfied that the End-User Equipment was provided free of charge by an applicant or Accredited Certificate Provider, but does not have sufficient evidence to be satisfied that the End-User Equipment has been installed or removed; or
- another value approved by the Scheme Administrator.
- An *Installation Discount Factor* value approved by the Scheme Administrator for the above purpose applies in the circumstances specified by the Scheme Administrator; and may be submitted by an applicant or Accredited Certificate Provider, or determined and imposed by the Scheme Administrator of its own volition.

#### 9.4 Commercial Lighting Energy Savings Formula

The Number of Certificates that may be calculated using **Equations 5, 6, 9** and either **Equations 7** or **8**, provided that:

- (a) it involves a Lighting Upgrade of:
  - (i) Lighting for roads and public spaces,
  - (ii) Traffic signals, or
  - (iii) Building Lighting, provided that the Scheme Administrator is satisfied that the lighting characteristics of each space, after implementation of the Lighting Upgrade, exceed the relevant recommendations of AS/NZS 1680, or another benchmark approved by the Scheme Administrator, and
- (b) the Lighting Upgrade is performed by appropriately trained persons.

Building Lighting is defined as lighting End-User-Equipment affixed to a Commercial/Industrial premises classified under the Building Code of Australia as either Class 3, 5, 6, 7, 8, 9, 10(b) or the Common Areas of Class 2.

##### Equation 5

Number of Certificates = Energy Savings x Certificate Conversion Factor

Where:

- *Number of Certificates* is in t CO<sub>2</sub>-e
- *Energy Savings* is in MWh, and is calculated using **Equation 6**

##### Equation 6

Energy Savings = *Baseline Energy Consumption* - *Upgrade Energy Consumption*

Where:

- *Baseline Energy Consumption* is in MWh, and is calculated using **Equation 7**, if the lighting upgrade is part of a site refurbishment that is not required to comply with



the Building Code of Australia Part J6, or using **Equation 8** if the lighting upgrade is part of a refurbishment that is required to comply with the Building Code of Australia Part J6

- *Upgrade Energy Consumption* is in MWh, and is calculated using **Equation 9**

### Equation 7

*Baseline Energy Consumption (MWh)* =

$$\sum_{\text{Each Incumbent Lamp}} (LCP \times \text{Asset Lifetime} \times \text{Annual Operating Hours} \times CM \times AM) \div 10^6$$

Where:

- *Each Incumbent Lamp* means each lamp and control gear in the pre-existing lighting system.
- *LCP* is the default lamp circuit power (Watts) Factor corresponding to that Type of Lamp and Control Gear for that End-User Equipment or activity as in **Table 9** of Schedule A to this Rule, representing the power drawn by the lamp, plus the losses of its control gear.
- *Asset Lifetime* is the default lifetime of the lighting upgrade in years for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, or another value approved by the Scheme Administrator.
- *Annual Operating Hours* is the default number of hours per annum that the upgraded lighting system is expected to operate for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, or another value approved by the Scheme Administrator.
- *CM* is the control multiplier. If the lamp is connected to a control system, the factor for the control multiplier shall be applied for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, otherwise  $CM = 1.0$ .
- *AM* is the air-conditioning multiplier. If the lamp is installed in an air-conditioned space, a multiplier of 1.3 shall be applied, otherwise  $AM = 1.0$ .

### Equation 8

*Baseline Energy Consumption (MWh)* =

$$\sum_{\text{Each Space}} (IPD \times \text{Area} \times \text{Asset Lifetime} \times \text{Annual Operating Hours} \times CM \times AM) \div 10^6$$

Where:

- *Each Space* means each portion of space within the site requiring a different illumination power density (IPD) as defined in Part J6 of the Building Code of Australia.
- *IPD* is the maximum allowable illumination power density for each space (in Watts/m<sup>2</sup>), as required by Table J6.2b of the Building Code of Australia. For simplicity, the Scheme Administrator may aggregate similar IPDs in the

Commercial Lighting Energy Savings Formula. The IPD should not be adjusted by the adjustment factors tabled in Table 6.2c of the Building Code of Australia.

- *Area* is the area of Each Space in m<sup>2</sup>.
- *Asset Lifetime* is the default lifetime of the lighting upgrade in years for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, or another value approved by the Scheme Administrator.
- *Annual Operating Hours* is the default number of hours per annum that the upgraded lighting system is expected to operate for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, or another value approved by the Scheme Administrator.
- *CM* is the control multiplier. If the lamp is connected to a control system, the factor for the control multiplier shall be applied for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, otherwise CM = 1.0.
- *AM* is the air-conditioning multiplier. If the lamp is installed in an air-conditioned space, a multiplier of 1.3 shall be applied, otherwise AM = 1.0.

