IPART Energy Sustainability Schemes

Commercial Lighting Energy Savings Formula

Method Guide

V3.6, September 2022

ESS »

The Independent Pricing and Regulatory Tribunal

IPART's independence is underpinned by an Act of Parliament. Further information on IPART can be obtained from IPART's website.

Acknowledgment of Country

IPART acknowledges the Traditional Custodians of the lands where we work and live. We pay respect to Elders, past, present and emerging.

We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples.

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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.[1]

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.[2]

This document provides guidance about how the Commercial Lighting Energy Savings Formula of the Deemed Energy Savings method (**Commercial 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, 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 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.

1.2 Related documents

As noted throughout this guide, the following documents and tools provide further information and assistance on the method:

- *Commercial Lighting - Evidence Manual* (**Evidence Manual**)
- *Commercial Lighting - Evidence Pack* (**Evidence Pack**)
- *Commercial Lighting - Fact Sheet*
- *Commercial Lighting – Template - Post Implementation Declaration*
- *Commercial Lighting - Calculation Tool*, and
- *Product Applications Guide.*

For further questions, please contact the Scheme Administrator.

1.3 Document control

Version number	Change description	Date published
V1.0	Initial release – following gazettal of ESS Rule Amendment No.2	18 July 2014
V1.1	Change in Chapter 2 to advise that guidance for roads and public spaces will be available soon	5 August 2014
V2.0	Application Form: Part B – Method Details and Nomination Form removed from the Method Guide to be separate documents.	19 January 2015
V3.0	Consultation draft: Inclusion of guidance related to Lighting for Roads and Public Spaces, clarifications regarding service levels, performance requirements and BCA classification of building/spaces.	20 August 2015
V3.1	Inclusion of guidance related to Lighting for Roads and Public Spaces, clarifications regarding service levels, performance requirements and BCA classification of building/spaces.	22 December 2015
V3.2	Updated to reflect amendments to the ESS Rule	April 2016
V3.3	Updated to reflect amendments to the ESS Rule	May 2017
V3.4	Updated to reflect amendments to the ESS Rule and Application Guide	November 2018
V3.5	Updated to reflect amendments to the ESS Rule	March 2020
V3.6	Updated to reflect minor changes to processes following the introduction of The Energy Security Safeguard Application (TESSA)	September 2022

2 Method overview

The Commercial Lighting method can be used to calculate energy savings and create ESCs from the following activities:

- upgrades of building lighting
- upgrades of lighting for roads and public spaces, and
- upgrades of lighting for traffic signals.[3]

This guide covers upgrades of building lighting and lighting for roads and public spaces only. Applicants planning to apply for accreditation for upgrades of lighting for traffic signals should contact the Scheme Administrator.

This guide does not provide information about the Public Lighting method, which provides an alternative method to calculate energy savings from upgrades of lighting for roads and public spaces where:

- the luminaire is owned and/or maintained by a distributor[4] or Roads and Maritime Services (**RMS**), or
- a council or RMS that is the customer of a distributor requests, in writing, the upgrade from the distributor that owns the luminaire.[5]

Please refer to the Public Lighting page of the ESS website for further information.

2.1 Building lighting

Building lighting is lighting equipment affixed to a commercial/industrial premise which is classified under the Building Code of Australia (**BCA**)[a] as:

- Class 3, 5, 6, 7, 8, 9, 10(a) or 10(b) buildings, or
- the common areas of a Class 2 building.[6]

Refer to Appendix A of this method guide for more information on building classifications.

Effectively, this means the method can be applied to lighting upgrades at most non-residential premises, including industrial facilities, public facilities (such as schools and health centres), office buildings and shopping centres. Additionally, the method can be applied to lighting upgrades in stairways, corridors and shared areas of multiple unit residential buildings such as apartment buildings.

[a] The Building Code of Australia forms Volume 1 and Volume 2 of the National Construction Code.

