



Independent Pricing and Regulatory Tribunal  
New South Wales

# Public Lighting Energy Savings Formula

## Method Guide

Energy Savings Scheme

Month 2017

© Independent Pricing and Regulatory Tribunal of New South Wales 2017

This work is copyright. *The Copyright Act 1968* permits fair dealing for study, research, news reporting, criticism and review. Selected passages, tables or diagrams may be reproduced for such purposes provided acknowledgement of the source is included.

Inquiries regarding this document should be directed to:

ESS Enquiries (02) 9290 8452 or ESS@ipart.nsw.gov.au

## Document Control

Version number	Change description	Date published
V1.0	Initial release – following amendments to the <i>Energy Savings Scheme Rule of 2009</i>	May 2016
V1.1	Amended to include additional information about equipment requirements in section 3.4 and control multipliers in section 4.1.	June 2016
V1.2	Update of the equipment requirements in section 3.4, eligibility requirements in section 3.7 and minimum required records in section 6.	October 2016
V1.3	Updated to reflect amendments to the ESS Rule.	May 2017
V1.4	Updated to correct an error in section 3.6.	May 2017

# Contents

<b>1</b>	<b>About this document</b>	<b>1</b>
1.1	Legislative requirements	1
<b>2</b>	<b>Method overview</b>	<b>2</b>
<b>3</b>	<b>Requirements that must be met</b>	<b>2</b>
3.1	Energy saver	2
3.2	Implementation, implementation date and site	3
3.3	Equipment requirements	3
3.4	Lighting upgrade	4
3.5	Lighting recycling requirements	4
3.6	Activities of network service providers that are not eligible	4
3.7	Minimum requirements for conduct of representatives	5
<b>4</b>	<b>Calculating energy savings</b>	<b>5</b>
4.1	Electricity savings	5
4.2	Gas Savings	6
<b>5</b>	<b>Calculating and creating ESCs</b>	<b>6</b>
5.1	Applying to register ESCs	6
<b>6</b>	<b>Minimum required records</b>	<b>7</b>
<b>7</b>	<b>Glossary</b>	<b>9</b>
	<b>Appendices</b>	<b>10</b>
A	Lighting equipment	11
B	Equations and tables for calculating energy savings	14



# 1 About this document

The NSW Energy Savings Scheme (ESS) seeks to reduce energy consumption in NSW by creating financial incentives for organisations to invest in energy saving projects.

The other objects of the ESS are to:

- ▼ assist households and businesses to reduce energy consumption and energy costs
- ▼ make the reduction of greenhouse gas emissions achievable at a lower cost, and
- ▼ reduce the cost of, and need for, additional energy generation, transmission and distribution infrastructure.<sup>1</sup>

Electricity retailers and other mandatory participants (**Scheme Participants**) are obliged to meet energy saving targets. Energy savings can be achieved by installing, improving or replacing energy saving equipment. Persons that become Accredited Certificate Providers (**ACPs**) can create energy savings certificates (**ESCs**) from these activities and then sell those ESCs to Scheme Participants. The Independent Pricing and Regulatory Tribunal of NSW (**IPART**) is both the Scheme Administrator and Scheme Regulator of the ESS.<sup>2</sup>

This document provides guidance about how the Public Lighting Energy Savings Formula (**Public Lighting**) method of the ESS operates, some of the key requirements that must be met when using the method, and how to calculate energy savings for a Recognised Energy Saving Activity (**RESA**) and create ESCs. This document should be used by:

- ▼ applicants seeking accreditation as a certificate provider, to assist them in completing their application,<sup>3</sup> and
- ▼ those persons who are already ACPs, to assist them in accurately calculating energy savings using this method.

## 1.1 Legislative requirements

This document is a guide only and is not legal advice. The legal requirements for ACPs participating in the ESS are set out in:

- ▼ Part 9 of the *Electricity Supply Act 1995* (**Act**)
- ▼ Part 6 of the *Electricity Supply (General) Regulation 2014* (**Regulation**), and
- ▼ the *Energy Savings Scheme Rule of 2009* (**ESS Rule**).

ACPs are also required to meet any additional accreditation conditions as set out in their Accreditation Notice.

---

<sup>1</sup> *Electricity Supply Act 1995*, section 98(2)

<sup>2</sup> *Electricity Supply Act 1995*, sections 153(2) and 151(2)

<sup>3</sup> A full explanation of the application process is provided in the Application Guide [www.ess.nsw.gov.au/How\\_to\\_apply\\_for\\_accreditation/The\\_application\\_process](http://www.ess.nsw.gov.au/How_to_apply_for_accreditation/The_application_process). Please ensure you read this document and the Application Guide in full before applying for accreditation.