### Equation 9

*Upgrade Energy Consumption (MWh) =*

$$\sum_{\text{Each Upgrade Lamp}} (LCP \times \text{Asset Lifetime} \times \text{Annual Operating Hours} \times CM \times AM) \div 10^6$$

Where:

- *Each Upgrade Lamp* means each lamp and control gear in the upgraded lighting system.
- *LCP* is the default lamp circuit power (Watts) Factor corresponding to that Type of Lamp and Control Gear for that End-User Equipment or activity as in **Table 9** of Schedule A to this Rule, representing the power drawn by the lamp, plus the losses of its control gear.
- *Asset Lifetime* is the default the lifetime of the lighting upgrade in years for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, or another value approved by the Scheme Administrator.
- *Annual Operating Hours* is the default the number of hours per annum that the upgraded lighting system is expected to operate for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, or another value approved by the Scheme Administrator.
- *CM* is the control multiplier. If the lamp is connected to a control system, the factor for the control multiplier shall be applied for the relevant End-User Equipment or activity as in **Table 10** of Schedule A to this Rule, otherwise CM = 1.0.

*AM* is the air-conditioning multiplier. If the lamp is installed in an air-conditioned space, a multiplier of 1.3 shall be applied, otherwise AM = 1.0.

## 9.5 High Efficiency Motor Energy Savings Formula

**Note:** This default Deemed Energy Savings Method is for Recognised Energy Savings Activities that only involve Energy Savings attributable to the sale or installation of one or more High Efficiency Motors.

This method can not be used in conjunction with the Project Impact Assessment or the Metered Baseline Method. As outlined in the Act, Energy Savings Certificates cannot be created for the same activity more than once. For example, if an End-User Equipment is the subject of a Recognised Energy Savings Activity under the Metered Baseline Method, which results in Energy Savings due to the installation of a High Efficiency Motor, Energy Savings Certificates can only be calculated using the Metered Baseline Method.

The Number of Certificates may be calculated using **Equation 10** and **Equation 11**, provided that the motor is a High Efficiency Motor.

#### **Equation 10**

Number of Certificates = Energy Savings x Certificate Conversion Factor

Where:

- *Number of Certificates* is in t CO<sub>2</sub>-e
- *Energy Savings* is in MWh, and is calculated using **Equation 11**

#### **Equation 11**

Energy Savings =  $P \times LUF \times DEI \times t \times 8766 \div 1000$

Where:

- *P* is the rated output of the High Efficiency Motor (kW)
- *LUF* is the combined load and utilisation factors (including confidence factors) for the relevant High Efficiency Motor as in **Table 12** or **Table 13** of Schedule A to this Rule
- *DEI* is the default efficiency improvement (as a fraction, not as a percentage) for the relevant High Efficiency Motor as in **Table 11** of Schedule A to this Rule
- *t* is the lifetime of the High Efficiency Motor (years) as set out in **Table 14** for the corresponding Rated Output of the High Efficiency Motor.

## **9.6 Power Factor Correction Energy Savings Formula**

**Note:** This default Deemed Energy Savings Method is for Recognised Energy Savings Activities that only involve Energy Savings attributable to the reduced losses from the installation of Power Factor Correction (PFC) equipment.

The Electricity Service and Installation Rules of NSW require the power factor of a site to be a minimum of 0.9 lagging. As such, certificates can be generated only by the implementation of PFC which increases the power factor of a site above 0.9 to a maximum of 0.98.

The Number of Certificates created through the implementation of power factor correction at a site may be calculated using **Equation 12** and **Equation 13**.

### Equation 12

Number of Certificates = Energy Savings x Certificate Conversion Factor

Where:

- *Number of Certificates* is in t CO<sub>2</sub>-e
- *Energy Savings* are the savings in MWh occurring over the default lifetime of the PFC equipment calculated using **Equation 13**

### Equation 13

Energy Savings = 0.1205 x [1.2346 – (1/Power Factor after installation of PFC capacitors<sup>2</sup>) – 0.0042] x Rating of Installed PFC Capacitors x Default Lifetime

Where:

- *Energy Savings* are the lifetime energy savings in MWh
- *Rating of Installed PFC Capacitors* is in kVAr and is rating of capacitors (PFC) installed to improve the power factor of the Site from 0.9 up to a maximum of 0.98 provided PFC is:
  - Not being installed as part of a mandatory program or installation
  - A central or global based PFC installation
  - A new installation
  - Installed on the low voltage distribution network
  - Not a replacement of old equipment
- *Default lifetime* of equipment is 10 years
- *Power Factor after installation of PFC capacitors* is the calculated power factor based on the measured maximum demand of the installation (kW) and the reactive power still required to bring the power factor of the installation to unity after installation of the PFC capacitors.

