SCHEDULE 1

Energy Savings Scheme Rule of 2009

The Hon Don Harwin, MLC
Minister for Energy and Utilities

Simplified outline

The following is a simplified outline of this Rule:

- clauses 1-4 set out the commencement of the Rule, the objects of the Rule, the application of the Rule, and status and operation of the Rule.
- clause 5 sets out the definitions of Energy Saver and Recognised Energy Saving Activity, and eligibility for accreditation as an Accredited Certificate Provider.
- clause 6 sets out the conditions on the creation of Energy Savings Certificates under the Rule.
- clause 7 sets out the calculation method for determining Energy Savings under the Project Impact Assessment Method.
- clause 7A sets out the calculation method for determining Energy Savings under the Project Impact Assessment with Measurement and Verification Method.
- clause 8 sets out the calculation method for determining Energy Savings under the Metered Baseline Method using one of the following sub-methods:
    - Baseline per unit of output (clause 8.5)
    - Baseline unaffected by output (clause 8.6)
    - Normalised baseline (clause 8.7)
    - NABERS baseline (clause 8.8)
    - Aggregated Metered Baseline(clause 8.9)
- clause 9 sets out the calculation method for determining Energy Savings under the Deemed Energy Savings Method using one of the following sub-methods:
    - Sale of New Appliances (clause 9.3)
    - Commercial Lighting Energy Savings Formula (clause 9.4)
    - Public Lighting Energy Savings Formula (clause 9.4A)
    - High Efficiency Motor Energy Savings Formula (clause 9.5)
    - Power Factor Correction Energy Savings Formula (clause 9.6)
    - Removal of Old Appliances (clause 9.7)
    - Home Energy Efficiency Retrofits (clause 9.8)

    - Installation of High Efficiency Appliances for Businesses (clause 9.9)
- clause 10 sets out the definitions and interpretation provisions.
- clause 11 sets out savings and transitional arrangements relating to the amendment of this Rule.
- Schedule A sets out Default Factors and Classifications.
- Schedule B sets out Activity Definitions for the Sale of New Appliances (clause 9.3)
- Schedule C sets out Activity Definitions for the Removal of Old Appliances (clause 9.7)
- Schedule D sets out Activity Definitions for General Activities for Home Energy Efficiency Retrofits (clause 9.8)
- Schedule E sets out Activity Definitions for Low Cost Activities for Home Energy Efficiency Retrofits (clause 9.8)
- Schedule F sets out Activity Definitions for the Installation of High Efficiency Appliances for Businesses (clause 9.9)

1 Name and commencement

1.1 This Rule is the *Energy Savings Scheme Rule of 2009* and commences on 28 April 2017, with the following exceptions:

(a) Activities D6, D7, D8 and D9 (Insulation) of Schedule D commence on a date notified by the Minister responsible for the Act by notice published in the NSW Government Gazette;

(b) Clauses 5.4(k), 5.4(l) and 5.9 commence on a date notified by the Minister responsible for the Act by notice published in the NSW Government Gazette.

> **Note:** The provisions referred to in clause 1.1(b) may commence on or after an Approved Corresponding Scheme is in operation in the Australian Capital Territory.

2 Objects of the Rule

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

3 Application of the Rule

3.1 This Rule applies to Accredited Certificate Providers accredited to create Energy Savings Certificates in respect of Recognised Energy Saving Activities in accordance with Part 9 Division 8 of the Act, the Regulations and this Rule.

3.2 For the avoidance of doubt, unless expressly provided otherwise, this Rule applies to the calculation of Energy Savings used to create Energy Savings Certificates for which an application for registration is made on or after 28 April 2017.

4 Status and Operation of the Rule

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

5 Definitions of Energy Saver and Recognised Energy Saving Activity, and eligibility for accreditation

> **Note:** Other definitions of terms used in this document are set out at clause 10.

5.1 (deleted)

Energy Saver

5.2 The Energy Saver with respect to Energy Savings arising from a Recognised Energy Saving Activity, as calculated according to a calculation method in this Rule, is either:

(a) the person defined as the Energy Saver in the relevant calculation method, provided that, as at the relevant Implementation Date, that person has not nominated another person to be the Energy Saver for those Energy Savings in accordance with clause 5.2 (b); or

(b) the person nominated to be the Energy Saver by the person in clause 5.2 (a), provided that:

(i) the nomination has been made in a form and manner approved by the Scheme Administrator; and

(ii) as at the relevant Implementation Date, another person has not been nominated as the Energy Saver with respect to the same Energy Savings.

Recognised Energy Saving Activity

5.3 A Recognised Energy Saving Activity is any activity that meets all of the following criteria:

(a) it increases the efficiency of energy consumption, by:

(i) modifying End-User Equipment or the usage of End-User Equipment (including by installing additional components) with the result that there is a reduction in the consumption of energy compared to what would have otherwise been consumed;

(ii) replacing End-User Equipment with other End-User Equipment that consumes less energy, subject to clause 5.3A;

(iii) installing New End-User Equipment that consumes less energy than other comparable End-User Equipment of the same type, function, output or service, subject to clause 5.3B;or

(iv) removing End-User Equipment with the result that there is a reduction in the consumption of energy compared to what would have otherwise been consumed, subject to clause 5.3A; and

(b) it does not result in a reduction in energy consumption by reducing production or service levels (including safety levels); and

(c) it is implemented at a Site or Sites in an ESS Jurisdiction; and

(d) it is not unlawful to carry out the activity in that ESS Jurisdiction as at the Implementation Date; and

(e) it increases the efficiency of the energy consumption by:

(i) increasing the efficiency of electricity consumption;

(ii) increasing the efficiency of consumption of a Gas, where the Gas is combusted for stationary energy;

(iii) fuel switching from electricity to Gas, or Gas to electricity; or

(iv) generating electricity where the electricity is used to provide equivalent goods or services, with the result that there is an overall reduction in the consumption of energy compared to what would have otherwise been consumed, subject to clause 5.4(i).

5.3A The replacement or removal of End-User Equipment only constitutes a Recognised Energy Saving Activity if the Accredited Certificate Provider:

(a) does not refurbish, re-use or resell that End-User Equipment; and

(b) if the Implementation Date is on or after 15 May 2016, disposes of that End-User Equipment appropriately, such that:

(i) if the postcode of the Implementation is in a Metropolitan Levy Area listed in Table A25 of Schedule A, any lighting End-User Equipment containing mercury must be recycled in accordance with the recycling requirements of a Product Stewardship Scheme; and

(ii) recycling evidence is obtained for any refrigerants being disposed of, such as a tax invoice or a recycling receipt, or any other evidence acceptable to the Scheme Administrator.

Note: any refrigerants in the End-User Equipment must be disposed of in a manner that is compliant with the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 (Cth).*

5.3B The installation of New End-User Equipment only constitutes a Recognised Energy Saving Activity if the Scheme Administrator is satisfied that the efficiency of energy consumption of the New End-User Equipment is greater than the average energy efficiency of End-User Equipment that provides the same type, function, output or service. For these purposes, the energy efficiency of End-User Equipment may be estimated by reference to:

(a) baseline efficiency for that class of End-User Equipment which may, from time to time, be Published by the Scheme Administrator;

(b) sales-weighted market data for that class of End-User Equipment collected from installers, retailers, distributors or manufacturers; or

(c) product-weighted averages of Products registered as complying with an AS/NZS that defines how energy efficiency is to be measured for that class of End-User Equipment.

Activities which are not Recognised Energy Saving Activities

5.4 Recognised Energy Saving Activities do not include any of the following:

(a) the installation of End-User Equipment defined as a:

(i) T5 Adaptor kit in Table A9.3 of Schedule A; or

(ii) Retrofit Luminaire-LED Linear Lamp in Table A9.3 of Schedule A;

(b) an activity undertaken in order to comply with any mandatory legal requirement imposed through a statutory or regulatory instrument of any jurisdiction, including, but not limited to, compliance with BASIX and BCA requirements;

(c) an activity that is a Standard Control Service or Prescribed Transmission Service undertaken by a Network Service Provider in accordance with the National Electricity Rules under the *National Electricity (NSW) Law*, except if the activity is a Non-Network Option;

Note: Clause 5.4(c) does not prohibit the calculation of Energy Savings under the Public Lighting Energy Savings Formula in clause 9.4A.

(d) the supply of electricity by an Electricity Retailer, or the purchase of electricity from an Electricity Retailer by a customer, from the Electricity Network, under a representation by the Electricity Retailer 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. This includes but is not limited to purchases of GreenPower;

Note: This excludes activities involving the purchase of electricity under "GreenPower" accredited or similar schemes that are eligible to create certificates or Renewable Energy Certificates at the point of generation.

(e) an activity that results in a reduction in the consumption of energy by reducing production or service levels (including safety levels);

Note: Reduced energy consumption not directly due to specific actions to improve efficiency does not qualify as a Recognised Energy Saving 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 energy do not qualify as a Recognised Energy Saving Activity.

Reducing energy 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 Saving Activity and is not excluded by this clause.

(f) an activity that reduces energy consumption by increasing consumption of non-renewable fuels (other than Gas) to provide equivalent goods or services;

(g) an activity that is eligible to create tradeable certificates under the *Renewable Energy (Electricity) Act 2000 (Cth)*;

(h) an activity that increases the efficiency of Gas consumption and results in flaring of Gas;

(i) an activity that reduces energy consumption by generating electricity from any source where:

(i) the generated electricity is exported to the Electricity Network; or

(ii) the generating system has a nameplate rating of 5 MW or higher;

(j) a fuel switching activity under clause 7A, clause 8.5, clause 8.6 or clause 8.7 that leads to a net increase in greenhouse gas emissions, where greenhouse gas emissions are calculated using Electricity Savings, Gas Savings, and full fuel cycle emissions factors and equations from the current version of the National Greenhouse Accounts Factors.

(k) an activity implemented at a Site in the Australian Capital Territory where the Site is required to report energy consumption under any of the following:

(i) the *National Greenhouse and Energy Reporting Act 2007* (*Cth*); or

(ii) the Australian Government's Energy Efficiency in Government Operations Policy; or

(iii) the Carbon Neutral ACT Government Framework.

(l) if the Site is in the Australian Capital Territory, any Lighting Upgrade (as referred to in clause 9.4) that is undertaken as part of a development or refurbishment requiring development approval under the *Planning and Development Act 2007* (ACT).

5.5 For the purposes of clause 5.3, a Recognised Energy Saving Activity may:

(a) involve multiple Activity Definitions or items of End-User Equipment; and

(b) occur at a single Site or across multiple Sites where each Implementation has an Implementation Date; and

(c) be delivered by Implementations with the same or different Implementation Dates.

Eligibility for accreditation

5.6 A person is only eligible for accreditation as an Accredited Certificate Provider if the person is a suitable person to be so accredited.

5.7 In considering the suitability of a person to be accredited as an Accredited Certificate Provider, the Scheme Administrator may take into account such matters as it thinks relevant, including:

(a) previous commercial dealings of the person and its associates; and

(b) the standard of honesty and integrity shown in previous commercial dealings of the person and its associates.

5.8 In clause 5.7, "associate", in relation to a person, has the same meaning it would have under Division 2 of Part 1.2 of the *Corporations Act 2001 (Cth)* if only sections 10, 11, 12(2), 12(5), 15 and 16(1) formed part of that Division.

5.9 For Implementations at any Site located in the Australian Capital Territory, the Accredited Certificate Provider must be an Approved Abatement Provider approved by the Energy Efficiency Improvement Scheme Administrator as at the Implementation Date.

6 Creation of Energy Savings Certificates

Note: Only Accredited Certificate Providers may create Energy Savings Certificates (section 134 of the Act).

6.1 (deleted)

6.2 An Accredited Certificate Provider may only create Energy Savings Certificates in respect of the Energy Savings for an Implementation where:

(a) the Accredited Certificate Provider is the Energy Saver for those Energy Savings as at the Implementation Date; and

(b) the Accredited Certificate Provider's Accreditation Date for that Recognised Energy Saving Activity is prior to the Implementation Date.

6.3 (deleted)

6.4 An Accredited Certificate Provider may not create Energy Savings Certificates in respect of any Energy Savings for which Energy Savings Certificates have already been created.

6.5 An Accredited Certificate Provider may only create a certain Number of Certificates in respect of the Energy Savings arising from a Recognised Energy Saving Activity, calculated in accordance with **Equation 1**.

Equation 1

$$\textit{Number of Certificates} = \sum_{\text{Implementations}} \textit{Electricity Savings} \times \textit{Electricity Certificate Conversion Factor} + \textit{Gas Savings} \times \textit{Gas Certificate Conversion Factor}$$

Where:

- *Number of Certificates* is rounded down to a whole number of Energy Savings Certificates;
- the summation is across the Energy Savings arising from one or more Implementations of the Recognised Energy Saving Activity;
- *Electricity Savings and Gas Savings* are the Electricity Savings and Gas Savings respectively, in MWh, arising from each Implementation as calculated according to (as relevant):

  - the Project Impact Assessment Method (clause 7);

  - the Project Impact Assessment with Measurement and Verification Method (clause 7A);

  - the Metered Baseline Method (clause 8); or

  - the Deemed Energy Savings Method (clause 9).
- *Electricity Certificate Conversion Factor* is 1.06, as specified in section 130(1) of the Act, or as amended by Regulation.
- *Gas Certificate Conversion Factor* is 0.39, as specified in section 130(1) of the Act, or as amended by Regulation.

Note: For fuel switching activities, either Gas Savings or Electricity Savings may be negative. Energy Savings Certificates may only be created where the result of Equation 1 is a positive number.

6.5A The method used to calculate the Energy Savings arising from a Recognised Energy Saving Activity must:

(a) be approved by the Scheme Administrator before any Energy Savings Certificates are created using that method. For the purposes of such an approval, the Scheme Administrator may impose additional conditions in respect of the use or application of that method; and

(b) produce a result reasonably reflecting, to the satisfaction of the Scheme Administrator, the Energy Savings arising from that Implementation.

6.5B Energy Savings may be totalled over more than one Implementations of the same Recognised Energy Saving Activity to create one or more Energy Savings Certificates.

6.5C Any Implementation that meets all of the Eligibility Requirements, Equipment Requirements and Implementation Requirements for the relevant Recognised Energy Saving Activity on the Implementation Date, is deemed to meet the requirements of this Rule for Energy Savings Certificate creation, unless otherwise advised in writing by the Scheme Administrator.

6.6 (deleted)

6.7 (deleted)

6.8 For the purpose of applying to register the creation of Energy Savings Certificates for one or more Implementations, an Accredited Certificate Provider must provide the following data to the Scheme Administrator in a manner and form determined by the Scheme Administrator:

(a) the Accredited Certificate Provider identifier;

(b) the Recognised Energy Saving Activity identifier;

(c) the Address of the Site or Sites where the Implementation(s) took place;

(d) any other identifiers required to identify the Site or Sites where the Implementation(s) took place;

(e) the Implementation Date of the Implementation(s);

(f) the Electricity Savings, Regional Network Factor applied and Gas Savings for each Implementation, and the estimated percentage of each attributable to fuel switching from electricity to Gas, and Gas to electricity;

(g) the Australian Business Number of the entity utilising the End-Use Service, where applicable;

(h) the cost to the person who pays for the goods or services that comprise the Implementation, excluding GST;

(i) the type of the End-Use Service for which energy was saved in accordance with Table A17 of Schedule A;

(j) the Business Classification of the entity utilising the End-Use Service in accordance with Table A18 of Schedule A;

(k) the Method or sub-method and Activity Definition, where relevant, used to calculate the Energy Savings;

(l) the Electricity Savings and Gas Savings calculated under each Activity Definition that is used for the Implementation, if the Energy Savings are calculated under clause 9.8 or 9.9 of the Deemed Energy Savings Method; and

(m) any other data providing evidence of Energy Savings from the Implementation as Published, from time to time, by the Scheme Administrator.

6.9 Before registering the creation of an Energy Savings Certificate, the Scheme Administrator may review the data provided in accordance with clause 6.8 to ensure that the calculation of the Energy Savings used to create the Energy Savings Certificate is based on complete data.

Note: An Energy Savings Certificate has no force or effect until the creation of the certificate is registered by the Scheme Administrator (section 143 of the Act).

7 Project Impact Assessment Method

Note: The Project Impact Assessment Method may only be used to "forward create" (under clause 7.4.4) or "top-up" (under clause 7.4.6) Energy Savings Certificates in relation to Implementations with an Implementation Date on or before 30 October 2015.

The Project Impact Assessment Method may only be used for "annual creation" (using Equation 2) to create Energy Savings Certificates in relation to Implementations with an Implementation Date on or before 15 April 2016.

7.1 Energy Savings under the Project Impact Assessment Method

(a) An Accredited Certificate Provider may only use the Project Impact Assessment Method to calculate the Energy Savings of Implementations if the Accredited Certificate Provider is authorised, on or before 30 September 2014, to use clause 7 to calculate those Energy Savings under its accreditation conditions.

(b) (deleted)

(c) Energy Savings calculated in accordance with clause 7.4.4 or 7.4.6, may only be used to create Energy Savings Certificates where those Energy Savings are for Implementations with an Implementation Date on or before 30 October 2015.

(d) Using the Project Impact Assessment Method, the Energy Savings of an Implementation may be calculated using **Equation 2**, where:

(i) those Energy Savings are for Implementations with an Implementation Date on or before 15 April 2016; and

(ii) those Energy Savings are for a maximum period of 10 years after the Implementation Date.

Equation 2

Electricity 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 Saving Activity, different to what it otherwise would have been, and is to be calculated in accordance with the engineering assessment in clause 7.2; and
- *Confidence Factor* is the number determined in accordance with clause 7.3 (depending on the type of engineering assessment performed).

7.2 Engineering assessment of reduced electricity consumption

Accredited Certificate Providers using the Project Impact Assessment Method in respect of any Recognised Energy Saving Activity must calculate the reduced electricity consumption of only the equipment, process, or system that is the subject of the Recognised Energy Saving 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 Saving 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; and

(c) that takes account of:

(i) the consumption of the existing equipment, systems or processes, or for the purposes of clause 5.3B, the average energy efficiency of comparable New End-User Equipment as described in that clause;

(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 factors or constants used in a Deemed Energy Savings Method under clause 9, 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 factors or constants used in a Deemed Energy Savings Method set out in 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 Energy Savings able to be brought forward using the Project Impact Assessment Method

Note: Section 131 of the Act provides that the Rules may specify when Energy Savings arising from a Recognised Energy Saving Activity are considered to have occurred.

Therefore, under the Rule, Accredited Certificate Providers may elect to 'forward create' Energy Savings Certificates by deeming Energy Savings which will cumulatively occur for a future period, to have occurred on the Implementation Date or a later date per the requirements of clause 7.4.3. However, a discount will be applied to the calculation of those Energy Savings.

7.4.1 For the purposes of section 131 of the Act, an Accredited Certificate Provider may elect for future Energy Savings for an Implementation to be deemed to have occurred on a date determined in accordance with clause 7.4.3.

7.4.2 The time period of future Energy Savings for an Implementation which may be deemed to have occurred on a date determined by clause 7.4.3, must be set such that:

(a) the period does not exceed 5 years;

(b) the sum of all time periods of future Energy Savings for an Implementation does not exceed the life of the Implementation (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;

(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, usage and typical frequency of replacement assuming that the use of the Site and End-User Equipment remains the same; and

(c) the end date of the period is not later than 10 years after the Implementation Date.

7.4.3 If an Accredited Certificate Provider makes the election in clause 7.4.1, the date on which the Energy Savings for that Implementation are deemed to occur is the later of:

(a) the Implementation Date; and

(b) in respect of an Implementation prior to 1 July 2014, 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 Saving Activity have actually occurred.

7.4.4 The amount of Energy Savings deemed to occur on the date determined by clause 7.4.3 must be calculated in accordance with the method set out in **Equation 3.**

Equation 3

$$Electricity\ Savings = Reduced\ Electricity\ Consumption_n \times Confidence\ Factor \times Decay\ Factor_n$$

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 Saving 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 according to clause 7.3;
- $Decay\ Factor_n$ is set out in **Table A16** of Schedule A for year *n*; and
- *n* is the year from 1 (the first year of Energy Savings claimed) to the number of years in the time period determined by clause 7.4.2.

Note: At the end of the period for which Energy Savings Certificates were 'forward created', Accredited Certificate Providers can apply to create Energy Savings Certificates for the Energy Savings which were previously discounted.

7.4.5 For the purposes of section 131 of the Act, Energy Savings which are used to create Energy Savings Certificates in accordance with clause 7.4.6 are taken to occur on the date on which the time period as determined in clause 7.4.2 ends.

7.4.6 At the end of the time period determined by clause 7.4.2, the Accredited Certificate Provider may create Energy Savings Certificates using Energy Savings for the relevant Implementation equal to:

(a) the Energy Savings for each year in the time period other than the first year as calculated using **Equation 2**; less

(b) the Energy Savings for each year in the time period other than the first year as calculated for the relevant year in **Equation 3**,

provided the Accredited Certificate Provider establishes, to the satisfaction of the Scheme Administrator, that the Energy Savings calculated in clause 7.4.6(a) have actually occurred.

7.4.7 (deleted)

7.5 The Implementation Date is the date that the Implementation commenced normal operations.

7.6 The Energy Saver is the Purchaser.

7.7 (deleted)

7A Project Impact Assessment with Measurement and Verification Method

7A.1 Equations to calculate Energy Savings

Using the Project Impact Assessment with Measurement and Verification Method, the Energy Savings for an Implementation may be calculated using either:

(a) **Equations 7A.1 and 7A.2 for forward creation for a single Site model,** for Energy Savings calculated from a Baseline Energy Model and Operating Energy Model established to model performance before and after the Implementation; or

(b) **Equations 7A.3 and 7A.4 for annual creation or top-up,** for Energy Savings calculated from actual measurements taken after Implementation compared with expected performance of a Baseline Energy Model under the same conditions; or

(c) **Equations 7A.1 and 7A.5 for creation based on a multiple Site model**, for Energy Savings calculated from a Baseline Energy Model and Operating Energy Model using a Sampling Method.

7A.2 Acceptable energy model types

(a) Baseline Energy Models and Operating Energy Models must be established in accordance with the following criteria:

(i) An Estimate of the Mean that is based on measurements of energy consumption, Independent Variables and Site Constants, where relevant, specifies a Measurement Period, and where the Coefficient of Variation of the energy consumption over the Measurement Period is less than 15%; or

(ii) Regression Analysis that is based on measurements of energy consumption, Independent Variables and Site Constants, specifies a Measurement Period, and where the number of independent observations for each Site when calculated in accordance with clause 7A.6 is at least six times the Number of Model Parameters in the energy model; or

(iii) Computer Simulation that uses a commercially available software package approved by the Scheme Administrator for use in modelling the relevant type of End-User Equipment, and that is calibrated against measurements taken from the actual End-User Equipment being simulated to meet any requirements as Published by the Scheme Administrator.

(b) Baseline Energy Models and Operating Energy Models may be developed for:

(i) a single Site based on measurements taken from that Site; or

(ii) multiple Sites based on measurements taken from Sample Sites, using a Sampling Method in accordance with clause 7A.20.

7A.3 Baseline Energy Model

A Baseline Energy Model must estimate either electricity consumption or Gas consumption in the absence of the Implementation and must:

(a) be dependent on Independent Variables and Site Constants, where relevant, that are established by measurements taken under normal operating conditions in accordance with clause 7A.5 of this Rule;

(b) if the model is for New End-User Equipment, be established based on Independent Variables and Site Constants that incorporate the average energy performance of the same type of equipment in accordance with clause 5.3B of this Rule;

(c) have an Effective Range determined in accordance with clause 7A.8 of this Rule;

(d) if using **Equation 7A.1**, estimate annual electricity consumption or Gas consumption based on a Normal Year established in accordance with clause 7A.7 of this Rule;

(e) if using **Equation 7A.3**:

(i) estimate annual electricity consumption or Gas consumption based on measurements of Independent Variables and Site Constants; and

(ii) use a baseline Measurement Period that has an end date that is no more than 10 years earlier than the end date of the Measurement Period that Energy Savings are being claimed for;

(f) be deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.4 Operating Energy Model

An Operating Energy Model must estimate electricity consumption or Gas consumption after an Implementation during a Normal Year and must:

(a) be dependent on Independent Variables and Site Constants, where relevant, that are established by measurements taken under normal operating conditions in accordance with clause 7A.5 of this Rule;

(b) have an Effective Range determined in accordance with clause 7A.8 of this Rule;

(c) estimate annual electricity consumption or Gas consumption based on a Normal Year established in accordance with clause 7A.7 of this Rule; and

(d) be deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.5 Measurement Procedures

When measuring electricity consumption, Gas consumption, Independent Variables, Site Constants, or any other relevant parameter, the Accredited Certificate Provider must:

(a) define the Measurement Period so that it consists of a start date and an end date, and optionally a time of day for each of those dates;

(b) define the Measurement Period so that it will have:

(i) in relation to the Baseline Energy Model under clause 7A.3 of this Rule, an end date that occurs before the Implementation Date;

(ii) in relation to the Operating Energy Model under clause 7A.4 of this Rule, a start date that occurs after the Implementation Date; and

(iii) in relation to Measured Annual Electricity Savings or Gas Savings under **Equation 7A.3** and **Equation 7A.4** of this Rule, a start date that occurs after the Implementation Date and an end date that is the day before the anniversary of the start date (such that the Measurement Period is for a full year).

(c) define the frequency of measurements over the Measurement Period;

(d) define which items of End-User Equipment will have their electricity consumption, Gas consumption, or both, measured (the measurement boundary);

(e) specify measurement equipment (meters) or other sources of measurements;

(f) define the calibration procedures, accuracy and precision of such measurement methods;

(f1) ensure that the Measurement Period includes any time periods during which Independent Variables may reasonably be expected to lead to the Implementation increasing electricity consumption or Gas consumption or both;

(g) record and exclude any Non-Routine Events that occurred during the Measurement Period, ensuring that the percentage of time excluded is less than 20% of the Measurement Period; and

(h) have the Measurement Procedures defined by clauses 7A.5 (a) to (g) deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.6 Energy consumption, Independent Variables and Site Constants

When identifying and assigning values for electricity consumption, Gas consumption, Independent Variables and Site Constants an Accredited Certificate Provider must:

(a) define procedures for converting measurements to estimates of the electricity consumption, Gas consumption, Independent Variables and Site Constants, if relevant;

(b) assign values for electricity consumption, Gas consumption, Independent Variables and Site Constants for each time period in each Measurement Period, where relevant;

(c) ensure the frequency of independent observations for the Independent Variables and electricity consumption or Gas consumption within the Measurement Period for each energy model are the same; and

(d) have the electricity consumption, Gas consumption, Independent Variables and Site Constants deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.7 Normal Year

When determining a Normal Year an Accredited Certificate Provider must:

(a) provide values for each Independent Variable and Site Constant over a full year;

(b) ensure the Normal Year represents a typical year for operation of the End-User Equipment within the Maximum Time Period for Forward Creation determined in accordance with clause 7A.12;

(c) describe the assumptions used to establish the Normal Year; and

(d) for a single Site model, have the Normal Year deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided; and

(e) for a multiple Site model:

(i) develop a procedure for determining the Normal Year for each Site in the Population; and

(ii) have the procedure for determining the Normal Year deemed appropriate by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.8 Effective Range

When defining the Effective Range of the energy models in clauses 7A.3 and 7A.4 an Accredited Certificate Provider must:

(a) ensure that the Effective Range is based on the range of measured values for each Independent Variable used to develop the energy model, where each Independent Variable has:

(i) a lower limit that is calculated as the minimum of the measured values, minus 5% of difference between the minimum and maximum of the measured values; and

(ii) an upper limit that is calculated as the maximum of the measured values, plus 5% of difference between the minimum and maximum of the measured values; and

(b) (deleted)

(c) have the Effective Range deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.9 Interactive Energy Savings

When estimating Interactive Energy Savings an Accredited Certificate Provider, in relation to **Equations 7A.2, 7A.4** or **7A.5**, must:

(a) estimate the changes to electricity consumption from End-User Equipment for which electricity consumption will not be measured (Interactive Electricity Savings);

(b) estimate the changes to Gas consumption from End-User Equipment for which Gas consumption will not be measured (Interactive Gas Savings);

(c) ensure that Interactive Electricity Savings and Interactive Gas Savings are not greater than 10% of total Electricity Savings and Gas Savings respectively, unless estimated in accordance with a Guide; and

(d) have the Interactive Energy Savings deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.10 Accuracy Factor

The Accuracy Factor, in relation to **Equations 7A.1** and **7A.3**, is between 1 and 0; and

(a) is either;

(i) the value corresponding to the energy model type and relative precision of the Electricity Savings or Gas Savings estimate at 90% confidence level as listed in Table A23 of Schedule A; or

(ii) determined by another process as Published by the Scheme Administrator; and

(b) must be deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.11 Energy Savings brought forward

(a) For the purposes of section 131 of the Act, the Energy Savings for an Implementation calculated using **Equation 7A.1**, based on Normal Year Electricity Savings or Gas Savings calculated using **Equation 7A.2**, are taken to occur on the last date of the Measurement Period for the Operating Energy Model as defined in clause 7A.4 of this Rule.

(b) For the purposes of section 131 of the Act, the Energy Savings for an Implementation calculated using **Equation 7A.1**, based on Normal Year Electricity Savings or Gas Savings calculated using **Equation 7A.5**, are taken to occur on the later of:

(i) the last date of the Measurement Period for the Operating Energy Model; and

(ii) the Implementation Date.

(c) A maximum of 50,000 Energy Savings Certificates can be brought forward from each Implementation.

7A.12 Maximum Time Period for Forward Creation

The Maximum Time Period for Forward Creation of Energy Savings Certificates in respect of Energy Savings for an Implementation calculated using **Equation 7A.1**, and for the purposes of clauses 7A.7, 7A.13 and 7A.14, must be set such that:

(a) the period does not exceed the expected lifetime of the End-User Equipment in whole years, as determined by a Persistence Model;

(b) if Energy Savings Certificates have previously been created for the Implementation using the Project Impact Assessment Method, the period does not exceed 5 years; and

(c) the start date of the period is the Implementation Date, and the end date of the period is not later than 10 years after the Implementation Date.

7A.13 Persistence Model

(a) A Persistence Model must not be used in connection with the calculation of Energy Savings unless it has first been determined to be acceptable for use by the Scheme Administrator.

(b) A Persistence Model must:

(i) estimate the expected lifetime of the End-User Equipment in whole years;

(ii) estimate the Decay Factor for each future year within the Maximum Time Period for Forward Creation;

(iii) be publicly accessible; and

(iv) satisfy any requirements Published by the Scheme Administrator.

(c) The use of a Persistence Model to forecast the Energy Savings from an Implementation must take into account:

(i) the Business Classification from Table A18 of Schedule A for the Site, if known and relevant;

(ii) the End-User Equipment type;

(iii) the operating hours for the End-User Equipment; and

(iv) typical ambient conditions for the Site, including, where relevant, temperature, humidity and salinity.

(d) The Accredited Certificate Provider must have the use of the Persistence Model deemed appropriate for the Implementation by a Measurement and Verification Professional, with their written explanatory reasoning provided.

7A.14 Top-up certificate creation

(a) Accredited Certificate Providers may create new Energy Savings Certificates in respect of Additional Energy Savings calculated using **Equation 7A.3** and **7A.4**, provided that:

(i) the calculation is based on a full year of measurements;

(ii) the start date of the Measurement Period must fall on an anniversary of the Implementation Date; and

(iii) the end date of the Measurement Period is within the Maximum Time Period for Forward Creation determined under clause 7A.12.

(b) For the purposes of section 131 of the Act, the Energy Savings for which Energy Savings Certificates are created under this clause are taken to occur on the end date of the Measurement Period of the Energy Savings.

7A.15 Measurement and Verification Professional

(a) A Measurement and Verification Professional is a person who is approved by the Scheme Administrator on the basis that such person meets the following criteria to the satisfaction of the Scheme Administrator,:

(i) the person can demonstrate an understanding of clause 7A and relevant measurement and verification techniques;

(ii) the person has an understanding of how the relevant End-User Equipment converts energy into End-Use Services and is affected by the Independent Variables;

(iii) the person is able to perform Regression Analysis, if relevant;

(iv) the person is able to perform an Estimate of the Mean, if relevant;

(v) the person is able to calibrate outputs from a computer simulation, if relevant;

(vi) the person has an understanding of the Sampling Method, if relevant; and

(vii) the person satisfies such additional requirements as Published, from time to time, by the Scheme Administrator.

(b) An application for approval as a Measurement Verification Professional must be in the manner and form (if any) as determined and Published by the Scheme Administrator.

(c) The Scheme Administrator may withdraw its approval of a person as a Measurement and Verification Professional if the Scheme Administrator considers that the person does not, or ceases to, satisfy the criteria set out in clause 7A.15(a).

(d) The Scheme Administrator may approve or refuse an application made under clause 7A.15(a).

7A.16 Guides

The Scheme Administrator may Publish, from time to time, Guides that detail acceptable and unacceptable approaches for Accredited Certificate Providers and Measurement and Verification Professionals to meet the requirements of clause 7A of this Rule.

7A.17 Implementation Date

The Implementation Date is the date that the Implementation commenced normal operations.

7A.18 Energy Saver

The Energy Saver is the Purchaser.

7A.19 (deleted)

7A.20 Sampling Method

When using the Sampling Method to establish a Baseline Energy Model and Operating Energy Model for multiple Sites, an Accredited Certificate Provider must:

(a) define the Eligibility Requirements to test if a Site can be included in the Population, based on the:

(i) existing End-User Equipment:

(ii) End-Use Services being provided;

(iii) Recognised Energy Saving Activity to be undertaken;

(iv) Site Constants; and

(v) any additional requirements as Published, from time to time, by the Scheme Administrator;

(b) only include Sites, that meet the Eligibility Requirements, in the Population;

(c) describe the expected distribution of Site Constants across the Population;

(d) define the Representativeness Test to determine if the Sample Sites are representative of the Population with respect to Site Constants;

(e) define conditions under which additional Sample Sites must be selected to ensure Representativeness Tests are met;

(f) ensure that the number of Sample Sites is at least six times the number of Site Constants in each energy model;

(g) ensure the process of selecting Sample Sites minimises bias;

(h) determine the Normal Year for each Site prior to the Implementation Date, according to the procedure that is deemed appropriate under clause 7A.7 (e);

(i) have the Sampling Method deemed appropriate for the Population by a Measurement and Verification Professional, with their written explanatory reasoning provided; and

(j) meet any other criteria as Published, from time to time, by the Scheme Administrator.

Note: Equations 7A.1 to 7A.5 are used as required to:

- calculate Electricity Savings for projects that affect electricity consumption;
- calculate Gas Savings for projects that affect Gas consumption; or
- calculate Electricity Savings and Gas Savings separately for projects that affect both electricity consumption and Gas consumption.