## 2 Method overview

The Public Lighting method can be used to calculate energy savings from an upgrade of lighting for Roads and Public Spaces or Traffic Signals provided that the Luminaire is an asset owned or maintained by a Distributor<sup>4</sup> or Roads and Maritime Services (RMS).

The Public Lighting method **cannot** be used to calculate energy savings where the activity 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 as defined in the National Electricity Rules.

## 3 Requirements that must be met

The information below is guidance about the requirements of the method. This is not an exhaustive list of requirements, and you should ensure that you are familiar with your obligations under the Act, Regulation, ESS Rule and any conditions of your accreditation.

### 3.1 Energy saver

An ACP can only calculate energy savings and create ESCs if the ACP is the ‘energy saver’ under the ESS Rule. The ACP must be the energy saver as at the implementation date. An energy saver can be either:

- ▼ **the original energy saver** – which, under this method, is:
  - the Distributor or RMS that is the owner of the Luminaire, or
  - the Council or RMS if they:
    - are a public lighting customer, for billing, regulatory or management purposes, of the Distributor that owns the Luminaire, and
    - request the lighting upgrade from the Distributor that owns the Luminaire, in writing.
- ▼ **the nominated energy saver** – which is someone the original energy saver has nominated as the energy saver by completing a Nomination Form.<sup>5</sup>

An ACP that is the original energy saver must be accredited as an ACP **prior to** the implementation date in order to create ESCs from an implementation.

An ACP that is a nominated energy saver must:

- ▼ be **accredited** as an ACP **prior** to the implementation date and before the nomination is made,<sup>6</sup>

---

<sup>4</sup> A ‘Distributor’ is a person who owns, controls or operates a distribution system. “Distribution system” is defined in the Act.

<sup>5</sup> Available at: [www.ess.nsw.gov.au/Accredited\\_Certificate\\_Providers/Templates](http://www.ess.nsw.gov.au/Accredited_Certificate_Providers/Templates)

<sup>6</sup> The ESS website provides information on applying to become an ACP at: [www.ess.nsw.gov.au/How\\_to\\_apply\\_for\\_accreditation](http://www.ess.nsw.gov.au/How_to_apply_for_accreditation).

- ▼ have a documented procedure for obtaining the nomination from the original energy saver, and
- ▼ be **nominated** by the original energy saver **on or before** the implementation date. The nomination is taken to occur on the date that the nomination form is signed by the original energy saver.

## 3.2 Implementation, implementation date and site

The ESS Rule defines ‘implementations’, ‘implementation dates’ and ‘site’ (explained below). These concepts are used to determine the number of ESCs, and from when they can be created.

### 3.2.1 Implementation

An implementation is the delivery of an energy saving activity (called a ‘RESA’ in the ESS Rule)<sup>7</sup> at a site.

### 3.2.2 Implementation date

For RESAs under the Public Lighting method, the implementation is the date the lighting upgrade was completed.<sup>8</sup>

### 3.2.3 Site

For the purposes of the Public Lighting method, the ‘site’ of a lighting upgrade may be described by reference to:

- ▼ a street address
- ▼ a unique identifier that identifies the affected end-user equipment, or
- ▼ a method accepted by the Scheme Administrator.

As part of the application for accreditation, the ACP will need to describe what is considered to be the ‘site’ of the proposed activity. For example, whether the site is an individual luminaire, or whether it is a council area. In turn, this will determine whether the activity is a single implementation with a single implementation date, or multiple implementations.

## 3.3 Equipment requirements

All lighting equipment used in the lighting upgrade must be listed in either Tables A9.1 or A9.3 of the ESS Rule. These tables are reproduced in Appendix A of this guide. If the lighting equipment is listed in Table A9.3, it must be accepted by the Scheme Administrator as meeting the requirements specified in Table A9.4 of the ESS Rule. The Scheme Administrator has decided, in relation to Table A9.4 of the ESS Rule:

---

<sup>7</sup> A RESA must meet all of the criteria set out in clause 5.3 and 5.4 of the ESS Rule.

<sup>8</sup> ESS Rule, cl 9.4A.2

- ▼ that the lighting equipment approval processes of Distributors and RMS are ‘certification schemes’ accepted by the Scheme Administrator, and
- ▼ that approval of the equipment by the relevant Distributor, or RMS, demonstrates compliance with a relevant AS/NZS standard.