**Note:** The Default Lifetime for which Energy Savings may be claimed commences from the date the PFC equipment is installed. For example, where an application concerning a PFC installation is lodged 2 years after the PFC equipment was installed, only 8 years of Energy Savings may be claimed.

## 10 Definitions and Interpretation

10.1 In this Rule:

**“Accredited Certificate Provider”** means a person accredited to create Energy Savings Certificates under clause 5 of this Rule.

**“Act”** means the *Electricity Supply Act 1995*.

**“Approved Corresponding Scheme”** means an Approved Corresponding Scheme as defined in section 127 of the Act.

“**AS/NZS 1680**” means the Standards set out in the most recent published version of the *Australian Standard 1680 - Interior and workplace lighting* series, as amended from time to time.

“**AS/NZS 1359.5-2004**” means the Standard set out in the most recent published version of the *Australian Standard 1359 - Rotating electrical machines—General requirements, Part 5 - Three-phase cage induction motors—High efficiency and minimum energy performance standards requirements*, as amended from time to time.

“**Ballast EEI**” means the ballast energy efficiency index as defined in AS/NZS 4783.2

“**CCFL**” means a cold cathode compact fluorescent lamp.

“**Certificate Conversion Factor**” is defined in section 130 of the Act.

“**CFL**” means compact fluorescent lamp.

“**CFLi**” means a compact fluorescent lamp with integral ballast.

“**CFLn**” means a compact fluorescent lamp with non-integral ballast.

“**CMH**” means a ceramic metal halide.

“**Common Areas**” means:

- (a) for buildings owned under strata title, the common property as defined in either the NSW Strata Schemes (Freehold Development) Act 1973, or NSW Strata Schemes (Leasehold Development) Act 1986; or
- (b) for buildings not owned under strata title (e.g. under company title), the non-residential property of class 2 buildings.

“**Control Gear**” means the lighting ballast or transformer.

“**Control System**” means a system for controlling the light output of a Luminaire, including:

- (a) occupancy sensor;
- (b) daylight-linked control;
- (c) programmable dimming; or
- (d) manual dimming.

“**Daylight-Linked Control**” means Luminaire light output varied automatically by a photoelectric cell to compensate for the availability of daylight. Luminaire must be located close to a significant source of daylight.

“**Default Load Utilisation Factor**” is a composite of a deemed load factor and a deemed utilisation factor for HEMs, as set out in Table 12 or Table 13 of this Rule.

“**Distribution System**” means a “distribution system” (as that term is defined in the National Electricity Law) in respect of which a person is registered as a “Network Service Provider” under the National Electricity Law.

**“Downward light”** means the light output (measured in lumens) emitted in the downwards direction; i.e. this is equivalent to the light output from a Lamp or Luminaire when installed flush with a ceiling.

**“DSF”** means Default Savings Factor, as per clause 9.3 of this Rule.

**“EEI”** means the ballast energy efficiency index as defined in AS/NZS 4783.2.

**“ELV”** means extra low voltage, typically not exceeding 50 V AC.

**“End-User Equipment”** means electricity consuming equipment, processes, or systems, including the equipment directly consuming electricity, and other equipment that causes, controls or influences the consumption of electricity, and includes (in the context of clause 8.8) a New NABERS Building.

**“Energy Savings”** means the amount of electricity consumption reduction arising from the undertaking of a Recognised Energy Savings Activity as calculated by the approved calculation method in clauses 7, 8 or 9 of this Rule.

**“Energy Savings Certificate”** is a transferable Certificate under part 9 of the Act, which is created in accordance with this Rule.

**“Energy Star Rating”** means an Energy Star Rating as defined in:

- (a) the standard set out in the most recent published version of the *Australian Standard AS/NZS 4474.2-2009* for refrigerators and freezers;
- (b) the standard set out in the most recent published version of the *Australian Standard AS/NZS2040.2-2005* for clothes washers; or
- (c) the standard set out in the most recent published version of the *Australian Standard AS/NZS2007.2-2005* for dishwashers.

**“Existing NABERS Building”** means an NABERS Building which was first occupied prior to 1 July 2009.

**“Group”** in the context of Table 8 in Schedule A of this Rule, means a class of refrigerator or freezer as defined in AS/NZS 4474.1-2007.

**“High Efficiency Motor”** (HEM) is an electric motor meeting the high efficiency requirements of AS/NZS 1359.5 (0.73 to <185kW).