Equation 7A.1

Energy Savings calculated from a Baseline Energy Model and Operating Energy Model

$$\textit{Electricity Savings} = \sum_i \left(\left(\textit{Normal Year Electricity Savings} \times \textit{Accuracy Factor} \times \textit{Decay Factor}_i - \textit{Counted Energy Savings}_i \right) \times \textit{Regional Network Factor} \right)$$

$$\textit{Gas Savings} = \sum_i \left(\textit{Normal Year Gas Savings} \times \textit{Accuracy Factor} \times \textit{Decay Factor}_i - \textit{Counted Energy Savings}_i \right)$$

Where:

- the summation is over each year *i* over the *Maximum Time Period for Forward Creation* of the Electricity Savings or Gas Savings.
- *Normal Year Electricity Savings or Gas Savings*, in MWh, is the estimated electricity savings, if calculating *Electricity Savings*, or estimated Gas savings, if calculating *Gas Savings*, attributable to the Implementation from a Normal Year of operation before taking into account equipment degradation, and is calculated using:
  - **Equation 7A.5** if a Sampling Method is used, and
  - **Equation 7A.2** in all other cases.
- *Accuracy Factor*, is a number between 0 and 1, as determined by clause 7A.10 of this Rule.
- *Decay Factor*$_i$, is a number between 0 and 1, which quantifies the decay of the Electricity Savings or Gas Savings in year *i* due to equipment degradation over time, and is:
  - equal to 1 for Electricity Savings in any years the Normal Year Electricity Savings are negative; and
  - equal to 1 for Gas Savings in any years the Normal Year Gas Savings are negative; and
  - in all other cases, determined by either:
    - applying the value corresponding to the relevant year since the Implementation Date in **Table A16** of Schedule A, or
    - assigning a value for that year from a Persistence Model in accordance with clause 7A.13 of this Rule.
- *Maximum Time Period for Forward Creation* is determined in accordance with clause 7A.12 of this Rule.
- *Counted Energy Savings*$_i$ is the:
  - total Electricity Savings for which Energy Savings Certificates have previously been created for

the Implementation in the year *i* if calculating Electricity Savings; or

- total Gas Savings for which Energy Savings Certificates have previously been created for the Implementation in the year *i* if calculating Gas Savings.

- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

Equation 7A.2

Calculation of Normal Year Electricity Savings or Gas Savings

$$\textit{Normal Year Electricity Savings or Gas Savings} = \sum_t \left(E_{Baseline}(\tilde{x}_1(t), \tilde{x}_2(t), \ldots \tilde{x}_p(t)) - E_{Operating}(\tilde{x}_1(t), \tilde{x}_2(t), \ldots \tilde{x}_p(t)) \right) + \textit{Interactive Energy Savings}$$

Where:

- the summation is over all time periods *t* in the Normal Year, excluding any time periods for which any of $\tilde{x}_1(t), \tilde{x}_2(t), \ldots \tilde{x}_p(t)$ are outside the Effective Range of either the Baseline Energy Model or Operating Energy Model; or where the Site Constants are not their standard value.
- $\tilde{x}_p(t)$ is the value of each of the Independent Variables x_p for time period *t* over the Normal Year determined in accordance with clause 7A.7 of this Rule.
- $E_{Baseline}$ is:
  - the electricity consumption predicted by a Baseline Energy Model established in accordance with clauses 7A.2 and 7A.3 using measurements of electricity consumption; or
  - the Gas consumption predicted by a Baseline Energy Model established in accordance with clauses 7A.2 and 7A.3 using measurements of Gas consumption.
- $E_{Operating}$ is:
  - the electricity consumption predicted by an Operating Energy Model established in accordance with clauses 7A.2 and 7A.4 using measurements of electricity consumption; or
  - the Gas consumption predicted by an Operating Energy Model established in accordance with clauses 7A.2 and 7A.4 using measurements of Gas consumption.
- *Interactive Energy Savings* is estimated in accordance with clause 7A.9 of this Rule and is either the:
  - Interactive Electricity Savings if calculating Electricity Savings; or
  - Interactive Gas Savings if calculating Gas Savings.

Equation 7A.3

Energy Savings calculated from measurements and Baseline Energy Model

$$\textit{Electricity Savings} = \left(\textit{Measured Annual Electricity Savings} \times \textit{Accuracy Factor} - \textit{Counted Energy Savings}_i\right) \times \textit{Regional Network Factor}$$

$$\textit{Gas Savings} = \textit{Measured Annual Gas Savings} \times \textit{Accuracy Factor} - \textit{Counted Energy Savings}_i$$

Where:

- *Measured Annual Electricity Savings or Gas Savings*, in MWh, is the Electricity Savings or Gas

Savings attributable to the Implementation from the actual measured conditions over a full year i, and is calculated in **Equation 7A.4**.

- *Accuracy Factor* is the number determined by clause 7A.10 of this Rule.
- *Counted Energy Savings*$_i$ is the:
  - total Electricity Savings for which Energy Savings Certificates have previously been created for the Implementation in the year *i* if calculating Electricity Savings; or
  - total Gas Savings for which Energy Savings Certificates have previously been created for the Implementation in the year *i* if calculating Gas Savings.
- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

Equation 7A.4

Calculation of Measured Annual Electricity Savings or Gas Savings

$$\textit{Measured Annual Electricity Savings or Gas Savings} = \sum_t \left(E_{Baseline}\left(x_1(t), x_2(t), \ldots x_p(t) \right) - E_{Measured}\left(t \right) \right) + \textit{Interactive Energy Savings}$$

Where:

- the summation is over all measurement time periods *t* in the year, excluding any time periods *t* for which any of the measured Independent Variable values $x_1(t), x_2(t), \ldots x_p(t)$ are outside the Effective Range of the Baseline Energy Model, or where the Site Constants are not their standard value
- $x_j(t)$ is the value of the Independent Variable x_j measured during time period *t* determined in accordance with clause 7A.5.
- $E_{Measured}$ is:
  - the electricity consumption measured during the time period *t* in accordance with clause 7A.5 if calculating Electricity Savings; or
  - the Gas consumption measured during the time period *t* in accordance with clause 7A.5 if calculating Gas Savings.
- $E_{Baseline}$ is:
  - the electricity consumption predicted by a Baseline Energy Model established in accordance with clauses 7A.2 and 7A.3 using measurements of electricity consumption; or
  - the Gas consumption predicted by a Baseline Energy Model established in accordance with clauses 7A.2 and 7A.3 using measurements of Gas consumption.
- *Interactive Energy Savings* is estimated in accordance with clause 7A.9 of this Rule and is either the:
  - Interactive Electricity Savings if calculating Electricity Savings; or
  - Interactive Gas Savings if calculating Gas Savings.

Equation 7A.5

Calculation of Normal Year Electricity Savings or Gas Savings using a Sampling Method

$$\textit{Normal Year Electricity Savings or Gas Savings} = \sum_t \Big(E_{Baseline}(\tilde{x}_1(t), \tilde{x}_2(t), \ldots \tilde{x}_p(t), y_1, y_2, \ldots y_q) - E_{Operating}(\tilde{x}_1(t), \tilde{x}_2(t), \ldots \tilde{x}_p(t), y_1, y_2, \ldots, y_q) \Big) + \textit{Interactive Energy Savings}$$

Where:

- the summation is over all time periods t in the Normal Year, excluding any time periods for which any of $\tilde{x}_1(t), \tilde{x}_2(t), \ldots \tilde{x}_p(t)$ are outside the Effective Range of either the Baseline Energy Model or Operating Energy Model, or where the Site Constants are not their standard value for the Site.
- $\tilde{x}_j(t)$ is the value of the Independent Variable x_j for time period t in the Normal Year for the Site determined in accordance with clause 7A.7 of this Rule.
- y_k is the value of the Site Constant k for the Site measured in accordance with clause 7A.6.
- $E_{Baseline}$ is:
  - the electricity consumption predicted by a Baseline Energy Model established in accordance with clauses 7A.2 and 7A.3 using measurements of electricity consumption; or
  - the Gas consumption predicted by a Baseline Energy Model established in accordance with clauses 7A.2 and 7A.3 using measurements of Gas consumption.
- $E_{Operating}$ is:
  - the electricity consumption predicted by an Operating Energy Model established in accordance with clauses 7A.2 and 7A.4 using measurements of electricity consumption; or
  - the Gas consumption predicted by an Operating Energy Model established in accordance with clauses 7A.2 and 7A.4 using measurements of Gas consumption.
- *Interactive Energy Savings* is estimated in accordance with clause 7A.9 of this Rule and is either the:
  - Interactive Electricity Savings if calculating Electricity Savings; or
  - Interactive Gas Savings if calculating Gas Savings.

8 Metered Baseline Method

Note: The Metered Baseline Method uses measurements of energy consumption "before" the Implementation has been undertaken to establish a "baseline" energy consumption standard for the Site being considered. The same measurements performed "after" the Implementation has been undertaken will establish new levels of energy consumption, with the difference representing the impact of the Implementation.

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.

8.1 The Metered Baseline Method in this clause 8 may only be used to calculate Energy Savings if measurements made are of a standard, duration, and to a level of accuracy, satisfactory to the Scheme Administrator.

8.2 Using the Metered Baseline Method, the Energy Savings are calculated under:

(a) clause 8.5, using the Baseline per unit of output sub-method;

(b) clause 8.6, using the Baseline unaffected by output sub-method;

(c) clause 8.7, using the Normalised baseline sub-method;

(d) clause 8.8, using the NABERS baseline sub-method; or

(e) clause 8.9, using the Aggregated Metered Baseline sub-method,

provided that all Energy Savings can (to the satisfaction of the Scheme Administrator) be attributed to the corresponding Recognised Energy Saving Activity.

8.3 The time period over which any baseline is determined under this clause 8, using energy measurements before the Implementation Date of the Implementation, must include one or more time periods preceding the Implementation Date. The time period(s) used to determine the baseline must be acceptable to the Scheme Administrator.

8.3A For the purposes of clauses 8.5, 8.6 and 8.7, where the Accreditation Date, with respect to the Recognised Energy Saving Activity, is:

(a) on or after 15 April 2016, Energy Savings may only be calculated for up to a maximum of 10 years from the end date of the baseline Measurement Period;

(b) before 15 April 2016 and the end date of the baseline Measurement Period is less than or equal to 10 years before 15 April 2016, Energy Savings may only be calculated for a maximum of 10 years from the end date of the baseline Measurement Period; and

(c) before 15 April 2016 and the end date of the baseline Measurement Period is more than 10 years before 15 April 2016, Energy Savings may only be calculated for a period that is, as a maximum, equal to the length of the period from the end date of the baseline Measurement Period to 15 April 2016.

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 the accuracy of the baseline and hence the Confidence Factor.

8.5 Baseline per unit of output

Note: This Metered Baseline Method is most appropriate where energy 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.

8.5.1 The Energy Savings for an Implementation may be calculated using **Method 1**, provided that:

(a) the energy consumption for the Site is a linear function of output;

(b) fixed energy consumption, which is the energy consumption of the Site that does not vary with variations in output, can be measured or estimated;

(c) output has not changed from the average output over the period during which the variable energy baseline is measured by more than 50%; and

(d) the variable energy 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.

(e) Electricity Savings and Gas Savings are calculated for Implementations that increase either electricity consumption or Gas consumption.

8.5.2 The Implementation Date is the earlier of the start date of the first Measurement Period that occurs after the end of the last period T_b referred to in Method 1 or the date on which the reduction of energy consumption commenced due to the Implementation.

8.5.3 The Energy Saver is the person who is liable (contractually or otherwise) to pay for the energy consumption at the Site at the Implementation Date.

8.5.4 For the purposes of section 131 of the Act, Energy Savings calculated under this clause 8.5 are taken to have occurred on the last date of the Measurement Period.

Method 1 – Baseline per unit of output

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 energy on the Site, an integer multiple of the period of that cycle.

Step (2) Determine *Electricity Savings*, or *Gas Savings*, or both, by completing Steps (2A) to (2G) for each energy source, 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 energy source for each such period.

Step (2A) Determine the *Fixed Consumption* (in MWh), which is the consumption of electricity or Gas 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 commence and the duration of which is equal to the Measurement Period.

Step (2B) Calculate $Variable\ Consumption_{Tb}$ (in MWh / unit of output) for n time periods T_b as follows:

$$Variable\ Consumption_{Tb} = (Total\ Consumption_{Tb} - Fixed\ Consumption) / Output_{Tb}$$

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;
- $Total\ Consumption_{Tb}$ (in MWh) is the consumption of electricity or Gas for the Site measured by metering that consumption over each time period T_b;
- $Output_{Tb}$ is the number of units of output during each time period T_b; and
- n is the number of time periods, T_b, where n must be at least 1.

Step (2C) Calculate *Variable Baseline* (in MWh / unit of output):

$$Variable\ Baseline = \{\sum_{T=1}^{n} Variable\ Consumption_{Tb}\} / n$$

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

If n > 2:

Baseline Variability = (*maximum Variable Consumption*$_{Tb}$ – *minimum Variable Consumption*$_{Tb}$) / 2

Where:

- *maximum Variable Consumption*$_{Tb}$ is the maximum value of *Variable Consumption*$_{Tb}$ over *n* time periods T_b; and
- *minimum Variable Consumption*$_{Tb}$ is the least value of *Variable Consumption*$_{Tb}$ over *n* time periods T_b.

If n ≤ 2:

Baseline Variability = 10% of *Variable Baseline*

Step (2E) Calculate *Reduced Consumption* (in MWh) for the time period T_a (after the Implementation Date) for which the Accredited Certificate Provider seeks to create Energy Savings Certificates as follows:

Reduced Consumption = (*Output*$_{Ta}$ × *Variable Baseline* + *Fixed Consumption*) – *Total Consumption*$_{Ta}$

Where:

- T_a denotes a time period, after the Implementation Date, the duration of which is equal to the *Measurement Period*;
- *Total Consumption*$_{Ta}$ (in MWh) is the consumption of electricity or Gas for the Site measured by metering that consumption over a time period T_a; and
- *Output*$_{Ta}$ is the number of units of output during the time period T_a.

Step (2F) Calculate the *Confidence Factor* as follows:

Confidence Factor = 1 – (*Baseline Variability* / *Variable Baseline*)

Step (2G) If measuring electricity consumption, calculate *Electricity Savings* (in MWh) for each time period T_a by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates as follows:

Electricity Savings = *Reduced Consumption* × *Confidence Factor* × *Regional Network Factor*

Where*:*

- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

If measuring Gas consumption, calculate *Gas Savings* (in MWh) for each time period T_a by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates as follows:

Gas Savings = *Reduced Consumption* × *Confidence Factor*

Step (3) Ensure net *Energy Savings* are non-negative.

If Electricity Savings × Electricity Certificate Conversion Factor + Gas Savings × Gas Certificate Conversion Factor < 0, then Electricity Savings = 0 and Gas Savings = 0

8.6 Baseline unaffected by output

Note: This Metered Baseline Method is most appropriate where consumption is not linked to output of the End-User Equipment subject to the energy savings activity. To use this method the output of the End-User Equipment should not be affected by temperature or other standard normalisation variables.

8.6.1 The Energy Savings for an Implementation 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 *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 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.

(c) Electricity Savings and Gas Savings are calculated for Implementations that increase either electricity consumption or Gas consumption.

8.6.2 The Implementation Date is the earlier of the start date of the first Measurement Period that occurs after the end of the last period T_b referred to in Method 2 or the date on which the reduction of energy consumption commenced due to the Implementation.

8.6.3 The Energy Saver is the person who is liable (contractually or otherwise) to pay for the energy consumption at the Site at the Implementation Date.

8.6.4 For the purposes of section 131 of the Act, Energy Savings calculated under this clause 8.6 are taken to have occurred on the last date of the Measurement Period.

Method 2 – Baseline unaffected by output

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 or Gas on the Site, an integer multiple of the period of the respective cycle.

Step (2) Determine *Electricity Savings*, or *Gas Savings*, or both, by completing Steps (2A) to (2E) for each energy source, 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 energy source for each such period.

Step (2A) Calculate *Baseline* (in MWh) as follows:

$$Baseline = \{ \sum_{T=1}^{n} Total\ Consumption_{Tb} \} / n$$

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
- $Total\ Consumption_{Tb}$ (in MWh) is the consumption of electricity or Gas for the Site measured by metering that consumption over each time period T_b; and
- n is the number of time periods, T_b, where n must be at least 1.

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

If n > 1:

$$Baseline\ Variability = (maximum\ Total\ Consumption_{Tb} - minimum\ Total\ Consumption_{Tb}) / 2$$

Where:

- *maximum Total Consumption*$_{Tb}$ is the maximum value of *Total Consumption*$_{Tb}$ over *n* time periods T_b*; and*
- *minimum Total Consumption*$_{Tb}$ is the least value of *Total Consumption*$_{Tb}$ over *n* time periods T_b

If n = 1:

Baseline Variability = 10% of *Baseline*

Step (2C) Calculate *Reduced Consumption* (in MWh) for the time period T_a (after the Implementation Date) for which the Accredited Certificate Provider seeks to create Energy Savings Certificates as follows:

Reduced Consumption = Baseline – Total Consumption$_{Ta}$

Where:

- T_a denotes a time period, after the Implementation Date, the duration of which is equal to the Measurement Period; and
- *Total Consumption*$_{Ta}$ (in MWh) is the consumption of electricity or Gas for the Site measured by metering that consumption over a time period T_a

Step (2D) Calculate *Confidence Factor* as follows:

Confidence Factor = 1 – (*Baseline Variability* / *Baseline*)

Step (2E) If measuring electricity consumption, calculate *Electricity Savings* (in MWh) for the time period T_a for which the Accredited Certificate Provider seeks to create Energy Savings Certificates as follows:

- *Electricity Savings = Reduced Consumption × Confidence Factor × Regional Network Factor*

Where*:*

- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

If measuring Gas consumption, calculate *Gas Savings* (in MWh) for each time period T_a by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates as follows:

Gas Savings = Reduced Consumption × Confidence Factor

Step (3) Ensure net *Energy Savings* are non-negative.

If *Electricity Savings* × *Electricity Certificate Conversion Factor* + *Gas Savings* × *Gas Certificate Conversion Factor* < 0, then *Electricity Savings* = 0 and *Gas Savings* = 0

8.7 Normalised baseline

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 the subject of removal) and not be the result of spurious correlations.

Option C of the IPMVP can be used for guidance as to the normalisation of baselines, particularly for complex cases.

8.7.1 The Energy Savings for an Implementation 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 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.

(c) Electricity Savings and Gas Savings are calculated for Implementations that increase either electricity consumption or Gas consumption.

8.7.2 The Implementation Date is the earlier of the start date of the first Measurement Period that occurs after the end of the last period T_b referred to in Method 3 or the date on which the reduction of energy consumption commenced due to the Implementation.

8.7.3 The Energy Saver is the person who is liable (contractually or otherwise) to pay for the energy consumption at the Site at the Implementation Date.

8.7.4 For the purposes of section 131 of the Act, Energy Savings calculated under this clause 8.7 are taken to have occurred on the last date of the Measurement Period.

Method 3 – Normalised baseline

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 energy on the Site, an integer multiple of the period of that cycle.

Step (2) Determine Savings, or *Gas Savings*, or both, by completing Steps (2A) to (2F) for each energy source and for the time period T_a for which the Accredited Certificate Provider seeks to create Energy Savings Certificates, by repeating Steps (2D) to (3) for each energy source for each such period.

Step (2A) Calculate *Normalised Consumption*$_{Tb}$ (in MWh) for n time periods T_b by normalising the *Total Consumption*$_{Tb}$ 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*$_{Tb}$ per unit of change for each corresponding normalisation variable used in Step(2A)(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*$_{Tb}$ (in MWh) is the consumption of electricity or Gas 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; and

- *Normalisation Variables* are the variables in respect of which the *Total Consumption*$_{Tb}$ is normalised and must correspond to factors that are a reason for change in *Total Consumption*$_{Tb}$

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

$$\textit{Normalised Baseline} = \{\sum_{T=1}^{n} \textit{Normalised Consumption}_{Tb}\} / n$$

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

If n > 1:

Baseline Variability = (*maximum Normalised Consumption*$_{Tb}$ – *minimum Normalised Consumption*$_{Tb}$) / 2

Where:

- *maximum Normalised Consumption*$_{Tb}$ is the maximum value of *Normalised Consumption*$_{Tb}$ over *n* time periods *Tb*; and
- *minimum Normalised Consumption*$_{Tb}$ is the least value of *Normalised Consumption*$_{Tb}$ over *n* time periods *Tb*

If n = 1:

Baseline Variability = 10% of *Normalised Baseline*

Step (2D) Calculate *Reduced Consumption* (in MWh) for the time period T_a (after the Implementation Date) for which the Accredited Certificate Provider seeks to create Energy Savings Certificates, as follows:

Reduced Consumption = Normalised Baseline – Total Consumption$_{Ta}$

Where:

- *Ta* denotes a time period, after the Implementation Date, the duration of which is equal to the Measurement Period; and
- *Total Consumption*$_{Ta}$ (in MWh) is the consumption of electricity or Gas for the Site measured by metering that consumption over a time period *Ta*

Step (2E) Calculate *Confidence Factor*:

Confidence Factor = 1 – (*Baseline Variability* / *Normalised Baseline*)

Step (2F) If measuring electricity consumption, calculate *Electricity Savings* (in MWh) for each time period T_a by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates:

Electricity Savings = Reduced Consumption × Confidence Factor × Regional Network Factor

Where*:*

- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

If measuring Gas consumption, calculate *Gas Savings* (in MWh) for each time period T_a by reference to which the Accredited Certificate Provider seeks to create Energy Savings Certificates as follows:

Gas Savings = Reduced Consumption × Confidence Factor

Step (3) Ensure net *Energy Savings* are non-negative:

If *Electricity Savings* × *Electricity Certificate Conversion Factor* + *Gas Savings* × *Gas Certificate Conversion Factor* < 0, then *Electricity Savings* = 0 and *Gas Savings* = 0

8.8 NABERS baseline

8.8.1 The Energy Savings for an Implementation may be calculated using **Method 4** for a NABERS Building, provided that:

(a) the NABERS Rating is calculated using one of the following NABERS tools:

(i) NABERS for Offices;

(ii) NABERS for Hotels;

(iii) NABERS for Shopping Centres;

(iv) NABERS for Data Centres; or

(v) NABERS for Hospitals;

(b) the NABERS Rating excludes any GreenPower in accordance with clause 5.4(d);

(c) the NABERS Rating meets the eligibility criteria applied in clause 8.8.3;

(d) all sources of on-site electricity generation have been identified; and

(e) all electricity generated from sources of On-site Unaccounted Electricity (as referred to in Method 4) has been metered and recorded over the Rating Period.

8.8.2 For the purposes of this clause 8.8:

(a) the NABERS Rating is a current NABERS rating that will be used to calculate Energy Savings;

(b) the Historical Baseline NABERS Rating is a previous NABERS Rating for the same NABERS Building, and is used for Calculation Method 2 at Step 2 of Method 4;

(c) the Rating Period is the time over which measurements were taken to establish the NABERS Rating or the Historical Baseline NABERS Rating for the NABERS Building;

(d) the Current Rating Year is the year for which Energy Savings Certificates will be created, and is the year that the Rating Period ended for the NABERS Rating; and

(e) the Baseline Rating Year is the year that the Rating Period ended for the Historical Baseline NABERS Rating.

8.8.3 The NABERS Rating must:

(a) if using Calculation Method 1:

(i) for the first Rating Period for which Energy Savings will be calculated, exceed the Benchmark NABERS Rating from Table A20 of Schedule A by at least 0.5 stars; and

(ii) for subsequent Rating Periods for which Energy Savings will be calculated, exceed the Benchmark NABERS Rating from Table A20 used for the first Rating Period by at least 0.5 stars.

(b) exceed the Historical Baseline NABERS Rating by at least 1 star if using Calculation Method 2.

8.8.4 When calculating a Benchmark NABERS Rating using Calculation Method 2 at step 2 of Method 4:

(a) the Benchmark NABERS Rating can only be calculated using a fixed Historical Baseline NABERS Rating which was calculated no more than 7 years before the end date of the Current Rating Year; or

(b) if this calculation method is to be used for Additional Energy Savings and the fixed Historical Baseline NABERS Rating does not meet the requirements of clause 8.8.4(a), it must be reset using a previous NABERS Rating that is at least 7 years later than the end date of the Rating Period for the previous fixed Historical Baseline NABERS Rating;

(c) The Historical Baseline NABERS Rating must be based on a similar configuration (for example, metering arrangements and on-site energy generation), as determined by the Scheme Administrator.

8.8.5 The Implementation Date is the end date of the first Rating Period for which Energy Savings will be calculated under clause 8.8.7.

8.8.6 The Energy Saver is the person whose name is identified on the NABERS Rating certificate, as issued by the NABERS National Administrator, in respect of the NABERS Rating.

8.8.7 For the purposes of section 131 of the Act, Energy Savings are taken to occur on the date that the Scheme Administrator determines that the relevant NABERS Rating was completed.

8.8.8 Energy Savings Certificates cannot be created for a NABERS Rating more than twelve months after the end of the Measurement Period applicable to that NABERS Rating.

8.8.9 The requirements of clauses 6.8(h) and 6.8(i) do not apply in relation to Energy Savings Certificates for Energy Savings calculated in accordance with clause 8.8.

Method 4 – NABERS Benchmark

Step 1 – Calculate Measured Electricity Consumption and Measured Gas Consumption

Using the measurements taken to establish the NABERS Rating, and other measurements taken as necessary, calculate total energy consumption for the NABERS Building as follows:

Measured Electricity Consumption (MWh)= NABERS Electricity + On-site Unaccounted Electricity

Measured Gas Consumption (MWh) = NABERS Gas

Where:

- *NABERS Electricity*, in MWh, is the electricity purchased or imported from the Electricity Network and accounted for in the NABERS Rating, including electricity purchased as GreenPower; and
- *On-site Unaccounted Electricity*, in MWh, is electricity generated on-site from energy sources which have not been accounted for in the NABERS Rating, including electricity generated from photovoltaic cells or Gas generators fed from on-site biogas sources, but excluding Gas generators where the imported Gas has been accounted for in the NABERS Rating; and
- *NABERS Gas*, in MWh, is the total of the Gas accounted for in the NABERS Rating.

Step 2 – Calculate Benchmark NABERS Rating

Calculate the Benchmark NABERS Rating, by using either:

(a) Calculation Method 1: Look up the Benchmark NABERS Rating in **Table A20** of Schedule A which corresponds to the relevant Current Rating Year, NABERS Rating tool and building category; or

(b) Calculation Method 2: Calculate the Benchmark NABERS Rating based on a Historical Baseline NABERS Rating as follows:

Benchmark NABERS Rating = Historical Baseline NABERS Rating + Annual Rating Adjustment × (Current Rating Year – Baseline Rating Year)

Where:

- *Historical Baseline NABERS Rating* is as defined in clause 8.8.2 and meets the requirements set out in clause 8.8.4

- *Annual Rating Adjustment* is the amount by which average NABERS Ratings increase each year and is the value in **Table A21** of Schedule A which corresponds to the relevant NABERS Rating tool and building category; and

- *Baseline Rating Year* is as defined in clause 8.8.2(e)

Step 3 – Calculate Benchmark Electricity Consumption and Benchmark Gas Consumption

Benchmark Electricity Consumption is the electricity consumption that would be required for that same NABERS Building to achieve the *Benchmark NABERS Rating* over the Rating Period, assuming the same breakdown of energy consumption. It is the electricity component of maximum allowable energy consumption, converted to MWh.

Benchmark Gas Consumption is the Gas consumption that would be required for that same NABERS Building to achieve the Benchmark NABERS Rating over the Rating Period, assuming the same breakdown of energy consumption. It is the Gas component of maximum allowable energy consumption, converted to MWh.

Calculate the *Benchmark Electricity Consumption* and *Benchmark Gas Consumption* in MWh by using the NABERS Reverse Calculator for the relevant NABERS method, setting the target star rating to the *Benchmark NABERS Rating*, and giving all other input parameters the same value as for the actual NABERS Rating over that Rating Period, including:

- Rating type;
- Building information (e.g. Rated Area, number of computers); and
- Percentage breakdown of energy consumption (on an energy use basis in MWh).

If necessary for use with the relevant NABERS Reverse Calculator, round down the *Benchmark NABERS Rating* to the nearest half or whole star increment.

Step 4 – Calculate Energy Savings

Calculate *Electricity Savings* and *Gas Savings*, in MWh as follows:

Electricity Savings = (Benchmark Electricity Consumption – Measured Electricity Consumption) × *Regional Network Factor*

Gas Savings = Benchmark Gas Consumption – Measured Gas Consumption

Where:

Regional Network Factor is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

8.9 Aggregated Metered Baseline

Note: The Aggregated Metered Baseline sub-method allows for Energy Savings to be calculated on the basis of measured savings across a group of electricity and/or natural gas customers, using statistical techniques. To use this method, the Accredited Certificate Provider must engage an Accredited Statistician to perform the randomised Site allocation and validate the statistical methods prior to the Implementation Date. This method may be used for any Recognised Energy Saving Activity, but it is best suited to those activities where:

- Energy Savings are small on a Site by Site basis; and/or
- Energy Savings can vary greatly from Site to Site; and/or
- there is insufficient evidence that the Recognised Energy Saving Activity will not be reversed.

This method requires a group of energy customers (the Population) to be assigned without bias into a Treatment Group and a Control Group. The Treatment Group is offered goods or services that are designed to deliver

Energy Savings over the Implementation Period. The Treatment is the offering of goods and services (and any subsequent provision, engagement and promotion activities) and is not just the provision of goods and services. The Control Group is not offered the Treatment, but instead is used to estimate what the energy consumption of the Treatment Group would have been in the absence of the Treatment.

8.9.1 The Energy Savings for an Implementation may be calculated using **Method 5.1** provided that all of the conditions in clauses 8.9.2 to 8.9.11 are met.

8.9.2 For each Implementation, a number of Sites must be identified and assigned to a Population, and every Site in that Population must be allocated to either a Treatment Group or a Control Group prior to the Implementation Date. Additionally:

(a) a Site may choose to join the Population, but once in the Population, must be allocated to the Treatment Group or the Control Group using an Unbiased Selection Method;

(b) Prior to allocating the Site to the Treatment Group or the Control Group, the Accredited Certificate Provider must:

(i) choose for each Site that is or will be in the Population, whether to measure the consumption of electricity or natural gas (or both), subject to clause 8.9.2(f)(ii); and

(ii) not decide which energy source(s) are included for measurement based on whether the Site is subsequently allocated in the Treatment Group or the Control Group; and

(iii) where the Population includes Sites that have measurements of different energy source combinations, ensure that the Treatment Group size to Control Group size ratio is, as close as possible, the same for each of the energy source combinations (electricity only; natural gas only; both electricity and natural gas).

(c) persons at Sites must not be informed explicitly that they have been allocated to the Treatment Group or the Control Group;

(d) once a Site has been allocated to the Treatment Group and the Implementation Date has occurred, persons managing End-User Equipment at that Site may be offered a choice as to whether they wish to receive the goods and services component of the Treatment;

(e) if a Site chooses not to receive the goods and services component of the Treatment, that Site must be retained in the Treatment Group for measurement purposes, except where clauses 8.9.2(g) and 8.9.2(h) apply;

(f) the Population should not be targeted with the offer of goods and services that;

(i) are aimed at increasing electricity or natural gas use with the intent of creating a greater difference in electricity or natural gas use between the Control Group and Treatment Group; or

(ii) promote switching from using grid electricity to natural gas, or vice versa, if both grid electricity and natural gas consumptions is not measured at all Sites in the Population; or

(iii) promote switching to a non-renewable energy source other than grid electricity or natural gas.

(g) a Site must be removed from the Population, and hence Treatment Group or Control Group, if Measured Electricity Consumption or Measured Gas Consumption data or both, as per Clause 8.9.2(b)(i), are not available for that Site during the Implementation Period;

(h) all Sites with Measured Electricity Consumption or Measured Gas Consumption data or both, as per Clause 8.9.2(b)(i), for only part of an Implementation Period due to Attrition, must be:

(i) removed from the Population; or

(ii) included in the Population until the last date Measured Electricity Consumption or Measured Gas Consumption data or both, are available for a given Site; and

(i) if data for a Pre-Implementation Period are used, the Accredited Certificate Provider must specify prior to the Implementation Date a period for which the data are available for the total Population.

8.9.3 Measurements of electricity consumption under this method must use Measured Electricity Consumption data for each Site in the Population, where the Measured Electricity Consumption for a Measurement Period means the metered amount of electricity used by a Site:

(a) as determined by the metering data held by the Electricity Retailer or Network Service Provider for that Site, pro-rated across the period, as measured and estimated in accordance with the provisions of the National Energy Retail Rules under the *National Energy Retail Law (NSW)*, and in accordance with the provisions of the *Electricity Supply (General) Regulation 2014*; or

(b) from a metering arrangement compliant with the accuracy requirements of National Measurement Institute document M6 (Electricity Meters), or another metering benchmark accepted by the Scheme Administrator, provided that:

(i) all metering devices are installed without bias as to whether that Site is in the Treatment Group or Control Group, and by parties who have no knowledge of whether each Site is part of the Treatment Group or Control Group; and

(ii) the reading of metering devices and checking, measurement, estimation and pro-rating of data is done without bias as to whether that Site is in the Treatment Group or Control Group, and by parties who have no knowledge of whether each Site is part of the Treatment Group or Control Group.

8.9.3A Measurements of natural gas consumption under this method must use Measured Gas Consumption data for each Site in the Population, where the Measured Gas Consumption for a Measurement Period means the metered amount of natural gas used by a Site:

(a) as determined by the metering data held by the Gas Retailer or gas network operator for that Site, pro-rated across the period, as measured and estimated in accordance with the provisions of the National Energy Retail Rules under the *National Energy Retail Law (NSW)*, and in accordance with the provisions of the *Gas Supply (Consumer Safety) Regulation 2012* ; or

(b) from a metering arrangement compliant with the accuracy requirements of National Measurement Institute document R137 (Gas Meters), or another metering benchmark accepted by the Scheme Administrator, provided that:

(i) all metering devices are installed without bias as to whether that Site is in the Treatment Group or Control Group, and by parties who have no knowledge of whether each Site is part of the Treatment Group or Control Group; and

(ii) the reading of metering devices and checking, measurement, estimation and pro-rating of data is done without bias as to whether that Site is in the Treatment Group or Control Group, and by parties who have no knowledge of whether each Site is part of the Treatment Group or Control Group.

8.9.4 For the purposes of calculating Energy Savings, the Measured Electricity Consumption or Measured Gas Consumption data or both, for a given Population must be recorded over one or more Measurement Periods, where:

(a) Implementation Periods and Pre-Implementation Periods are both Measurement Periods;

(b) the Implementation Period and the Pre-Implementation Period do not have to be immediately sequential in time;

(c) Measurement Periods must not overlap; and

(d) each Implementation Period must be at least 3 months and no more than 15 months in length.

8.9.4A Measured Energy Consumption is calculated for each Site in the Population in accordance with **Equation 8.9.1**.

Equation 8.9.1

$$Measured\ Energy\ Consumption = Measured\ Electricity\ Consumption \times Regional\ Network\ Factor + Measured\ Gas\ Consumption \times \frac{Gas\ Certificate\ Conversion\ Factor}{Electricity\ Certificate\ Conversion\ Factor}$$

Where:

- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place
- *Electricity Certificate Conversion Factor* is 1.06, as specified the Act, or as amended by Regulation.
- *Gas Certificate Conversion Factor* is 0.39, as specified in the Act, or as amended by Regulation.

8.9.5 For the purposes of section 131 of the Act, Energy Savings for each Implementation are taken to have occurred on the last date of that Implementation Period.

8.9.6 Where required, the Energy Savings for the Implementation will be the sum of estimated Energy Savings for all Sites in a Treatment Group for each Implementation Period.

8.9.7 The records that must be kept of the method, data and assumptions used to calculate Energy Savings under Method 5.1 must include:

(a) the Addresses of the Sites in the Population and whether they are allocated to the Treatment Group or the Control Group;

(b) evidence that Sites were assigned to the Population and were allocated to the Treatment Group and Control Group in accordance with clause 8.9.2;

(c) information on metering arrangements used according to clause 8.9.3 and 8.9.3A;

(d) information on the Treatment offered to the Treatment Group;

(e) confirmation in writing (together with reasoning) from an Accredited Statistician prior to the Implementation Date, that the:

(i) Accredited Statistician has randomly allocated Sites from the Population into the Control Group and the Treatment Group;

(ii) analysis method used to calculate the observed Energy Savings in Step 2 of Method 5.1 has been selected and is valid;

(iii) explanatory variables, including any interactions between them, have been documented if Method 5.4 is used;

(iv) lengths of the Implementation Period and the Pre-Implementation Period (if applicable) have been determined and documented;

(f) information on Sites removed from the Population in accordance with clauses 8.9.2(g) and 8.9.2(h), including reasoning for each Site's removal;

(g) documentation of reproducible steps and log files for the calculations performed; and

(h) any additional requirements as Published, from time to time, by the Scheme Administrator.