As such, all lighting equipment listed in Table A9.3 that has been approved for use by the relevant Distributor or RMS (when applicable) is accepted by the Scheme Administrator as meeting the equipment requirements specified in table A9.4 of the ESS Rule.

If the existing or replacement lamp or luminaire **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 Lamp Circuit Power (**LCP**) in Equations 7 and 9 of clause 9.4 of the ESS Rule.<sup>9</sup>

If the existing or replacement lamp or luminaire **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 of the ESS Rule.<sup>10</sup>

### 3.4 Lighting upgrade

A lighting upgrade means the replacement of existing lighting equipment with new lighting equipment that consumes less electricity, or, the modification of existing lighting equipment resulting in a reduction in the consumption of electricity compared to what would have otherwise been consumed.

### 3.5 Lighting recycling requirements

Accredited Certificate Providers are responsible for ensuring that lighting equipment removed or replaced during a lighting upgrade is disposed of appropriately. Furthermore, if the implementation:

- ▼ is in a Metropolitan Levy Area (ie, an area with a postcode listed in Table A25 of the ESS Rule), and
- ▼ has an implementation date on or after 15 May 2016,

any lighting end-user equipment containing mercury must be recycled in accordance with the recycling requirements of a recycling program such as ‘Fluorocycle’ or equivalent.<sup>11</sup>

### 3.6 Activities of network service providers that are not eligible

Clause 5.4 of the ESS Rule specifies that an activity is not a RESA if it 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,

---

<sup>9</sup> ESS Rule, cl 9.4A.4(a)

<sup>10</sup> ESS Rule, cl 9.4A.4(b)

<sup>11</sup> Further information about Fluorocycle can be found here: [www.fluorocycle.org.au/](http://www.fluorocycle.org.au/)



except if the activity is a Non-Network Option.<sup>12</sup> ACPs must ensure that all implementations meet this test.

### 3.7 Minimum requirements for conduct of representatives

The Scheme Administrator has established minimum requirements for the conduct of ACPs and their representatives. This includes ACP responsibilities for:

- ▼ training representatives
- ▼ maintaining a register of representatives
- ▼ ensuring there is a formal, documented, signed and enforceable (legally binding) contract or agreement in place for each representative, and
- ▼ providing appropriate customer service.

ACPs are accountable for all ESS activities conducted by employees, third parties and other representatives. This includes all aspects of an activity for which they create ESCs, from the initial engagement with customers, through to the final quality assurance of documents. ACPs will be held responsible for all actions, omissions and information provided by representatives acting on their behalf under the ESS – regardless of any contract or agreement with other parties. For more information, refer to *ESS Notice 01/2013 (amended July 2014) Minimum requirements for conduct of persons acting on behalf of ACPs*.<sup>13</sup>

## 4 Calculating energy savings

The relevant equations and tables used to calculate energy savings using the method are reproduced in Appendices A and B of this guide. Under the ESS Rule, energy savings comprise both ‘electricity savings’ and ‘gas savings’.

### 4.1 Electricity savings

The electricity savings from an implementation of the Public Lighting method can be calculated using:

- ▼ equations 6, 7 and 9 of Clause 9.4 of the ESS Rule (reproduced in Appendix B of this guide), and
- ▼ the relevant tables from Schedule A of the ESS Rule (reproduced in Appendix A of this guide).

If a lighting upgrade involves the installation of a control system, the control multiplier is equal to 1 when calculating electricity savings under this method.

---

<sup>12</sup> Refer clause 10.1 of the ESS Rule for definitions of the key terms used.

<sup>13</sup> Refer: [www.ess.nsw.gov.au/ESS\\_Notices\\_and\\_Updates](http://www.ess.nsw.gov.au/ESS_Notices_and_Updates)

### 4.1.1 Regional Network Factor

The equation to calculate electricity savings under the Public Lighting method includes a regional network factor. The applicable regional network factor is based on the postcode of the site and can be found in Table A24 of the ESS Rule (refer to Appendix B of this guide).

## 4.2 Gas Savings

The gas savings from this method will always be equal to zero (as, under the ESS Rule, gas savings are not calculated for this method and are therefore not applicable to this method).

# 5 Calculating and creating ESCs

Equation 1 of the ESS Rule is used to calculate the number of ESCs that may be created from the energy savings calculated in relation to an implementation.