**“HPS”** means a high pressure sodium lamp.

**“Implementation Date”** means the date on which the Energy Savings from the Recognised Energy Savings Activity commences or occurs. In the case of a single Recognised Energy Savings Activity that involves multiple End-User Equipment or occurs across multiple Sites, it means the date on which the Energy Savings resulting from the first End-User Equipment at the first Site commences or the Energy Savings at the first Site occurs. And in relation to any particular End-User Equipment forming part of a Recognised Energy Savings Activity where the Number of Certificates is calculated using the Deemed Energy Savings Method, the following date (as relevant):

- (a) in the case of an Installation Discount Factor of 1.0, the date on which the End-User Equipment was installed;

- (b) in the case of an Installation Discount Factor of less than 1.0, the date on which the End-User Equipment is sold to or otherwise received by an end-user who intends to install it or ensure that it is installed.

“**IPD**” means the illumination power density as defined in the Building Code of Australia part J6.

“**Lamp**” means an artificial source of visible light.

“**Lamp Life**” means the lifetime of the lamp, expressed in hours, as determined by testing using a method approved by the Scheme Administrator.

“**LCP**” means lamp circuit power. The power drawn by a single lamp and its associated Control Gear. Control Gear losses are pro-rata if the control gear supplies multiple lamps.

“**LED**” means light emitting diode.

“**Lighting for roads and public spaces**” means lighting covered by *AS/NZS 1158: Lighting for roads and public spaces*.

“**Lighting Upgrade**” means the replacement of existing general lighting End-User Equipment with new general lighting End-User Equipment that consumes less electricity, or the modification of existing general lighting End-User Equipment resulting in a reduction in the consumption of electricity compared to what would have otherwise been consumed.

“**LUF**” means default Load Utilisation Factor

“**Lumen maintenance**” means the ratio of maintained light output (measured after 2000 hours of operation) to initial light output (measured after 100 hours of operation). Note that in the case of replacements for 50W ELV halogen reflector lamps, light output refers only to Downward Light.

“**Luminaire**” means the apparatus which distributes, filters or transforms the light transmitted from a light source, including lamp(s), control gear and all components necessary for fixing and protecting the lamps.

“**Luminous Flux**” means the light power emitted by a source, as defined by the International Commission on Illumination (CIE).

“**Manual Dimming**” means Luminaire light output controlled by a knob, slider or other mechanism or where pre-selected light levels (scenes) are manually selected.

“**NABERS**” means the National Australian Built Environment Rating System.

“**NABERS Building**” means a building that can be rated under NABERS, as determined by the NABERS National Administrator.

“**NABERS Rating Holder**” means the person who is the customer in respect of the rating for a NABERS Building as determined by the NABERS National Administrator.

“**New End-User Equipment**” means End-User Equipment where no End-User Equipment of the same type, function, output or service was previously in its place (but does not include additional components installed in the course of modifying existing End-User Equipment), but (in the context of clause 8.8) does not include a New NABERS Building.

“**New NABERS Building**” means an NABERS Building which was first occupied on or after 1 July 2009.

**“Nominal Lamp Power”** means the manufacturer’s rated value for power drawn by a single lamp

**“NLP”** means nominal lamp power.

**“NSW Electricity Network”** means all electricity Transmission Systems and Distribution Systems located in New South Wales.

**“Number of Certificates”** means the number of Energy Savings Certificates to be created by an Accredited Certificate Provider for Energy Savings calculated in accordance with the methods set out in clause 7, 8 or 9 (as the case may be).

**“Occupancy sensor”** means a motion sensor that detects the presence of occupants and switches Luminaires on and off. Each occupancy sensor must control a maximum of 6 Luminaires.

**“Programmable Dimming”** means Luminaire light output controlled by pre-selected light levels (scenes) which are automatically selected according to time of day, photoelectric cell and/or occupancy sensor. Scenes must reduce lighting power.

**“Project Impact Assessment Method”** means the method in clause 7

**“REC”** means a renewable energy certificate as defined in s 97AB of the Act.

**“Recognised Energy Savings Activity”** has the meaning given to that term in clause 5.3 and excludes the activities listed in clause 5.4.

**“Regulations”** means regulations made pursuant to Part 9 of the Act.

**“Scheme Administrator”** is defined in Part 9 Division 11 of the Act.

**“Site”** means all End-User Equipment for which the electricity consumed is:

- a) measured by the same utility meter allocated a National Meter Identifier (NMI) under the National Electricity Rules, or
- b) measured by such other meters or logging devices (including more than one utility meter allocated a NMI under the National Electricity Rules) as are measuring a part of this site, and approved by the Scheme Administrator (whether alone or in combination with the a utility meter referred to in paragraph (a)); or
- c) determined by a methodology approved by the Scheme Administrator.