8.9.8 The Accredited Certificate Provider can only modify the methods in clause 8.9.7(e) for subsequent Implementation Periods. If modified, the Accredited Certificate Provider must obtain from an Accredited Statistician prior to the Implementation Date of the subsequent Implementation Periods, a new verification in writing.

8.9.9 The Implementation Date is the start date of the Implementation Period.

8.9.10 The Energy Saver is the person who holds the Measured Electricity Consumption or Measured Gas Consumption data or both, for all Sites in a Population in accordance with clause 8.9.3 or 8.9.3A.

8.9.11 For the purposes of this clause 8.9, the requirements under clause 6.8 are as Published by the Scheme Administrator for the purposes of this calculation method.

Method 5.1

Calculation of Energy Savings under the Aggregated Metered Baseline sub-method

Step (1) For each Population, adjust the Control Group and the Treatment Group for Attrition at the end of each Implementation Period, in accordance with clause 8.9.2. The number of Sites in the Treatment and Control Groups will be designated N_T and N_C respectively.

Step (2) Calculate the *Observed Energy Savings*, $ES_{observed}$, in MWh, over the Implementation Period using one of the following methods:

(a) Method 5.2 (Time-Aggregated Energy Consumption During the Implementation Period); or

(b) Method 5.3 (Time-Aggregated Energy Consumption During the Implementation and Pre-Implementation Periods - Difference in Differences); or

(c) Method 5.4 (Regression Modelling).

Step (3) The Scheme Administrator may provide the Accredited Certificate Provider with an estimate of *Uplift Energy Savings*, ES_{uplift}, over the Implementation Period using:

(a) Method 5.5 (Estimation of Uplift Energy Savings); or

(b) another method as Published by the Scheme Administrator.

If the Scheme Administrator does not provide an estimate of *Uplift Energy Savings*, the value of *Uplift Energy Savings* must be taken to be zero.

Unless otherwise notified by the Scheme Administrator, the Accredited Certificate Provider must provide the Scheme Administrator with data required to estimate *Uplift Energy Savings*, including the Addresses of Sites in the Treatment Group and Control Group; the Implementation Period data; and any other data, as requested by the Scheme Administrator.

For Sites with Measured Electricity Consumption or Measured Gas Consumption data or both, as per Clause 8.9.2(b)(i), for part of an Implementation Period due to Attrition, the date of Attrition is considered the last date of the Implementation Period for those given Sites.

Step (4) Calculate *Electricity Savings* in MWh, by subtracting the effect of *Uplift Energy Savings* from the *Observed Energy Savings*, ensuring the result is non-negative:

$$Electricity\ Savings = \max\left(0, ES_{observed} - ES_{uplift}\right)$$

$$Gas\ Savings = 0$$

Method 5.2

Calculation of *Observed Energy Savings* from Time-Aggregated Energy Consumption During the Implementation Period

Step (1) Calculate the mean daily energy use of the Treatment Group (E_T) over the Implementation Period:

$$E_T = {(\sum_s E_s)}/{(\sum_s D_s)}$$

where:

- s indexes over Sites in the Treatment Group
- E_s is the Measured Energy Consumption for Site (s) in the Treatment Group over the Implementation Period, calculated in accordance with clause 8.9.4A of this Rule; and
- D_s is number of days of Measured Energy Consumption at Site (s) in the Treatment Group over the Implementation Period

Step (2) Calculate the mean daily energy use of the Control Group (E_C) over the Implementation Period:

$$E_C = {(\sum_s E_s)}/{(\sum_s D_s)}$$

where:

- s indexes over Sites in the Control Group
- E_s is the Measured Energy Consumption for Site (s) in the Control Group over the Implementation Period, calculated in accordance with clause 8.9.4A of this Rule; and
- D_s is number of days of Measured Energy Consumption at Site (s) in the Control Group over the Implementation Period

Step (3) Using the Treatment Group measurements, the Control Group measurements and the standard error for the Control Group mean, perform the following hypothesis test:

$H_0 : E_C \leq E_T$

$H_{alt} : E_C > E_T$

Calculate $t = (E_C - E_T) / \left(sd * \sqrt{\frac{fpc_T}{N_T} + \frac{fpc_C}{N_C}} \right)$

Reject H_0 (and accept H_{alt}) if $t > T_{(p=0.95)}$

where:

- sd is the standard deviation of mean daily energy use at Sites in the Control Group in the Implementation Period, weighted by the number of days in the Implementation Period for which there is data about Measured Energy Consumption at Sites in the Control Group, as worked out using the formula

$$sd = \sqrt{\left\{ \sum_s f_s * \left(\frac{E_s}{D_s} - E_C \right)^2 \right\} * \frac{N_c}{N_c - 1}}$$

where:

f_s means the number of days in the Implementation Period for which there is data about Measured Energy Consumption at Site (s), as a proportion of the sum of all the days in the Implementation Period for which there is data about Measured Energy Consumption at Sites in the Control Group, as follows:

$$f_s = {}^{D_s}/_{(\sum_s D_s)}$$

- N_C is the number of Sites in the Control Group and N_T is number of Sites in the Treatment Group;
- $T_{(p=0.95)}$ is the value from standard T tables with $(N_C - 1)$ degrees of freedom. For degrees of freedom exceeding 2400 use the value of 1.6449. Note that 0.95 values of the T statistic are from the upper 5% points of the distribution;
- fpc_C is an optional finite population correction for estimating the Population mean from the Control Group, $fpc_C = (N - N_C)/(N - 1)$; and
- fpc_T is an optional finite population correction when using the Population mean to predict the Treatment Group mean, $fpc_T = (N - N_T)/(N - 1)$.

If able to reject H_0, proceed to step (4). Otherwise, E_C is taken to be less than or equal to E_T and $ES_{observed}$ is taken to be zero.

Step (4) Calculate the *Observed Energy Savings*, $ES_{observed}$, in MWh, over the Implementation Period:

$$ES_{observed} = (E_C - E_T) * \left(\sum_s D_s\right)$$

where:

- s indexes over Sites in the Treatment Group; and
- D_s is number of days of Measured Energy Consumption at Site (s) in the Treatment Group over the Implementation Period

Method 5.3

Calculation of *Observed Energy Savings* from Time-Aggregated Energy Consumption During the Implementation and Pre-Implementation Periods – Difference in Differences

Step (1) Calculate the change in mean daily energy use (C_s) between the Implementation Period and the Pre-Implementation Period for each Site in the Population:

$$C_s = E_{s,i} - E_{s,p} * \left(\frac{D_{s,i}}{D_{s,p}}\right)$$

where:

- $E_{s,i}$ is the Measured Energy Consumption at each Site (s) over the Implementation Period, calculated in accordance with clause 8.9.4A of this Rule;
- $E_{s,p}$ is the Measured Energy Consumption at Site (s) over the Pre-Implementation Period, calculated in accordance with clause 8.9.4A of this Rule;
- $\left(\frac{D_{s,i}}{D_{s,p}}\right)$ corrects for minor differences in length of Implementation Period compared to Pre-Implementation Period due to leap year;
- $D_{s,i}$ is the number of days of over the Implementation Period for which there is data about Measured Energy Consumption at Site (s); and
- $D_{s,p}$ is the number of days in the Pre-Implementation Period and must cover the same period of time in a previous year as $D_{s,i}$.

Step (2) Calculate the change in mean daily energy use of the Treatment Group (C_T) between the Implementation Period and the Pre-Implementation Period:

$$\mathrm{C_T} = \frac{\sum_s C_s}{\sum_s D_{s,i}}$$

where:

- s indexes over Sites in the Treatment Group; and
- $D_{s,i}$ is the number of days over the Implementation Period for which there is data about Measured Energy Consumption at Site (s).

Step (3) Calculate the change in mean daily energy use of the Control Group (C_C) between the Implementation Period and the Pre-Implementation Period:

$$C_C = \frac{\sum_s C_s}{\sum_s D_{s,i}}$$

where:

- s indexes over Sites in the Control Group; and

$D_{s,i}$is the number of days over the Implementation Period for which there is data about Measured Energy Consumption at Site (s).

Step (4) Using the Treatment Group measurements, the Control Group measurements and the standard error for the Control Group mean difference, perform the following hypothesis test:

$H_0 : C_C \leq C_T$

$H_{alt} : C_C > C_T$

Calculate $t = (C_C - C_T) \Big/ \left(sd * \sqrt{\frac{fpc_T}{N_T} + \frac{fpc_C}{N_C}} \right)$

Reject H_0 (and accept H_{alt}) if $t > T_{(p=0.95)}$

where:

- sd is the standard deviation of change, between the Pre-Implementation Period and Implementation Period, in the mean daily energy use at Sites in the Control Group, weighted by the number of days in the Implementation Period for which there is data about Measured Energy Consumption at Sites in the Control Group, as worked out using the formula

$$\mathrm{sd} = \sqrt{\left\{ \sum_s \mathrm{f_s} * \left(\frac{\mathrm{C_s}}{\mathrm{D_{s,i}}} - \mathrm{C_C} \right)^2 \right\} * \frac{\mathrm{N_c}}{\mathrm{N_c} - 1}}$$

where:

$\mathrm{f_s}$ means the number of days in the Implementation Period for which there is data about Measured Energy Consumption at Site (s), as a proportion of the sum of all the days in the Implementation Period for which there is data about Measured Energy Consumption at Sites in the Control Group, as follows:

$$\mathrm{f_s} = D_{s,i} \Big/ \left(\sum_s D_{s,i} \right)$$

- $\mathrm{N_C}$ is number of Sites in the Control Group and $\mathrm{N_T}$ is number of Sites in the Treatment Group;

- $T_{(p=0.95)}$ is the value from standard *T* tables with $(N_C - 1)$ degrees of freedom. For degrees of freedom exceeding 2400 use the value of 1.6449. Note that 0.95 values of the T statistic are from the upper 5% points of the distribution;
- fpc_C is an optional finite population correction for estimating the Population mean from the Control Group, $fpc_C = (N - N_C)/(N - 1)$; and
- fpc_T is an optional finite population correction when using the Population mean to predict the Treatment Group mean, $fpc_T = (N - N_T)/(N - 1)$.

If able to reject H_0, proceed to step (5). Otherwise, C_C is taken to be less than or equal to C_T and $ES_{observed}$ is taken to be zero

Step (5) Calculate the *Observed Energy Savings*, $ES_{observed}$, in MWh, over the Implementation Period:

$$ES_{observed} = (C_C - C_T) * \left(\sum_s D_s\right)$$

where:

- s indexes over Sites in the Treatment Group; and
- $D_{s,i}$ is the number of days over the Implementation Period for which there is data about Measured Energy Consumption at Site (s).

Method 5.4

Calculation of *Observed Energy Savings* from Regression Modelling

Step (1) Calculate the mean daily energy use $(DE_{s,i})$ for each Site in the Population for the Implementation Period:

$$DE_{s,i} = E_{s,i}/D_{s,i}$$

where:

- $E_{s,i}$ is the Measured Energy Consumption for Site (s) over the Implementation Period, calculated in accordance with clause 8.9.4A of this Rule; and
- $D_{s,i}$ is the number of days of Measured Energy Consumption at Site (s) over the Implementation Period

Step (2) Calculate the mean daily energy use $(\text{DE}_{\text{s,p}})$ for each Site in the Population for the Pre-Implementation Period:

$$DE_{s,p} = E_{s,p}/D_{s,p}$$

where:

- $E_{s,p}$ is the Measured Energy Consumption for each Site (s) over the Pre-Implementation Period, calculated in accordance with clause 8.9.4A of this Rule; and
- $D_{s,p}$is the number of days of Measured Energy Consumption at Site (s) over the Pre-Implementation Period.

Step (3) Create the evaluation data set consisting of one observation for each Site in the Population containing $DE_{s,i}$, $DE_{s,p}$, T_s and other appropriate explanatory variables, where:

- T_s is a variable taking the value 1 if a Site (s) is in the Treatment Group and 0 if it is in the Control Group; and
- OtherVariables_s is the vector of other appropriate explanatory variables.

Step (3B) For cases where there are Sites with Measured Energy Consumption data for part of an Implementation Period due to Attrition, create another variable $W_{s,m}$, where:

- $W_{s,m}$ is a variable taking the value 1 if the Site (s) has Measured Energy Consumption during time period m and 0 otherwise. m = 1 … NTP; and
- NTP is the number of non-overlapping and exhaustive time periods for the implementation.
- The time periods are to be allocated so that each time period has (as close as is possible) the same number of Sites subject to Attrition during that period.

Step (4) Estimate the average treatment effect per day $(\hat{\beta})$ by estimating the following regression via Weighted Least Squares (WLS) and weighting by $D_{s,i}$:

$$DE_{s,i} = \alpha + \beta T_s + \delta DE_{s,p} + \sum \lambda_m W_{s,m} + \sum \gamma_k OtherVariables_{s,k} + \varepsilon_s$$

where:

- α is the intercept;
- β is the treatment effect;
- δ is the impact of Pre-Implementation Period energy consumption;
- λ_m accounts for time period (m) variation;
- γ_k is the effect of the kth other explanatory variable, k=1….K where K is the total number of other explanatory variables; and
- ε_s is the error term.

Step (5) Using the estimated treatment effect (denoted as $\hat{\beta}$) and its standard error perform the following hypothesis test:

$H_0: \hat{\beta} \geq 0$

$H_{alt}: \hat{\beta} < 0$

Calculate $t = \hat{\beta} / se(\hat{\beta})$

Reject H_0 (and accept H_{alt}) if $t < T_{(p=0.05)}$

where:

- $se(\hat{\beta})$ is the standard error of $\hat{\beta}$; and
- T(p=0.05) is the value from the standard T table with $N_T + N_C - (3 + K + NTP)$~~$(N_T + N_C - 2)$~~degrees of freedom. For degrees of freedom exceeding 2400 use the value of -1.6449. Note that 0.05 values of the T statistic are from the lower 5% points of the distribution.

A negative value for $\hat{\beta}$ indicates a reduction in energy usage. Therefore, if able to reject H_0, proceed to step (6). Otherwise, $\hat{\beta}$ is taken to be non-negative and $ES_{observed}$ is taken to be zero.

Step (6) Calculate the *Observed Energy Savings*, $ES_{observed}$, in MWh, over the Implementation Period*:*

$$ES_{observed} = -\hat{\beta} * \left(\sum_s D_s \right)$$

where:

- s indexes over Sites in the Treatment Group; and
- D_s is the number of days of Measured Energy Consumption at Site (s) in the Treatment Group over the Implementation Period.

Method 5.5 - Estimation of *Uplift Energy Savings*

Step (1) Estimate the *Lifetime Energy Savings*, $LES_{s,a}$, from each *Other Activity (a)* implemented in each Site (s) in the Population, within the Implementation Period.

Where:

- *Other Activity* (*a)* means either:
  - any other Recognised Energy Saving Activity, apart from the Recognised Energy Saving Activity that is the subject of this calculation; or
  - an activity referred to in clauses 5.4(f) 5.4(g), or 5.4(i) of this Rule.

Step (2) Calculate the Energy Savings, $ES_{s,a}$, for each Site *s* due to each *Other Activity a* during the Implementation Period:

$$ES_{s,a} = LES_{s,a} * \left(\frac{Overlap_a}{Lifetime_a}\right)$$

where:

- $Lifetime_a$, in years, is the Lifetime of the Energy Savings for each *Other Activity (a)*, or 10 years if it is not defined in this Rule; and
- $Overlap_a$, in years, is the length of time of the Implementation Period that overlaps with the Lifetime of the Energy Savings for each *Other Activity (a)*.
- If the *Other Activity (a)* had one or more Energy Savings calculated using the Metered Baseline Method, then the Lifetime of the Energy Savings is the length of the Measurement Period of that calculation.
- The calculation of the duration of overlap must take account of Attrition of Sites.

Step (3) Calculate the average Energy Savings, $ES_{T,all\ Other\ Activities}$ and $ES_{C,all\ Other\ Activities}$, due to all *Other Activities* (*a)* for all Sites in the Treatment Group and Control Group respectively, over the Implementation Period:

$$ES_{T,all\ Other\ Activities} = \frac{\sum_{s\ in\ Treament\ Group,a} ES_{s,a}}{N_T}$$

and

$$ES_{C,all\ Other\ Activities} = \frac{\sum_{s\ in\ Control\ Group,a} ES_{s,a}}{N_C}$$

where:

- The summation is over all Sites (s) in the Treatment Group (for $ES_{T,all\ Other\ Activities}$) and Control Group (for $ES_{C,all\ Other\ Activities}$), respectively, and all Other Activities that overlap with the Implementation Period; and
- The N_T and N_C are the number of Sites in the Treatment Group and Control Group respectively for Implementation Period.

Step (4) Calculate the *Uplift Energy Savings*, ES_{uplift}, from *Other Activities* due to participation in the program:

$$ES_{uplift} = \left(ES_{T,all\ Other\ Activities} - ES_{C,all\ Other\ Activities}\right) * N_T$$

Step (5) Ensure the *Uplift Energy Savings*, ES_{uplift}, are non-negative:

$$ES_{uplift} = \max\left(0, ES_{uplift}\right)$$

9 Deemed Energy Savings Method

Note: The Deemed Energy Savings Method can be used for the replacement, installation and delivery of common End-User Equipment such as lighting, refrigerators and electric motors.

9.1 Energy Savings for Implementations may be calculated in accordance with:

(a) clause 9.3 (Sale of New Appliances), for the Activity Definitions set out in Schedule B;

(b) clause 9.4 (Commercial Lighting Energy Savings Formula);

(c) clause 9.4A (Public Lighting Energy Savings Formula);

(d) clause 9.5 (High Efficiency Motor Energy Savings Formula);

(e) clause 9.6 (Power Factor Correction Energy Savings Formula);

(f) clause 9.7 (Removal of Old Appliances), for the Activity Definitions set out in Schedule C;

(g) clause 9.8 (Home Energy Efficiency Retrofits), for the Activity Definitions set out in Schedules D and E; or

(h) clause 9.9 (High Efficiency Appliances for Businesses), for the Activity Definitions set out in Schedule F.

(i) (deleted).

9.2 For the purposes of section 131 of the Act, where the Energy Savings for an Implementation are calculated using the Deemed Energy Savings Method in this clause 9, those Energy Savings are taken to occur on the Implementation Date.

9.2A Acceptable End-User Equipment

9.2A.1 Under the Deemed Energy Savings Method, Equipment Requirements apply to End-User Equipment. The Equipment Requirements are specified in clauses 9.3 to 9.9, and also include any additional Equipment Requirements (as Published from time to time by the Scheme Administrator) that apply to the relevant calculation method of this Rule.

9.2A.2 The Scheme Administrator may Publish, from time to time, a list of Products that are accepted by the Scheme Administrator as meeting the Equipment Requirements referred to in clause 9 by:

(a) Publishing a detailed list identifying each Product;

(b) Publishing a reference to a list from a certifying body, along with any restrictions on that list; and/or

(c) Publishing a requirement for labelling in accordance with a labelling scheme, along with any restrictions on that labelling.

9.2A.3 Subject to clause 9.2A.4, any Accredited Certificate Provider (or other persons as Published by the Scheme Administrator), may apply to the Scheme Administrator to have a Product accepted as meeting the Equipment Requirements, provided that they:

(a) apply in a form and manner required by the Scheme Administrator;

(b) pay any fee required by the Scheme Administrator in respect of the investigation and determination of the application on a cost recovery basis and including an allowance for:

(i) the recovery by the Scheme Administrator of its costs in establishing, operating and maintaining the systems and databases required in connection with the assessment, acceptance and rejection of applications made under this clause 9.2A.3;

(ii) the exercise of the Scheme Administrator's powers under clauses 9.2A.2 and 9.2A.5; and

(iii) the payment and collection of fees under this clause 9.2A.3(b);

(c) identify the Product; and

(d) provide evidence that the Product meets all of the Equipment Requirements.

9.2A.4 The Scheme Administrator may limit the number of applications that may be made during a period under clause 9.2A.3, either in aggregate or by particular persons or classes of persons, by Publishing a notice that sets out that period and limit.

9.2A.5 The Scheme Administrator may, at any time, cease to accept a Product as meeting the Equipment Requirements, provided that it:

(a) notifies all Accredited Certificate Providers accredited for the relevant Recognised Energy Saving Activity of the change and the reason for the change, prior to the Product ceasing to be accepted for this purpose; and

(b) ensures that all Published lists reflect the change in a timely manner.

9.2A.5A The Scheme Administrator may accept or reject an application made under clause 9.2A.3.

9.2A.6 Without limiting clause 9.2A.5A, the Scheme Administrator may reject an application made under clause 9.2A.3 where the applicant has not provided additional information requested by the Scheme Administrator in support of that application within a timeframe Published by the Scheme Administrator.

9.3 Sale of New Appliances

9.3.1 The Energy Savings for an Implementation may be calculated using **Equation 5**, provided that:

(a) each item of End-User Equipment meets the Equipment Requirements in one of the Activity Definitions set out in Schedule B;

(b) each item of End-User Equipment was sold by an Appliance Retailer;

(c) each item of End-User Equipment was new at the time it was sold by the Appliance Retailer;

(d) each item of End-User Equipment was delivered to an Address, or was sold to a Purchaser with an Address recorded by the Appliance Retailer; and

(e) compliance with the requirements in clauses (a) to (d) above is evidenced by a tax invoice and/or other evidence acceptable to the Scheme Administrator.

9.3.2 For the purposes of clause 5.3(a), End-User-Equipment under clause 9.3 is deemed to be installed upon its sale.

9.3.3 For the purposes of clause 6.8, the Site of the Implementation is the Address referred to in clause 9.3.1 (d) of this Rule.

9.3.4 The Implementation Date is the date that the End-User Equipment was sold.

9.3.5 The Energy Saver is the Appliance Retailer who sells the End-User Equipment to a Purchaser.

9.3.6 (deleted)

Equation 5

For each Implementation:

$$Electricity\ Savings = \sum Deemed\ Equipment\ Electricity\ Savings \times Regional\ Network\ Factor$$

Where:

- the summation is over all items of End-User Equipment that have been sold as part of the Implementation; and
- *Deemed Equipment Electricity Savings*, in MWh, for each item of End-User Equipment are calculated according to the respective **Activity Definition B1, B2, B3, B4, B5, B6, or B7** of Schedule B.
- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

9.4 Commercial Lighting Energy Savings Formula

9.4.1 The Energy Savings for an Implementation may be calculated using **Equations 6** and **9** and either **7** or **8**, provided that:

(a) the activity is a Lighting Upgrade of:

(i) Lighting for Roads and Public Spaces;

(ii) Traffic Signals; or

(iii) Building Lighting;

(b) the Lighting Upgrade meets or exceeds the relevant lighting standards for each upgrade, to the satisfaction of the Scheme Administrator;

(c) if the Lighting Upgrade is of Building Lighting, then each space, after implementation of the Lighting Upgrade must, to the satisfaction of the Scheme Administrator, achieve:

(i) the relevant requirements of AS/NZS 1680, specifically including but not limited to maintained illuminance accounting for lumen depreciation, control of glare, and uniformity of illuminance, or another benchmark approved by the Scheme Administrator where the Lighting Upgrade is outside the scope of AS/NZS1680;

(ii) the requirements of the BCA section F4.4, Safe Movement (as updated from time to time);

(iii) an IPD that equals or is less than the maximum IPD for each space, as defined in Part J6 of the BCA; and

(iv) any other minimum performance requirements as Published by the Scheme Administrator;

(d) the Lighting Upgrade is performed by appropriately trained persons, according to requirements Published by the Scheme Administrator, and is undertaken by or under the supervision of a Licensed electrician;

(e) the Purchaser has paid a net amount of at least $5 (excluding GST) per MWh of Electricity Savings, which must not be reimbursed, for the goods or services making up the Implementation, and which payment is evidenced to the satisfaction of the Scheme Administrator;

(f) each item of End-User Equipment used in the Lighting Upgrade is either:

(i) a Standard Equipment Class as listed in Table A9.1 of Schedule A or,

(ii) an Other Equipment Class as listed in Table A9.3 of Schedule A , provided that the item is accepted by the Scheme Administrator as meeting the Equipment Requirements specified in Table A9.4 of Schedule A.

(g) if the Lighting Upgrade is of Lighting for Roads and Public Spaces, then the Lighting Upgrade, must, to the satisfaction of the Scheme Administrator, achieve:

(i) the requirements of the AS/NZS 1158 series of standards; or

(ii) any other standard or benchmark specified by the Scheme Administrator.

(h) if the Lighting Upgrade is of Traffic Signals, then the Lighting Upgrade must, to the satisfaction of the Scheme Administrator, achieve:

(i) the relevant requirements of AS 2144:2014; or

(ii) any other standard or benchmark specified by the Scheme Administrator.

Note: In-kind payments are not an acceptable form of payment for the purposes of clause 9.4.1(e). For example, the purchaser cannot provide goods and services in exchange for goods and services that make up the Implementation for the purposes of clause 9.4.1(e).

9.4.2 The Implementation Date is the date when the Lighting Upgrade was completed.

9.4.3 The Energy Saver is the Purchaser.

9.4.4 (deleted).

Equation 6

For each Implementation:

$$Electricity\ Savings = [Baseline\ Consumption - Upgrade\ Consumption] \times Regional\ Network\ Factor$$

Where:

- *Baseline Consumption*, in MWh, is calculated:
  - using **Equation 7**, if the Lighting Upgrade is part of a refurbishment that would not have been required to comply with the BCA Part J6, had the Lighting Upgrade component of the refurbishment not occurred;
  - using **Equation 7** if the Lighting Upgrade is part of a refurbishment that would have been required to comply with the BCA Part J6, had the Lighting Upgrade component of the refurbishment not occurred and where the existing lighting meets or is below the maximum IPD requirements of the BCA Part J6; or

- using **Equation 8** if the Lighting Upgrade is part of a refurbishment that would have been required to comply with the BCA Part J6, had the Lighting Upgrade component of the refurbishment not occurred, and where the existing lighting does not meet the IPD requirements of the BCA Part J6.

- *Upgrade Consumption*, in MWh, is calculated using **Equation 9**
- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

Equation 7

Baseline Consumption (MWh) =

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

Where:

- *Each Incumbent Lamp* means each Lamp and Control Gear in the pre-existing lighting system;
- *LCP*, in Watts, is the default lamp circuit power corresponding to that type of Lamp and Control Gear for that End-User Equipment as set out in **Table A9.2** or **Table A9.4** of Schedule A, representing the power drawn by the Lamp, plus the losses of its Control Gear;
- *Asset Lifetime*, in years, is the default lifetime of the Lighting Upgrade for the relevant End-User Equipment as used in **Equation 9**;
- *Annual Operating Hours*, in hours/year, is the default number of hours per annum that the upgraded lighting system is expected to operate for the relevant building and space type as set out in **Table A10.2** of Schedule A;
- *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 set out in **Table A10.4** of Schedule A to this Rule, otherwise CM = 1.0; and.
- *AM* is the air-conditioning multiplier for the space as used in **Equation 9**.

Equation 8

Baseline Consumption (MWh) =

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

Where:

- *Each Space* means each portion of space within the Site requiring a different IPD as defined in Part J6 of the BCA;
- *IPD*, in Watts/m^2, is the maximum allowable IPD for each space, as required by Table J6.2a of the BCA. For simplicity, the Scheme Administrator may take a weighted average of similar IPDs in the Commercial Lighting Energy Savings Formula.
- *Area*, in m^2, is the area of Each Space;
- *Asset Lifetime*, in years, is the default lifetime of the Lighting Upgrade for the relevant End-User Equipment as used in **Equation 9**;

- *Annual Operating Hours*, in hours/year, is the default number of hours per annum that the upgraded lighting system is expected to operate for the relevant building and space type as set out in **Table A10.2** of Schedule A; and
- *AM* is the air-conditioning multiplier for the space as used in **Equation 9**.

Equation 9

Upgrade Consumption (MWh) =

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

Where:

- *Each Upgrade Lamp* means each Lamp and Control Gear in the upgraded lighting system.
- *LCP*, in Watts, is the default lamp circuit power corresponding to that type of Lamp and Control Gear for that End-User Equipment as set out in **Table A9.2** or **Table A9.4** of Schedule A, representing the power drawn by the Lamp, plus the losses of its Control Gear;
- *Asset Lifetime*, in years, is the default lifetime of the Lighting Upgrade for the relevant End-User Equipment as set out in **Table A10.1** of Schedule A, or another value accepted by the Scheme Administrator;
- *Annual Operating Hours*, in hours/year, is the default number of hours per annum that the upgraded lighting system is expected to operate for the relevant building and space type as set out in **Table A10.2** of Schedule A.
- *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 set out in **Table A10.4** of Schedule A, otherwise CM = 1.0; and
- *AM* is the air-conditioning multiplier for the space, after Implementation, as set out in **Table A10.5** of Schedule A.

9.4A Public Lighting Energy Savings Formula

9.4A.1 The Energy Savings for an Implementation may be calculated using **Equations 6, 7** and **9** of Clause 9.4, provided that:

(a) the activity is a Lighting Upgrade of:

(i) Lighting for Roads and Public Spaces; or

(ii) Traffic Signals; and

(b) the Luminaire is an asset owned and/or maintained by a Distributor or Roads and Maritime Services; and

(c) each item of End-User Equipment used in the Lighting Upgrade is either:

(i) a Standard Equipment Class as listed in Table A9.1 of Schedule A or,

(ii) an Other Equipment Class as listed in Table A9.3 of Schedule A, provided that the item is accepted by the Scheme Administrator as meeting the Equipment Requirements specified in Table A9.4 of Schedule A.

9.4A.2 The Implementation Date is the date when the Lighting Upgrade was completed.

9.4A.3 The Energy Saver is:

(a) the Distributor or Roads and Maritime Services that is the owner of the Luminaire; or

(b) the Council or Roads and Maritime Services if they:

(i) are a public lighting customer, for billing, regulatory or management purposes, of the Distributor that owns the Luminaire, and

(ii) request the Lighting Upgrade from the Distributor that owns the Luminaire, in writing.

9.4A.4 If the Lighting Upgrade involves an existing or replacement Lamp or Luminaire that:

(a) is registered on a national electricity market load table for unmetered connection points, the device load value listed in that load table must be used as the LCP in **Equations 7** and **9** of clause 9.4; or

(b) is not registered on a national electricity market load table for unmetered connection points, the device load value as listed in a Public Lighting Inventory must be used as the LCP in **Equations 7** and **9** of clause 9.4.

9.4A.5 If the Lighting Upgrade involves the installation of a Control System the control multiplier *CM* when calculating Energy Savings using **Equations 6, 7** and **9** of Clause 9.4 must be set equal to 1.

9.5 High Efficiency Motor Energy Savings Formula

9.5.1 The Energy Savings may be calculated using **Equation 12**, provided that:

(a) the End-User Equipment is a new High Efficiency Motor; and

(b) the High Efficiency Motor is installed.

9.5.2 The Implementation Date is the date that the High Efficiency Motor was installed.

9.5.3 The Energy Saver is the Purchaser.

9.5.4 (deleted).

9.5.5 An Accredited Certificate Provider may only calculate Energy Savings for an Implementation using **Equation 12** if they were accredited by the Scheme Administrator to create Energy Savings Certificates using the High Efficiency Motor Energy Savings Formula on or before 15 April 2016.

Equation 12

For each Implementation:

$$Electricity\ Savings = P \times LUF \times DEI \times Asset\ Life \times 8760 \div 1000 \times Regional\ Network\ Factor$$

Where:

- *P*, in kW, is the rated output of the High Efficiency Motor
- *LUF* is the Default Load Utilisation Factors for the relevant High Efficiency Motor as set out in **Table A12** of Schedule A, where the Business Classification and End-Use Service relevant to the Energy Savings is known, or **Table A13** of Schedule A otherwise;
- *DEI* is the default efficiency improvement (as a fraction, not as a percentage) for the relevant High Efficiency Motor as set out in **Table A11** of Schedule A; and
- *Asset Life*, in years, of the High Efficiency Motor is set out in **Table A14** of Schedule A to this Rule for the corresponding rated output of the High Efficiency Motor.

- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

9.6 Power Factor Correction Energy Savings Formula

9.6.1 The Energy Savings may be calculated using **Equations 13** and **14**, provided that:

(a) the capacitors to provide the power factor correction services are installed at a Site where electricity is supplied from the Electricity Network at less than 50 kilovolts (kV);

(b) the capacitors improve the power factor of the Site to achieve a minimum of 0.9 lagging;

(c) the capacitors are not installed as part of a mandatory program of installation;

(d) the capacitors are installed at the main switchboard, where the Site is connected to the Electricity Network; and

(e) the capacitors are new.

9.6.2 The Implementation Date is the date on which the capacitors were installed.

9.6.3 The Energy Saver is the Purchaser.

9.6.4 (deleted)

Equation 13

For each Implementation:

$$Electricity\ Savings = (Power\ Savings) / 1000 \times (Annual\ operating\ hours) \times (Site\ Life) \times Regional\ Network\ Factor$$

Where:

- *Power Savings*, in kW, is the line loss power savings, less capacitor losses, during operating hours, and is calculated according to **Equation 14;**
- *Annual operating hours*, in hours/year, is the number of hours per year that the Site is operating and equals 1750; and
- *Site Life*, in years, is the expected remaining lifetime of the Site and the capacitors and equals 10.
- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

Equation 14

$$Power\ Savings\ (kW) = Real\ Power \times 0.7 \times (DLF - 1) \times (1 - (Initial\ power\ factor)^2 / (Final\ power\ factor)^2) - 0.0039 \times (Rating\ of\ installed\ capacitors)$$

Where:

- *Real Power*, in kW, is the real power component of the average Site load during operating hours;
- *DLF* is the distribution loss factor for the Distribution District that the Site is connected to, as detailed in **Table A19** of Schedule A;

- *Initial power factor* is the power factor of the load before the capacitors are installed, or 0.9, whichever is greater;
- *Final power factor* is the power factor of the load after the capacitors have been installed, or 0.98, whichever is lesser; and
- *Rating of installed capacitors*, in kvar, is the rated reactive power of the installed capacitors.

9.7 Removal of Old Appliances

9.7.1 The Energy Savings for an Implementation may be calculated using **Equation 15**, provided that:

(a) the Site is a Residential Building or a Small Business Site;

(b) each item of End-User Equipment meets one of the Equipment Requirements in Activity Definition C1 or C2 of Schedule C;

(c) each item of End-User Equipment is removed from the Site and disposed of; and

(d) compliance with the requirements in clauses 9.7.1(a) to (c) above is evidenced by a copy of the disposal agent's refrigerant handling Licence, and/or other evidence acceptable to the Scheme Administrator.

9.7.2 The Implementation Date is the date that the End-User Equipment was removed from the Site.

9.7.3 The Energy Saver is the person who is contracted to remove the End-User Equipment.

Equation 15

For each Implementation:

$$Electricity\ Savings = \sum Deemed\ Equipment\ Electricity\ Savings \times Regional\ Network\ Factor$$

Where:

- the summation is over all items of End-User Equipment that have been removed as part of the Implementation; and
- *Deemed Equipment Electricity Savings*, in MWh, are calculated according to **Activity Definition C1 or C2** of Schedule C.
- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

9.8 Home Energy Efficiency Retrofits

9.8.1 The Energy Savings for an Implementation may be calculated using **Equation 16**, provided that:

(a) the Site is a Residential Building or a Small Business Site, as evidenced to the satisfaction of the Scheme Administrator;

(b) a Site Assessment has been conducted on or before the Implementation Date;

(c) the Eligibility Requirements for the relevant Activity Definition are met immediately prior to the Implementation Date;

(d) installed End-User Equipment or Products that modify End-User Equipment meet all of the Equipment Requirements for the relevant Activity Definition;

(e) the completed Implementation satisfies all of the relevant Implementation Requirements;

(f) where the Implementation only consists of activities from Schedule E, sufficient activities are implemented to create a minimum of four Energy Savings Certificates, unless the activities are delivered through a Low-income Energy Program; and

(g) the Purchaser has paid a net amount of at least $30 (excluding GST) which must not be reimbursed, for the Implementation, assessment and other associated works carried out at the Site, and which payment is evidenced to the satisfaction of the Scheme Administrator, unless delivered through a Low-income Energy Program or an Exempt Energy Program.