2.2 Lighting for roads and public spaces

Lighting for roads and public spaces is defined as lighting covered by the *AS/NZS 1158: Lighting for Roads and Public Spaces* standard series or *AS/NZS 60598.2.3 Luminaires - Particular requirements - Luminaires for road and street lighting* or both.[7] Effectively, this means the method can be applied to lighting upgrades on roads[b] located between the boundaries of adjoining properties (i.e. outside the boundaries of any private property) where the visual needs of motorists are dominant and in outdoor spaces of a public nature (e.g. public squares, parks, beaches, etc) where the visual needs of pedestrians are dominant.

The AS/NZS 1158 series defines two main categories of lighting for roads and public spaces:

- **Category V Lighting (Vehicular traffic)**. This is lighting for roads where the visual requirements of motorists are dominant – e.g. traffic routes. This category includes subcategories ranging from V1 to V5, which relate to the level of traffic on the road among other things.
- **Category P Lighting (Pedestrian areas).** This is lighting for roads and other outdoor public spaces where the visual requirements of pedestrians are dominant – e.g. local roads, outdoor shopping precincts, or outdoor carparks.[c]

The appropriate lighting category, subcategory and requirements for the particular road or public space must be determined by (or in consultation with) the appropriate authority concerned (e.g. road and traffic authorities, local councils, RailCorp, etc).

The lighting equipment installed as part of the lighting upgrade must comply with all parts of the AS/NZS 1158 series applicable to the road or public space where the upgrade will take place.[8] Where the lighting upgrade deviates from these requirements, AS/NZS 1158 requires that these deviations be justified.[d]

[b] AS/NZS 1158.0 Standard – 'Road' is defined as the right of way between boundaries of adjoining properties. It could include laneways, pathways, footpaths, etc.

[c] Refer to AS/NZS 1158 Standard for the complete listing of all subcategories.

[d] Appendix E of AS/NZS 1158.3.1 and Appendix D of AS/NZS 1158.1.1 list the mandatory documentation for demonstrating compliance with AS/NZS 1158.

3 Requirements that must be met

We have provided information below about the requirements of the method. This is not an exhaustive list of requirements, and ACPs should ensure that they are familiar with their obligations under the Act, Regulation, ESS Rule and any conditions of their accreditation.

3.1 Energy saver

An ACP can only calculate energy savings and create ESCs from an implementation 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 the Commercial Lighting method, is the purchaser (discussed in the next section), or
- **the nominated energy saver** – which is someone the original energy saver has nominated as the energy saver by completing a Nomination Form.

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
- 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 Purchaser

In general, the purchaser is the person who purchases or leases the goods or services that enable the relevant energy savings to be made. However, the following persons cannot be a purchaser and therefore cannot be an original energy saver under the Commercial Lighting method:[9]

- an ACP that is not the owner, occupier or operator of the relevant site,[e] and
- a person who 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 a strata scheme lot.[f]

[e] ACPs that are the nominated energy saver will typically fall under this category.

[f] Wholesalers will typically fall under this category.

3.3 Minimum co-payment

Energy savings may only be calculated using this method if the purchaser has paid a net minimum of $5 per mega-watt hour (**MWh**) of (calculated) electricity savings (excluding GST) (**minimum co-payment**).[10] For example, if the upgrade results in 50 MWh of energy savings, the purchaser must contribute a minimum of $250 (excluding GST) (i.e. $5 x 50 MWh). The minimum co-payment must not be reimbursed, credited by a third party, or made by in-kind payment. The minimum co-payment must be made **in full** before ACPs can apply to register ESCs. Proof that the minimum co-payment was made before the ESC registration date will be checked at audit.

Future payment plans, partial payment and subsequent reimbursement are not permitted if they result in either:

- the minimum co-payment not being made in full before registration, or
- a reduction of the net amount paid below the required minimum co-payment at any time after registration.

ACPs must ensure that any payment made is for the goods and services that make up the lighting upgrade and that evidence of payments being made is provided to the Scheme Administrator. Where the payment includes equipment that is used in the lighting upgrade but is primarily used for other purposes, ACPs must justify why it is appropriate to attribute the cost of the equipment to the lighting upgrade.