*Equation 1*

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

## 5.1 Applying to register ESCs

Certain information must be submitted to the Scheme Administrator **before** an ACP applies to register ESCs.<sup>14</sup> ACPs are to provide the required information by completing an *Implementation Data Sheet*<sup>15</sup> and submitting it through the ESS Portal.<sup>16</sup> The *Implementation Data Sheet* will include a calculation of the number of ESCs to be created in accordance with Equation 1 in the ESS Rule. This calculation involves multiplying the electricity savings arising from the implementation or implementations by the certificate conversion factor for electricity (1.06).<sup>17</sup>

The result is the total number of ESCs that ACPs can apply to register from the implementation or implementations. If the result is not a whole number, it is rounded down to the nearest whole number.

There are no restrictions on how many implementations can be bundled together in the same *Implementation Data Sheet*. However:

- ▼ ACPs must apply to register all ESCs included in an *Implementation Data Sheet* in a single application
- ▼ ACPs cannot split energy savings calculated from a single implementation across two or more *Implementation Data Sheets*, and

<sup>14</sup> ESS Rule, cl 6.8

<sup>15</sup> Available at: [http://www.ess.nsw.gov.au/Registry/Registering\\_certificates](http://www.ess.nsw.gov.au/Registry/Registering_certificates)

<sup>16</sup> Information and access to the portal can be found here: [www.ess.nsw.gov.au/ESS\\_Portal](http://www.ess.nsw.gov.au/ESS_Portal)

<sup>17</sup> *The Act*, s 130(1)(a). This may be amended by regulations: see the Act, s 130(3).

- ▼ each *Implementation Data Sheet* must only include the calculation of energy savings that are taken to have occurred in the same calendar year (commonly referred to as 'vintage').

When determining how many implementations to bundle in the same *Implementation Data Sheet*, ACPs should consider:

- ▼ the ESC creation limit specified in their Accreditation Notice, as they must be able to register all the ESCs in the bundle at the same time, and
- ▼ the cost of registering the ESCs.<sup>18</sup>

More information on applying to register the creation of ESCs can be found on the ESS website.<sup>19</sup>

## 6 Minimum required records

ACPs are required to keep records in respect of a RESA, including records of:

- ▼ the location in which the RESA occurred
- ▼ the energy savings arising from that RESA
- ▼ the methodology, data and assumptions used to calculate those energy savings, and
- ▼ any other records specified by the Scheme Administrator.<sup>20</sup>

ACPs must retain records for at least six years, in a form and manner approved by the Scheme Administrator. Each ACP's Accreditation Notice may include a condition requiring that the ACP's record keeping arrangements are consistent with the ESS Record Keeping Guide.<sup>21</sup>

Table 6.1 below describes the minimum documents you are required to keep as a record of the energy savings from your project. You must collect the required documents for each implementation of your activity.

---

<sup>18</sup> The ESC registration fee must be paid in a single payment for all ESCs registered in a single bundle. Payment for a single bundle cannot be split into two payments. Refer: [www.ess.nsw.gov.au/Registry/Registering\\_certificates](http://www.ess.nsw.gov.au/Registry/Registering_certificates)

<sup>19</sup> Available at: [www.ess.nsw.gov.au/Registry/Creating\\_certificates](http://www.ess.nsw.gov.au/Registry/Creating_certificates)

<sup>20</sup> *Electricity Supply (General) Regulation 2014*, cl 46

<sup>21</sup> Available at: [www.ess.nsw.gov.au/Accredited\\_Certificate\\_Providers/Record\\_keeping\\_arrangements](http://www.ess.nsw.gov.au/Accredited_Certificate_Providers/Record_keeping_arrangements)

**Table 6.1 Minimum required records for all implementations**

Requirement	Document	Description
Implementation Date	Please propose what document you will keep as a record of the implementation date in your application for accreditation.	The document must clearly show the date the lighting upgrade was completed.
Energy Saver	Please propose what document or documents you will keep as a record of the energy saver in your application for accreditation.	The document must clearly show: <ul style="list-style-type: none"> <li>▼ the name of the energy saver</li> <li>▼ the ABN of the energy saver</li> <li>▼ ownership of the luminaire, and</li> <li>▼ that the upgrade has been requested and approved in writing from the owner of the luminaire (only applicable where the original energy saver is not the owner of the luminaire).</li> </ul>
Nomination	Nomination form (not required if you are the original energy saver)	The nomination form must: <ul style="list-style-type: none"> <li>▼ be the relevant template available from the ESS website</li> <li>▼ be signed by the original energy saver, and</li> <li>▼ be completed on or before the implementation date.</li> </ul>
Calculations	The spreadsheet or calculation tool you use to calculate energy savings from each implementation.	The document must clearly show your calculation of energy savings.
Equipment Requirements	The lighting equipment being published in the relevant Distributor's Standard Luminaire list, <b>or</b> A document issued by RMS showing that the lighting equipment has been accepted for use, <b>or</b> A letter from the Distributor confirming that the lighting equipment is approved to be installed on their distribution network.	
Lighting upgrade	Lighting inventory or similar document (you may propose what this document will be in your application for accreditation).	The document must clearly show: <ul style="list-style-type: none"> <li>▼ the location of the lighting upgrade, and</li> <li>▼ the specifications of the existing and replacement lighting equipment.</li> </ul>
Recycling of lighting equipment containing mercury	Receipt or similar document	The document must show that the lighting equipment has been recycled in accordance with the recycling requirements of a product stewardship scheme such as Fluorocycle or equivalent (refer to clause 5.3A(b)(i) of the ESS Rule).
Regulatory investment test	Please propose what document or documents you will keep as a record that each implementation meets clause 5.4(c) of the ESS Rule (refer section 3.6 of this Guide).	