Note: In-kind payments are not an acceptable form of payment for the purposes of clause 9.8.1(g). For example, the purchaser cannot provide goods and services in exchange for goods and services that make up the Implementation for the purposes of clause 9.8.1(g).

9.8.2 The Implementation Date is the earliest date that all of the conditions of clause 9.8.1 are met.

9.8.3 The Energy Saver is the Purchaser.

9.8.4 (deleted)

9.8.5 The activities that make up the Implementation must be identified, recorded and reported to the Scheme Administrator in a manner and form determined by the Scheme Administrator.

Equation 16

For each Implementation:

$$Electricity\ Savings = \sum Deemed\ Activity\ Electricity\ Savings \times Regional\ Network\ Factor$$

$$Gas\ Savings = \sum (Deemed\ Activity\ Gas\ Savings)$$

Where:

- the summation is over all activities at the Site in accordance with this clause 9.8; and
- *Deemed Activity Electricity Savings*, in MWh, are calculated according to the Activity Energy Savings formula set out in the relevant **Activity Definition** in Schedule D or Schedule E for each Implementation at the Site.
- *Deemed Activity Gas Savings*, in MWh, are calculated according to the Activity Energy Savings formula set out in the relevant **Activity Definition** in Schedule D or Schedule E for each Implementation at the Site.
- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

9.9 Installation of High Efficiency Appliances for Businesses

9.9.1 The Energy Savings for an Implementation may be calculated using **Equation 17**, provided that:

(a) each item of End-User Equipment meets the Equipment Requirements in an Activity Definition listed in Schedule F;

(b) each item of End-User Equipment meets the Installation Requirements as specified in the relevant Activity Definition; and

(c) each item of End-User Equipment is installed at an Address in an ESS Jurisdiction.

9.9.2 The Implementation Date is the date that the End-User Equipment is installed.

9.9.3 The Energy Saver is the Purchaser.

9.9.4 (deleted)

Equation 17

For each Implementation:

$$Electricity\ Savings = \sum Deemed\ Equipment\ Electricity\ Savings \times Regional\ Network\ Factor$$

$$Gas\ Savings = \sum Deemed\ Equipment\ Gas\ Savings$$

Where:

- the summation is over all items of End-User Equipment that have been installed as part of the Implementation; and
- *Deemed Equipment Electricity Savings*, in MWh, for each item of End-User Equipment are calculated according to the relevant **Activity Definition** in Schedule F.
- *Regional Network Factor* is the value from **Table A24** of Schedule A corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.
- *Deemed Equipment Gas Savings*, in MWh, for each item of End-User Equipment are calculated according to the relevant **Activity Definition** in Schedule F.

9.10 (deleted)

10 Definitions and Interpretation

10.1 In this Rule:

"Accuracy Factor" has the meaning given to that term in clause 7A.10.

"Accreditation Date" means, with respect to a Recognised Energy Saving Activity, the date on which the Scheme Administrator approves an Accredited Certificate Provider's application:

(a) for accreditation with respect to that activity; or

(b) to amend its existing accreditation to add that activity.

"Accredited Certificate Provider" has the same meaning it has in the Act.

"Accredited Statistician" means a person:

(a) accredited by the Statistical Society of Australia Inc. at the time of carrying out the verification in accordance with clause 8.9.7(e); and

(b) accepted by the Scheme Administrator for the purposes of this Rule.

"Act" means the *Electricity Supply Act 1995*.

"Activity Definition" means an activity as specified in a Schedule to this Rule.

"Additional Energy Savings" means, in respect of clauses 7, 7A and 8, Energy Savings for which no Energy Savings Certificates have been created, but which arise from an Implementation in relation to which Energy Savings Certificates have been created.

"Address" means a street address within an ESS Jurisdiction, in a format approved by the Scheme Administrator.

"ANZSIC" means the Australian and New Zealand Standard Industrial Classification developed by the Australian Bureau of Statistics and Statistics New Zealand.

"Appliance Retailer" means a person who has sold End-User Equipment which meets the Equipment Requirements of a Recognised Energy Saving Activity set out in Schedule B, in a new condition, to a Purchaser.

"Approved Corresponding Scheme" has the same meaning as it has in section 127 of the Act.

"AS" means an Australian Standard as published by SAI Global.

"**AS/NZS"** means an Australian/New Zealand Standard as published by SAI Global.

"Attrition" means, in relation to clause 8.9, the termination of the natural gas or electricity account in relation to a specific Site, for example, due to electricity customers switching retailers, relocating to a different Site, or disconnection from their electricity service.

"Ballast EEI" means the ballast energy efficiency index as defined in AS/NZS 4783.2 *Performance of electrical lighting equipment - Ballasts for fluorescent lamps - Energy labelling and minimum energy performance standards requirements*.

"Baseline NABERS Rating" has the meaning given in Step 2 of Method 4, under clause 8.8.

"Baseline Energy Model" is the model described in clause 7A.3.

"BASIX" means the NSW Building Sustainability Index established under the *Environmental Planning and Assessment Regulation 2000*.

"BCA" means the Building Code of Australia, forming part of the National Construction Code as updated from time to time.

"Building Lighting" means End-User-Equipment lighting affixed to a Commercial/Industrial premises which is classified under the BCA as Class 3, 5, 6, 7, 8, 9, or 10(b) buildings or the Common Area of a BCA Class 2 building.

"Business Classification" is the primary classification of the business making use of the End-Use Service for which energy was saved, detailed in Table A18 of Schedule A.

"Certificate Conversion Factor" has the same meaning as it has in the Act.

"CFL" means compact fluorescent Lamp.

"CFLi" means a compact fluorescent Lamp with integrated ballast.

"CFLn" means a compact fluorescent Lamp with non-integrated ballast.

"**Coefficient of Variation**" means, for the purposes of clause 7A, the sample standard deviation expressed as a percentage of the sample mean.

"Common Areas" means:

(a) for buildings owned under strata title, the common property as defined in either the *Strata Schemes (Freehold Development) Act 1973*, or *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 BCA Class 2 buildings.

"Computer Simulation" means a method to establish an energy model that uses software to simulate energy consumption by End-User Equipment and can be tested against statistical requirements Published by the Scheme Administrator for the purposes of clause 7A of this Rule.

"Control Gear" means the lighting ballast, transformer or driver.

"Control Group" means, in relation to clause 8.9, the group of Sites selected to not be offered the Treatment.

"Control Multiplier A" is a factor from Table A10.4A of Schedule A for a control device that switches the luminaire on and off and must control a maximum of 6 luminaires (except Occupancy Sensor 1).

"Control Multiplier B" is a factor from Table A10.4A of Schedule A for a control device that reduces the luminaire's power output and must control a maximum of 6 luminaires (except Occupancy Sensor 1). The luminaire must have at least two rated LCP modes that must not be adjusted after the Implementation.

"Control System" means a system for controlling the light output of a Luminaire, including:

(a) Occupancy Sensor;

(b) Daylight-Linked Control;

(c) Programmable Dimming;

(d) Manual Dimming; or

(e) Voltage Reduction Unit.

"Council" means a Council as defined by the *Local Government Act 1993* or corresponding legislation in an approved corresponding scheme jurisdiction.

"Decay Factor" is a number between 0 and 1 which quantifies the decay of the Electricity Savings or Gas Savings due to equipment degradation over time, as determined in accordance with clauses 7 and 7A.

"Deemed Energy Savings Method" means the method in clause 9.

"Default Load Utilisation Factor" is a composite of a deemed load factor and a deemed utilisation factor for HEMs, as set out in Table A12 or Table A13 of Schedule A.

"Distribution District" has the same meaning as it has in the Act.

"Distributor" has the same meaning as it has in the Act.

"Distribution Pipeline" has the same meaning as it has in the *Gas Supply Act 1996*.

"Distribution System" has the same meaning as it has in the Act.

"Downward Light Output" means the luminous flux (measured in lumens) emitted in the downwards direction, equivalent to the Light Output from a Lamp or Luminaire when installed flush with a ceiling.

"Effective Range" means the range over which values of Independent Variables for which a Baseline Energy Model or Operating Energy model (as the case may be) is valid for the purposes of clause 7A of this Rule.

"Electricity Network" means all electricity Transmission Systems and Distribution Systems located in an ESS Jurisdiction.

"**Electricity Retailer**" has the same meaning as "retailer" in the *National Energy Retail Law (NSW)*.

"Electricity Savings" means the reduction of the amount or equivalent amount of electricity consumption (in MWh) arising from the Implementation as calculated by the approved calculation method in clauses 7, 7A, 8 or 9. Electricity Savings may be negative for fuel switching activities.

"Eligibility Requirements" means:

(a) in relation to clause 7A, the set of defined requirements that a Site must meet to be included in the Population; or

(b) in relation to the Deemed Energy Savings Method, the eligibility requirements specified in an Activity Definition in the Schedules to this Rule.

"ELV" means extra low voltage, not exceeding 50 volts alternating current (AC) or 120 volts ripple free direct current (DC), as defined in *AS/NZS 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules)*.

"End-Use Service" is the primary service provided by End-User Equipment, such services being as detailed in Table A17 of Schedule A.

"End-User Equipment" means electricity or Gas consuming equipment or both, processes, or systems, including the equipment directly consuming electricity or Gas, or both, and other equipment or products that cause, control or influence the consumption of electricity or Gas, or both, and includes (in the context of clause 8.8) a NABERS Building.

"Energy Saver" means the person who has the right to create Energy Savings Certificates for particular Energy Savings arising from an Implementation of a Recognised Energy Saving Activity at a Site, as defined in the relevant calculation method of this Rule.

"Energy Savings" means the Electricity Savings or Gas Savings or both.

"Energy Savings Certificate" has the same meaning as it has in the Act.

"Energy Star Rating" means an Energy Star Rating as defined in the relevant AS/NZS.

"Equipment Requirements" means the equipment requirements as specified in a Schedule in this Rule.

"ESS Jurisdiction" means the state of New South Wales, or a jurisdiction in which an Approved Corresponding Scheme is in operation in accordance with section 127 of the Act.

"Estimate of the Mean" means, for the purposes of clause 7A, a method to establish an energy model as described in clause 7A.2 (a)(i).

"Exempt Energy Program" means a New South Wales Government energy initiative which has been notified to the Scheme Administrator, and approved by the Minister for the Environment, as an Exempt Energy Program for the purposes of this Rule.

"Exempt Seller" has the same meaning as it has in the *National Energy Retail Law (NSW)*.

"Gas Retailer" has the same meaning as "retailer" in the *National Energy Retail Law (NSW)*.

"Gas Savings" means the reduction of the amount of Gas combusted for stationary energy (in MWh) arising from the Implementation as calculated by the approved calculation method in clauses 7, 7A, 8 or 9. Gas Savings may be negative for fuel switching activities.

"Gas" means any fuel listed in *National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Cth) Schedule 1 Part 2—Fuel combustion—gaseous fuels* or liquefied petroleum gas.

"GEMS Registry" means a published registry of products registered under either Greenhouse and Energy Minimum Standards or published Minimum Energy Performance Standards (MEPS).

"GreenPower" means renewable energy purchased in accordance with the National GreenPower Accreditation Program Rules.

"GST" means the tax imposed by the *A New Tax System (Goods and Services Tax) Act 1999 (Cth)* and the related impositions by Acts of the Commonwealth.

"Guide" means a guidance document Published by the Scheme Administrator.

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

"Implementation" means the delivery of a Recognised Energy Saving Activity at a Site, or for the purposes of clause 8.9, the delivery of a Recognised Energy Saving Activity across a Population.

"Implementation Date" is defined in each calculation method of this Rule.

"Implementation Period" means the Measurement Period for which Energy Savings Certificates may be created.

"Implementation Requirements" means the implementation requirements specified in an Activity Definition in the Schedules to this Rule.

"Independent Variable" means a parameter that varies over time, can be measured, and affects the End-User Equipment's energy consumption for the purposes of clause 7A of this Rule.

"Interactive Electricity Savings" means a change in a Site's electricity consumption due to interactions with End-User Equipment for which energy consumption is not measured for the purposes of clause 7A.

"Interactive Energy Savings" refers to either the Interactive Electricity Savings or the Interactive Gas Savings for the purposes of **Equations 7A.2, 7A.4** or **7A.5** of this Rule.

"Interactive Gas Savings" means a change in a Site's Gas consumption due to interactions with End-User Equipment for which energy consumption is not measured for the purposes of clause 7A.

"Integrated Luminaire" means a Luminaire that integrates Lamp and Control Gear into a single item of End-User Equipment and connects to 240V supply.

"Installation Requirements" means the installation requirements specified in an Activity Definition in the Schedules to this Rule.

"IPD" means the illumination power density as defined in the BCA part J6.

"IPMVP" means the International Performance Measurement and Verification Protocol, published by the Efficiency Valuation Organization.

"kV" means a kilovolt of electrical potential.

"kvar" means a kilovolt-amperes reactive of reactive power.

"kW" means a kilowatt of electrical power.

"kWh" means a kilowatt-hour of electrical energy.

"Lamp" means an artificial source of visible light.

"Lamp Life" means the expected operating lifetime of a Lamp, in hours, measured in accordance with Table A9.6 of Schedule A.

"Lamp Only" means the replacement of an existing Lamp with a Lamp that consumes less electricity, and could include the installation or replacement of a Control System.

"Large Customer" has the same meaning as it has in the National Energy Retail Law (NSW)

"LCP" means lamp circuit power, which is the power drawn by a single Lamp and its associated Control Gear. If the Control Gear supplies multiple Lamps, then the Control Gear losses are assigned pro rata to each Lamp, according to power drawn by each Lamp.

"LED" means light emitting diode.

"Licensed" means a person that holds a current licence that covers activities in the ESS Jurisdiction in which the Recognised Energy Saving Activity is implemented for the duration of the Implementation.

"Lifetime" means the time period over which Energy Savings will be delivered and for the purposes of Schedules B, C, D, E, and G are for reference only, as the relevant time period is already taken into account in the savings factors in those Schedules.

"Light Output" means the luminous flux (measured in lumens) emitted by a Lamp or Luminaire.

"Lighting for Roads and Public Spaces" means lighting covered by *AS/NZS 1158: Lighting for roads and public space*s or *AS/NZS 60598.2.3 Luminaires - Particular requirements - Luminaires for road and street lighting* or both, as applicable.

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

"Low-income Energy Program" means a New South Wales Government low income household energy initiative which has been notified to the Scheme Administrator by the New South Wales Government, and approved by the Minister for the Environment, as a Low-income Energy Program for the purposes of this Rule.

"LUF" means load utilisation factor.

"Luminaire" means the apparatus that distributes, filters or transforms the light emitted from a light source, including Lamps, Control Gear and all components necessary for fixing and protecting the Lamps, including the troffer.

"Maintained Emergency Lighting" means a Maintained illuminated emergency exit sign or always-on Maintained emergency luminaire as defined in AS 2293.1: *Emergency escape lighting and exit signs for buildings - System design, installation and operation.*

"Maximum Time Period for Forward Creation" is determined in accordance with clause 7A.12.

"Measured Electricity Consumption": (a) for the purposes of clause 8.8 means the electricity consumption as determined in accordance with Method 4; and (b) for the purposes of clause 8.9 means the electricity consumption as determined in accordance with clause 8.9.3.

"Measured Gas Consumption": (a) for the purposes of clause 8.8 means the Gas consumption as determined in accordance with Method 4; and (b) for the purposes of clause 8.9 means the natural gas consumption as determined in accordance with clause 8.9.3A.

"Measurement and Verification Professional" is defined in clause 7A.15 of this Rule.

"**Measurement Period**" means the duration of time over which measurement of energy consumption will be taken for the purposes of calculating the Energy Savings under clause 7, 7A or 8, and defined therein.

"**Metered Baseline Method**" means the method in clause 8.

"MWh" means a megawatt-hour of electrical energy.

"NABERS" means the National Australian Built Environment Rating System.

"NABERS Building" means a building that has been rated under NABERS.

"NABERS Rating" means a rating, expressed as a number, for a NABERS Building.

"NABERS Reverse Calculator" means the tool provided by the NABERS National Administrator.

"National Greenhouse Accounts Factors" means the factors published by the Australian Government's Department of the Environment designed for use by companies and individuals to estimate greenhouse gas emissions.

"National GreenPower Accreditation Program Rules" mean the terms and conditions of participation in the National GreenPower Accreditation Program, available on the GreenPower website at http://www.greenpower.gov.au/Business-Centre/Rules-and-Accreditation/

"Network Service Provider" has the same meaning as it has in the *National Electricity (NSW) Law*.

"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).

"NLP", or Nominal Lamp Power, means the manufacturer's rated value (or tested value, as acceptable to the Scheme Administrator) for power drawn by a single Lamp.

"Non-Habitable Building" means a building built as a BCA Class 10a or Class 10b building.

"Non-Network Option" has the same meaning as it has in the National Electricity Rules under the *National Electricity (NSW) Law*.

"Non-Routine Events" means, for the purposes of clause 7A, events which affect energy use, within the chosen Measurement Period, that are not modelled by any Independent Variables or Site Constants. They are required to be removed from the Measurement Period to enable like-for-like comparison of before and after energy savings scenarios. They are typically due to static factors that may include fixed, environmental, operational and maintenance characteristics.

"Normal Year" is a typical year for the operation of the End-User Equipment at the Site after the Implementation Date for the purposes of clause 7A of this Rule.

"Number of Certificates" means the number of Energy Savings Certificates permitted to be created by an Accredited Certificate Provider for Energy Savings calculated in accordance with clause 6.5 and the methods set out in clause 7, 7A, 8 or 9.

"Number of Model Parameters" means, for the purposes of clause 7A:

(a) if the energy model is developed for a single Site, the number of Independent Variables; or
(b) if the energy model is developed for multiple Sites, the sum of the number of Independent Variables and Site Constants.

"Operating Energy Model" is the model established in accordance with the criteria in clause 7A.2 and described in clause 7A.4.

"Persistence Model" means a model that is able to forecast the continuation of Energy Savings from an Implementation over its useful lifetime.

"Population"

(a) in relation to clause 8.9, means the set of all Sites in the Control Group and Treatment Group; or

(b) in relation to Implementations under clause 7A using the Sampling Method, means the set of all Sites identified as meeting the Eligibility Requirements.

"Pre-Implementation Period" means the Measurement Period prior to the Implementation Period. If Method 5.3 is used, the Pre-Implementation Period must cover the same period of time in a previous year as the Implementation Period.

"Prescribed Transmission Services" has the same meaning as it has in the National Electricity Rules under the *National Electricity (NSW) Law*.

"Previous Rule" means the Energy Savings Scheme Rule of 2009 as in force immediately prior to the commencement of the Energy Savings Scheme (Amendment No. 1) Rule 2017.

"Prior Accreditation" means an accreditation with respect to a Recognised Energy Saving Activity where the Accreditation Date is on or before 30 June 2014 and that accreditation has not been cancelled, and includes the conditions to that accreditation.

"Product" means a class of End-User Equipment identified uniquely by its manufacturer identifier and manufacturer's model identifier and, in some cases, model year or year of manufacture.

"Product Stewardship Scheme" means a recycling program such as 'Fluorocycle' or equivalent.

"Project Impact Assessment Method" means the method in clause 7.

"Project Impact Assessment with Measurement and Verification Method" means the method in clause 7A.

"Public Lighting Inventory" means the inventory required to be maintained by the Distributor, in accordance with the NSW Public Lighting Code issued by the NSW Department of Industry, Resources and Energy Division.

"Publish" means to document and make publicly available, on the Energy Savings Scheme website, www.ess.nsw.gov.au.

"Purchaser" means, for the purposes of clause 7, 7A and 9, the person who purchases or leases the goods or services that enable the relevant Energy Savings to be made; except where

(a) the person is an Accredited Certificate Provider and is not the owner, occupier or operator of the Site; or

(b) the person purchases or leases the goods or services for the purpose of reselling the End-User Equipment, unless the resale will be an inclusion in a contract for the sale of land, or in a strata scheme, the sale of a lot.

Note: Housing developers that bulk purchase and install appliances in their residential developments are defined as the purchaser if the appliances will be sold in the contract for the sale of the home (as opposed to display appliances only). This applies to both the sale of land, and covers strata apartments, involving the sale of lots.

"Rating Period" means the continuous 12-month period covered by the data used for a NABERS Rating.

"Recognised Energy Saving Activity" has the same meaning as it has in the Act.

"Regression Analysis" means a method to establish an energy model that determines a mathematical function for approximating the relationship between Energy Consumption and Independent Variables and / or Site Constants for the purposes of clause 7A of this Rule, and includes, but is not limited to, linear regression, and mixed models.

"Regulations" means regulations made for the purposes of Part 9 of the Act.

"Representativeness Test" means, for the purposes of clause 7A, a test that can be applied to the set of Site Constants across the Sample Sites to test whether they are distributed in a way that represents the expected distribution of those Site Constants across the Population.**"Residential Building"** means a building or part of a building classified as a BCA Class 1, 2 or 4 building, and may include any Non-Habitable Building on the same site.

"Sample Site" means, for the purposes of clause 7A, a Site in the Population where measurements are taken for inclusion in a multiple Site model.

"Sampling Method" means the statistical method for conducting measurements at Sample Sites in a Population to estimate the Energy Savings of the entire Population for the purposes of clause 7A of this Rule.

"Scheme Administrator" has the same meaning as in the Act.

"Site" means the location of the End-User Equipment included in a Recognised Energy Saving Activity, as defined by:

(a) an Address; or

(b) a unique identifier, as specified for the relevant Implementation that identifies the affected End-User Equipment; or

(c) a method accepted by the Scheme Administrator.

"**Site Assessment**" means identification of Energy Savings that may be generated at a Site using **Equation 16** with reference to activities identified in Schedule D and Schedule E.

"Site Constant" means a parameter that varies between Sites, does not vary over time under normal operating conditions, and affects the End-User Equipment's energy consumption for the purposes of clause 7A of this Rule.

"Small Business Site" means a Site:

(a) that is entirely occupied by one business; and
(b) where the business, as a consumer of electricity at the Site:
    i. is a Small Customer (and, for the avoidance of doubt, has not aggregated its load at the Site with consumption at other Sites for the purposes of being treated as a Large Customer under its electricity purchase arrangements); or
    ii. is a customer of an Exempt Seller, and has an annual electricity consumption below the Upper Consumption Threshold for electricity.

"Small Customer" has the same meaning as it has in the National Energy Retail Law (NSW).

"**Standard Control Service**" has the same meaning as it has in the National Electricity Rules under the *National Electricity (NSW) Law*.

"Standard Luminaire" means, in relation to Table A9.4 of Schedule A, a Luminaire that is listed on a Distributor's current maintained list of standard luminaires, in accordance with the NSW Public Lighting Code.

"System U-Value" is a measure of the thermal transmittance, in W/m^2K, of a window system including glass, sash and frame, as registered under WERS.

"Traffic Signals" means lighting referred to in *AS 2144 Traffic signal lanterns* series of standards.

"Transmission System" has the same meaning as it has in the Act.

"Treatment" is the offering of goods and services (and any subsequent provision, engagement and promotion activities) to the Treatment Group to deliver Energy Savings.

"Treatment Group" means, in relation to clause 8.9, the group of Sites selected to be offered the Treatment.

"Unbiased Selection Method" means a randomisation technique which ensures that every Site in the Population has an equal chance of being selected into the Treatment Group. This does not require Treatment Group and Control Group to be of an equal size.

"Uplift Energy Savings" means, in relation to clause 8.9, is the difference in energy consumption between the Control Group and Treatment Group that is estimated to have taken place due to other Recognised Energy Saving Activities or activities excluded as ineligible under clause 5.4 of this Rule.

"Upper Consumption Threshold" has the same meaning as it has in the National Energy Retail Law (NSW).

"VEET" means the Victorian Energy Efficiency Target Scheme established under the *Victorian Energy Efficiency Target Act 2007 (Victoria)*.

"WERS" means the Window Energy Rating Scheme managed by the Australian Window Association.

10.2 Simplified outlines and notes in this Rule do not form part of this Rule.

10.3 (deleted)

10.4 The terms and expressions used in this Rule have the same meaning as they have for the purposes of Part 9 of the Act, unless otherwise defined by this clause 10.

10.4A Any reference to "AS" or "AS/NZS" is a reference to that standard as amended from time to time.

10.5 A reference to accreditation with respect to a Recognised Energy Saving Activity means accreditation as an Accredited Certificate Provider in respect of that Recognised Energy Saving Activity.

11 Savings and Transitional Arrangements

General

11.1 An Accredited Certificate Provider may calculate Energy Savings pursuant to the Previous Rule for the calculation of Energy Savings used to create Energy Savings Certificates for which an application for registration is made after 28 April 2017 if all of the following criteria are satisfied:

(a) the Implementation Date of the relevant Implementation is prior to 28 April 2017;

(b) no previous applications to register Energy Savings Certificates in respect of that Implementation have been made prior to 28 April 2017; and

(c) an application to register Energy Savings Certificates in respect of those Energy Savings is made on or before 30 June 2017.

Definitions of Energy Saver and Recognised Energy Saving Activity

11.2 Notwithstanding clause 5.2, an Accredited Certificate Provider may create Energy Savings Certificates in respect of the Additional Energy Savings of an Implementation for which they are the Energy Saver in accordance with their Prior Accreditation, if the initial Energy Savings Certificates for that Implementation were created on or before 30 June 2014.

(deleted)

Creation of Energy Savings Certificates

11.3 (deleted)

11.4 Clause 6.2 does not apply to Energy Savings Certificates created in respect of the Additional Energy Savings of an Implementation if the initial Energy Savings Certificates for that Implementation were created on or before 30 June 2014.

11.5 (deleted)

11.6 (deleted)

11.7 (deleted)

11.8 (deleted)

Schedule A – Default Factors and Classifications

Table A9.1: Standard Equipment Classes for Lighting Upgrades

Equipment Class	Definition
T12 linear fluorescent Lamp	A double-capped fluorescent Lamp as defined by *AS/NZS 4782.1 Double-capped fluorescent lamps – Performance specifications* with a tube diameter of 38.1mm. These are also referred to as T38.
T8 linear fluorescent Lamp	A double-capped fluorescent Lamp as defined by *AS/NZS 4782.1 Double-capped fluorescent lamps – Performance specifications* with a tube diameter of 25.4mm. These are also referred to as T26.
T5 linear fluorescent Lamp	A double-capped fluorescent Lamp as defined by *AS/NZS 4782.1 Double-capped fluorescent lamps – Performance specifications* with a tube diameter of 15.9mm. These are also referred to as T16.
T5 or T8(T9) Circular fluorescent Lamp	A double-capped circular fluorescent Lamp with a typical tube diameter of 16mm or 29mm as defined by *AS/NZS 4782.1 Double-capped fluorescent lamps – Performance specifications*. These are also referred to as T9.
Compact fluorescent Lamp with non-integrated ballast (CFLn)	An externally ballasted single-capped fluorescent Lamp as defined by *AS/NZS 60901 Single-capped fluorescent lamps-Performance specifications*. The Lamp may include an internal means of starting and pre-heated cathodes.
Compact fluorescent Lamp with integrated ballast (CFLi)	A Self-ballasted compact fluorescent Lamp as defined by *AS/NZS 4847 Self-ballasted lamps for general lighting services.*
Tungsten halogen Lamp (240V)	A Tungsten halogen Lamp as defined in *AS 4934 Incandescent lamps for general lighting service*, with a rated voltage of 240V.
Tungsten halogen Lamp (ELV)	A Tungsten halogen Lamp as defined in *AS 4934 Incandescent lamps for general lighting service*, with an ELV rating, typically 12V. These Lamps run off an Extra-low voltage lighting converter (ELC) as defined in *AS 4879.1*.
Infrared coated (IRC) halogen Lamp (ELV)	An ELV Tungsten halogen Lamp as defined in *AS 4934* where the halogen globe is coated with a reflective infrared coating which improves the efficiency of the globe.
Metal halide Lamp	A discharge Lamp classified as a Metal halide Lamp as defined *by IEC 61167 Metal halide lamps – Performance specification.*
Mercury vapour Lamp	A discharge Lamp classified as a High-pressure mercury vapour Lamp as defined by *IEC 60188 High-pressure mercury vapour lamps – Performance specifications.*
High pressure sodium (HPS) Lamp	A discharge Lamp classified as a High pressure sodium vapour Lamp as defined by *IEC 60662 High-pressure sodium vapour lamps.*
Lighting for Roads and Public Spaces or Traffic Signals (other than LED lighting)	Lighting for Roads and Public spaces as defined by *AS 1158 Lighting for roads and public spaces.*

Table A9.2: Lamp Circuit Power (LCP) values for Standard Equipment Classes

Equipment Class	Control Gear	LCP (Watts)	Notes
T8 or T12 linear fluorescent Lamp or T8(T9) or T12 circular fluorescent Lamp	Ballast EEI = A1	NLP + 2	
	Ballast EEI = A2	NLP	
	Ballast EEI = A3	NLP + 2	
	Ballast EEI = B1	NLP + 6	
	Ballast EEI = B2	NLP + 8	
	Ballast EEI = C	NLP + 10	
	Ballast EEI = D	NLP + 12	
	EEI Unknown (Electronic ballast)	NLP + 2	

	EEI Unknown (Magnetic ballast)	NLP + 10	
T5 linear fluorescent Lamp or T5 circular fluorescent Lamp	Ballast EEI = A1	1.13 × NLP + 2.5	
	Ballast EEI = A2	1.08 × NLP + 1.5	
	Ballast EEI = A3	1.13 × NLP + 2.5	
	EEI = Unknown (Electronic ballast)	1.13 × NLP + 2.5	
Compact fluorescent Lamp with non-integrated ballast (CFLn)	Ballast EEI = A1	NLP + 3	
	Ballast EEI = A2	NLP + 1	
	Ballast EEI = A3	NLP + 3	
	Ballast EEI = B1	NLP + 5	
	Ballast EEI = B2	NLP + 7	
	Ballast EEI = C	NLP + 9	
	Ballast EEI = D	NLP + 11	
	EEI Unknown (Electronic ballast)	NLP + 3	
	EEI Unknown (Magnetic ballast)	NLP + 9	
Compact fluorescent Lamp with integrated ballast (CFLi)	Built In	NLP	
Tungsten halogen Lamp (240V)	Built In	NLP	
Tungsten halogen Lamp (ELV) or Infrared coated (IRC) halogen Lamp (ELV)	Magnetic transformer	1.25 × NLP	Maximum NLP of removed Lamp = 35W
	Electronic transformer	1.08 × NLP	
Metal halide Lamp	Magnetic ballast (reactor type)	1.05 × NLP + 14	
	Magnetic ballast (constant wattage type)	1.07 × NLP + 22	
	Electronic ballast	1.10 × NLP + 0.9	
Mercury vapour Lamp	Magnetic ballast	1.03 × NLP + 11	
High pressure sodium (HPS) Lamp	Magnetic ballast	1.05 × NLP + 13	
Lighting for Roads and Public Spaces or Traffic Signals (other than LED lighting)	Built in or Independent	Lighting Load Table Published by AEMO or relevant regulator.	An entire traffic signal unit or Integrated Luminaire is used as the basis for calculation, rather than individual Lamps.

Table A9.3: Other Equipment Classes for Lighting Upgrades

Equipment Class	Definition
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.
LED Lamp Only – ELV	An LED Lamp that runs off an existing Extra-low voltage lighting converter (ELC) designed for retrofitting into an existing Luminaire or Lamp holder. These are typically used as a replacement for ELV Tungsten halogen Lamps.
LED Lamp Only – 240V Self Ballasted	A self-ballasted LED Lamp as defined by AS/NZS IEC 62560 Self-ballasted LED lamps for general lighting services by voltage > 50 V. These Lamps are connected directly to a 240V supply.
Induction Luminaire	A gas discharge Lamp in which the power required to generate light is transferred from outside the Lamp envelope to the gas via electromagnetic induction.
LED Lamp and Driver	A LED-reflector Lamp and matching LED Driver intended as an alternative to a Mirrored Reflector Halogen Lamp.
Modified Luminaire –LED Linear Lamp	A T5, T8 or T12 luminaire that has been modified for use with an LED linear Lamp. This involves modifying, removing or rendering redundant any wiring or structure of the Luminaire, beyond the replacement of a starter.
LED Luminaire – fixed type	An LED Luminaire intended for use as a fixed luminaire as defined in AS/NZS 60598.2.1 Luminaires – Particular requirements – Fixed general purpose luminaires.
LED Luminaire – Linear Lamp	An LED Luminaire intended for use as an alternative to a linear fluorescent Luminaire, where the Luminaire houses a matching Linear LED tube or a linear array of integrated LEDs. Where the Luminaire uses a Linear LED tube, the Luminaire must not be compatible with a linear fluorescent Lamp.
LED Luminaire – floodlight	An LED Luminaire intended for use as a floodlight as defined in AS/NZS 60598.2.5 Luminaires – Particular requirements – Floodlights.
LED Luminaire – recessed	An LED Luminaire intended for use as a recessed luminaire as defined in AS/NZS 60598.2.2 Luminaires – Particular requirements – Recessed luminaires.
LED Luminaire – high/lowbay	An LED Luminaire intended for use as high-bay or low-bay lighting.
LED Luminaire – streetlight	An LED Luminaire intended for use as a streetlight as defined in AS/NZS 60598.2.3 Particular requirements – Luminaires for road and street lighting.
LED Luminaire – emergency lighting	An LED Luminaire intended for use as an Emergency lighting luminaire as defined in AS/NZS 60598.2.22 Particular requirements – Luminaires for emergency lighting.
LED Luminaire – hospital use	An LED Luminaire intended for use in the clinical areas of a hospital or health care building as defined in AS/NZS 60958.2.25 Particular requirements – Luminaires for use in clinical areas of hospitals and health care buildings.
Other Emerging Lighting Technology	Any lighting equipment not defined above.