3.4 Implementation, implementation date and site

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

3.4.1 Implementation

An implementation is the delivery of a RESA at a site. A RESA must meet all of the criteria set out in clauses 5.3, 5.3A, 5.3B of the *ESS Rule* and does not include those activities set out in clause 5.4 of the *ESS Rule.*

3.4.2 Implementation date

For RESAs that use the Commercial Lighting method, the implementation date is the date the lighting upgrade is completed[11] as supported by evidence.

3.4.3 Site

Under the ESS Rule, a site means the location where the end-user equipment was installed. This may be defined by:

- an address; or
- a unique identifier, as specified for the relevant implementation that identifies the affected end-user equipment; or
- a method accepted by the Scheme Administrator.[12]

3.5 Eligible activities and equipment requirements

ACPs can replace or modify existing lighting equipment with lighting equipment that is classed as standard equipment for lighting upgrades under the ESS Rule. The standard equipment classes are listed and defined in Table A9.1 of Schedule A to the ESS Rule. Each class has a default Lamp Circuit Power (**LCP**) value, listed in Table A9.2 of Schedule A to the ESS Rule. The LCP values are used to calculate the energy savings.

Alternatively, ACPs may replace or modify existing lighting equipment with certain other lighting equipment as listed by class in Table A9.3 of Schedule A to the ESS Rule, provided it is eligible and is accepted as meeting the equipment requirements specified in Table A9.4 of Schedule A to the ESS Rule. The LCP value of these other equipment classes is listed in Table A9.4. If an ACP plans to use any of these other equipment classes, they should first read the *Product Applications Guide.*

Lighting control systems, such as occupancy sensors, can be installed to reduce electricity consumption by reducing light output when it is not required. ACPs can install these control systems as a standalone upgrade to existing lighting, or as part of a larger lighting refurbishment involving the equipment above.

3.5.1 Ineligible activities

The ESS Rule is designed to promote energy savings activities with no negative effect on production or service levels.[13] As such, a range of specific activities are not eligible for the creation of ESCs, including:

- the installation of T5 adaptor kits or retrofit luminaire-LED linear lamps (see Table A9.4 of Schedule A to the ESS Rule)
- an activity undertaken in order to comply with any mandatory legal requirement imposed through a statutory or regulatory instrument of any jurisdiction, including compliance with BASIX and BCA requirements, and
- an activity that results in a reduction in energy consumption by reducing production or service levels (including safety levels).[14]

Applications for accreditation must describe how any activities that are not RESAs under the ESS Rule will be excluded from energy savings and ESC calculations.

3.5.2 Equipment requirements for lighting for roads and public spaces

If an ACP replaces and modifies lighting for roads and public spaces, the equipment must meet the requirements specified by the standards below:

- *AS/NZS 60598.1.1 Luminaires – General requirements and tests*
- *AS/NZS 60598.2.3 Luminaires – Particular Requirements – Luminaires for road and street lighting* (for Category V lighting – Vehicular Traffic),[g] and
- Table 2.10 of *AS/NZS 60598.3.1 Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements* (for Category P lighting – Pedestrian Areas).[h]

If an ACP uses equipment of an equipment class listed in Table A9.3 of Schedule A to the ESS Rule, it must also be accepted under the Scheme Administrator's current Product acceptance process. Requirements for acceptance under this process are summarised in Table A9.4 of Schedule A to the ESS Rule, but ACPs should review the complete guidance materials provided on the ESS website.

3.5.3 Recycling and disposal requirements

ACPs are responsible for ensuring that lighting equipment removed or replaced during the lighting upgrade is disposed of appropriately.

The ACP must not refurbish, re-use or resell end-user equipment. Furthermore, if the implementation:[15]

- is in a metropolitan levy area (i.e. an area with a postcode listed in Table A25 of Schedule A to 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 product stewardship scheme such as 'Fluorocycle' or equivalent.

3.6 Installation requirements

3.6.1 Electrical work

ACPs must ensure that all electrical work involved in the lighting upgrade is performed by a person authorised to carry out electrical wiring work under section 14(1) of the *Home Building Act 1989*.[16] This requirement applies even when the lighting upgrade does not require any wiring work to be conducted or otherwise require an electrician to be present.