<p><b>Note:</b> In order to be approved by the Scheme Administrator a methodology should identify energy savings from End User Equipment (EUE) for which there is no direct metering or logging device, but for which an energy supplier issues bills for electricity consumed by that EUE on the basis of verifiable data from a government Regulator or Operator (such the Australian Energy Market Operator). Examples of such EUE include lighting for roads and public spaces and traffic signals.</p>
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**“Statutory Requirement”** means any mandatory legal requirement imposed through a statutory or regulatory instrument of any originating jurisdiction, including but not limited to compliance with BASIX and Building Code of Australia requirements.

**“T5 adaptor kit”** has the meaning given in Table 17 of Schedule A.



**“Transmission System”** is a “transmission system” (as that term is defined in the National Electricity Law) in respect of which a person is registered as a “Network Service Provider” under the National Electricity Law.

**“VRU”** means voltage reduction unit, used to reduce voltage to a lighting system.

- 10.2 Notes in this Rule do not form part of the Rule.
- 10.3 In the event that the Number of Certificates is not a whole number, the Number of Certificates is taken to be rounded down to a whole number.
- 10.4 For the purpose of this Rule the terms and expressions used in this Rule have the same meaning as in the Act or as defined in Part 9 of the Act, except the terms that are expressly defined in this Rule.
- 10.5 A reference to accreditation in respect of a Recognised Energy Savings Activity means accreditation in respect of Energy Savings from that Recognised Energy Savings Activity.
- 10.6 A reference in clause 1.3 to the commencement of this Rule includes a reference to the commencement of any particular provision of this Rule that commences at a different time from the rest of the Rule.

**Schedule A – Default Savings Factors and supporting information**

**Table 1: Replacement of 50W ELV halogen lamp with a 35W ELV halogen lamp**

Activity	Lamp Life of Replacement Lamp (hours)	DSF (MWh)	Sales Discount Factor
Replacement of 50W ELV halogen lamp with 35W ELV halogen lamp	4000	0.07	0.8
	5000	0.09	0.8
	6000	0.11	0.8
	10000	0.17	0.8

**Table 2: Replacement of 50W ELV halogen lamp and magnetic transformer with a 35W ELV halogen lamp and electronic transformer**

Activity	Lamp Life of Replacement Lamp (hours)	DSF (MWh)	Sales Discount Factor
Replacement of 50W ELV halogen lamp and magnetic transformer with 35W ELV halogen lamp and electronic transformer – Residential	4000	0.15	N/A
	5000	0.17	N/A
	6000	0.18	N/A
	10000	0.25	N/A
Replacement of 50W ELV halogen lamp and magnetic transformer with 35W ELV halogen lamp and electronic transformer – Commercial	4000	0.33	N/A
	5000	0.34	N/A
	6000	0.36	N/A
	10000	0.42	N/A

**Table 3: Replacement of 50W ELV halogen lamp and transformer with CFL, CCFL, LED or CMH lamp with lifetime  $\geq$  10,000 hours**

Activity	Total Power Drawn by Replacement Lamp and any Connected Control Gear (Watts)	DSF (MWh)	Sales Discount Factor -
Replacement of a 50W halogen ELV lamp and transformer with a CFL, CCFL, LED or CMH, which has a Lamp Life of $\geq$ 10,000 hours	$\leq$ 10	0.50	N/A
	11 to 15	0.45	N/A
	16 to 20	0.40	N/A
	21 to 25	0.35	N/A
	26 to 30	0.30	N/A

**Table 4: Showerhead replacement <Retracted on 22 December 2011>**


**Table 5: Purchase of a new high efficiency Clothes Washer**

Activity	Energy Star Rating of New Clothes Washer	DSF (MWh)	Sales Discount Factor
Purchase of a new high efficiency Top Loader Clothes Washer	3.0	0.8	1.0
	3.5	1.2	1.0
	4.0	1.5	1.0
	4.5	1.8	1.0
	5.0	2.0	1.0
	5.5	2.2	1.0
	≥ 6.0	2.4	1.0
Purchase of a new high efficiency Front Loader Clothes Washer	4.5	1.9	1.0
	5.0	2.1	1.0
	5.5	2.3	1.0
	≥ 6.0	2.4	1.0

**Table 6: Purchase of a new high efficiency Dishwasher**

Activity	Energy Star Rating of New Dishwasher	DSF (MWh)	Sales Discount Factor
Purchase of a new high efficiency Dishwasher with 4 – 7.99 place settings	4.0	0.1	1.0
	4.5	0.2	1.0
	5.0	0.3	1.0
	≥ 5.5	0.4	1.0
Purchase of a new high efficiency Dishwasher with 8 - 11.99 place settings	3.5	0.3	1.0
	4.0	0.5	1.0
	4.5	0.7	1.0
	5.0	0.8	1.0
	≥ 5.5	1.0	1.0
Purchase of a new high efficiency Dishwasher with > 12 place settings	3.5	0.4	1.0
	4.0	0.7	1.0
	4.5	0.9	1.0
	5.0	1.2	1.0
	≥ 5.5	1.3	1.0