Table A9.4: Lamp Circuit Power (LCP) values and Equipment Requirements for other Equipment Classes for Lighting Upgrades

Equipment Class	Control Gear	LCP Value	Equipment Requirement (Equipment being installed)	Equipment Requirement (Equipment being removed)
T5 Adaptor Kit	Not Applicable (ineligible)	As Published by the Scheme Administrator	Ineligible	Must demonstrate the LCP to the satisfaction of the Scheme Administrator.
Retrofit Luminaire - LED Linear Lamp	Not Applicable(ineligible)	As Published by the Scheme Administrator	Ineligible	
LED Lamp Only – ELV	Built In + Existing Magnetic Transformer	1.25 × NLP as Published by Scheme Administrator	Must meet product requirements and minimum performance specifications for Lamp Life, electro-magnetic compatibility (where applicable), lumen efficacy, power factor and LCP as evidenced by: (a) a certification scheme accepted by the Scheme Administrator, including but not limited to a Standard Luminaire list; and (b) test reports from an accredited laboratory, in accordance with requirements Published by the Scheme Administrator; or (c) compliance with a relevant AS/NZS standard for the relevant Equipment Class recognised by the Scheme Administrator; or (d) demonstrated product acceptance under schedules of the VEET scheme recognised as relevant by the Scheme Administrator including compliance with any additional Equipment Requirements Published by the Scheme Administrator.	
	Built In + Existing Electronic Transformer	1.08 × NLP as Published by Scheme Administrator		
LED Lamp Only – 240V Self Ballasted	Built In	As Published by the Scheme Administrator		
Induction Luminaire	Built In or Independent			
LED Lamp and Driver				
Modified Luminaire- LED Linear Lamp				
LED Luminaire – fixed type				
LED Luminaire – Linear Lamp				
LED Luminaire – floodlight				
LED Luminaire – recessed				
LED Luminaire – high/lowbay				
LED Luminaire – streetlight				
LED Luminaire – emergency lighting				
LED Luminaire – hospital use				
Other Emerging Lighting Technology				

Table A9.5: Control gear for Lighting Upgrades

Control Gear	Definition
Magnetic ballast	A Ferromagnetic ballast as defined in *AS/NZS 4783 Performance of electrical lighting equipment – Ballasts for fluorescent lamps*
Electronic ballast	An A.C. supplied electronic ballast as defined in *AS/NZS 4783 Performance of electrical lighting equipment – Ballasts for fluorescent lamps*
Magnetic ballast (reactor type)	An electromagnetic ballast that use an inductor or autotransformer to limit the current and provide the voltage necessary to ignite the Lamp. These ballasts do not include any means of regulating the light output.
Magnetic ballast (constant wattage type)	An electromagnetic ballast that uses a combination of inductive and capacitive components to provide a regulated power output (constant wattage) to the Lamp
Magnetic transformer	A magnetic isolating transformer as defined in *AS/NZS 4879.1 Performance of transformers and electronic step-down convertors for ELV lamps - Test method - Energy performance.*
Electronic transformer	An electronic step-down convertor as defined in *AS/NZS 4879.1 Performance of transformers and electronic step-down convertors for ELV lamps - Test method - Energy performance.*

Table A9.6: Default Lamp Life for Lighting Upgrades

Type of Lamp	Lamp Life (hours)
Standard equipment classes defined in Table A9.1	As per product labelling.
Other equipment classes defined in Table A9.3	As Published by the Scheme Administrator.

Table A10.1: Asset Lifetimes for Lighting Upgrades

Activity	Asset Lifetime (years)
Replacement of : • Luminaire, or • Control Gear (not integrated into Lamp).	Lighting for Roads and Public Spaces or Traffic Signals: 12 years All other lighting: 10 years
Replacement of: • Lamp Only.	Lamp Life ÷ Annual Operating Hours (Where Lamp Life is measured in accordance with Table A9.6 and is a maximum of 30,000 hours) Maximum Asset Lifetime = 10 years for Building Lighting and 12 years for Lighting for Roads and Public Spaces or Traffic Signals
Installation of: • Control System as listed in Table A10.4 where the Lighting Upgrade only consists of the installation of a Control System	Maximum Asset Lifetime = 5 years

Table A10.2: Operating Hours for Lighting Upgrades by space type

Space Type	Annual Operating Hours (hours per annum)
Auditorium, church and public hall	2,000
Board room and conference room	3,000
Carpark – general (undercover) and Car Park - entry zone (first 20 m of travel)	7,000
Carpark – general (open air)	4,500
Common rooms, spaces and corridors in a BCA Class 2 building	7,000
Control room, switch room, and the like	Value in Table A10.3 for BCA Classification of the surrounding space
Corridors	Value in Table A10.3 for BCA Classification of the surrounding space
Courtroom	2,000
Dormitory of a BCA Class 3 building used for sleeping only or sleeping and study	3,000

Space Type	**Annual Operating Hours (hours per annum)**
Entry lobby from outside the building	Value in Table A10.3 for BCA Classification of the surrounding space.
Health-care - children's ward, examination room, patient ward, all patient care areas including corridors where cyanosis lamps are used	6,000
Kitchen and food preparation area	Value in Table A10.3 for BCA Classification surrounding space
Laboratory - artificially lit to an ambient level of 400 lx or more	3,000
Library - stack and shelving area, reading room and general areas	3,000
Lounge area for communal use in a BCA Class 3 building or BCA Class 9c aged care building	7,000
Maintained Emergency Lighting	8,500
Museum and gallery - circulation, cleaning and service lighting	2,000
Office	3,000
Plant room	Value in Table A10.3 for BCA Classification of the surrounding space
Restaurant, café, bar, hotel lounge and a space for the serving and consumption of food or drinks	5,000
Retail space including a museum and gallery whose purpose is the sale of objects	5,000
School - general purpose learning areas and tutorial rooms	3,000
Sole-occupancy unit of a BCA Class 3 building	3,000
Sole-occupancy unit of a BCA Class 9c aged care building	6,000
Storage with shelving no higher than 75% of the height of the aisle lighting	5,000
Storage with shelving higher than 75% of the height of the aisle lighting	5,000
Service area, cleaner's room and the like	Value in Table A10.3 for BCA Classification of the surrounding space
Toilet, locker room, staff room, rest room and the like	Value in Table A10.3 for BCA Classification of the surrounding space
Wholesale storage and display area	5,000
Other spaces not defined above	Value in Table A10.3 for BCA Classification of space

Table A10.3: Annual Operating Hours for Lighting Upgrades by building type

Building Classification	Annual Operating Hours (hours per annum)
BCA Class 2 buildings (Common Areas)	7,000
BCA Class 3 buildings (Common Areas)	7,000
BCA Class 3 buildings (other than Common Areas)	3,000
BCA Class 5 buildings	3,000
BCA Class 6 buildings	5,000
BCA Class 7 buildings	5,000
BCA Class 7 (a) buildings (open air car parks)	4,500
BCA Class 7 (a) buildings (undercover car parks)	7,000
BCA Class 8 buildings (other than ANZSIC Division C, Manufacturing)	3,000
BCA Class 8 buildings (ANZSIC Division C, Manufacturing)	5,000
BCA Class 9a and 9c buildings	6,000
BCA Class 9b buildings	2,000
BCA Class 10b buildings	1,000
Roads and Public Spaces	4,500
Traffic Signals	8,760

Table A10.4: Control Systems and Control Multipliers for Lighting Upgrades

Control System	Definition	Control Multiplier (CM)
Occupancy Sensor	Control device that uses a motion sensor to detect the presence of people in the Space and adjusts the light output of the Luminaire. Each Occupancy Sensor must control a maximum of 6 Luminaires.	0.7
Daylight-Linked Control	Control device that uses a photoelectric cell to measure ambient daylight levels to automatically vary Luminaire light output. Each Luminaire must be located close to a significant source of daylight. (Not applicable to Carpark – general (open air) space type as referenced in Table A10.2 and BCA Class 7 (a) buildings (open air car parks) and Roads and Public Spaces building type as referenced in Table A10.3)	0.7
Programmable Dimming	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.	0.85
Manual Dimming	Control device that allows a user to control Luminaire light output using a knob, slider or other manual input mechanism or by manually selecting a pre-programmed light level (scene).	0.9
Multiple Control Systems	Programmable Dimming and Manual Dimming	0.76
	Any other combination of 2 or more control systems above.	0.6
Voltage Reduction Units (VRU)	A control device that reduces the voltage applied to the Luminaire after start-up, when used with appropriate Luminaires.	As approved by Scheme Administrator
Specialised Occupancy Sensor	An Occupancy Sensor defined in Table A10.4A	CM in Table A10.4A as applicable

Table A10.4A: Occupancy Sensor Control Multipliers for Lighting Upgrades

Control System	**Definition**	**Control Multiplier (CM) A (See Definition in 10.1)**	**Control Multiplier (CM) B (See Definition in 10.1)**
Occupancy Sensor 1	Control device that uses a motion sensor to detect the presence of people in the Space and adjusts the light output of the Luminaire. Each Occupancy Sensor must control a maximum of 2 Luminaires.	0.55	0.55 + 0.45 * ($LCP_{low\ power}$/ LCP)
Occupancy Sensor 2 in a Carpark – general (undercover) of a BCA class 2, 5 and 7a building.	Control device that uses a motion sensor to detect the presence of people in the parking area of a BCA class 2, 5 or 7a building and adjusts the light output of the Luminaire.	0.3	0.3 + 0.7 * ($LCP_{low\ power}$/ LCP)
Occupancy Sensor 3 in a fire stairs of a BCA class 2, 5 and 7a building.	Control device that uses a motion sensor to detect the presence of people in the fire stairs of a BCA class 2, 5 or 7a building and adjusts the light output of the Luminaire.	0.15	0.15 + 0.85 * ($LCP_{low\ power}$/ LCP)
Occupancy Sensor 4 in a corridor of a BCA class 2 building.	Control device that uses a motion sensor to detect the presence of people in the corridor area of a BCA class 2 building and adjusts the light output of the Luminaire.	0.25	0.25 + 0.75 * ($LCP_{low\ power}$/ LCP)

Table A10.5: Air-conditioning Multipliers for Lighting Upgrades

Space Air-conditioning system	**Air-conditioning Multiplier (AM)**
Space air-conditioned during normal operating hours by a refrigerant-based air-conditioner.	1.07
Data Centre spaces air-conditioned by a refrigerant-based air conditioner.	1.3
Refrigerated rooms	1.3
All other spaces	1

Table A11: Default Efficiency Improvement (DEI) 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 < 185	0.008	0.007	0.008	0.008

Table A12: Default Load Utilisation Factor for High Efficiency Motors – Where Business Classification and End-Use Service are known

Load Utilisation Factor	Refrigeration and freezing	Water/liquid pumping	Air compression	Air handling, fans, ventilation	Process Drives	Milling, mixing, grinding	Material handling/ conveying
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 A13: Default Load Utilisation Factor for High Efficiency Motors – Where Business Classification or End-Use Service 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 < 185	0.15

Table A14: 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 < 185	25

Table A16: Decay Factors for calculating future Energy Savings under the Project Impact Assessment Method (clause 7) or the Project Impact Assessment with Measurement and Verification Method (clause 7A)

Year	Decay Factor	
	Energy Savings Calculated using clause 7	Default Decay Factor for Energy Savings calculated using clause 7A
1	1.00	1.00
2	0.80	0.80
3	0.60	0.64
4	0.40	0.51
5	0.20	0.41
6	Not applicable	0.33
7	Not applicable	0.26
8	Not applicable	0.21
9	Not applicable	0.17
10	Not applicable	0.13

Table A17: End-Use Services

End-Use Services
Air heating and cooling
Air handling, fans, ventilation
Water heating
Water/liquid pumping
Refrigeration and freezing
Lighting
Cooking
Home entertainment
Computers, office equipment
Communications
Cleaning, washing
Process heat
Air compression
Process drives
Milling, mixing, grinding
Transport
People movement, lifts, escalators

End-Use Services
Materials handling, conveying
Other machines
Electricity supply
Unknown
Other End-Use Services as Published by the Scheme Administrator

Table A18: Business Classifications

Business Classification	
A Agriculture, Forestry and Fishing	
B Mining	
C Manufacturing	
D Electricity, Gas, Water and Waste Services	
E Construction	
F Wholesale Trade	
G Retail Trade	
H Accommodation and Food Services	
I Transport, Postal and Warehousing	
J Information Media and Telecommunications	
K Financial and Insurance Services	
L Rental, Hiring and Real Estate Services	
M Professional, Scientific and Technical Services	
N Administrative and Support Services	
O Public Administration and Safety	
P Education and Training	
Q Health Care and Social Assistance	
R Arts and Recreation Services	
S Other Services	
Residential	
Unknown	

Table A19: Distribution Loss Factors (DLF) for losses between the Subtransmission network and Low Voltage connection points

Distributor	**Distribution District**	**DLF**
Endeavour Energy	Endeavour Energy	1.054
Essential Energy	Essential Energy	1.074
AusGrid	AusGrid	1.043

Table A20: Benchmark NABERS Ratings Index

NABERS Rating tool	Building category	Year of NABERS Rating End Date					
		2015	2016	2017	2018	2019	2020
Offices	Built prior to 1 November 2006	4.0	4.0	4.5	4.5	4.5	5.0
Offices	Built on or after 1 November 2006	5.0	5.0	5.5	5.5	5.5	6.0
Hotels	Built prior to 1 November 2006	3.0	3.5	3.5	3.5	3.5	4.0
Hotels	Built on or after 1 November 2006	4.0	4.5	4.5	4.5	4.5	5.0
Shopping Centres	Built prior to 1 November 2006	3.5	4.0	4.0	4.0	4.0	4.5
Shopping Centres	Built on or after 1 November 2006	4.5	5.0	5.0	5.0	5.0	5.5
Data Centres	Built prior to 1 November 2006	3.5	3.5	3.5	4.0	4.0	4.0
Data Centres	Built on or after 1 November 2006	4.5	4.5	4.5	5.0	5.0	5.0
Hospitals	Built prior to 1 November 2006	3	3	3.5	3.5	3.5	3.5
Hospitals	Built on or after 1 November 2006	4	4	4.5	4.5	4.5	4.5

Table A21: NABERS Annual Ratings Adjustment

NABERS Rating tool	Building category	Annual rating adjustment for Historical Baseline NABERS Rating that is 1 year old.	Annual ratings adjustment for Historical Baseline NABERS Rating that is 2 - 7 years old.
Offices	All	0	0.15
Hotels	All	0	0.15
Shopping Centres	All	0	0.15
Data Centres	All	0	0.15
Hospitals	All	0	0.15

Table A22: (deleted)

Table A23: Accuracy Factor according to energy model type and relative precision of Energy Savings estimate

Relative precision of Electricity Savings or Gas Savings estimate at a 90% confidence level	Accuracy Factor if an energy model developed under clause 7A.2 (a)(i) is used for the Baseline Energy Model or Operating Energy Model or both	Accuracy Factor for all other energy models
< 25%	0.9	1
25% - 50%	0.8	0.9
50% - 75%	0.7	0.8
75% - 100%	0.5	0.6
100% - 150%	0.3	0.4
150% - 200%	0.1	0.2
> 200%	0	0

Table A24: Regional Network Factors

Postcode of Site where Implementation occurred	Regional Network Factor
2311-2312	1.03
2321	1.03
2324	1.03
2329	1.03
2338-2490	1.03
2536-2537	1.03
2545-2551	1.03
2579-2594	1.03
2611	1.03
2618-2739	1.03
2787	1.03

Postcode of Site where Implementation occurred	Regional Network Factor
2791-2844	1.03
2850-2880	1.03
3644	1.03
3691	1.03
3707	1.03
4375	1.03
4377	1.03
4380	1.03
4383	1.03
4385	1.03
All other postcodes	1

Table A25: Metropolitan Levy Area by postcode

Metropolitan Levy Area postcodes
2000-2011
2015-2050
2052
2060-2077
2079-2090
2092-2097
2099-2122
2125-2148
2150-2168
2170-2179
2190-2200
2203-2214
2216-2234
2250-2251
2256-2265
2267
2278
2280-2287
2289-2300
2302-2308
2314-2327
2334-2335
2500
2502
2505-2506
2508
2515-2519
2525-2530
2533-2536
2538-2541
2555-2560
2563-2567
2570
2571
2575-2579
2622

2745
2747-2750
2753-2763
2765-2770
2775

Schedule B – Activity Definitions for the Sale of New Appliances (clause 9.3)

Activity Definition B1

Name of Activity

SELL A HIGH EFFICIENCY CLOTHES WASHING MACHINE

Equipment Requirements

1. The End-User Equipment must be a Clothes Washing Machine as defined in *AS/NZS 2040:2005 Performance of household electrical appliances—Clothes washing machines*.
2. The Clothes Washing Machine must be registered for energy labelling.
3. The Clothes Washing Machine must be either a top loader or a front loader.
4. The Clothes Washing Machine must have a rated capacity, load in kilograms, recorded in the GEMS Registry.
5. If the Clothes Washing Machine is a combination washer/dryer, only the Energy Star Rating and rated capacity for the wash cycle may be used to calculate the Deemed Equipment Electricity Savings.

Equipment Electricity Savings

Energy Star Rating	Deemed Equipment Electricity Savings (MWh per washing machine sold)			
	Rated capacity > 4kg to ≤ 6kg	**Rated capacity > 6kg to ≤ 7kg**	**Rated capacity > 7kg to ≤ 8kg**	**Rated capacity > 8kg**
2.5	1.3	-	-	-
3.0	1.9	-	-	-
3.5	2.4	-	-	-
4.0	2.8	1.5	1.1	1.5
4.5	3.1	2.1	1.7	2.3
5.0	3.4	2.6	2.2	3.0
5.5	3.7	3.0	2.7	3.5
≥6.0	3.9	3.4	3. 1	4.0

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition B2

Name of Activity

SELL A HIGH EFFICIENCY CLOTHES DRYER

Equipment Requirements

1. The End-User Equipment must be a Clothes Dryer as defined by "Rotary clothes dryer" in *AS/NZS 2442.1 and 2442.2 Performance of household electrical appliances—Rotary clothes dryers*.
2. The Clothes Dryer must be registered for energy labelling.
3. The Clothes Dryer must not form part of a combination washer/dryer.
4. The Clothes Dryer must have a rated capacity, load in kilograms, recorded in the GEMS registry.

Equipment Electricity Savings

Energy Star Rating	Deemed Equipment Electricity Savings (MWh per clothes dryer sold)		
	Rated capacity < 5kg	Rated capacity ≥ 5kg to <7kg	Rated capacity ≥ 7kg
2.0	0.2	-	-
2.5	0.3	0.2	-
3.0	0.4	0.3	-
3.5	0.5	0.5	-
4.0	0.7	0.7	0.2
4.5	0.8	0.8	0.4
5.0	0.8	0.9	0.6
5.5	0.9	1.0	0.8
6.0	1.0	1.1	0.9
7.0	1.2	1.3	1.2
8.0	1.3	1.5	1.4
9.0	1.4	1.6	1.6
10.0	1.5	1.8	1.8

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition B3

Name of Activity

SELL A HIGH EFFICIENCY DISHWASHER

Equipment Requirements

1. The End-User Equipment must be a Dishwasher as defined in *AS/NZS 2007 Performance of household electrical appliances—Dishwashers.*
2. The Dishwasher must be registered for energy labelling.
3. The Dishwasher must have a rated capacity, in number of place settings, recorded in the GEMS Registry.

Equipment Electricity Savings

Energy Star Rating	Deemed Equipment Electricity Savings (MWh per dishwasher sold)		
	Rated capacity < 9 place settings	**Rated capacity ≥ 9 place settings to < 13 place settings**	**Rated capacity ≥ 13 place settings**
3.5	0.4	0.6	-
4.0	0.6	0.9	-
4.5	0.8	1.3	0.8
5.0	1.0	1.5	1.2
5.5	1.1	1.7	1.4
≥6.0	1.2	1.9	1.6

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition B4

Name of Activity

SELL A HIGH EFFICIENCY 1-DOOR REFRIGERATOR

Equipment Requirements

1. The End-User Equipment must be a 1-door Refrigerator of Groups 1, 2, or 3 as defined in *AS/NZS 4474.1 and 4474.2 Performance of household electrical appliances—Refrigerating appliances.*
2. The Refrigerator must be registered for energy labelling.
3. The Refrigerator must have a rated capacity, volume in litres, recorded in the GEMS Registry.

Equipment Electricity Savings

Energy Star Rating	Deemed Equipment Electricity Savings (MWh per refrigerator sold)	
	Rated capacity < 300 litres	Rated capacity ≥ 300 litres
2.5	0.7	-
3.0	1.0	-
3.5	1.2	1.2
4.0	1.4	1.5
4.5	1.6	1.8
5.0	1.8	2.0
5.5	1.9	2.2
6.0	2.0	2.4
7.0	2.3	2.7
8.0	2.4	3.0
9.0	2.5	3.2
10.0	2.6	3.3

Lifetime (for information purposes only)

Lifetime = 12 years.

Activity Definition B5

Name of Activity

SELL A HIGH EFFICIENCY 2-DOOR REFRIGERATOR

Equipment Requirements

1. The End-User Equipment must be a 2-door Refrigerator of Groups 4, 5B, 5T or 5S as defined in *AS/NZS 4474.1 and 4474.2 Performance of household electrical appliances—Refrigerating appliances.*
2. The Refrigerator must be registered for energy labelling.
3. The Refrigerator must have a rated capacity, volume in litres, recorded in the GEMS Registry.

Equipment Electricity Savings

Energy Star Rating	Deemed Equipment Electricity Savings (MWh per refrigerator sold)		
	Rated capacity < 300 litres	Rated capacity ≥ 300 litres to < 500 litres	Rated capacity ≥ 500 litres
3.5	0.8	-	0.9
4.0	1.2	1.1	1.6
4.5	1.6	1.6	2.2
5.0	1.9	1.9	2.7
5.5	2.2	2.3	3.1
6.0	2.4	2.5	3.5
7.0	2.8	3.0	4.2
8.0	3.1	3.4	4.7
9.0	3.3	3.7	5.1
10.0	3.5	3.9	5.4

Lifetime (for information purposes only)

Lifetime = 12 years.

Activity Definition B6

Name of Activity

SELL A HIGH EFFICIENCY CHEST FREEZER OR UPRIGHT FREEZER

Equipment Requirements

1. The End-User Equipment must be a Chest Freezer or Upright Freezer of Groups 6C, 6U or 7 as defined in *AS/NZS 4474.1 and 4474.2:2009 Performance of household electrical appliances—Refrigerating appliances.*
2. The Freezer must be registered for energy labelling.
3. The Freezer must have a rated capacity, volume in litres, recorded in the GEMS Registry.

Equipment Electricity Savings

Energy Star Rating	Deemed Equipment Electricity Savings (MWh per freezer sold)			
	Rated capacity < 150 litres	**Rated capacity ≥ 150 litres to < 300 litres**	**Rated capacity ≥ 300 litres to < 500 litres**	**Rated capacity ≥ 500 litres**
2.5	-	-	0.9	-
3.0	-	-	1.6	1.1
3.5	0.6	0.9	2.2	1.8
4.0	0.9	1.2	2.7	2.5
4.5	1.1	1.6	3.2	3.1
5.0	1.4	1.9	3.5	3.6
5.5	1.6	2.2	3.9	4.1
6.0	1.8	2.4	4.2	4.5
7.0	2.1	2.8	4.7	5.1
8.0	2.3	3.1	5.1	5.7
9.0	2.4	3.3	5.4	6.0
10.0	2.6	3.5	5.6	6.3

Lifetime (for information purposes only)

Lifetime = 12 years.

Activity Definition B7

Name of Activity

SELL A HIGH EFFICIENCY TELEVISION

Equipment Requirements

1. The End-User Equipment must be a Television as defined in *AS/NZS 62087.1 Power consumption of audio, video and related equipment; and 62087.2.2:2011 Power consumption of audio, video and related equipment—Minimum energy performance standards (MEPS) and energy rating label requirements for Television Sets.*
2. The Television must be registered for energy labelling.
3. The Television must have a rated capacity, diagonal screen size in centimetres, recorded in the GEMS Registry.

Equipment Electricity Savings

Energy Star Rating	**Deemed Equipment Electricity Savings (MWh per television sold)**		
	Rated capacity Diagonal screen size **> 40cm to ≤ 80cm**	**Rated capacity Diagonal screen size** **> 80cm to ≤ 120cm**	**Rated capacity Diagonal screen size** **> 120cm**
Tier 2 MEPS: 5.5	0.2	0.3	-
Tier 1 MEPS: 9 Tier 2 MEPS: 6	0.3	0.5	0.8
Tier 1 MEPS: 10 Tier 2 MEPS: 7	0.4	0.8	1.6
Tier 2 MEPS: 8	0.6	1.1	2.1
Tier 2 MEPS: 9	0.7	1.3	2.6
Tier 2 MEPS: 10	0.8	1.5	3.0

Lifetime (for information purposes only)

Lifetime = 10 years.

Schedule C – Activity Definitions for the Removal of Old Appliances (clause 9.7)

Activity Definition C1

Name of Activity

REMOVE A SPARE REFRIGERATOR OR FREEZER

Equipment Requirements

1. The Site where the End-User Equipment is located must be a Residential Building.
2. The End-User Equipment must be a Refrigerator or Freezer (or combination) that may be classified as Group 1, 2, 3, 4, 5T, 5B, 5S, 6C, 6U or 7 according to *AS/NZS 4474.1* and *4474.2 Performance of household electrical appliances—Refrigerating appliances.*
3. The Capacity of the Refrigerator or Freezer (as defined in AS/NZS 4474) must be 200 litres or more.
4. The Refrigerator or Freezer must be in working order.
5. There must be another Refrigerator or Freezer (as appropriate) at the Site that provides primary refrigeration or freezing services, located in, or closer to, the kitchen.
6. As a result of the activity there must be 1 fewer spare refrigerators and freezers at the Site.

Equipment Electricity Savings

Deemed Equipment Electricity Savings = 5.7 MWh per spare refrigerator or freezer removed

Lifetime (for information purposes only)

Lifetime = 7 years.

Activity Definition C2

Name of Activity

REMOVE A PRIMARY REFRIGERATOR OR FREEZER

Equipment Requirements

1. The Site where the End-User Equipment is located must be a Residential Building or Small Business Site.
2. The End-User Equipment must be a Refrigerator or Freezer (or combination) that may be classified as Group 1, 2, 3, 4, 5T, 5B, 5S, 6C, 6U or 7 according to *AS/NZS 4474.1* and *4474.2 Performance of household electrical appliances—Refrigerating appliances.*
3. The Capacity of the Refrigerator or Freezer (as defined in AS/NZS 4474) must be 200 litres or more.
4. The Refrigerator or Freezer must be in working order.
5. The activity may be carried out in combination with the delivery of a new refrigerator or freezer.

Equipment Electricity Savings

Deemed Equipment Electricity Savings = 2.4 MWh per primary refrigerator or freezer removed

Lifetime (for information purposes only)

Lifetime = 7 years.

Schedule D – Activity Definitions for General Activities for Home Energy Efficiency Retrofits (clause 9.8)

Activity Definition D1

Name of Activity

REPLACE AN EXTERNAL SINGLE GLAZED WINDOW OR DOOR WITH A THERMALLY EFFICIENT WINDOW OR DOOR

Eligibility Requirements

1. The existing window must be single glazed.
2. The existing door must be a fully single glazed framed unit.
3. The existing window or door must be an external window or door of a Residential Building or Small Business Site.

Equipment Requirements

1. The new End-User Equipment must be a window or door product (glazing and frame) rated by WERS.
2. The new End-User Equipment can be either a single glazed or double glazed or triple glazed insulating glass unit.
3. The window or door must comply with AS 2047 and AS 1288.
4. The window or door must be rated as 6 Star by WERS in accordance with the minimum requirements for a thermally efficient window or door as detailed in Table D1.1.
5. The window or door must have a warranty of at least 5 years.

Table D1.1 – Minimum requirements for a thermally efficient window or door

Window/ door rating	Minimum WERS star rating in heating mode	Minimum WERS rating in cooling mode	Maximum System U-Value (W/m^2K)
6 Star Window or Door	6 stars	3.5 stars	2.3

Implementation Requirements

The window or door must be installed in compliance with of AS 2047 and AS 1288.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor × Glazing Unit Area
Deemed Activity Gas Savings = Gas Savings Factor × Glazing Unit Area

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per m^2, are the values from Tables D1.2 and D1.3, corresponding to the type of window or door and the Site's location.
- *Glazing Unit Area*, in m^2, is the total window or door area of the thermally efficient window or door installed.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table D1.2 – Electricity Savings Factors for thermally efficient windows or doors (MWh per m^2 of window or door replaced)

Window/ Door rating	BCA Climate Zones 2 and 3	BCA Climate Zones 4	BCA Climate Zones 5 and 6	BCA Climate Zones 7 and 8
6 Star Window or Door	0.24	0.41	0.22	0.59

Table D1.3 – Gas Savings Factors for thermally efficient windows or doors (MWh per m^2 of window or door replaced)

Window/ Door rating	BCA Climate Zones 2 and 3	BCA Climate Zones 4	BCA Climate Zones 5 and 6	BCA Climate Zones 7 and 8
6 Star Window or Door	0.09	0.23	0.13	0.38

Lifetime (for information purposes only)

Lifetime = 30 years.

Activity Definition D2

Name of Activity

MODIFY AN EXTERNAL WINDOW OR GLAZED DOOR BY INSTALLING SECONDARY GLAZING

Eligibility Requirements

1. The existing window must be single glazed.
2. The existing door must be a fully single glazed framed unit.
3. The existing window or door must be an external window or door of a Residential Building or Small Business Site.

Equipment Requirements

1. The End-User Equipment must be a secondary glazing product that retrofits a second glazing sheet (e.g. glass or acrylic or polycarbonate) to an existing single glazed window or door so as to form a still air gap between the specified product and the existing glazing.
2. The secondary glazing product when retrofitted must produce a window or door that is a 6 Star Window or Door in accordance with the minimum requirements for a thermally efficient window or door as detailed in Table D2.1.
3. The secondary glazing product must have a warranty of at least 5 years.

Table D2.1 – Minimum requirements for a thermally efficient window or door fitted with secondary glazing

Window/ Door rating	Minimum WERS star rating in heating mode	Minimum WERS rating in cooling mode	Maximum System U-Value (W/m^2K)
6 Star Window or Door	6 stars	3.5 stars	2.3

Implementation Requirements

The secondary glazing product must be fitted in compliance with AS 2047 and AS 1288 and in accordance with the manufacturer's instructions.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor × Glazing Unit Area
Deemed Activity Gas Savings = Gas Savings Factor × Glazing Unit Area

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per m^2, are the values from Tables D2.2 and D2.3 corresponding to the type of window or door and the Site's location.
- *Glazing Unit Area*, in m^2, is the total window or door area of the thermally efficient window or door installed.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table D2.2 – Electricity Savings Factors for secondary glazing products (MWh per m^2 of window or door modified)

Window/ Door rating	BCA Climate Zones 2 and 3	BCA Climate Zones 4	BCA Climate Zones 5 and 6	BCA Climate Zones 7 and 8
6 Star Window or Door	0.08	0.14	0.07	0.20

Table D2.3 – Gas Savings Factors for secondary glazing products (MWh per m^2 of window or door modified)

Window/ Door rating	BCA Climate Zones 2 and 3	BCA Climate Zones 4	BCA Climate Zones 5 and 6	BCA Climate Zones 7 and 8
6 Star Window or Door	0.03	0.08	0.04	0.13

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition D3

Name of Activity

REPLACE AN EXISTING AIR CONDITIONER WITH A HIGH EFFICIENCY AIR CONDITIONER

Eligibility Requirements

The existing air conditioner must be in working order at time of replacement.

Equipment Requirements

1. The new End-User Equipment must be an air conditioner as defined in AS/NZS 3823.2.
2. The unit must be assigned a minimum star rating for cooling, as outlined in Table D3.1, and heating, if relevant under Table D3.2, under AS/NZS 3823.2.
3. The replacement unit must have a cooling capacity the same as or smaller than the unit that it replaces.
4. Where the unit being replaced has a star rating, the replacement unit must be assessed under the AS/NZS 3823.2 as having a higher star energy rating than the unit it replaces.
5. The new End-User Equipment must have a warranty of at least 5 years.

Implementation Requirements

1. The new air conditioner must be installed.
2. The existing air conditioner must be removed.
3. The activity must be performed or supervised by a suitably qualified licence holder in compliance with the relevant installation standards and legislation as outlined by NSW Fair Trading.

Activity Energy Savings

Deemed Activity Electricity Savings = Cooling Capacity × Cooling Energy Savings Factor + Heating Capacity × Heating Energy Savings Factor

Where:

- *Cooling Capacity*, in kW, is the rated cooling capacity of the system from the GEMS Registry;
- *Cooling Energy Savings Factor*, in MWh/kW, is the lifetime energy savings per unit of capacity in cooling mode, as specified in Table D3.1, according to the type of system, climate zone, and rated cooling capacity (kW);
- *Heating Capacity*, in kW, is the rated heating capacity of the system from the GEMS Registry; and
- *Heating Energy Savings Factor*, in MWh/kW, is the lifetime energy savings per unit of capacity in heating mode as specified in Table D3.2, according to the type of system, climate zone, and rated heating capacity (kW).

Table D3.1 – Cooling Energy Savings Factors (MWh per kW of cooling capacity replaced)

Product category	Star Rating	BCA Climate Zones 2 & 3	BCA Climate Zone 4	BCA Climate Zones 5 & 6	BCA Climate Zones 7 & 8
Non ducted split systems – all types, <4kW, all phases	4.0 Stars	0.30	0.18	0.16	0.14
	4.5 Stars	0.36	0.22	0.19	0.17
	5.0 Stars	0.42	0.25	0.22	0.19
	5.5 Stars	0.47	0.28	0.25	0.21
	6.0 Stars	0.51	0.31	0.27	0.23
	7.0 Stars	0.59	0.36	0.32	0.27
	8.0 Stars	0.65	0.40	0.35	0.30
	9.0 Stars	0.71	0.43	0.38	0.32
	10.0 Stars	0.76	0.46	0.41	0.34
Non ducted split systems – all types, 4kW to <10kW all phases	3.0 Stars	0.35	0.21	0.19	0.16
	3.5 Stars	0.43	0.26	0.23	0.19
	4.0 Stars	0.49	0.30	0.26	0.22
	4.5 Stars	0.55	0.34	0.30	0.25
	5.0 Stars	0.61	0.37	0.33	0.28
	5.5 Stars	0.66	0.40	0.35	0.30
	6.0 Stars	0.70	0.43	0.38	0.32

	7.0 Stars	0.78	0.47	0.42	0.35
	8.0 Stars	0.84	0.51	0.45	0.38
	9.0 Stars	0.90	0.55	0.48	0.41
	10.0 Stars	0.95	0.58	0.51	0.43
All other product description in AS/NZS 3823.2	2.5 Stars	0.36	0.22	0.19	0.16
	3.0 Stars	0.45	0.27	0.24	0.21
	3.5 Stars	0.53	0.32	0.28	0.24
	4.0 Stars	0.60	0.36	0.32	0.27
	4.5 Stars	0.66	0.40	0.35	0.30
	5.0 Stars	0.71	0.43	0.38	0.32
	5.5 Stars	0.76	0.46	0.41	0.35
	6.0 Stars	0.81	0.49	0.43	0.37
	7.0 Stars	0.88	0.54	0.47	0.40
	8.0 Stars	0.95	0.58	0.51	0.43
	9.0 Stars	1.00	0.61	0.54	0.46
	10.0 Stars	1.05	0.64	0.56	0.48

Table D3.2 – Heating Energy Savings Factors (MWh per kW of heating capacity replaced)

Product category	**Star Rating**	**BCA Climate Zones 2 & 3**	**BCA Climate Zone 4**	**BCA Climate Zones 5 & 6**	**BCA Climate Zones 7 & 8**
Non ducted split systems – all types, <4kW, all phases	4.0 Stars	0.10	0.45	0.16	1.37
	4.5 Stars	0.13	0.54	0.19	1.64
	5.0 Stars	0.14	0.62	0.22	1.89
	5.5 Stars	0.16	0.69	0.24	2.11
	6.0 Stars	0.18	0.76	0.27	2.31
	7.0 Stars	0.20	0.88	0.31	2.66
	8.0 Stars	0.23	0.97	0.34	2.95
	9.0 Stars	0.24	1.05	0.37	3.20
	10.0 Stars	0.26	1.12	0.39	3.41
Non ducted split systems – all types, 4kW to <10kW all phases	3.0 Stars	0.12	0.52	0.18	1.57
	3.5 Stars	0.15	0.63	0.22	1.92
	4.0 Stars	0.17	0.73	0.26	2.23
	4.5 Stars	0.19	0.82	0.29	2.50
	5.0 Stars	0.21	0.91	0.32	2.75
	5.5 Stars	0.23	0.98	0.34	2.97
	6.0 Stars	0.24	1.04	0.37	3.17
	7.0 Stars	0.27	1.16	0.41	3.52
	8.0 Stars	0.29	1.26	0.44	3.81
	9.0 Stars	0.31	1.34	0.47	4.06
	10.0 Stars	0.33	1.41	0.49	4.27
All other product description in AS/NZS 3823.2	2.5 Stars	0.13	0.54	0.19	1.64
	3.0 Stars	0.16	0.67	0.24	2.04
	3.5 Stars	0.18	0.79	0.28	2.39
	4.0 Stars	0.21	0.89	0.31	2.70
	4.5 Stars	0.23	0.98	0.34	2.97
	5.0 Stars	0.25	1.06	0.37	3.22
	5.5 Stars	0.26	1.13	0.40	3.44
	6.0 Stars	0.28	1.20	0.42	3.64
	7.0 Stars	0.30	1.31	0.46	3.99

	8.0 Stars	0.33	1.41	0.49	4.28
	9.0 Stars	0.35	1.49	0.52	4.53
	10.0 Stars	0.36	1.56	0.55	4.74

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition D4

Name of Activity

INSTALL A HIGH EFFICIENCY AIR CONDITIONER

Eligibility Requirements

1. No existing air conditioner is fixed in place that provides cooling and/or heating to the conditioned space.

Equipment Requirements

1. The new End-User Equipment must be an air conditioner as defined in AS/NZS 3823.2.
2. The unit must be assigned a minimum star rating for cooling, as outlined in Table D4.1, and heating, if relevant under Table D4.2, under AS/NZS 3823.2.
3. The new End-User Equipment must have a warranty of at least 5 years.