[g] As required by clause 2.11.1 (a) of AS/NZS 1158.1.1.
[h] As required by clause 2.10.1 of AS/NZS 1158.3.1

3.6.2 Service levels

ACPs must only create ESCs from lighting upgrades that reduce electricity consumption **without** reducing service levels (including safety levels) below the pre-upgrade levels.[17] For example, ACPs cannot create ESCs from activities that reduce electricity only by the de- lamping of a particular area as this would also reduce service levels.

3.7 Performance requirements

ACPs must satisfy the minimum performance requirements for upgrades of building lighting and upgrades of roads and public spaces (outlined below), to the satisfaction of the Scheme Administrator. We may publish additional minimum performance requirements for these upgrades from time to time.

3.7.1 Performance requirements for upgrades of building lighting

For upgrades of building lighting, each space, after implementation of the lighting upgrade must meet:

- the relevant requirements of AS/NZS 1680 or, where this standard is not applicable, another benchmark agreed to in advance by the Scheme Administrator
- the requirements of the BCA section F4.4 'Artificial lighting', and
- an Illumination Power Density (**IPD**) for each space less than or equal to the maximum IPD allowed under BCA Part J6.

Further information about how BCA requirements apply to the calculation of energy savings is provided in the *Evidence Manual.*

Building lighting upgrades where AS/NZS 1680 applies must achieve the relevant requirements of AS/NZS 1680. These may include, but are not limited to, the requirements related:

- maintained illuminance accounting for lumen depreciation
- control of glare, and
- uniformity of illuminance.

Further information about each of these requirements can be found in AS/NZS 1680.

In addition, AS/NZS 1680 includes specific requirements for a range of lighting upgrades. At a minimum, ACPs must satisfy the requirements related to:

- Correlated Colour Temperature[i] and matching existing lighting
- Colour Rendering Index[j] in order to accurately portray colour

[i] Correlated Colour Temperature is a measurement of the apparent colour of the light source.

[j] Colour Rendering Index is a measurement of how accurately a light source can portray the colour of an object in comparison to an ideal light source such as an incandescent lamp.

- glare, in order to avoid 'disability glare' and 'discomfort glare'
- reflectance off surfaces, and
- daylight effects.

Compliance with the relevant requirements may be checked at the time of audit, so it is advisable to involve the person responsible for providing the lighting solution and upgrade in:

- assessing how these requirements apply to the lighting upgrade, and
- ensuring that the lighting upgrade satisfies the requirements.

Other benchmarks where AS/NZS 1680 does not apply

Where the lighting upgrade is outside the scope of AS/NZS 1680, ACPs may apply to the Scheme Administrator to use another performance benchmark. The application must include:

- the nature of the lighting upgrade
- why AS/NZS 1680 does not apply
- what benchmark or alternative standard is proposed to ensure service levels are appropriate, and
- how each space will meet, as a minimum, the requirements of BCA Section F4.4, 'Artificial lighting'.

Compliance with the performance requirements of the agreed benchmark may be checked at the time of audit, so it is advisable to prepare the application in consultation with the person responsible for providing the lighting solution and upgrade.

Commercial Lighting Fact Sheet and Post Implementation Declaration

ACPs must provide the original energy saver with the *Commercial Lighting - Fact Sheet* at the start of the upgrade. Upon completion of the building lighting upgrade, the installer and the original energy saver must complete and sign a *Commercial Lighting Post Implementation Declaration.* The *Commercial Lighting - Post Implementation Declaration* consists of the lighting quality statement, recommended maintenance schedule and customer declaration.

ACPs must keep a copy of the signed declaration and maintenance schedule. Both will be checked at audit and may be checked by the Scheme Administrator.

3.7.2 Performance requirements for upgrades of lighting for roads and public spaces

All upgrades of lighting for roads and public spaces must meet the requirements of AS/NZS 1158, or any other standard or benchmark specified by the Scheme Administrator.[18]

AS/NZS 1158 primarily considers the need for lighting for roads and public spaces to facilitate the safe movement of vehicles and pedestrians. AS/NZS 1158 also considers other objectives of public lighting, such as discouraging illegal acts and improving the amenity of an area through increased aesthetic appeal.