**Table 7: Destruction of refrigerator or freezer before 1996**

Activity	Type of Appliance Removed	DSF (MWh)
Permanent removal (for disposal and destruction, with appropriate disposal of refrigerant) of spare refrigerator that is built before 1996, 200 litres or greater in gross volume, in working order and in regular use but not providing the primary refrigeration service of a household.	1-door refrigerator (Group 1, 2 or 3 according to AS/NZS4474.1:2007)	4.5
	2-door refrigerator (Group 4, 5T, 5B or 5S according to AS/NZS4474.1:2007)	6.5
Permanent removal (for disposal and destruction, with appropriate disposal of refrigerant) of spare freezer that is built before 1996, 200 litres or greater in gross volume, in working order and in regular use but not providing the primary refrigeration service of a household.	Chest (Group 6C according to AS/NZS4474.1:2007)	3.3
	Upright (Group 6U or 7 according to AS/NZS4474.1:2007)	5.2
Permanent removal (for disposal and destruction, with appropriate disposal of refrigerant) of Primary operating refrigerator built before 1996, greater than 200 Litres in capacity and replacement with a new high efficiency refrigerator of the equivalent type (1-door or 2-door).	1-door refrigerator	2.2
	2-door refrigerator	3.4
Permanent removal (for disposal and destruction, with appropriate disposal of refrigerant) of Primary operating freezer built before 1996, and replacement with a new high efficiency freezer of the equivalent type (chest or upright).	Chest	1.4
	Upright	3.0

**Table 8a: Purchase of a new high efficiency 1 door refrigerator**

Activity	Energy Star Rating of new 1 door refrigerator	Capacity less than 300 litres	Capacity 300 litres or more	Sales Discount Factor
		DSF (MWh)	DSF (MWh)	
Purchase of a new high efficiency 1 door refrigerator (Group 1, 2 or 3 according to AS/NZS4474.1:2007)	2.0	0.3	0.3	1.0
	2.5	0.7	0.9	1.0
	3.0	1.1	1.4	1.0
	3.5	1.5	1.8	1.0
	4.0	1.8	2.2	1.0
	4.5	2.0	2.5	1.0
	5.0	2.3	2.8	1.0
	5.5	2.5	3.1	1.0
	6.0	2.7	3.5	1.0

**Table 8b: Purchase of a new high efficiency 2 door refrigerator**

		Capacity less than 300 litres	Capacity 300 litres or more and less than 500 litres	Capacity 500 litres or more	
Activity	Energy Star Rating of new 2 door refrigerator	DSF (MWh)	DSF (MWh)	DSF (MWh)	Sales Discount Factor
Purchase of a new high efficiency 2 door refrigerator (Group 4, 5T, 5B or 5S according to AS/NZS4474.1:2007)	2.5	0.5	0.7	0.9	1.0
	3.0	1.1	1.5	1.9	1.0
	3.5	1.6	2.2	2.8	1.0
	4.0	2.1	2.8	3.5	1.0
	4.5	2.5	3.4	4.2	1.0
	5.0	2.9	3.9	4.8	1.0
	5.5	3.2	4.3	5.4	1.0
	6.0	3.5	4.7	5.8	1.0

**Table 8c: Purchase of new high efficiency chest freezer**

		Capacity less than 300 litres	Capacity 300 litres or more and less than 500 litres	Capacity 500 litres or more	
Activity	Energy Star Rating of new chest freezer	DSF (MWh)	DSF (MWh)	DSF (MWh)	Sales Discount Factor
Purchase of a new high efficiency chest freezer (Group 6C according to AS/NZS4474.1:2007)	3.0	0.4	0.6	0.8	1.0
	3.5	1.0	1.5	1.9	1.0
	4.0	1.6	2.3	2.9	1.0
	4.5	2.1	3.0	3.8	1.0
	5.0	2.5	3.6	4.6	1.0
	5.5	2.9	4.1	5.3	1.0
	6.0	3.2	4.6	5.9	1.0

**Table 8d: Purchase of new high efficiency upright freezer**

		Capacity less than 300 litres	Capacity 300 litres or more	
Activity	Energy Star Rating of new upright freezer	DSF (MWh)	DSF (MWh)	Sales Discount Factor
Purchase of a new high efficiency upright freezer (Group 6U or 7 according to AS/NZS4474.1:2007)	2.5	0.5	0.7	1.0
	3.0	1.3	1.8	1.0
	3.5	1.9	2.7	1.0
	4.0	2.5	3.5	1.0
	4.5	3.0	4.2	1.0
	5.0	3.4	4.8	1.0
	5.5	3.8	5.3	1.0
	6.0	4.2	5.8	1.0