Implementation Requirements

1. The new air conditioner must be installed.
2. The activity must be performed or supervised by a suitably qualified licence holder in compliance with the relevant installation standards and legislation as outlined by NSW Fair Trading.

Activity Energy Savings

Deemed Activity Electricity Savings = Cooling Capacity × Cooling Energy Savings Factor + Heating Capacity × Heating Energy Savings Factor

Where:

- *Cooling Capacity*, in kW, is the rated cooling capacity of the system from the GEMS Registry;
- *Cooling Energy Savings Factor*, in MWh/kW, is the lifetime energy savings per unit of capacity in cooling mode, as specified in Table D4.1, according to the type of system, climate zone, and rated cooling capacity (kW);
- *Heating Capacity*, in kW, is the rated heating capacity of the system from the GEMS Registry; and
- *Heating Energy Savings Factor*, in MWh/kW, is the lifetime energy savings per unit of capacity in heating mode as specified in Table D4.2, according to the type of system, climate zone, and rated heating capacity (kW).

Table D4.1 – Cooling Energy Savings Factors (MWh per kW of cooling capacity installed)

Product category	Star Rating	BCA Climate Zones 2 & 3	BCA Climate Zone 4	BCA Climate Zones 5 & 6	BCA Climate Zones 7 & 8
Non ducted split systems – all types, <4kW, all phases	4.0 Stars	0.08	0.05	0.04	0.04
	4.5 Stars	0.14	0.08	0.07	0.06
	5.0 Stars	0.19	0.12	0.10	0.09
	5.5 Stars	0.24	0.15	0.13	0.11
	6.0 Stars	0.29	0.17	0.15	0.13
	7.0 Stars	0.36	0.22	0.19	0.16
	8.0 Stars	0.43	0.26	0.23	0.19
	9.0 Stars	0.48	0.29	0.26	0.22
	10.0 Stars	0.53	0.32	0.28	0.24
Non ducted split systems – all types, 4kW to <10kW all phases	3.0 Stars	0.11	0.07	0.06	0.05
	3.5 Stars	0.19	0.11	0.10	0.08
	4.0 Stars	0.25	0.15	0.14	0.12
	4.5 Stars	0.31	0.19	0.17	0.14
	5.0 Stars	0.37	0.22	0.20	0.17
	5.5 Stars	0.42	0.25	0.22	0.19

	6.0 Stars	0.46	0.28	0.25	0.21
	7.0 Stars	0.54	0.33	0.29	0.25
	8.0 Stars	0.60	0.37	0.32	0.27
	9.0 Stars	0.66	0.40	0.35	0.30
	10.0 Stars	0.71	0.43	0.38	0.32
All other product description in AS/NZS 3823.2	2.5 Stars	0.12	0.08	0.07	0.06
	3.0 Stars	0.21	0.13	0.11	0.10
	3.5 Stars	0.29	0.18	0.16	0.13
	4.0 Stars	0.36	0.22	0.19	0.16
	4.5 Stars	0.42	0.26	0.23	0.19
	5.0 Stars	0.47	0.29	0.25	0.22
	5.5 Stars	0.52	0.32	0.28	0.24
	6.0 Stars	0.57	0.35	0.30	0.26
	7.0 Stars	0.65	0.39	0.35	0.29
	8.0 Stars	0.71	0.43	0.38	0.32
	9.0 Stars	0.77	0.47	0.41	0.35
	10.0 Stars	0.81	0.49	0.44	0.37

Table D4.2 – Heating Energy Savings Factors (MWh per kW of heating capacity installed)

Product category	**Star Rating**	**BCA Climate Zones 2 & 3**	**BCA Climate Zone 4**	**BCA Climate Zones 5 & 6**	**BCA Climate Zones 7 & 8**
Non ducted split systems – all types, <4kW, all phases	4.0 Stars	0.27	1.16	0.40	0.55
	4.5 Stars	0.29	1.25	0.44	0.83
	5.0 Stars	0.31	1.33	0.46	1.07
	5.5 Stars	0.32	1.40	0.49	1.29
	6.0 Stars	0.34	1.47	0.51	1.49
	7.0 Stars	0.37	1.58	0.55	1.84
	8.0 Stars	0.39	1.68	0.59	2.13
	9.0 Stars	0.41	1.76	0.62	2.38
	10.0 Stars	0.42	1.83	0.64	2.60
Non ducted split systems – all types, 4kW to <10kW all phases	3.0 Stars	0.29	1.27	0.44	0.54
	3.5 Stars	0.32	1.38	0.48	0.89
	4.0 Stars	0.34	1.48	0.52	1.19
	4.5 Stars	0.36	1.57	0.55	1.47
	5.0 Stars	0.38	1.65	0.58	1.72
	5.5 Stars	0.40	1.73	0.60	1.94
	6.0 Stars	0.42	1.79	0.63	2.14
	7.0 Stars	0.44	1.91	0.67	2.48
	8.0 Stars	0.46	2.00	0.70	2.78
	9.0 Stars	0.48	2.09	0.73	3.03
	10.0 Stars	0.50	2.16	0.76	3.24
All other product description in AS/NZS 3823.2	2.5 Stars	0.31	1.32	0.46	0.50
	3.0 Stars	0.34	1.45	0.51	0.90
	3.5 Stars	0.36	1.57	0.55	1.25
	4.0 Stars	0.39	1.67	0.58	1.56
	4.5 Stars	0.41	1.76	0.62	1.83

	5.0 Stars	0.43	1.84	0.64	2.08
	5.5 Stars	0.44	1.91	0.67	2.30
	6.0 Stars	0.46	1.98	0.69	2.50
	7.0 Stars	0.49	2.09	0.73	2.85
	8.0 Stars	0.51	2.19	0.77	3.14
	9.0 Stars	0.53	2.27	0.80	3.39
	10.0 Stars	0.54	2.34	0.82	3.61

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition D5

Name of Activity

REPLACE AN EXISTING POOL PUMP WITH A HIGH EFFICIENCY POOL PUMP

Eligibility Requirements

1. The existing pool pump must be in working order at time of replacement.

Equipment Requirements

1. The new End-User Equipment must be a product for use with a domestic pool or spa that is a single phase, single speed, dual speed, multiple speed or variable speed pump unit with an input power of not less than 300W and not more than 2500W when tested in accordance with AS 5102.1.
2. The new End-User Equipment must be listed as part of a labelling scheme determined in accordance with the Equipment Energy Efficiency (E3) Committee's Voluntary Energy Rating Labelling Program for Swimming Pool Pump-units: Rules for Participation, April 2010, and achieve a minimum 5.5 star rating when determined in accordance with AS 5102.2.
3. The new End-User Equipment must have a warranty of at least 5 years.

Implementation Requirements

1. The pool pump must be installed by a Licensed plumber and/or electrician, where required by relevant legislation.
2. The decommissioned pool pump must be removed in accordance with relevant safety standards and legislation.

Activity Energy Savings

Deemed Activity Electricity Savings = Savings Factor

Where:

- *Savings Factor*, in MWh, is the value from Table D5.1 corresponding to the pool pump's flow rate (in L/min) and energy star rating.

Table D5.1 – Savings Factors (MWh per pool pump installed)

Energy Star Rating	**Pump flow rate > 120 to < 200 L/min**	**Pump flow rate ≥ 200 to < 275 L/min**	**Pump flow rate ≥ 275 to < 350 L/min**
5.5	0.7	1.1	1.4
6	1.4	2.1	2.7
7	2.4	3.6	4.7
8	3.2	4.7	6.2
9	3.7	5.6	7.4
10	4.2	6.3	8.2

Lifetime (for information purposes only)

Lifetime = 12 years.

Activity Definition D6

Name of Activity

INSTALL CEILING INSULATION IN AN UNINSULATED CEILING SPACE

Eligibility Requirements

1. There must be no existing roof or ceiling insulation present in the ceiling space.
2. For the purposes of this Activity, ceiling spaces with single sheet reflective foil insulation hung below the roofing material are deemed to be uninsulated ceiling spaces.

Equipment Requirements

1. The insulation product used must comply with the performance requirements of AS/NZS 4859.1, as evidenced by test reports from an accredited NATA laboratory.
2. The insulation product must achieve a minimum winter R-value, when measured in accordance with AS/NZS 4859.1, of:
    - R3.0 if the Site is in BCA Climate Zone 2 or 3;
    - R3.5 if the Site is in BCA Climate Zone 4, 5 or 6;
    - R5.0 if the Site is in BCA Climate Zone 7 or 8

   after being adjusted for perimeter insulation in accordance with AS 3999.
3. The insulation product must have a warranty of at least 25 years.
4. Foil insulation products are not eligible to be used in this activity.

Implementation Requirements

1. The insulation product used must be installed in compliance with AS 3999 and the National Construction Code BCA Section J1.
2. Installers are required to have completed training courses CPCCOHS1001A; CPCCCM2010A; CPCCOHS2001A; CPCCPB3027A; CPCCPB3014A and other training requirements as Published by the Scheme Administrator.
3. Insulation must only be installed in ceiling spaces with an exposed roof.
4. Insulation must be installed in at least 95% of the ceiling area able to have insulation installed, after being adjusted for perimeter insulation in accordance with AS 3999.
5. Cut outs around ceiling penetrations such as downlights must be kept to the minimum permitted by regulation.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor × Insulation Area
Deemed Activity Gas Savings = Gas Savings Factor × Insulation Area

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per m^2, are the values from Tables D6.1 and D6.2 corresponding to the Site's building construction and location.
- *Insulation Area*, in m^2, is the total ceiling area that has had insulation product installed.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table D6.1 – Electricity Savings Factors (MWh per m^2 of ceiling insulation installed)

Climate zone	**BCA Climate Zones 2 and 3 Minimum R3.0**	**BCA Climate Zones 4 Minimum R3.5**	**BCA Climate Zones 5 and 6 Minimum R3.5**	**BCA Climate Zones 7 and 8 Minimum R5.0**
MWh per m2	0.16	0.29	0.17	0.47

Table D6.2 – Gas Savings Factor (MWh per m^2 of ceiling insulation installed)

Climate zone	**BCA Climate Zones 2 and 3 Minimum R3.0**	**BCA Climate Zone 4 Minimum R3.5**	**BCA Climate Zones 5 and 6 Minimum R3.5**	**BCA Climate Zones 7 and 8 Minimum R5.0**
MWh per m^2	0.09	0.18	0.11	0.30

Lifetime (for information purposes only)

Lifetime = 25 years.

Activity Definition D7

Name of Activity

INSTALL CEILING INSULATION IN AN UNDER-INSULATED CEILING SPACE

Eligibility Requirements

1. There must be existing roof or ceiling insulation present in the ceiling space.
2. For the purposes of this Activity, ceiling spaces with single sheet reflective foil insulation hung below the roofing material are deemed to be uninsulated ceiling spaces.
3. The R-value of existing roof or ceiling insulation must be below 3.0 when measured in accordance with AS/NZS 4859.1.

Equipment Requirements

1. The insulation product used must comply with the performance requirements of AS/NZS 4859.1, as evidenced by test reports from an accredited NATA laboratory.
2. The insulation product must achieve a minimum winter R-value, when measured in accordance with AS/NZS 4859.1, of:
    - R3.0 if the Site is in BCA Climate Zone 2 or 3;
    - R3.5 if the Site is in BCA Climate Zone 4, 5 or 6;
    - R5.0 if the Site is in BCA Climate Zone 7 or 8

   after being adjusted for perimeter insulation in accordance with AS 3999.
3. The insulation product must have a warranty of at least 25 years.
4. Foil insulation products are not eligible to be used in this activity.

Implementation Requirements

1. The insulation product used must be installed in compliance with AS 3999 and the National Construction Code BCA Section J1.
2. Installers are required to have completed training courses CPCCOHS1001A; CPCCCM2010A; CPCCOHS2001A; CPCCPB3027A; CPCCPB3014A and other training requirements as Published by the Scheme Administrator.
3. Insulation must only be installed in ceiling spaces with an exposed roof.
4. Insulation must be installed in at least 95% of the ceiling area able to have insulation installed, after being adjusted for perimeter insulation in accordance with AS 3999.
5. Cut outs around ceiling penetrations such as downlights must be consistent with regulation requirements.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor × Insulation Area
Deemed Activity Gas Savings = Gas Savings Factor × Insulation Area

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per m^2, are the values from Tables D7.1 and D7.2 corresponding to the Site's building construction and location.
- *Insulation Area*, in m^2, is the total ceiling area that has had insulation product installed.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table D7.1 – Electricity Savings Factors (MWh per m^2 of ceiling insulation installed)

Climate zone	**BCA Climate Zones 2 and 3 Minimum R3.0**	**BCA Climate Zones 4 Minimum R3.5**	**BCA Climate Zones 5 and 6 Minimum R3.5**	**BCA Climate Zones 7 and 8 Minimum R5.0**
MWh per m2	0.01	0.03	0.02	0.04

Table D7.2 – Gas Savings Factors (MWh per m^2 of ceiling insulation installed)

Climate zone	**BCA Climate Zones 2 and 3 Minimum R3.0**	**BCA Climate Zones 4 Minimum R3.5**	**BCA Climate Zones 5 and 6 Minimum R3.5**	**BCA Climate Zones 7 and 8 Minimum R5.0**
MWh per m^2	0.01	0.02	0.01	0.03

Lifetime (for information purposes only)

Lifetime = 25 years.

Activity Definition D8

Name of Activity

INSTALL UNDER-FLOOR INSULATION

Eligibility Requirements

1. There must be no existing ground floor insulation present.
2. The Site must have a suspended timber floor.

Equipment Requirements

1. The insulation product used must comply with the performance requirements of AS/NZS 4859.1 and achieve a minimum winter R-value of R2.5 when measured in accordance with AS/NZS 4859.1, as evidenced by test reports from an accredited NATA laboratory.
2. The insulation product must have a warranty of at least 25 years.
3. Foil insulation products are not eligible to be used in this activity.

Implementation Requirements

1. The Activity is restricted to ground floor suspended timber floor spaces.
2. Installers are required to have completed training courses CPCCOHS1001A; CPCCCM2010A; CPCCOHS2001A; CPCCPB3014A; and other training requirements as Published by the Scheme Administrator.
3. The insulation product must be installed in accordance with AS 3999 and the National Construction Code BCA Section J1.
4. Insulation must be installed in at least 95% of the ground floor area able to have insulation installed.
5. Insulation may only be applied to areas that have not been previously insulated.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor × Insulation Area
Deemed Activity Gas Savings = Gas Savings Factor × Insulation Area

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per m^2, are the values from Tables D8.1 and D8.2 corresponding to the Site's building construction and location.
- *Insulation Area*, in m^2, is the total ground floor area that has had insulation product installed.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table D8.1 – Electricity Savings Factor (MWh per m^2 of under -floor insulation installed)

Climate zone	**BCA Climate Zones 2 and 3 Minimum R2.5**	**BCA Climate Zones 4 Minimum R2.5**	**BCA Climate Zones 5 and 6 Minimum R2.5**	**BCA Climate Zones 7 and 8 Minimum R2.5**
MWh per m^2	n/a	0.02	0.01	0.05

Table D8.2 – Gas Savings Factor (MWh per m^2 of under -floor insulation installed)

Climate zone	**BCA Climate Zones 2 and 3 Minimum R2.5**	**BCA Climate Zones 4 Minimum R2.5**	**BCA Climate Zones 5 and 6 Minimum R2.5**	**BCA Climate Zones 7 and 8 Minimum R2.5**
MWh per m^2	0.01	0.02	0.01	0.04

Lifetime (for information purposes only)

Lifetime = 25 years.

Activity Definition D9

Name of Activity

INSTALL WALL INSULATION

Eligibility Requirements

1. There must be no existing wall insulation present.
2. For the purposes of this activity, wall cavities that contain reflective foil sarking only shall be deemed to be uninsulated spaces.

Equipment Requirements

1. The insulation product used must comply with the performance requirements of AS/NZS 4859.1 and achieve a minimum winter R-value of 2.0 when measured in accordance with AS/NZS 4859.1, as evidenced by test reports from an accredited NATA laboratory.
2. The insulation product used must have a warranty of at least 25 years.
3. Foil insulation products are not eligible to be used in this activity.

Implementation Requirements

1. The insulation product used must be installed in accordance with AS 3999 and the National Construction Code BCA Section J1.
2. Installers are required to have completed training courses CPCCOHS1001A; CPCCCM2010A; CPCCOHS2001A; CPCCPB3014A; and other training requirements as Published by the Scheme Administrator.
3. The insulation product must be installed in an external wall space (or part of an external wall space) but not in any common walls (as defined by the National Construction Code).
4. Insulation must be installed in at least 95% of the wall area able to have insulation installed.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor × Insulation Area
Deemed Activity Gas Savings = Gas Savings Factor × Insulation Area

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per m^2, are the values from Tables D9.1 and D9.2 corresponding to the Site's building construction and location.
- *Insulation Area*, in m2, is the total wall area that has had insulation product installed.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table D9.1 – Electricity Savings Factor (MWh per m^2 of wall insulation installed)

Climate zone	**BCA Climate Zones 2 and 3 Minimum R2.0**	**BCA Climate Zones 4 Minimum R2.0**	**BCA Climate Zones 5 and 6 Minimum R2.0**	**BCA Climate Zones 7 and 8 Minimum R2.0**
MWh per m^2	0.05	0.09	0.05	0.15

Table D9.2 – Gas Savings Factor (MWh per m^2 of wall insulation installed)

Climate zone	**BCA Climate Zones 2 and 3 Minimum R2.0**	**BCA Climate Zones 4 Minimum R2.0**	**BCA Climate Zones 5 and 6 Minimum R2.0**	**BCA Climate Zones 7 and 8 Minimum R2.0**
MWh per m^2	0.02	0.06	0.03	0.10

Lifetime (for information purposes only)

Lifetime = 25 years.

Activity Definition D10

Name of Activity

REPLACE AN EXISTING ELECTRIC WATER HEATER WITH A HIGH EFFICIENCY GAS FIRED WATER HEATER

Eligibility Requirements

1. The existing electric water heater is an electric resistance storage or instantaneous water heater.
2. The existing electric water heater does not have to be in working order at time of replacement.
3. The existing electric water heater is not on a controlled load tariff (commonly known as 'off peak').

Equipment Requirements

1. The installed End-User Equipment must be a Gas fired storage or instantaneous water heater as defined in AS4552 or AS/NZS 5263.1.2.
2. The installed End-User Equipment must be listed as certified in the Gas Technical Regulators Committee (GTRC) National Certification Database and be certified for the fuel to which it will be connected.
3. The capacity of the installed End-User Equipment in Table D10.1 can be either a stored volume for a Gas fired storage water heater or a heated flow rate for a Gas fired instantaneous water heater.
4. The installed End-User Equipment must be rated at an Annual Energy Consumption of ≤ 20302 MJ (equal to 5.25 stars) in accordance with AS4552 or AS/NZS 5263.1.2, unless one or more of the following conditions are met, in which case installed End-User Equipment must be rated an Annual Energy Consumption of ≤ 18279 MJ (equivalent to 6.25 stars):
    a. the Site does not have an existing connection to a Distribution Pipeline;
    b. it will be connected to a Gas cylinder, including but not limited to liquefied petroleum gas cylinders;
    c. it is a Gas fired instantaneous water heater.
5. The installed End-User Equipment must have a capacity the same or smaller than the existing End-User Equipment it replaces.
6. The installed End-User Equipment must have a warranty of at least 10 years for the cylinder or tank of a Gas fired storage water heater, or the heat exchanger of a Gas fired instantaneous water heater.

Implementation Requirements

1. The existing End-User Equipment must be disconnected and removed; these tasks must be performed or supervised by a qualified person in accordance with relevant standards and legislation.
2. The End-User Equipment must be installed.
3. The activity must be performed or supervised by a qualified person in accordance with the End-User Equipment installation instructions and in compliance with plumbing, Gas work, electrical work and permanent wiring standards; and as required by other relevant legislation, local regulations, and all local codes and regulatory authority requirements.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor
Deemed Activity Gas Savings = Gas Savings Factor

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per installed End-User Equipment, are the values from Table D10.1 corresponding to the capacity and Annual Energy Consumption of the installed End-User Equipment.
- Capacity of installed End-User Equipment is available from Gas fired water heater specifications.
- Annual Energy Consumption of the installed End-User Equipment is the value listed for the equipment in the GTRC National Certification Database.

Table D10.1 – Electricity and Gas Savings Factor (MWh per installed End-User Equipment)

Capacity of installed End-User Equipment	**Annual Energy Consumption (MJ)**	**Electricity Savings Factor (MWh)**	**Gas Savings Factor (MWh)**
Gas fired storage water heater: < 95 L Gas fired instantaneous water heater: < 18 L/min at 25ºC rise	> 19797 and ≤ 20302	22.39	-25.38
	> 19291 and ≤ 19797	22.39	-24.75
	> 18785 and ≤ 19291	22.39	-24.11
	> 18279 and ≤ 18785	22.39	-23.48
	> 17774 and ≤ 18279	22.39	-22.85
	> 17268 and ≤ 17774	22.39	-22.22
	> 16762 and ≤ 17268	22.39	-21.58
	≤ 16762	22.39	-20.95
Gas fired storage water heater: 95 to 140 L Gas fired instantaneous water heater: 18 to 22 L/min at 25ºC rise	> 19797 and ≤ 20302	34.09	-42.30
	> 19291 and ≤ 19797	34.09	-41.24
	> 18785 and ≤ 19291	34.09	-40.19
	> 18279 and ≤ 18785	34.09	-39.14
	> 17774 and ≤ 18279	34.09	-38.08
	> 17268 and ≤ 17774	34.09	-37.03
	> 16762 and ≤ 17268	34.09	-35.97
	≤ 16762	34.09	-34.92
Gas fired storage water heater: > 140 L Gas fired instantaneous water heater: > 22 L/min at 25ºC rise	> 19797 and ≤ 20302	45.78	-59.21
	> 19291 and ≤ 19797	45.78	-57.74
	> 18785 and ≤ 19291	45.78	-56.26
	> 18279 and ≤ 18785	45.78	-54.79
	> 17774 and ≤ 18279	45.78	-53.31
	> 17268 and ≤ 17774	45.78	-51.84
	> 16762 and ≤ 17268	45.78	-50.36
	≤ 16762	45.78	-48.89

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition D11

Name of Activity

REPLACE AN EXISTING GAS FIRED WATER HEATER WITH A HIGH EFFICIENCY GAS FIRED WATER HEATER

Eligibility Requirements

1. The existing Gas fired water heater is a Gas fired storage water heater.
2. The existing Gas fired water heater does not have to be in working order at time of replacement.

Equipment Requirements

1. The installed End-User Equipment must be a Gas fired water heater as defined in AS4552 or AS/NZS 5263.1.2.
2. The installed End-User Equipment must be listed as certified in the Gas Technical Regulators Committee (GTRC) National Certification Database and be certified for the fuel to which it will be connected.
3. The capacity of the installed End-User Equipment in Table D11.1 can be either a stored volume for a Gas fired storage water heater or a heated flow rate for a Gas fired instantaneous water heater.
4. The installed End-User Equipment must be rated at an Annual Energy Consumption of ≤ 18279 MJ (equivalent to 6.25 stars) in accordance with AS4552 or AS/NZS 5263.1.2 if it is a Gas fired instantaneous water heater.
5. The installed End-User Equipment must be rated at an Annual Energy Consumption of ≤ 20302 MJ (equal to 5.25 stars) in accordance with AS4552 or AS/NZS 5263.1.2 if it is a Gas fired storage water heater.
6. The installed End-User Equipment must have a capacity the same or smaller than the existing End-User Equipment it replaces.
7. The installed End-User Equipment must have a warranty of at least 10 years for the cylinder or tank of a Gas fired storage water heater, or the heat exchanger of a Gas fired instantaneous water heater.

Implementation Requirements

1. The existing End-User Equipment must be disconnected and removed; these tasks must be performed or supervised by a qualified person in accordance with relevant standards and legislation.
2. The End-User Equipment must be installed.
3. The activity must be performed or supervised by a qualified person in accordance with the End-User Equipment installation instructions and in compliance with plumbing, Gas work, electrical work and permanent wiring standards; and as required by other relevant legislation, local regulations, and all local codes and regulatory authority requirements.

Activity Energy Savings

Deemed Activity Gas Savings = Gas Savings Factor

Where:

- *Gas Savings Factor*, in MWh per installed End-User Equipment, is the value from Table D11.1 corresponding to the capacity and Annual Energy Consumption of the installed End-User Equipment.
- Capacity of installed End-User Equipment is available from Gas fired water heater specifications.
- Annual Energy Consumption of the installed End-User Equipment is the value listed for the equipment in the GTRC National Certification Database.

Table D11.1 – Gas Savings Factor (MWh per installed End-User Equipment)

Capacity of installed End-User Equipment	**Annual Energy Consumption (MJ)**	**Gas Savings Factor (MWh)**
Gas fired storage water heater: < 95 L Gas fired instantaneous water heater: < 18 L/min at 25ºC rise	> 19797 and ≤ 20302	4.43
	> 19291 and ≤ 19797	5.06
	> 18785 and ≤ 19291	5.69
	> 18279 and ≤ 18785	6.32
	> 17774 and ≤ 18279	6.95
	> 17268 and ≤ 17774	7.59
	> 16762 and ≤ 17268	8.22
	≤ 16762	8.85
Gas fired storage water heater: 95 to 140 L Gas fired instantaneous water heater: 18 to 22 L/min at 25ºC rise	> 19797 and ≤ 20302	7.38
	> 19291 and ≤ 19797	8.43
	> 18785 and ≤ 19291	9.48
	> 18279 and ≤ 18785	10.54
	> 17774 and ≤ 18279	11.59
	> 17268 and ≤ 17774	12.64
	> 16762 and ≤ 17268	13.70
	≤ 16762	14.75
Gas fired storage water heater: > 140 L Gas fired instantaneous water heater: > 22 L/min at 25ºC rise	> 19797 and ≤ 20302	10.33
	> 19291 and ≤ 19797	11.80
	> 18785 and ≤ 19291	13.28
	> 18279 and ≤ 18785	14.75
	> 17774 and ≤ 18279	16.23
	> 17268 and ≤ 17774	17.70
	> 16762 and ≤ 17268	19.18
	≤ 16762	20.65

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition D12

Name of Activity

INSTALL A HIGH EFFICIENCY GAS SPACE HEATER OR REPLACE AN EXISTING GAS SPACE HEATER WITH A HIGH EFFICIENCY GAS SPACE HEATER

Eligibility Requirements

1. This activity must be an installation of a high efficiency Gas space heater or a replacement of an existing Gas space heater with a high efficiency Gas space heater.

Equipment Requirements

1. The installed End-User Equipment must be a Gas space heating appliance as defined in AS4553 or AS/NZS 5263.1.3.
2. The installed End-User Equipment must be rated at a minimum of 5 stars in accordance with AS4553 or AS/NZS 5263.1.3, listed in the Directory of Australian Gas Association (AGA) Certified Products and be certified for the fuel to which it will be connected.
3. The installed End-User Equipment can be a Flued Radiant/Convection Heater, a Balanced Flue Convection Heater or a Wall Furnace, as listed in the Directory of AGA Certified Products.
4. The installed End-User Equipment must have a capacity the same or smaller than the existing End-User Equipment it replaces, in the case of replacement of a Gas space heater.
5. The installed End-User Equipment must have a warranty of at least 10 years for the heat exchanger.

Implementation Requirements

1. If there is any existing End-User Equipment, it must be disconnected and removed; these tasks must be performed or supervised by a qualified person in accordance with relevant standards and legislation.
2. The End-User Equipment must be installed.
3. The activity must be performed or supervised by a qualified person in accordance with the End-User Equipment installation instructions and in compliance with Gas work, electrical work and permanent wiring standards; and as required by other relevant legislation, local regulations, and all local codes and regulatory authority requirements.

Activity Energy Savings

Deemed Activity Gas Savings = Gas Savings Factor

Where:

- *Gas Savings Factor*, in MWh per installed End-User Equipment, is the value from Table D12.1 corresponding to the installed End-User Equipment Annual Energy Consumption and Star Rating; as well as the BCA climate zone where the Site is situated.
- Annual Energy Consumption and Star Rating of the installed End-User Equipment are the values listed for the equipment in the most recent version of Directory of AGA Certified Products.
- In cases where the Star Rating for the installed End-User Equipment is between increments, or above 5.50, it is rounded down to the closest Star Rating.

Table D12.1 – Gas Savings Factor (MWh per installed End-User Equipment)

Annual Energy Consumption (MJ/y)	Star Rating	BCA Climate Zones 2 & 3	BCA Climate Zone 4	BCA Climate Zones 5 & 6	BCA Climate Zones 7 & 8
< 9000	5.00 Stars	0.19	0.52	0.28	0.95
	5.25 Stars	0.20	0.57	0.31	1.05
	5.50 Stars	0.21	0.63	0.33	1.16
9000 to 13000	5.00 Stars	0.39	1.45	0.68	2.83
	5.25 Stars	0.42	1.62	0.75	3.18
	5.50 Stars	0.46	1.79	0.82	3.52
> 13000	5.00 Stars	0.48	1.90	0.87	3.75
	5.25 Stars	0.53	2.13	0.97	4.22
	5.50 Stars	0.58	2.36	1.07	4.68

Lifetime (for information purposes only)

Lifetime = 10 years.

Schedule E – Activity Definitions for Low Cost Activities for Home Energy Efficiency Retrofits (clause 9.8)

Activity Definition E1

Name of Activity

REPLACE HALOGEN DOWNLIGHT WITH AN LED LUMINAIRE AND/OR LAMP

Eligibility Requirements

1. The existing Lamp must be a Tungsten halogen Lamp (240V), Tungsten halogen Lamp (ELV), or Infrared coated (IRC) halogen Lamp (ELV) as defined in Table A9.1 of Schedule A.
2. The existing Lamp must be a multifaceted reflector Lamp.
3. The existing Lamp must be rated at either 35W or 50W.
4. The existing Lamp and Luminaire must be in working order.

Equipment Requirements

1. The new End-User Equipment must be a LED Lamp only – ELV, LED Lamp and Driver, LED Luminaire-recessed, or an LED Lamp Only – 240V Self Ballasted, as defined in Table A9.1 or Table A9.3 of Schedule A.
2. Any End-User Equipment classified under Table A9.3 must be accepted by the Scheme Administrator as meeting the requirements of Table A9.4 of Schedule A.
3. The new End-User Equipment must have an initial Downward Light Output of ≥462 lumens.
4. The new End-User Equipment must have a beam angle consistent with the original Lamp being replaced.
5. The new End-User Equipment must be compatible with any dimmer installed on the same circuit as the new End-User Equipment.

Implementation Requirements

1. The activity must be performed or supervised by a Licensed electrician.
2. When installing a LED Lamp only – 240V Self Ballasted Lamp the existing ELV halogen Control Gear must be removed and not used as part of the Lighting Upgrade.
3. When installing a LED Lamp only – ELV the new End-User Equipment must be compatible with the existing transformer.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor

Where:

- *Electricity Savings Factor*, in MWh, is the value from Table E1.1 or Table E1.2, corresponding to the existing Lamp or Luminaire where the Lamp Circuit Power of the replacement Lamp being installed (in Watts); and
- Lamp Circuit Power is the Lamp Circuit Power of the replacement Lamp being installed (in Watts) and is measured in accordance with Table A9.4 of Schedule A.

Table E1.1 Residential Building Electricity Savings Factor (MWh per Lamp replaced)

Existing Lamp and/or Luminaire	**New Lamp and/or Luminaire**	**New Lamp Circuit Power (Watts)**		
		≤5 W	≤10 W	≤15 W
Tungsten halogen Lamp (ELV) with Electronic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with Electronic Transformer, with or without Luminaire.	LED Lamp only - ELV	0.49	0.41	0.32
	LED Lamp and Driver or LED Luminaire - recessed	0.49	0.42	0.34
	LED Lamp only – 240V Self Ballasted			
Tungsten halogen Lamp (ELV) with Magnetic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with Magnetic Transformer, with or without Luminaire.	LED Lamp only - ELV	0.56	0.47	0.38

	LED Lamp and Driver or LED Luminaire - recessed	0.58	0.51	0.43
	LED Lamp only – 240V Self Ballasted			
Tungsten halogen Lamp (240V), with or without Luminaire.	LED Lamp only – 240V Self Ballasted	0.68	0.60	0.53
	LED Lamp and Driver or LED Luminaire - recessed			

Table E1.2 Small Business Site Electricity Savings Factor (MWh per Lamp replaced)

Existing Lamp and/or Luminaire	**New Lamp and/or Luminaire**	**New Lamp Circuit Power (Watts)**		
		≤5 W	≤10 W	≤15 W
Tungsten halogen Lamp (ELV) with Electronic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with Electronic Transformer, with or without Luminaire.	LED Lamp only - ELV	0.97	0.81	0.65
	LED Lamp and Driver or LED Luminaire - recessed	1.38	1.17	0.96
	LED Lamp only – 240V Self Ballasted			
Tungsten halogen Lamp (ELV) with Magnetic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with Magnetic Transformer, with or without Luminaire.	LED Lamp only - ELV	0.95	0.76	0.57
	LED Lamp and Driver or LED Luminaire - recessed	1.63	1.42	1.21
	LED Lamp only – 240V Self Ballasted			
Tungsten halogen Lamp (240V), with or without Luminaire.	LED Lamp only – 240V Self Ballasted	1.35	1.20	1.05
	LED Lamp and Driver or LED Luminaire – recessed	1.89	1.68	1.47

Lifetime (for information purposes only)

Residential Building Lifetime = 15 years.
Small Business Site Lifetime = 10 years.

Activity Definition E2

Name of Activity

REPLACE A LINEAR HALOGEN FLOODLIGHT WITH A HIGH EFFICIENCY LAMP

Eligibility Requirements

1. The existing Lamp must be a linear halogen floodlight.
2. The existing Lamp must be rated at more than 100W.
3. Existing equipment must be in working order at time of replacement.

Equipment Requirements

1. The new End-User Equipment must be a CFLi or an LED Luminaire – Floodlight, as defined in Table A9.1 or Table A9.3 of Schedule A.
2. Any End-User Equipment classified under Table A9.3 must be accepted by the Scheme Administrator as meeting the requirements of Table A9.4 of Schedule A.
3. CFLs must have a Lamp Life of at least 10,000 hours when measured in accordance with Table A9.6 of Schedule A.
4. The new End-User Equipment must have a beam angle consistent with that of the original Lamp being replaced.