## 7 Glossary

Words which are defined in the ESS Rule and used in this Method Guide have the same meaning in this Method Guide as in the ESS Rule, unless the context requires otherwise.

<b>Term</b>	<b>Definition</b>
ACP	Accredited Certificate Provider
Energy Saver	Refer to section 3.1 of this guide
ESC	Energy Savings Certificate
ESS	Energy Savings Scheme
ESS Rule	<i>Energy Savings Scheme Rule of 2009</i>
Implementation	The delivery of a RESA at a site
Implementation Date	The date the lighting upgrade was completed. Refer to section 9.4A.2 of the ESS Rule
NSW	New South Wales
Public Lighting	Public Lighting Energy Savings Formula
RESA	Recognised Energy Saving Activity. Refer to section 5.3 and 5.4 of the ESS Rule
RMS	Roads and Maritime Service



## Appendices

## A Lighting equipment

**Table A9.1: Standard Equipment Classes for Lighting Upgrades**

Equipment Class	Definition
T12 linear fluorescent Lamp	A double-capped fluorescent Lamp as defined by <i>AS/NZS 4782.1 Double-capped fluorescent lamps – Performance specifications</i> 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 <i>AS/NZS 4782.1 Double-capped fluorescent lamps – Performance specifications</i> 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 <i>AS/NZS 4782.1 Double-capped fluorescent lamps – Performance specifications</i> 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 <i>AS/NZS 4782.1 Double-capped fluorescent lamps – Performance specifications</i> . 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 <i>AS/NZS 60901 Single-capped fluorescent lamps-Performance specifications</i> . 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 <i>AS/NZS 4847 Self-ballasted lamps for general lighting services</i>
Tungsten halogen Lamp (240V)	A Tungsten halogen Lamp as defined in <i>AS 4934 Incandescent lamps for general lighting service</i> , with a rated voltage of 240V.
Tungsten halogen Lamp (ELV)	A Tungsten halogen Lamp as defined in <i>AS 4934 Incandescent lamps for general lighting service</i> , with an ELV rating, typically 12V. These Lamps run off an Extra-low voltage lighting converter (ELC) as defined in <i>AS 4879.1</i>
Infrared coated (IRC) halogen Lamp (ELV)	An ELV Tungsten halogen Lamp as defined in <i>AS 4934</i> 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 <i>IEC 61167 Metal halide lamps – Performance specification</i>
Mercury vapour Lamp	A discharge Lamp classified as a High-pressure mercury vapour Lamp as defined by <i>IEC 60188 High-pressure mercury vapour lamps – Performance specifications</i>
High pressure sodium (HPS) Lamp	A discharge Lamp classified as a High pressure sodium vapour Lamp as defined by <i>IEC 60662 High-pressure sodium vapour lamps</i>
Lighting for Roads and Public Spaces or Traffic Signals (other than LED lighting)	Lighting for Roads and Public spaces as defined by <i>AS 1158 Lighting for roads and public spaces</i> .

**Table A9.3: Other Equipment Classes for Lighting Upgrades**

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

## B Equations and tables for calculating energy savings

### Equation 6

For each Implementation:

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

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)* =

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

Where:

- *Each Incumbent Lamp* means each Lamp and Control Gear in the pre-existing lighting system;
- *LCP*, 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 9

Upgrade Consumption (MWh) =

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

Where:

- *Each Upgrade Lamp* means each Lamp and Control Gear in the upgraded lighting system.
- *LCP*, 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.

**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
2579-2599	1.03
2619-2739	1.03
2787	1.03
2791-2844	1.03
2850-2880	1.03
3585	1.03
3644	1.03
4383	1.03
All other postcodes	1