**Table 9: Default LCP for Commercial Lighting Energy Savings Formula**

LCP								
Type of Lamp and Control Gear	LCP (Watts)							
Ballast EEI:	A1	A2	A3	B1	B2	C	D	
Linear fluorescent, circular fluorescent and CFLn	<b>T8 and T12 Lamps</b>	NLP + 2	NLP	NLP + 2	NLP + 6	NLP + 8	NLP + 10	NLP + 12
	<b>T5 Lamps</b>	1.13 x NLP + 2.5	1.08 x NLP + 1.5	1.13 x NLP + 2.5	N/A	N/A	N/A	N/A
	<b>CFLn Lamps</b>	NLP + 3	NLP + 1	NLP + 3	NLP + 5	NLP + 7	NLP + 9	NLP + 11
	Where NLP = nominal lamp power							
CFLi	NLP							
Tungsten halogen (mains voltage)	NLP							
Tungsten halogen (extra low voltage)	Where connected to magnetic transformer, NLP ÷ 80%. Where connected to electronic transformer, NLP ÷ 93%.							
Metal halide with magnetic ballast (reactor type)	1.0456 x NLP + 14							
Metal halide with magnetic ballast (constant wattage type)	1.071 x NLP + 22							
Metal halide with electronic ballast	1.096 x NLP + 0.9							
Mercury vapour with magnetic ballast	1.033 x NLP + 11							
High pressure sodium (HPS) with magnetic ballast	1.051 x NLP + 13							
Traffic signals	From Traffic Light Load Table published by IPART or relevant regulator. Note that, unlike other lamps, an entire traffic signal unit is used as the basis for calculation, rather than individual lamps.							
LED, induction lighting or other Emerging Technology	Proponent shall apply to the Scheme Administrator in advance for LCP value, and supply product specification sheets or laboratory test reports. Control gear losses shall be included in the LCP.							
<p><b>Notes:</b></p> <p>If the EEI is not marked on a magnetic ballast, it is assumed to be C. If the EEI is not marked on an electronic ballast, it is assumed to be A3.</p> <p>Evidence of LCP should take the form of manufacturer specification sheets or independent testing at the discretion of the Scheme Administrator.</p> <p>Different LCP values, to those outlined in this table, can be sought from the Scheme Administrator <u>in advance</u>, accompanied by product specification sheets or test reports.</p>								

**Table 10: Default Operating Factors for Commercial Lighting Energy Savings Formula**

Default Lighting Operating Factors		
Field	Value	Notes
<b>Illumination power density = IPD</b>	Maximum allowable illumination power density for each space, as required by Table J6.2b of the Building Code of Australia.	
<b>Asset Lifetime</b>	<b>If the following are replaced:</b> <ul style="list-style-type: none"> <li>• Luminaire , or</li> <li>• control gear, or</li> <li>• lamp and control gear</li> </ul> Lighting for roads and public spaces and traffic signals: 12 years Other lighting: 10 years	If the replacement lamp can be easily replaced with a higher power lamp, the asset lifetimes of lamp and control gear may be treated separately. The asset lifetime of the lamp is to be calculated according to the provisions for a lamp only replacement.
	<b>If only lamp is replaced or T5 adaptor kit is used</b>	Nominal lamp lifetime ÷ Annual Operating Hours (nominal lamp lifetime is not to exceed 30,000 hours)
<b>Annual Operating Hours</b>	Lighting for roads and public spaces and traffic signals: 4,500 hours p.a. Building lighting (Class 3(b)): as approved by the Scheme Administrator Other Building lighting: 3,000 hours p.a.	If sites have longer annual operating hours, proponent can request a higher value from the Scheme Administrator (in advance).
<b>Control Multiplier = CM</b>	No control system: 1.0 Occupancy sensor: 0.7 Daylight-linked control: 0.7 Programmable dimming: 0.85 Manual dimming: 0.9 VRU: as verified with the Scheme Administrator	Maximum of 2 control multipliers can be used, multiplied together, resulting in minimum product of 0.6.
<b>Air-conditioning Multiplier = AM</b>	1.0 if not air-conditioned, 1.3 if air-conditioned.	