Implementation Requirements

1. The activity must be performed or supervised by a Licensed electrician.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor

Where:

- *Electricity Savings Factor*, in MWh, is the value from Table E2.1 or Table E2.2 corresponding to the Lamp Circuit Power of the existing Lamp and the replacement Lamp being installed (in Watts); and
- *Lamp Circuit Power* is measured in Accordance with Table A9.2 of Schedule A.

Table E2.1 – Residential Building Electricity Savings Factor (MWh per linear halogen floodlight replaced)

Lamp Circuit Power of existing Lamp	**New End-User Equipment**	**Initial Light Output of new End-User Equipment (lm)**	**Lamp Circuit Power of replacement Lamp (W)**				
			≤30W	**≤45W**	**≤60W**	**≤90W**	**≤150W**
100W ≤ LCP < 150W	LED Luminaire – Floodlight or CFLi	≥1,500	0.27				
150W ≤ LCP < 200W	LED Luminaire – Floodlight or CFLi	≥2,500	0.46	0.38			
200W ≤ LCP < 300W	LED Luminaire – Floodlight or CFLi	≥3,500		0.57	0.51		
300W ≤ LCP < 500W	LED Luminaire – Floodlight or CFLi	≥5,700			0.88	0.73	
500W ≤ LCP	LED Luminaire – Floodlight or CFLi	≥10,000				1.46	1.17

Table E2.2 – Small Business Site Electricity Savings Factor (MWh per linear halogen floodlight replaced)

Lamp Circuit Power of existing Lamp	**New End-User Equipment**	**Initial Light Output of new End-User Equipment (lm)**	**Lamp Circuit Power of replacement Lamp (W)**				
			≤30W	**≤45W**	**≤60W**	**≤90W**	**≤150W**
100W ≤ LCP < 150W	LED Luminaire – Floodlight or CFLi	≥1,500	0.75				
150W ≤ LCP < 200W	LED Luminaire – Floodlight or CFLi	≥2,500	1.25	1.05			
200W ≤ LCP < 300W	LED Luminaire – Floodlight or CFLi	≥3,500		1.55	1.40		

300W ≤ LCP < 500W	LED Luminaire – Floodlight or CFLi	≥5,700			2.40	2.00	
500W ≤ LCP	LED Luminaire – Floodlight or CFLi	≥10,000				4.00	3.20

Lifetime (for information purposes only)

Residential Building Lifetime = 10 years.
Small Business Site Lifetime = 10 years.

Activity Definition E3

Name of Activity

REPLACE PARABOLIC ALUMINISED REFLECTOR (PAR) LAMP WITH EFFICIENT LUMINAIRE AND/OR LAMP

Eligibility Requirements

1. The existing Lamp must be a 240V parabolic aluminised reflector (PAR) Lamp.
2. The existing Lamp must be rated at between 80W and 160W.
3. Existing lighting equipment must be in working order at time of replacement.

Equipment Requirements

1. The new End-User Equipment must be a LED Lamp Only – 240V Self Ballasted, CFLi or LED Luminaire – Floodlight as defined in Table A.9.1 or Table A9.3 of Schedule A.
2. Any End-User Equipment classified under Table A9.3 must be accepted by the Scheme Administrator as meeting the requirements of Table A9.4 of Schedule A.
3. CFL Lamps must have a Lamp Life of at least 10,000 hours when measured in accordance with Table A9.6 of Schedule A.
4. The new End-User Equipment must have a beam angle consistent with that of the original Lamp being replaced.

Implementation Requirements

1. The activity must be performed or supervised by a Licensed electrician.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor

Where:

- *Electricity Savings Factor*, in MWh, is the value from Table E3.1 or Table E3.2 corresponding to the lighting retrofit activity and the Lamp Circuit Power of the replacement lamp being installed (in Watts); and
- Lamp Circuit Power is measured in accordance with Table A9.2 of Schedule A.

Table E3.1 Residential Building Electricity Savings Factor (MWh per PAR lamp replaced)

LCP of Existing Lamp	**Initial Light output of new End-User Equipment**	**Lamp Circuit Power of the replacement lamp (Watts)**			
		≤15 W	**≤25 W**	**≤30 W**	**≤40 W**
80W ≤ LCP < 100W	≥ 1200 lm	0.60	-	-	-
100W ≤ LCP < 120W	≥ 1500 lm	0.80	0.75	-	-
120W ≤ LCP < 140W	≥ 1900 lm	1.00	0.95	0.90	-
140W ≤ LCP < 160W	≥ 2300 lm	1.20	1.15	1.10	1.00

Table E3.2 Small Business Site Electricity Savings Factor (MWh per PAR lamp replaced)

LCP of Existing Lamp	**Initial Light output of new End-User Equipment**	**Lamp Circuit Power of the replacement lamp (Watts)**			
		≤15 W	**≤25 W**	**≤30 W**	**≤40 W**
80W ≤ LCP < 100W	≥ 1200 lm	1.80	-	-	-
100W ≤ LCP < 120W	≥ 1500 lm	2.40	2.25	-	-
120W ≤ LCP < 140W	≥ 1900 lm	3.00	2.85	2.70	-
140W ≤ LCP < 160W	≥ 2300 lm	3.60	3.45	3.30	3.00

Lifetime (for information purposes only)

Residential Building Lifetime = 10 years.
Small Business Site Lifetime = 10 years.

Activity Definition E4

Name of Activity

REPLACE A T8 OR T12 LUMINAIRE WITH A T5 LUMINAIRE

Eligibility Requirements

1. Must be an existing 2 foot, 3 foot, 4 foot, or 5 foot T8 or T12 Luminaire.
2. Existing lighting equipment must be in working order at time of replacement.

Equipment Requirements

1. The new End-User equipment must be a T5 linear fluorescent Luminaire.
2. The new End-User Equipment must not be a T5 Adaptor kit.
3. The new Luminaire must have a length consistent with the existing Luminaire.
4. Lamp Life must be at least 20,000 hours when measured in accordance with Table A9.6 of Schedule A.

Implementation Requirements

1. The activity must be performed or supervised by a Licensed electrician.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor

Where:

- *Electricity Savings Factor*, in MWh, is the value from Table E4.1 or Table E4.2 corresponding to the Lamp size.

Table E4.1 – Residential Building Electricity Savings Factor (MWh per T8 or T12 Luminaire replaced)

Luminaire and Lamp size	Electricity Savings Factor (MWh)
2 foot (600mm)	0.10
3 foot (900mm)	0.12
4-foot (1200mm)	0.14
5-foot (1500mm)	0.16

Table E4.2 – Small Business Site Electricity Savings Factor (MWh per T8 or T12 Luminaire replaced)

Luminaire and Lamp size	Electricity Savings Factor (MWh)
2 foot (600mm)	0.42
3 foot (900mm)	0.50
4-foot (1200mm)	0.59
5-foot (1500mm)	0.67

Lifetime **(for information purposes only)**

Residential Building Lifetime = 10 years.
Small Business Site Lifetime = 10 years.

Activity Definition E5

Name of Activity

REPLACE A T8 OR T12 LUMINAIRE WITH A LED LUMINAIRE

Eligibility Requirements

1. Must be an existing 2 foot, 3 foot, 4 foot or 5 foot T8 or T12 Luminaire.
2. Existing lighting equipment must be in working order at time of replacement.

Equipment Requirements

1. The new End-User Equipment must be a LED Luminaire – Linear Lamp as defined in Table A9.3 of Schedule A.
2. The new End-User Equipment must not be a Retrofit Luminaire – LED Linear Lamp or Modified Luminaire – LED Linear Lamp as defined in Table A9.3 of Schedule A.
3. Any End-User Equipment classified under Table A9.3 must be accepted by the Scheme Administrator as meeting the requirements of Table A9.4 of Schedule A.
4. Lamp Life must be at least 20,000 hours when measured in accordance with Table A9.6.
5. The new End-User Equipment must be compatible with any dimmer installed on the same circuit as the new End-User Equipment.

Implementation Requirements

1. The activity must be performed or supervised by a Licensed electrician.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor

Where:

- *Electricity Savings Factor*, in MWh, is the value from Table E5.1 or Table E5.2 corresponding to the Lamp Circuit Power (LCP) specified in Table A9.2 of Schedule A.

Table E5.1 – Residential Building Electricity Savings Factor (MWh per T8 or T12 Luminaire replaced)

Existing Luminaire	**Initial Light Output of new End-User Equipment (lm)**	**Lamp Circuit Power of the replacement luminaire (Watts)**												
		≤10 W	**≤15 W**	**≤20 W**	**≤25 W**	**≤30 W**	**≤35 W**	**≤40 W**	**≤45 W**	**≤50 W**	**<60 W**	**<70 W**	**<80 W**	**<90 W**
2 foot (1 x 600mm lamp)	≥ 1000	0.24	0.17	-	-	-	-	-	-	-	-	-	-	-
3 foot (1 x 900mm lamp)	≥ 1600	-	0.35	0.27	0.20	0.12	-	-	-	-	-	-	-	-
4 foot (1 x 1200mm lamp)	≥ 2500	-	-	0.36	0.29	0.21	0.14	0.06	-	-	-	-	-	-
5 foot (1 x 1500mm lamp)	≥ 3200	-	-	-	-	0.54	0.47	0.39	0.32	0.24	0.09	-	-	-
2 foot (2 × 600mm lamps)	≥ 2000	-	0.56	0.48	0.41	0.33	-	-	-	-	-	-	-	-
3 foot (2 × 900mm lamps)	≥ 3200	-	-	-	-	0.69	0.62	0.54	0.47	0.39	0.24	-	-	-
4 foot (2 × 1200mm lamps)	≥ 5000	-	-	-	-	-	-	0.72	0.65	0.57	0.42	0.27	0.12	-
5 foot (2 × 1500mm lamps)	≥ 6400	-	-	-	-	-	-	-	-	-	1.08	0.93	0.78	0.63
2 foot (3 or more 600mm lamps)	≥ 3000	-	-	-	0.80	0.72	0.65	0.57	0.50	0.42	-	-	-	-
3 foot (3 or more 900mm lamps)	≥ 5000	-	-	-	-	-	-	1.11	1.04	0.96	0.81	0.66	0.51	0.36

4 foot (3 or more 1200mm lamps)	≥ 7000	-	-	-	-	-	-	-	-	-	1.08	0.93	0.78	0.63
5 foot (3 or more 1500mm lamps)	≥ 8000	-	-	-	-	-	-	-	-	-	-	-	-	1.62

Table E5.2 – Small Business Site Electricity Savings Factor (MWh per T8 or T12 Luminaire replaced)

Existing Luminaire	**Initial Light Output of new End-User Equipment (lm)**	**Lamp Circuit Power of the replacement luminaire (Watts)**												
		≤10 W	**≤15 W**	**≤20 W**	**≤25 W**	**≤30 W**	**≤35 W**	**≤40 W**	**≤45 W**	**≤50 W**	**<60 W**	**<70 W**	**<80 W**	**<90 W**
2 foot (1 × 600mm lamp)	≥ 1000	0.67	0.46	-	-	-	-	-	-	-				
3 foot (1 × 900mm lamp)	≥ 1600	-	0.97	0.76	0.55	0.34	-	-	-	-				
4 foot (1 × 1200mm lamp)	≥ 2500	-	-	1.01	0.80	0.59	0.38	0.17	-	-				
5 foot (1 × 1500mm lamp)	≥ 3200	-	-	-	-	1.51	1.30	1.09	0.88	0.67				
2 foot (2 × 600mm lamps)	≥ 2000	-	1.55	1.34	1.13	0.92	-	-	-	-	-	-	-	-
3 foot (2 × 900mm lamps)	≥ 3200	-	-	-	-	1.93	1.72	1.51	1.30	1.09	0.67	-	-	-
4 foot (2 × 1200mm lamps)	≥ 5000	-	-	-	-	-	-	2.02	1.81	1.60	1.18	0.76	0.34	-
5 foot (2 × 1500mm lamps)	≥ 6400	-	-	-	-	-	-	-	-	-	3.02	2.60	2.18	1.76
2 foot (3 or more 600mm lamps)	≥ 3000	-	-	-	2.23	2.02	1.81	1.60	1.39	1.18	-	-	-	-
3 foot (3 or more 900mm lamps)	≥ 5000	-	-	-	-	-	-	3.11	2.90	2.69	2.27	1.85	1.43	1.01
4 foot (3 or more 1200mm lamps)	≥ 7000	-	-	-	-	-	-	-	-	-	3.02	2.60	2.18	1.76
5 foot (3 or more 1500mm lamps)	≥ 8000	-	-	-	-	-	-	-	-	-	-	-	-	4.54

Lifetime (for information purposes only)

Residential Building Lifetime = 15 years.
Small Business Site Lifetime = 10 years.

Activity Definition E6

Name of Activity

REPLACE AN EXISTING SHOWERHEAD WITH AN ULTRA LOW FLOW SHOWERHEAD

Eligibility Requirements

1. The hot water service supplying the shower must be provided by an electric resistance water heater, an electrically boosted solar water heater or an electric heat pump water heater (for electricity savings); or by a Gas fired storage water heater, Gas fired instantaneous water heater or a Gas boosted solar water heater (for Gas savings).
2. There must be an existing showerhead on each shower.

Equipment Requirements

1. The End-User Equipment must be a showerhead as defined in *AS/NZS 3662– Performance of showers for bathing*.
2. The showerhead must be assigned a minimum 3 Star WELS Rating with a nominal flow rate of ≤ 6 litres/minute when tested according to *AS/NZS 6400 – Water efficient products*.
3. The showerhead must have a warranty of at least 2 years.

Implementation Requirements

1. The replacement of the showerhead must be performed or supervised by a Licensed plumber in accordance with the Plumbing Code of Australia.
2. A maximum of one showerhead per shower can be replaced.
3. The showerhead must be compatible with the installed water heating system**.**

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor
Deemed Activity Gas Savings = Gas Savings Factor

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per showerhead, are the values from Tables E6.1 and E6.2 corresponding to the type of water heating system servicing the shower.
- The Electricity Savings Factor and Gas Savings Factor that are applied must match the type of water heating system.
- In the case where showerhead replacement occurs in conjunction with a water heating system replacement, the Electricity Savings Factor and Gas Savings Factor that are applied must match the new installed water heating system.

Table E6.1 – Electricity Savings Factor (MWh per showerhead replaced)

Electric water heating system	**Electricity Savings Factor (MWh)**
Electric resistance water heater	1.9
Electrically boosted solar water heater	1.1
Electric heat pump water heater	1.1

Table E6.2 – Gas Savings Factor (MWh per showerhead replaced)

Gas fired water heating system	**Gas Savings Factor (MWh)**
Gas fired storage water heater	3.4
Gas fired instantaneous water heater	3.1
Gas boosted solar water heater	1.2

Lifetime (for information purposes only)

Lifetime = 7 years.

Activity Definition E7

Name of Activity

MODIFY AN EXTERNAL DOOR WITH DRAUGHT-PROOFING

Eligibility Requirements

1. Doors to be draught-proofed must have gaps between the door and frame and/or threshold that permit the infiltration of air into or out of the Site.
2. Only external doors may be draught-proofed.

Equipment Requirements

1. The equipment to be applied must be a retail door bottom sealing product or door perimeter weather-stripping product or a combination of the two.
2. The product must be fit for purpose.
3. The product's sealing surface must be made of a durable compressible material such as foam, polypropylene pile, flexible plastic, rubber compressible strip, fibrous seal or similar.
4. The product must not impair the proper operation of the door.
5. The product must have a warranty of at least 2 years.

Implementation Requirements

1. The product must be applied to a door bottom seal or a set of door jamb and head seals or a combination of both.
2. The product, once applied, must effectively restrict the airflow into or out of the Site around the perimeter of the door.
3. The product must be installed in strict accordance with the manufacturer's instructions.
4. All external doors (excluding sliding doors) at the Site that meet the Eligibility Requirements must be draught-proofed.
5. The product must be installed in accordance with the National Construction Code BCA Section J3 and any relevant AS/NZS as required by the Scheme Administrator.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor
Deemed Activity Gas Savings = Gas Savings Factor

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per door, are the values from Tables E7.1 and E7.2 corresponding to the type of building construction and the BCA Climate Zone of the Site.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table E7.1 – Electricity Savings Factor (MWh per door modified)

Climate zone	**BCA Climate Zones 2 and 3**	**BCA Climate Zones 4**	**BCA Climate Zones 5 and 6**	**BCA Climate Zones 7 and 8**
MWh per door	0.14	0.12	0.09	0.22

Table E7.2 – Gas Savings Factor (MWh per door modified)

Climate zone	**BCA Climate Zones 2 and 3**	**BCA Climate Zones 4**	**BCA Climate Zones 5 and 6**	**BCA Climate Zones 7 and 8**
MWh per door	0.04	0.11	0.06	0.16

Lifetime (for information purposes only)

Lifetime = 5 years.

Activity Definition E8

Name of Activity

MODIFY AN EXTERNAL WINDOW WITH DRAUGHT-PROOFING

Eligibility Requirements

1. Windows to be draught-proofed must present with gaps between the sash and frame that permit the infiltration of air into or out of the Site.
2. Only external windows may be draught-proofed.

Equipment Requirements

1. The equipment to be applied must be a retail window sealing or weather stripping product or a combination of the two.
2. The product must be fit for purpose.
3. The product's sealing surface must be made of a durable compressible material such as foam, polypropylene pile, flexible plastic, rubber compressible strip, fibrous seal or similar.
4. The product must not impair the proper operation of the window.
5. The product must have a warranty of at least 2 years.

Implementation Requirements

1. The product must be applied to the perimeter of the window sash.
2. The product, once applied, must effectively restrict the airflow into or out of the Site around the perimeter of the window.
3. The product must be installed in strict accordance with the manufacturer's instructions.
4. All external windows at the Site that meet the Eligibility Requirements must be draught-proofed.
5. The draught-proofing product (or products) must be installed in accordance with the National Construction Code BCA Section J3 and any relevant AS/NZS as required by the Scheme Administrator.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor × Length
Deemed Activity Gas Savings = Gas Savings Factor × Length

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per metre, are the values from Tables E8.1 and E8.2 corresponding to the type of building construction and the BCA Climate Zone of the Site.
- *Length*, in metres, is the length of window perimeter to which the product has been applied.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table E8.1 – Electricity Savings Factor (MWh per metre of window perimeter modified)

Climate zone	**BCA Climate Zones 2 and 3**	**BCA Climate Zones 4**	**BCA Climate Zones 5 and 6**	**BCA Climate Zones 7 and 8**
MWh per metre of window perimeter	0.02	0.03	0.02	0.05

Table E8.2 – Gas Savings Factor (MWh per metre of window perimeter modified)

Climate zone	**BCA Climate Zones 2 and 3**	**BCA Climate Zones 4**	**BCA Climate Zones 5 and 6**	**BCA Climate Zones 7 and 8**
MWh per metre of window perimeter	0.01	0.02	0.01	0.03

Lifetime (for information purposes only)

Lifetime = 5 years.

Activity Definition E9

Name of Activity

MODIFY A FIREPLACE CHIMNEY BY SEALING WITH A DAMPER

Eligibility Requirements

1. The fireplace that the damper is to be installed in must be within a Residential Building.
2. The fireplace must be an open fireplace; and not have an existing damper.

Equipment Requirements

1. The damper must be fit for purpose and capable of effectively sealing the flue or chimney of an open fireplace.
2. If the damper is designed to be used in an operable fireplace then it must be of a durable construction such that its operation is not adversely affected by the heat of a fire and when open it must not adversely affect the operation of the fireplace, in particular the chimney/flue's capacity to "draw" smoke out of the firebox.
3. The chimney damper must, to the satisfaction of the Scheme Administrator, be a durable product that will deliver long-lasting energy savings.
4. The damper installed must have a warranty of at least 5 years

Implementation Requirements

1. The damper must be installed in accordance with the manufacturer's instructions.
2. If the damper is not designed to be used in an operable fireplace (i.e. permanent sealing) the fireplace must be sealed such that access to the combustion chamber is also permanently sealed or if the firebox is not to be sealed then the fuel burning device must be clearly tagged as having been sealed.
3. If the damper is designed to be used in an operable fireplace it must be installed in a manner that ensures that the safe operation of the fireplace is not compromised.
4. Works must be carried out in accordance with the National Construction Code BCA Section J3 and any relevant AS/NZS as required by the Scheme Administrator.
5. All fireplaces at the Site that meet the Eligibility Requirements must be sealed.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor
Deemed Activity Gas Savings = Gas Savings Factor

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per fireplace, are the values from Tables E9.1 and E9.2 corresponding to the type of building construction and the BCA Climate Zone of the Site.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises.

Table E9.1 – Electricity Savings Factor (MWh per fireplace modified)

Climate zone	BCA Climate Zones 2 and 3	BCA Climate Zones 4	BCA Climate Zones 5 and 6	BCA Climate Zones 7 and 8
MWh per fireplace	1.4	2.4	1.3	2.5

Table E9.2 – Gas Savings Factor (MWh per fireplace modified)

Climate zone	BCA Climate Zones 2 and 3	BCA Climate Zones 4	BCA Climate Zones 5 and 6	BCA Climate Zones 7 and 8
MWh per fireplace	0.7	1.7	0.9	1.7

Lifetime (for information purposes only)

Lifetime = 5 years.

Activity Definition E10

Name of Activity

MODIFY A SINGLE GLAZED WINDOW OR DOOR BY APPLYING A FILM

Eligibility Requirements

1. The Site must be a Residential Building or Small Business Site.
2. The window must be an external window.
3. The existing door must be external and a fully single glazed framed unit.
4. The window or door must not face south (between 135° and 225° of true north).
5. The window or door must not be shaded by any existing external shading device (including, but not limited to, window or door film, roller blinds, awnings or louvres, but excluding roof eaves).

Equipment Requirements

1. The End-User Equipment to be applied to the window or door must be a film product certified under WERS for Film.
2. The film product must, as registered with WERS, when applied to a single clear glazed window or door that is set within a standard aluminium frame deliver a thermal efficiency equivalent to a minimum 3 star WERS rating in cooling mode.
3. The product must have a warranty of at least 10 years.

Implementation Requirements

1. The window or door insulating film must be applied according to the manufacturer's instructions.
2. The window or door film must be applied by a person holding a WERS for Film Licence or equivalent accreditation as accepted by the Scheme Administrator.

Activity Energy Savings

Deemed Activity Electricity Savings = Electricity Savings Factor × Area
Deemed Activity Gas Savings = Gas Savings Factor × Area

Where:

- *Electricity Savings Factor* and *Gas Savings Factor*, in MWh per m^2, are the values from Tables E10.1 and E10.2 corresponding to the BCA Climate Zone of the Site.
- *Area*, in m^2, is the area of window or door glazing to which insulating film is applied.
- Implementation of the Activity allows both Electricity and Gas Savings Factors to be applied, regardless of fuel used for heating or cooling at the premises. However, Gas Savings Factors equal zero (0.00).

Table E10.1 – Electricity Savings Factor (MWh per m^2 of window or door film applied)

Climate zone	**BCA Climate Zones 2 and 3**	**BCA Climate Zones 4**	**BCA Climate Zones 5 and 6**	**BCA Climate Zones 7 and 8**
MWh per m^2	0.10	0.10	0.06	0.04

Table E10.2 – Gas Savings Factor (MWh per m^2 of window or door film applied). Note: Figures are all zero (0.00).

Climate zone	**BCA Climate Zones 2 and 3**	**BCA Climate Zones 4**	**BCA Climate Zones 5 and 6**	**BCA Climate Zones 7 and 8**
MWh per m^2	0.00	0.00	0.00	0.00

Lifetime (for information purposes only)

Lifetime = 10 years.

Activity Definition E11

Name of Activity

REPLACE AN EDISON SCREW OR BAYONET LAMP WITH AN LED LAMP FOR GENERAL LIGHTING PURPOSES

Eligibility Requirements

1. The existing Lamp must be a 240V fixed ceiling or wall mounted luminaire fixture.
2. The existing Lamp must be an Edison screw or Bayonet Lamp.
3. The existing Lamp must be an Incandescent, halogen or CFL Lamp.
4. The existing Lamp and Luminaire must be in working order.
5. Must be a Lamp only replacement.

Equipment Requirements

1. The new End-User Equipment must be a 240V Edison screw or Bayonet self-ballasted LED Lamp.
2. Any End-User Equipment classified under Table A9.3 of Schedule A must be accepted by the Scheme Administrator as meeting the requirements of Table A9.4 of Schedule A.
3. The new End-User Equipment must be compatible with any dimmer installed on the same circuit as the new End-User Equipment.
4. The new End-User Equipment must have a lumen output the same or higher than the replaced Lamp.

Implementation Requirements

1. The activity must be performed or supervised by a Licensed electrician

Residential Building Activity Energy Savings

Deemed Activity Electricity Savings = LCP of new Lamp × (lumen efficacy of new Lamp / 33.9 – 1) × 840 × 10 / 10^6

Where:

- *Lamp Circuit Power*, is the wattage of the replacement Lamp being installed and is measured in accordance with Table A9.4 of Schedule A.
- *Lumen efficacy of the new Lamp*, is the rated lumens divided by the Lamp Circuit Power of the new Lamp being installed.

Small Business Site Activity Energy Savings

Deemed Activity Electricity Savings = LCP of new Lamp × (lumen efficacy of new Lamp / 33.9 – 1) × 3000 × 10 / 10^6

Where:

- *Lamp Circuit Power*, is the wattage of the replacement Lamp being installed and is measured in accordance with Table A9.4 of Schedule A.
- *Lumen efficacy of the new Lamp*, is the rated lumens divided by the Lamp Circuit Power of the new Lamp being installed.

Lifetime (for information purposes only)

Residential Building Lifetime = 10 years.
Small Business Site Lifetime = 10 years.

Schedule F – Activity Definitions for Installation of High Efficiency Appliances for Businesses (clause 9.9)

Activity Definition F1

Name of Activity

INSTALL A NEW HIGH EFFICIENCY REFRIGERATED DISPLAY CABINET

Equipment Requirements

1. The End-User Equipment must be a Refrigerated Display Cabinet (RDC) rated 'high efficiency' within the meaning of AS1731.14 when tested in accordance with AS 1731.9-2003 and AS 1731.12.
2. The RDC must be a registered product under GEMS and comply with the Greenhouse and Energy Minimum Standards (Refrigerated Display Cabinets) Determination 2012.

Installation Requirements

1. The RDC must be installed.

Equipment Energy Savings

Deemed Equipment Electricity Savings = (Baseline Efficiency × TDA – TEC) × 365.24 × Lifetime / 1000

Where:

- TEC, in kWh/day, is the daily Total Energy Consumption of the new RDC model as determined using AS1731.9 and AS1731.12 (as applicable) and recorded in the GEMS Registry;
- Baseline Efficiency, in kWh/day/m2, is the corresponding figure for the type and temperature class of the new RDC model as determined by AS1731.14 in Table F1.1.
- TDA, in m2, is the Total Display Area of the new RDC model as determined using AS1731.14 and recorded in the GEMS Registry;
- Lifetime, in years, is the expected lifetime of the new RDC model, and is the corresponding figure for the type and temperature class of the new RDC model in Table F1.2.

Table F1.1

Refrigerated Display Cabinet Type	Temperature class	Baseline efficiency (kWh/day/m^2)
RS1 - Unlit shelves	all	8.37
RS1 - Lit shelves	all	10.66
RS2 - Unlit shelves	all	8.49
RS2 - Lit shelves	all	11.32
RS3 - Unlit shelves	all	10.32
RS3 - Lit shelves	all	12.26
RS4 - Glass door	all	6.48
RS6 - Gravity coil	all	7.62
RS6 - Fan coil	all	6.19
RS7 - Fan coil	all	6.68
RS8 - Gravity coil	all	8.52
RS8 - Fan coil	all	6.26
RS9 - Fan coil	all	6.03
RS10 - Low	all	10.80
RS11	all	26.52
RS12	all	46.14
RS13 - Solid sided	all	12.99
RS13 - Glass sided	all	12.47
RS14 - Solid sided	all	11.45
RS14 - Glass sided	all	12.59
RS15 - Glass door	all	20.22
RS16 - Glass door	all	20.12

RS18	all	29.92
RS19	all	29.57
HC1	M1	7.86
HC1	M2	8.50
HC4	M1	10.47
HC4	M2	11.40
HF4	L1	19.50
HF4	L2	19.50
HF6	L1	5.90
HF6	L2	5.46
VC1	M1	24.24
VC1	M2	14.22
VC2	M1	15.97
VC2	M2	14.72
VC4 (a) - Solid Door	M1	5.37
VC4 (a) - Solid Door	M2	7.30
VC4 (b) - Glass Door	M1	8.37
VC4 (b) - Glass Door	M2	9.70
VF4 (b) - Solid Door	L1	32.40
VF4 (b) - Solid Door	L2	28.70
VF4 (b) - Glass Door	L1	23.94
VF4 (b) - Glass Door	L2	28.70

Lifetime

The Energy Savings from the installation of a new Refrigerated Display Cabinet are assumed to persist at a constant level for the expected lifetime of the RDC. The Lifetime, in years, is the figure corresponding to the display type and temperature class in Table F1.2.

Table F1.2

Refrigerated Display Cabinet Type	Temperature class	Lifetime (years)
all	all	8

Activity Definition F2

Name of Activity

INSTALL A NEW HIGH EFFICIENCY LIQUID CHILLING PACKAGE

Equipment Requirements

1. The End User Equipment must be a Liquid Chilling Package (LCP) registered under GEMS and comply with the Greenhouse and Energy Minimum Standards (Liquid-chilling Packages Using the Vapour Compression Cycle) Determination 2012.
2. The LCP must have an IPLV at least 10% greater than the *Baseline* for the corresponding figure for the type and cooling capacity in Table F2.1.

Installation Requirements

1. The LCP must be installed.

Equipment Energy savings

Deemed Equipment Electricity Savings = (Capacity ÷ Baseline – Capacity ÷ IPLV) × EFLH × Lifetime / 1000

Where:

- *Capacity*, in kWR, is the total rated cooling capacity of the new Liquid Chilling Package as determined using AS/NZS 4776 Series of Standards and recorded in the GEMS Registry.
- *Baseline* is the corresponding figure for the cooling capacity class and type of the new Liquid Chilling Package as determined by AS/NZS 4776 Series of Standards in Table F2.1. The *Baseline* has been determined using the lower value of either the minimum standard using AS/NZS 4776 or the average efficiency of registered products on the GEMS Registry.
- IPLV is the Integrated Part Load Value of the new Liquid Chilling Package as determined using AS/NZS 4776 and recorded in the GEMS Registry.
- *EFLH* is the Equivalent Full Load Hours and is the corresponding figure for the cooling capacity class and type of the new Liquid Chilling Package in Table F2.1. The EFLH has been estimated using the low estimate of operating hours in the *Decision Regulation Impact Statement: Minimum Energy Performance Standards and Alternative Strategies for Chillers, July 2008.*
- *Lifetime*, in years, is the corresponding figure for the cooling capacity class and type of the new Liquid Chilling Package as determined by AS/NZS 4776 in Table F2.2.

Table F2.1

LCP type	Cooling capacity	Baseline (IPLV)	EFLH (hours)
Air cooled	350 to 499 kWR	4.6	2323
Air cooled	500 to 699 kWR	4.7	2323
Air cooled	700 to 999 kWR	4.7	2323
Air cooled	1000 to 1499 kWR	4.5	2323
Air cooled	Greater than 1500 kWR	4.1	2323
Water cooled	350 to 499 kWR	9.0	2323
Water cooled	500 to 699 kWR	8.6	2323
Water cooled	700 to 999 kWR	9.7	2323
Water cooled	1000 to 1499 kWR	9.0	2323
Water cooled	Greater than 1500 kWR	9.9	2323

Lifetime

The Energy Savings from the installation of a new Liquid Chilling Package are assumed to persist at a constant level for the expected lifetime of the LCP. The Lifetime, in years, is the figure corresponding to the type and capacity class in Table F2.2.

Table F2.2

LCP Type	Capacity class	Lifetime (years)
all	all	10

Activity Definition F3

Name of Activity

INSTALL A NEW HIGH EFFICIENCY CLOSE CONTROL AIR CONDITIONER

Equipment Requirements

1. The End User Equipment must be a Close Control Air Conditioner (CCAC) registered under GEMS and comply with the Greenhouse and Energy Minimum Standards (Close Control Air Conditioner) Determination 2012.
2. The CCAC must have an EER at least 20% greater than the *Baseline* for the corresponding figure for the type and cooling capacity in Table F3.1.

Installation Requirements

1. The CCAC must be installed.

Equipment Energy savings

Deemed Equipment Electricity Savings = (Capacity ÷ Baseline – Capacity ÷ EER) × Hours × Lifetime / 1000

Where:

- *Capacity*, in kW, is the total cooling capacity of the new CCAC as determined using AS/NZS 4965.1 and recorded in the GEMS Registry.
- *Baseline* is the corresponding figure for the cooling capacity class of the new CCAC as determined by AS/NZS 4965.1 in Table F3.1. The *Baseline* has been determined using the lower value of either the minimum standard using AS/NZS 4965.2 or the average efficiency of registered products on the GEMS registered products for sale in Australia.
- *EER* is the Energy Efficiency Ratio as determined using AS/NZS 4965.1 and recorded in the GEMS Registry.
- *Hours* is the annual operating hours and is the corresponding figure for the cooling capacity class of the new CCAC. The *Hours* has been estimated using the estimate of operating hours in the *Decision Regulation Impact Statement: Minimum Energy Performance Standards and Alternative Strategies for Close Control Air Conditioners, December 2008.*
- *Lifetime*, in years, is the corresponding figure for the cooling capacity class of the new CCAC as determined by AS/NZS 4965.1 in Table F3.2.

Table F3.1

CCAC cooling capacity class	Baseline (EER)	Hours (hours p.a.)
Less than 19.05 kW	3.21	5694
19.05 to less than 39.5 kW	3.18	5694
39.5 to less than 70.0 kW	3.20	5694
Greater than or equal to 70.0 kW	3.18	5694

Lifetime

The Energy Savings from the installation of a new CCAC are assumed to persist at a constant level for the expected lifetime of the CCAC. The Lifetime, in years, is the figure corresponding to the type and capacity class in Table F3.2.

Table F3.2

CCAC capacity class	Capacity class	Lifetime (years)
all	all	10

Activity Definition F4

Name of Activity

INSTALL A NEW HIGH EFFICIENCY AIR CONDITIONER

Equipment Requirements

1. The End User Equipment must be an Air to Air Heat Pump or Air Conditioner (AC) registered under GEMS and comply with the Greenhouse and Energy Minimum Standards (Air to Air Heat Pump or Air Conditioner) Determination 2012
2. The AC must have an AEER at least 20% greater than the *Baseline Cooling AEER* for the corresponding figure for the type and cooling capacity in Table F4.1.
3. If the AC has a Heating Capacity registered in the GEMS Registry, the AC must have an AEER at least 20% greater than the *Baseline Heating AEER* for the corresponding figure for the type and heating capacity in Table F4.2.
4. The AC must have a Cooling Capacity less than or equal to 65kW to be eligible to calculate Cooling Energy Savings
5. The AC must have a Heating Capacity less than or equal to 65kW to be eligible to calculate Heating Energy Savings

Installation Requirements

1. The AC must not be installed in a Residential Building.

Equipment Energy savings

Equation F4.1

Deemed Equipment Electricity Savings = Cooling Energy Savings + Heating Energy Savings

Where:

- *Cooling Energy Savings Capacity*, in MWh, is the lifetime energy savings in cooling mode, as calculated in **Equation F4.2** below; and
- *Heating Energy Savings Capacity*, in MWh, is the lifetime energy savings in heating mode:
- as calculated in **Equation F4.3**; or
- is 0 MWh if the AC does not have a Heating Capacity registered in the GEMS Registry.

Equation F4.2

Cooling Electricity Savings = (Cooling Capacity ÷ Baseline Cooling AEER – Cooling Capacity ÷ AEER) × Cooling Hours × Lifetime / 1000

Where:

- *Cooling Capacity*, in kW, is the total cooling capacity of the new AC as determined using AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.4, or as determined in accordance with AS/NZS 3823.2, and recorded in the GEMS Registry;
- *Baseline Cooling AEER* is Annual Energy Efficiency Ratio and is the corresponding figure for the cooling capacity of the new AC as determined by AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.4, or as determined in accordance with AS/NZS 3823.2 in Table F4.1 or F4.2. The *Baseline Cooling AEER* has been determined using the lower value of either the minimum standard using AS/NZS 3823.2 or the average efficiency of GEMS registered products for sale in Australia.
- *AEER* is the Annual Energy Efficiency Ratio for cooling as determined using AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.4, or as determined in accordance with AS/NZS 3823.2, and recorded in the GEMS Registry
- *Cooling Hours*, in hours per annum, is the annual operating hours and is the corresponding figure for the cooling capacity of the new AC. *Cooling Hours* has been estimated using the estimate of operating hours in the *Decision Regulation Impact Statement: Minimum Energy Performance Standards for Air Conditioners, December 2010.*
- *Lifetime*, in years, is the figure in Table F4.3.

Table F4.1

AC type	Cooling capacity (kW)	Baseline Cooling AEER	Cooling Hours (hours p.a.)
Non ducted unitary	Less than 10kW	3.2	628
Non ducted unitary	10kW to <19kW	3.1	628
Non ducted split systems	Less than 4kW	3.7	628
Non ducted split systems	4kW to <10kW	3.2	628
Non ducted split systems	10kW to <19kW	3.1	628
Ducted systems	Less than 10kW	3.1	628

Ducted systems,	10kW to <19kW	3.1	628
All configurations,	19kW to <39kW	3.1	628
All configurations	39kW to 65kW	3.0	628

Equation F4.3

Heating Electricity Savings = (Heating Capacity ÷ Baseline Heating ACOP – Heating Capacity ÷ ACOP) × Heating Hours × Lifetime / 1000

Where:

- *Heating Capacity*, in kW, is the total heating capacity of the new AC as determined using AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.4, or as determined in accordance with AS/NZS 3823.2, and recorded in the GEMS Registry;
- *Baseline Heating ACOP* is Annual Coefficient of Performance and is the corresponding figure for the heating capacity of the new AC as determined by AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.4, or as determined in accordance with AS/NZS 3823.2, in Table F4.1 or F4.2. The *Baseline Heating ACOP* has been determined using the lower value of either the minimum standard using AS/NZS 3823.2 or the average efficiency of GEMS registered products for sale in Australia.
- *ACOP* is the Annual Coefficient of Performance for heating as determined using AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.4, or as determined in accordance with AS/NZS 3823.2, and recorded in the GEMS Registry
- *Heating Hours*, in hours per annum, is the annual operating hours and is the corresponding figure for the heating capacity of the new AC. *Heating Hours* has been estimated using the estimate of operating hours in the *Decision Regulation Impact Statement: Minimum Energy Performance Standards for Air Conditioners, December 2010.*
- *Lifetime*, in years, is the figure in Table F4.3.

Table F4.2

AC type	Heating Capacity (kW)	Baseline Heating ACOP	Heating Hours (hours p.a.)
Non ducted unitary	Less than 10kW	3.2	157
Non ducted unitary	10kW to <19kW	3.1	157
Non ducted split systems	Less than 4kW	3.7	157
Non ducted split systems	4kW to <10kW	3.2	157
Non ducted split systems	10kW to <19kW	3.1	157
Ducted systems	Less than 10kW	3.1	157
Ducted systems,	10kW to <19kW	3.1	157
All configurations,	19kW to <39kW	3.1	157
All configurations	39kW to 65kW	3.0	157

Lifetime

The Energy Savings from the installation of a new AC are assumed to persist at a constant level for the expected lifetime of the AC. The Lifetime, in years, is the figure corresponding to the phase and capacity class in Table F4.3.

Table F4.3

Phase	Cooling Capacity or Heating Capacity	Lifetime (years)
all	all	10

Activity Definition F5

Name of Activity

INSTALL AN ELECTRONICALLY COMMUTATED MOTOR TO POWER A FAN IN AN INSTALLED REFRIGERATED DISPLAY CABINET, FREEZER OR COOL ROOM

Equipment Requirements

1. The End-User Equipment must be an electronically commutated (brushless DC) motor.
2. The nominal input power (W) of the End-User Equipment as declared by the manufacturer must be less than or equal to 500 W at full capacity with the impeller fitted.
3. The output power (W) or airflow volume (m^3/hour) of the End-User Equipment as declared by the manufacturer must be equal to or greater than the existing refrigeration fan it replaces.
4. The End-User Equipment must meet any other requirements specified by the Scheme Administrator, including the suitability of the impeller for the motor.

Installation Requirements

1. The End-User Equipment must be installed into a refrigerated display cabinet or reach in freezer as defined by AS1731.1, or a cool room evaporator unit that is in use (i.e. not a new refrigeration system).
2. The End-User Equipment must replace an equivalent shaded pole motor or a permanent split capacitor motor as identified by the manufacturer of the End-User Equipment and accepted by the Scheme Administrator.
3. The installation must be according to manufacturer guidelines and any requirements specified by the Scheme Administrator.

Equipment Energy savings

Deemed Equipment Electricity Savings = (Input Power × (a – Average Power) + b) × (1 + (1 ÷ COP)) × Hours × Lifetime / 10^6

Where:

- *Input Power*, in Watts, is the nominal input power of the new End User-Equipment at full throttle with the impeller fitted.
- *a* is the regression coefficient and *b* is the error in Regression Analysis between the nominal input power of a sample of fans powered by an electronically commutated motor and fans powered by a shaded pole motor or a permanent split capacitor motor and are the corresponding figures for the End-User Equipment nominal power consumption in Table F5.1.
- *Average Power* is the average input power of the new End-User Equipment over a year compared to its nominal input power and is the corresponding figure the End-User Equipment's control system in Table F5.2.
- *COP* is the co-efficient of performance of the refrigeration system and is the corresponding figure for the refrigeration system in Table F5.3.
- *Hours* is the number of hours the fan is active per year and is the corresponding figure for the refrigeration system in Table F5.3.
- *Lifetime*, in years, is the useful life of the End-User Equipment and is the corresponding figure for the refrigeration system in Table F5.4.

Table F5.1

End-User Equipment nominal input power	***a***	***b***
Less than or equal to 34 W	1.7692	19.385
Greater than 34W and less than or equal to 500 W	1.2698	6.453

Table F5.2

Control system	***Average Power***
No control system in place	1
Temperature or pressure dependent speed control	0.8
Timer speed control (with low speed setting at least 8 hours per day)	0.8

Table F5.3

Refrigerator system type	***COP***	***Hours***
Refrigerated display cabinet	2.8	8000
Reach in freezer	1.8	8000
Cool room	2.6	8000

Lifetime

The energy savings from the new End User Equipment are assumed to persist at a constant level for the expected lifetime of the equipment. The Lifetime, in years, is the corresponding figure for the refrigerator system type in Table F5.4.

Table F5.4

Refrigerator type	**Years**
Refrigerated display cabinet	4
Reach in freezer	4
Cool room	7

Activity Definition F6

Name of Activity

INSTALL AN ELECTRONICALLY COMMUTATED MOTOR TO POWER A VENTILATION FAN

Equipment Requirements

1. The End-User Equipment must be an electronically commutated (brushless DC) motor.
2. The nominal input power (W) of the End-User Equipment as declared by the manufacturer must be less than or equal to 500 W at full capacity with the impeller fitted.
3. The output power (W) or airflow volume (m^3/hour) of the End-User Equipment as declared by the manufacturer must be equal to or greater than the existing ventilation fan it replaces.
4. The End-User Equipment must meet any other requirements specified by the Scheme Administrator, including the suitability of the impeller for the motor.

Installation Requirements

1. The End-User Equipment must be part of a ducted fan or partition fan in an air-handling system, as defined in ISO 13349:2010.
2. The End-User Equipment must replace an equivalent shaded pole motor or a permanent split capacitor motor as identified by the manufacturer of the End-User Equipment.
3. The installation must be according to manufacturer guidelines and any requirements specified by the Scheme Administrator.

Equipment Energy savings

Deemed Equipment Electricity Savings = (Input Power × (a – Average Power) + b) × Hours × Lifetime / 10^6

Where:

- *Input Power*, in Watts, is the nominal input power of the new End User-Equipment at full throttle with the impeller fitted.
- *a* is the regression coefficient and *b* is the error in regression analysis between the nominal input power of a sample of fans powered by an electronically commutated motor and fans powered by a shaded pole motor or a permanent split capacitor motor and are the corresponding figures for the End-User Equipment nominal power consumption in Table F6.1.
- *Average Power* is the average input power of the new End-User Equipment over a year compared to its nominal input power and is the corresponding figure the End-User Equipment's control system in Table F6.2.
- *Hours* is the number of hours the fan is active per year and is the corresponding figure in Table F6.3 for the BCA building classification and Business Classification of the entity utilising the End-Use Service.
- *Lifetime*, in years, is the useful life of the End-User Equipment and is the corresponding figure for the ventilation system in Table F6.4.

Table F6.1

End-User Equipment nominal input power	***a***	***b***
Less than or equal to 34 W	1.7692	19.385
Greater than 34W and less than or equal to 500 W	1.2698	6.453

Table F6.2

Control system	***Average Power***
No control system in place	1
Temperature or pressure dependent speed control	0.8
Timer speed control (with low speed setting at least 8 hours per day)	0.8

Table F6.3

Building classification	**Business Classification**	**Annual operating hours**
BCA Class 2 (multi-unit dwellings)	Services provided by the body corporate or building owner	6300
BCA Class 3 (hotels)	All	6300
BCA Class 5 (offices)	All	2800
BCA Class 6 (shops or shopping centres)	All	4000
BCA Class 6 (restaurants or cafes)	All	5200
BCA Class 7a (car parks)	All	6900

BCA Class 7b (warehouses)	ANZSIC Division A (Agriculture, Forestry and Fishing)	8760
BCA Class 7b (warehouses)	Other than ANZSIC Division A	5100
BCA Class 8 (factories)	ANZSIC Division A (Agriculture, Forestry and Fishing)	5100
BCA Class 8 (factories)	ANZSIC Division C (Manufacturing)	5100
BCA Class 8 (factories)	Other than ANZSIC Division A or ANZSIC Division C	2800
BCA Class 9a (clinics)	All	2800
BCA Class 9a (hospitals)	All	8760
BCA Class 9b (theatres)	All	5200
BCA Class 9b (schools)	All	2000
BCA Class 9c (aged care)	All	6300

Lifetime

The energy savings from the new End User Equipment are assumed to persist at a constant level for the expected lifetime of the equipment. The Lifetime, in years, is the corresponding figure for the fan type in Table F6.4.

Table F6.4

Fan type	**Years**
Ducted fan	7
Partition fan	7

Activity Definition F7

Name of Activity

INSTALL A NEW HIGH EFFICIENCY MOTOR

Equipment Requirements

1. The End-User Equipment must be a 3 phase electric motor rated 'high efficiency' within the meaning of AS1359.5 when tested in accordance with AS 1359.102.1 and AS 1359.102.3.
2. The electric motor must be a registered product under GEMS and comply with the Greenhouse and Energy Minimum Standards (Three Phase Cage Induction Motors) Determination 2012.

Installation Requirements

1. The electric motor must be installed.
2. The electric motor must have a rated output from 0.73kW to <185kW.

Equipment Energy Savings

Deemed Equipment Electricity Savings = P × LUF × ((New Efficiency – Baseline Efficiency) ÷100) × Asset Life × 8760 ÷ 1000

Where:

- *P* is the rated output of the new electric motor as recorded in the GEMS Registry.
- *LUF* is the Default Load Utilisation Factors for the relevant High Efficiency Motor as set out in Table F7.1 (where the Business Classification and End-Use Service relevant to the Energy Savings are known), or otherwise Table F7.2
- *New Efficiency*, in %, is the Full Load Efficiency of the new electric motor as determined using AS1359.5 and recorded in the GEMS Registry.
- *Baseline Efficiency*, in %, is:
  - the Full Load Efficiency of the existing motor as determined using AS1359.5 and recorded in the GEMS Registry; or
  - the corresponding value for the number of poles and rated output of the new electric motor from Table F7.3, if the existing motor is not listed in the GEMS Registry or if the new electric motor is New End User Equipment. For intermediate values of rated output, the efficiency shall be determined by linear interpolation
- *Asset Life*, in years, of the High Efficiency Motor is set out in Table F7.4 for the corresponding rated output of the High Efficiency Motor.

Table F7.1 Default Load Utilisation Factor for High Efficiency Motors – Where Business Classification and End-Use Service are known

Load Utilisation Factor	Refrigeration and freezing	Water/liquid pumping	Air compression	Air handling, fans, ventilation	Process Drives	Milling, mixing, grinding	Material handling/ conveying
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 F7.2 Default Load Utilisation Factor for High Efficiency Motors – Where Business Classification or End-Use Service 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 < 185	0.15

Table F7.3

Rated Output (kW)	Baseline efficiency (%)			
	2 pole	4 pole	6 pole	8 pole
0.73	78.8	80.5	76.0	71.8
0.75	78.8	80.5	76.0	71.8
1.1	80.6	82.2	78.3	74.7
1.5	82.6	83.5	79.9	76.8
2.2	84.1	84.9	81.9	79.4
3	85.3	86.0	83.5	81.3
4	86.3	87.0	84.7	82.8
5.5	87.2	87.9	86.1	84.5
7.5	88.3	88.9	87.3	86.0
11	89.5	89.9	88.7	87.7
15	90.3	90.8	89.6	88.9
18.5	90.8	91.2	90.3	89.7
22	91.2	91.6	90.8	90.2
30	92.0	92.3	91.6	91.2
37	92.5	92.8	92.2	91.8
45	92.9	93.1	92.7	92.4
55	93.2	93.5	93.1	92.9
75	93.9	94.0	93.7	93.7
90	94.2	94.4	94.2	94.1
110	94.5	94.7	94.5	94.5
132	94.8	94.9	94.8	94.8
150	95.0	95.2	95.1	95.2
>150 < 185	95.0	95.2	95.1	95.2

Table F7.4 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 < 185	25

Activity Definition F8

Name of Activity

REPLACE EXISTING GAS FIRED STEAM BOILER WITH HIGH EFFICIENCY GAS FIRED STEAM BOILER

Eligibility Requirements

1. The existing End-User Equipment must be a single, or multiple, Gas fired steam boiler(s) as defined in AS/NZS 3814.
2. The existing End-User Equipment is installed at a Site classified under the BCA as one or more of the following: Class 2, 3, 5, 6, 7, 8, 9 and 10 buildings.
3. The existing End-User Equipment must be:
    a. more than 10 years old; and
    b. be in working order at the time of replacement.

Equipment Requirements

1. The replacement End-User Equipment must be a single, or multiple, Gas fired steam boiler(s) as defined in AS/NZS 3814.
2. The replacement End-User Equipment must have a nameplate capacity of 200 kW or higher.
3. Replacement End-User Equipment with a nameplate capacity of 1000 kW or above must have a linkageless (two service/stepper motors) burner with a turn-down ratio of at least 4:1.
4. Replacement End-User Equipment with a nameplate capacity of 2000 kW or above must include an oxygen trim system and have a linkageless (two service/stepper motors) burner with a turn-down ratio of at least 4:1.
5. The replacement End-User Equipment must have a fuel-to-fluid efficiency of at least 80% when at high fire conditions.
6. The replacement End-User Equipment must meet any relevant standards and legislation.

Implementation Requirements

1. The existing End-User Equipment must be disconnected and removed; these tasks must be performed or supervised by a qualified person in accordance with relevant standards and legislation.
2. The installation must be in accordance with manufacturer guidelines, relevant standards and legislation and any requirements specified by the Scheme Administrator.

Activity Energy Savings

For each Implementation:

$$Deemed\ Equipment\ Gas\ Savings = P \times DEI \times LUF \times Lifetime \times 8760 \div 1000$$

Where:

- *P*, in kW, is the lower of the nameplate capacity of the replacement or existing End-User Equipment.
- *DEI* is the Default Efficiency Improvement (as a fraction, not as a percentage) for replacing existing End-User Equipment with replacement End-User Equipment as specified in Table F8.1.
- *LUF* is the assigned Load Utilisation Factor for all Gas fired steam boilers as specified in Table F8.2.
- *Lifetime* is the number of years that savings will be deemed as specified in Table F8.3.

Table F8.1 Default Efficiency Improvement (DEI) for replacing existing End-User Equipment

Existing End-User Equipment installation year	**DEI for replacing existing End-User Equipment**	
	Steam boiler with a burner that is >10 years old	**Steam boiler with burner replaced ≤ 10 years ago**
Pre 1990	0.064	0.053
1990 and after	0.059	0.048

Table F8.2 Load Utilisation Factor (LUF) for Gas fired steam boilers

Business classification	**LUF**
All	0.206

Lifetime

Table F8.3 End-User Equipment Lifetime

End-User Equipment type	Years
All	10

Activity Definition F9

Name of Activity

REPLACE EXISTING GAS FIRED HOT WATER BOILER OR GAS FIRED WATER HEATER WITH A HIGH EFFICIENCY GAS FIRED HOT WATER BOILER OR GAS FIRED WATER HEATER

Eligibility Requirements

1. The existing End-User Equipment must be a single, or multiple, Gas fired hot water boiler(s), or Gas fired water heater(s) as defined in AS/NZS 3814.
2. The existing End-User Equipment is installed at a Site classified under the BCA as one or more of the following: Class 2, 3, 5, 6, 7, 8, 9 and 10 buildings.
3. The existing End-User Equipment must be:
    c. more than 10 years old; and
    d. be in working order at the time of replacement.

Equipment Requirements

1. The replacement End-User Equipment must be a single, or multiple, Gas fired hot water boiler(s), or Gas fired water heater(s) as defined in AS/NZS 3814.
2. The replacement End-User Equipment must not be a Gas fired storage water heater or a Gas fired instantaneous water heater as defined in AS4552 or AS/NZS 5263.1.2.
3. The replacement End-User Equipment must have a nameplate capacity of 200 kW or higher.
4. Replacement End-User Equipment with a nameplate capacity of 1000 kW or above must have a linkageless (two service/stepper motors) burner with a turn-down ratio of at least 4:1.
5. Replacement End-User Equipment with a nameplate capacity of 2000 kW or above must include an oxygen trim system and have a linkageless (two service/stepper motors) burner with a turn-down ratio of at least 4:1.
6. The replacement End-User Equipment must have a fuel-to-fluid efficiency of at least 85% at a return water temperature of 60°C when at high fire conditions.
7. The replacement End-User Equipment must meet any relevant standards and legislation.

Implementation Requirements

1. The existing End-User Equipment must be disconnected and removed; these tasks must be performed or supervised by a qualified person in accordance with relevant standards and legislation.
2. The installation must be in accordance with manufacturer guidelines, relevant standards and legislation and any requirements specified by the Scheme Administrator.

Activity Energy Savings

For each Implementation:

$$Deemed\ Equipment\ Gas\ Savings = P \times DEI \times LUF \times Lifetime \times 8760 \div 1000$$

Where:

- *P*, in kW, is the lower of the nameplate capacity of the replacement or existing End-User Equipment.
- *DEI* is the Default Efficiency Improvement (as a fraction, not as a percentage) for replacing existing End-User Equipment with replacement End-User Equipment as specified in Table F9.1.
- *LUF* is the assigned Load Utilisation Factor for all Gas fired hot water boilers or water heaters as specified in Table F9.2.
- *Lifetime* is the number of years that savings will be deemed as specified in Table F9.3.

Table F9.1 Default Efficiency Improvement (DEI) for replacing existing End-User Equipment

Existing End-User Equipment installation year	**DEI for replacing existing End-User Equipment**	
	Hot water boiler or water heater with a burner that is >10 years old	**Hot water boiler or water heater with burner replaced ≤ 10 years ago**
Pre 1990	0.059	0.048
1990 and after	0.053	0.042

Table F9.2 Load Utilisation Factor (LUF) for Gas fired hot water boilers and water heaters

Business classification	**LUF**
All	0.206

Lifetime

Table F9.3 End-User Equipment Lifetime

End-User Equipment type	**Years**
All	10

Activity Definition F10

Name of Activity

INSTALL AN OXYGEN TRIM SYSTEM ON A GAS FIRED STEAM BOILER, HOT WATER BOILER OR WATER HEATER

Eligibility Requirements

1. The End-User Equipment must be installed on a Gas fired steam boiler, hot water boiler, or water heater as defined in AS/NZS 3814.
2. The Gas fired steam boiler, hot water boiler, or water heater on which the End-User Equipment is installed must be located at a Site classified under the BCA as one or more of the following: Class 2, 3, 5, 6, 7, 8, 9 and 10 buildings.
3. The End-User Equipment cannot replace existing End-User Equipment regardless of its condition.
4. The Gas fired steam boiler, hot water boiler, or water heater on which the End-User Equipment is installed must have an existing digital burner control system capable of receiving a signal from a flue gas sensor for oxygen trim purposes, or have one installed at the time of commissioning of the End-User Equipment.

Equipment Requirements

1. The End-User Equipment must be an oxygen trim system including a flue gas sensor connected to a control panel, capable of sending a signal to a control damper on the burner air supply or variable speed drive on the fan motor.

Implementation Requirements

1. The installation must be in accordance with manufacturer guidelines, relevant standards and legislation and any requirements specified by the Scheme Administrator.

Activity Energy Savings

For each Implementation:

$$Deemed\ Equipment\ Gas\ Savings = P \times DEI \times LUF \times Lifetime \times 8760 \div 1000$$

Where:

- *P*, in kW, is the current nameplate capacity of the Gas fired steam boiler, hot water boiler, or water heater on which the End-User Equipment is installed. The nameplate capacity that can be used is capped at 3000kW. An Installation on a larger Gas fired steam boiler, hot water boiler, or water heater must use this capped figure.
- *DEI* is the Default Efficiency Improvement (as a fraction, not as a percentage) for installing the End-User Equipment as specified in Table F10.1.
- *LUF* is the assigned Load Utilisation Factor for all Gas fired steam boilers, hot water boilers, or water heaters as specified in Table F10.2.
- *Lifetime*, is the number of years that savings will be deemed as specified in Table F10.3.

Table F10.1 – Default Efficiency Improvement (DEI) for installing End-User Equipment

Activity	**DEI**
Install End-User Equipment on a steam boiler	0.018
Install End-User Equipment on a hot water boiler or water heater	0.015

Table F10.2 Load Utilisation Factor (LUF) for Gas fired steam boilers, hot water boilers, and water heaters

Business classification	**LUF**
All	0.206

Lifetime

Table F10.3 End-User Equipment Lifetime

End-User Equipment type	**Years**
All	10

Activity Definition F11

Name of Activity

REPLACE BURNER ON A GAS FIRED STEAM BOILER, HOT WATER BOILER, OR WATER HEATER

Eligibility Requirements

1. The existing End-User Equipment must be a Gas fired burner as defined in AS/NZS 3814.
2. The existing End-User Equipment must be installed on a Gas fired steam boiler, hot water boiler, or water heater as defined in AS/NZS 3814.
3. The Gas fired steam boiler, hot water boiler, or water heater on which the End-User Equipment is installed must be located at a Site classified under the BCA as one or more of the following: Class 2, 3, 5, 6, 7, 8, 9 and 10 buildings.
4. The existing End-User Equipment must be:
    a. in working order at the time of replacement;
    b. more than 10 years old; and
    c. have an air/fuel ratio that is controlled via a mechanical linkage.

Equipment Requirements

1. The replacement End-User Equipment must be a Gas fired burner as defined in AS/NZS 3814.
2. Replacement End-User Equipment that has a nameplate capacity of 1000 kW or more must:
    a. be of the linkageless (two service/stepper motors) type;
    b. have a turn-down ratio of at least 4:1; and
    c. be capable of receiving a signal from a flue gas sensor for oxygen trim purposes.

Implementation Requirements

1. Existing End-User Equipment that is replaced must be disconnected and removed; these tasks must be performed or supervised by a qualified person in accordance with relevant standards and legislation.
2. The installation must be in accordance with manufacturer guidelines, relevant standards and legislation and any requirements specified by the Scheme Administrator.

Activity Energy Savings

For each Implementation:

$$Deemed\ Equipment\ Gas\ Savings = P \times DEI \times LUF \times Lifetime \times 8760 \div 1000$$

Where:

- *P*, in kW, is the current nameplate capacity of the Gas fired steam boiler, hot water boiler, or water heater on which the End-User Equipment is installed. The nameplate capacity that can be used is capped at 3000kW. Installation on a larger Gas fired steam boiler, hot water boiler, or water heater must use this capped figure.
- *DEI* is the Default Efficiency Improvement (as a fraction, not as a percentage) for replacing the End-User Equipment as specified in Table F11.1.
- *LUF* is the assigned Load Utilisation Factor for all Gas fired steam boilers, hot water boilers, or water heaters as specified in Table F11.2.
- *Lifetime*, is the number of years that savings will be deemed as specified in Table F11.3.

Table F11.1 – Default Efficiency Improvement (DEI) for replacing End-User Equipment

Activity	**DEI**
Replace End-User Equipment	0.027

Table F11.2 Load Utilisation Factor (LUF) for Gas fired steam boilers, hot water boilers, and water heaters

Business classification	**LUF**
All	0.206

Lifetime

Table F11.3 End-User Equipment Lifetime

End-User Equipment type	**Years**
All	10

Activity Definition F12

Name of Activity

INSTALL AN ECONOMISER ON A GAS FIRED STEAM BOILER, HOT WATER BOILER, OR WATER HEATER

Eligibility Requirements

1. The End-User Equipment must be installed on a Gas fired steam boiler, hot water boiler, or water heater as defined in AS/NZS 3814.
2. The Gas fired steam boiler, hot water boiler, or water heater on which the End-User Equipment is installed must be located at a Site classified under the BCA as one or more of the following: Class 2, 3, 5, 6, 7, 8, 9 and 10 buildings.
3. The End-User Equipment cannot replace existing End-User Equipment regardless of its condition.
4. The End-User Equipment cannot be installed on a condensing Gas fired steam boiler, hot water boiler or water heater.
5. In cases where the End-User Equipment will be pre-heating a stream other than feedwater, a heat rejection stream must be available to run through the End-User Equipment at least 80% of the operating time of the Gas fired steam boiler, hot water boiler, or water heater.

Equipment Requirements

1. The End-User Equipment must be a heat exchanger that uses the products of combustion from a Gas fired steam boiler, hot water boiler, or water heater, to heat a fluid stream such as boiler feedwater.
2. The End-User Equipment must be of the condensing kind if it is installed on a Gas fired hot water boiler or water heater. The Gas fired hot water boiler or water heater stack must be constructed of stainless steel.
3. The End-User Equipment can be of the condensing or non-condensing kind if it is installed on a Gas fired steam boiler. The steam boiler stack can be constructed of carbon steel only if the End-User Equipment is of the non-condensing kind and the exhaust temperature can be maintained above dewpoint at all points in the stack.
4. The End-User Equipment must be fitted with a control system with minimum flow rates such that manual intervention is not required for operation, unless the End-User Equipment is specifically designed to run dry.

Implementation Requirements

1. At the time of commissioning, the exhaust temperature exiting the End-User Equipment whilst at high firing must be below 180°C for steam boilers, or below 100°C for condensing steam boilers, hot water boilers and water heaters.
2. The installation must be in accordance with manufacturer guidelines, relevant standards and legislation and any requirements specified by the Scheme Administrator.

Activity Energy Savings

For each Implementation:

$$Deemed\ Equipment\ Gas\ Savings = P \times DEI \times LUF \times Lifetime \times 8760 \div 1000$$

Where:

- *P* is the current nameplate capacity of the Gas fired steam boiler, hot water boiler, or water heater on which the End-User Equipment is installed, in kW.
- *DEI* is the Default Efficiency Improvement (as a fraction, not as a percentage) for installing the End-User Equipment as specified in Table F12.1.
- *LUF* is the assigned Load Utilisation Factor for all Gas fired steam boilers, hot water boilers, or water heaters as specified in Table F12.2.
- *Lifetime* is the number of years that savings will be deemed as specified in Table F12.3.

Table F12.1 – Default Efficiency Improvement (DEI) for installing End-User Equipment

Activity	**DEI**
Install End-User Equipment on a steam boiler	0.041
Install End-User Equipment on a hot water boiler or water heater	0.030

Table F12.2 Load Utilisation Factor (LUF) for Gas fired steam boilers, hot water boilers, and water heaters

Business classification	**LUF**
All	0.206

Lifetime

Table F12.3 End-User Equipment Lifetime

End-User Equipment type	Years
All	10

Activity Definition F13

Name of Activity

INSTALL A SENSOR BASED BLOWDOWN CONTROL ON A GAS FIRED STEAM BOILER

Eligibility Requirements

1. The End-User Equipment must be installed on a Gas fired steam boiler as defined in AS/NZS 3814.
2. The Gas fired steam boiler on which the End-User Equipment is installed must be located at a Site classified under the BCA as one or more of the following: Class 2, 3, 5, 6, 7, 8, 9 and 10 buildings.
3. The End-User Equipment cannot replace existing End-User Equipment regardless of its condition.

Equipment Requirements

1. The End-User Equipment must be a sensor based blowdown control, capable of automatically blowing down based on a sensor reading of the concentration of total dissolved solids (TDS) in the steam boiler.

Implementation Requirements

1. The installation must be in accordance with manufacturer guidelines, relevant standards and legislation and any requirements specified by the Scheme Administrator.

Activity Energy Savings

For each Implementation:

$$Deemed\ Equipment\ Gas\ Savings = P \times DEI \times LUF \times Lifetime \times 8760 \div 1000$$

Where:

- *P* is the current nameplate capacity of the Gas fired steam boiler on which the End-User Equipment is installed, in kW.
- *DEI* is the Default Efficiency Improvement (as a fraction, not as a percentage) for installing the End-User Equipment as specified in Table F13.1. Use your average operating pressure as defined in AS/NZS 3814, or the next lowest pressure in this table. If your average operating pressure is less than 8 bar, use 8 bar.
- *LUF* is the assigned Load Utilisation Factor for all Gas fired steam boilers as specified in Table F13.2.
- *Lifetime* is the number of years that savings will be deemed as specified in Table F13.3.

Table F13.1 – Default Efficiency Improvement (DEI) for installing End-User Equipment

Activity type	**Steam boiler operating pressure (bar)**			
	8	**10**	**12**	**15**
Installation of a sensor based blowdown control	0.0032	0.0034	0.0036	0.0038

Table F13.2 Load Utilisation Factor (LUF) for Gas fired steam boilers

Business classification	**LUF**
All	0.206

Lifetime

Table F13.3 End-User Equipment Lifetime

End-User Equipment type	**Years**
All	10

Activity Definition F14

Name of Activity

INSTALL A BLOWDOWN FLASH STEAM HEAT RECOVERY SYSTEM ON GAS FIRED STEAM BOILER

Eligibility Requirements

1. The End-User Equipment must be installed on a single, or multiple, Gas fired steam boiler(s) as defined in AS/NZS 3814.
2. The Gas fired steam boiler on which the End-User Equipment is installed must be located at a Site classified under the BCA as one or more of the following: Class 2, 3, 5, 6, 7, 8, 9 and 10 buildings.
3. The Gas fired steam boiler on which the End-User Equipment is installed must have an existing sensor based blowdown control, or have a sensor based blowdown control installed at the time of commissioning of the End-User Equipment.
4. The End-User Equipment cannot replace existing End-User Equipment regardless of its condition.

Equipment Requirements

1. The End-User Equipment must be a blowdown flash steam heat recovery system that injects flash steam from boiler blowdown into the boiler feed water tank via a sub-surface sparge line.

Implementation Requirements

1. The installation must be in accordance with manufacturer guidelines, relevant standards and legislation and any requirements specified by the Scheme Administrator.

Activity Energy Savings

For each Implementation:

$$Deemed\ Equipment\ Gas\ Savings = P \times DEI \times LUF \times Lifetime \times 8760 \div 1000$$

Where:

- *P* is the current nameplate capacity of the Gas fired steam boiler on which the End-User Equipment is installed, in kW. For End-User Equipment that recovers flash steam from blowdown from multiple steam boilers, the combined nameplate capacity of the steam boilers can be used.
- *DEI* is the Default Efficiency Improvement (as a fraction, not as a percentage) for installing the End-User Equipment as specified in Table F14.1. Use your average operating pressure as defined in AS/NZS 3814, or the next lowest pressure in this table. If your average operating pressure is less than 8 bar, use 8 bar.
- *LUF* is the assigned Load Utilisation Factor for all Gas fired steam boilers as specified in Table F14.2.
- *Lifetime* is the number of years that savings will be deemed as specified in Table F14.3.

Table F14.1 – Default Efficiency Improvement (DEI) for installing End-User Equipment

Activity type	**Steam boiler average operating pressure (bar)**			
	8	**10**	**12**	**15**
Installation of a blowdown flash steam heat recovery system	0.0052	0.0059	0.0065	0.0072

Table F14.2 Load Utilisation Factor (LUF) for Gas fired steam boilers

Business classification	**LUF**
All	0.206

Lifetime

Table F14.3 End-User Equipment Lifetime

End-User Equipment type	**Years**
All	10

Activity Definition F15

Name of Activity

INSTALL A RESIDUAL BLOWDOWN HEAT EXCHANGER ON GAS FIRED STEAM BOILER

Eligibility Requirements

1. The End-User Equipment must be installed on single, or multiple, Gas fired steam boiler(s) as defined in /NZS 3814.
2. The Gas fired steam boiler on which the End-User Equipment is installed must be located at a Site classified under the BCA as one or more of the following: Class 2, 3, 5, 6, 7, 8, 9 and 10 buildings.
3. The Gas fired steam boiler on which the End-User Equipment is installed must have an existing sensor based blowdown control, or have a sensor based blowdown control installed at the time of commissioning of the End-User Equipment.
4. The End-User Equipment cannot replace existing End-User Equipment regardless of its condition.
5. A fluid stream below 40°C, such as boiler makeup water, must be available at all times to transfer heat from the boiler blowdown.

Equipment Requirements

1. The End-User Equipment must be a residual blowdown heat exchanger; such that it transfers heat from the steam boiler's blowdown fluid to a fluid stream with a temperature not exceeding 40°C, such as steam boiler makeup water.

Implementation Requirements

1. The installation must be in accordance with manufacturer guidelines, relevant standards and legislation and any requirements specified by the Scheme Administrator.

Activity Energy Savings

For each Implementation:

$$Deemed\ Equipment\ Gas\ Savings = P \times DEI \times LUF \times Lifetime \times 8760 \div 1000$$

Where:

- *P* is the current nameplate capacity of the Gas fired steam boiler on which the End-User Equipment is installed, in kW. For End-User Equipment that recovers heat from blowdown from multiple steam boilers, the combined nameplate capacity of the steam boilers can be used.
- *DEI* is the Default Efficiency Improvement (as a fraction, not as a percentage) for installing the End-User Equipment as specified in Table F15.1. Use your average operating pressure as defined in AS/NZS 3814, or the next lowest pressure in this table. If your average operating pressure is less than 8 bar, use 8 bar.
- *LUF* is the assigned Load Utilisation Factor for all Gas fired steam boilers as specified in Table F15.2.
- *Lifetime* is the number of years that savings will be deemed as specified in Table F15.3.

Table F15.1 – Default Efficiency Improvement (DEI) for installing End-User Equipment

Activity type	**Steam boiler operating pressure (bar)**			
	8	**10**	**12**	**15**
Installation of a residual blowdown heat exchanger	0.0038	0.0037	0.0036	0.0035

Table F15.2 Load Utilisation Factor (LUF) for Gas fired steam boilers

Business classification	**LUF**
All	0.206

Lifetime

Table F15.3 End-User Equipment Lifetime

End-User Equipment type	**Years**
All	10

Schedule G – (deleted)