**Table 11: Default Efficiency Improvements for High Efficiency Motors**

Rated output (kW)	DEI by number of Poles			
	2 pole	4 pole	6 pole	8 pole
0.73 to < 2.6	0.033	0.030	0.039	0.047
2.6 to < 9.2	0.021	0.020	0.024	0.027
9.2 to < 41	0.014	0.014	0.016	0.017
41 to < 100	0.010	0.009	0.010	0.010
100 to < 180	0.008	0.007	0.008	0.008

**Table 12: Default Load Utilisation Factor for High Efficiency Motors – Where End-User Equipment Industry and End-use are known**

<b>Load Utilisation Factor</b>	<b>Refrigeration</b>	<b>Pumping</b>	<b>Compressed Air</b>	<b>Fans</b>	<b>Process Drives</b>	<b>Mill / Refining / Mix / Grind</b>	<b>Material Handling/ conveying</b>
Division A Agriculture, Forestry and Fishing	0.14	0.32	0.27	0.28	0.32	0.2	0.2
Division B Mining	0.09	0.36	0.32	0.41	0.32	0.32	0.28
Division C Manufacturing	0.28	0.32	0.27	0.32	0.27	0.24	0.28
Division D Electricity, Gas, Water and Waste Services	0.11	0.32	0.24	0.28	0.28	0.12	0.17
Division E Construction	0.09	0.24	0.15	0.15	0.17	0.14	0.2
Division F Wholesale Trade	0.2	0.14	0.07	0.13	0.13	0.03	0.11
Division G Retail Trade	0.17	0.09	0.07	0.13	0.13	0.03	0.07
Division H Accommodation and Food Services	0.24	0.11	0.04	0.14	0.13	0.09	0.11
Division I Transport, Postal and Warehousing	0.17	0.11	0.08	0.13	0.17	0.03	0.16
Division J Information Media and Telecommunications	0.11	0.09	0.04	0.1	0.11	0.03	0.03
Division K Financial and Insurance Services	0.09	0.05	0.04	0.06	0.06	0.03	0.03
Division L Rental, Hiring and Real Estate Services	0.09	0.05	0.04	0.06	0.06	0.03	0.03
Division M Professional, Scientific and Technical Services	0.17	0.07	0.05	0.08	0.08	0.04	0.03
Division N Administrative and Support Services	0.11	0.05	0.04	0.06	0.04	0.03	0.03
Division O Public Administration and Safety	0.09	0.05	0.04	0.06	0.04	0.03	0.03
Division P Education and Training	0.11	0.05	0.04	0.06	0.04	0.03	0.03
Division Q Health Care and Social Assistance	0.11	0.08	0.11	0.06	0.06	0.03	0.03
Division R Arts and Recreation Services	0.09	0.05	0.04	0.06	0.04	0.03	0.03
Division S Other Services	0.07	0.05	0.04	0.06	0.04	0.03	0.03



**Table 13: Default Load Utilisation Factor for High Efficiency Motors – Where End-User Equipment Industry and End-use are not known**

Rated output (kW)	LUF
0.73 to < 2.6	0.09
2.6 to < 9.2	0.10
9.2 to < 41	0.11
41 to < 100	0.13
100 to < 180	0.15

**Table 14: Asset Life for High Efficiency Motors (t)**

Rated output (kW) of High Efficiency Motor	t (Asset life (years))
0.73 to < 2.6	12
2.6 to < 9.2	15
9.2 to < 41	20
41 to < 100	22
100 to < 180	25

**Table 15: Default Efficiencies**

Application	Device type	Default Efficiency
Electric Space heating	Resistance	100%
	Reverse cycle	280%
Electric Cooking	Hotplate	60%
	Oven	50%
Electric Industrial heat	Boiler	90%
Natural gas and LPG Water heating	Instantaneous	75%
	Storage	60%
Natural gas and LPG Space heating	Flued heater	70%
Wood space heating	Closed combustion	50%
	Open fire	20%
Natural gas and LPG Cooking	Burners	50%
	Oven	45%
Natural gas and LPG Industrial heat	Boiler	80%
Bagasse Industrial heat	Boiler	60%

**Table 16: Discount Factors for calculating forward creation of Certificates under the Project Impact Assessment Method**

<b>Year</b>	<b>Discount Factor</b>
1	1.00
2	0.80
3	0.60
4	0.40
5	0.20

**Table 17: Other Equipment Classes for Lighting Upgrades**

<b>Equipment Class</b>	<b>Definition</b>
T5 adaptor kit	Any equipment that enables a T8 or T12 Luminaire to accommodate or provide physical support to a T5 Lamp or Luminaire.
Retrofit Luminaire - LED Linear Lamp	A T5, T8 or T12 Luminaire that has been retrofitted with an LED linear Lamp in place of the linear fluorescent Lamp. This cannot involve modification to the wiring of the Luminaire other than removal, replacement or modification of the starter.