Relevant parts of AS/NZS 1158

The parts of AS/NZS 1158 that are applicable to the lighting upgrade will depend on the lighting category, subcategory and performance requirements of the particular road or public space involved. As noted above, these are matters that must be determined by or in consultation with the responsible authority.[k]

These parts may include:

- *AS/NZS 1158.0 – Introduction*
- *AS/NZS 1158.1.1 – Vehicular Traffic (Category V) lighting – Performance and design requirements*
- *AS/NZS 1158.1.2 – Vehicular Traffic (Category V) lighting – Guide to design, installation, operation and maintenance*
- *AS/NZS 1158.2 – Computer procedures for the calculation of light technical parameters for Category V and Category P lighting*
- *AS/NZS 1158.3.1 – Pedestrian Area (Category P) lighting – Performance and design requirements*
- *AS/NZS 1158.4 – Lighting for pedestrian crossings*
- *AS/NZS 1158.5 – Tunnels and underpasses*
- *SA/SNZ TS 1158.6 Luminaires – Performance*

The documentation required for demonstrating compliance with the AS/NZS 1158 series is specified in an appendix of the relevant standard. In particular, the documentation related to:

- vehicular lighting (category V lighting) is specified in Appendix D of AS/NZS 1158.1.1
- pedestrian lighting (category P lighting) is specified in Appendix E of AS/NZS 1158.3.1
- pedestrian crossing lighting (category PX) is specified in Appendix D of AS/NZS 1158.4.

ACPs are required to collect and retain the documentation described in the appendices applicable to each lighting upgrade to demonstrate that the upgrade is compliant with the requirements laid out in the AS/NZS 1158 series. This documentation will be checked at audit.

[k] Most authorities responsible for public lighting in NSW (e.g. electricity distributors, local councils and RailCorp) maintain their own requirements they have deemed necessary including elements of AS/NZS 1158. Demonstrated compliance with such requirements would generally indicate compliance with the relevant requirements of AS/NZS 1158.

3.8 Minimum requirements of conduct

The Scheme Administrator has established minimum requirements for the conduct of ACPs and their representatives, for example, employees or subcontractors. 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 (V3.0) Minimum requirements of conduct*.

3.9 Use of templates

A number of templates have been provided for the use of ACPs and their installers when engaging with customers, as outlined in Table 3.1 below. More information on the use of these templates can be found on the ESS website.

Table 3.1 Relationship between templates/forms and implementation stage

Project Stage	Template/Form	Primary purpose
Before implementation commences	• *Commercial Lighting Fact Sheet* given to customer • *Nomination form* signed by customer and ACP	• Inform customer • Nominate ACP as the energy saver and declaration ESS requirements met
At the end of the implementation	• *Commercial Lighting Post Implementation Declaration* signed by the lighting upgrade solution provider and customer	• Declaration that that lighting upgrade satisfies all relevant lighting requirements, customer is satisfied with upgrade and co-payment has been paid in full • Providing a recommended maintenance schedule to the customer

3.10 Insurance

ACPs (and any contractor[l] involved in the delivery of the RESA) must hold and maintain public liability insurance of at least $5 million. Insurance cover of this amount must be maintained for the life of the RESA. Public liability insurance must, at a minimum, cover the replacement and/or rectification of customers' property damaged as a result of work performed by the ACP and/or the ACP's contractors.

Either the ACP or the ACP's contractors must also hold and maintain product liability insurance of at least $5 million that covers all products used in the RESA. In the event that the ACP is unable to obtain product liability insurance, the ACP must ensure that their contractors hold product liability insurance of at least $5 million.

ACPs must also:

- provide the Scheme Administrator with certificates of currency for their, and their contractors', public liability and product liability insurances, within seven days of each renewal, reissue or change of policy, and
- maintain a register of contractors that contains copies of their public liability insurance and, where required, their product liability insurance.

Compliance with these requirements will be checked at the time of audit.

3.11 Energy savings involving Maintained Emergency Luminaires

Space types Un-Switched Maintained Emergency Luminaire and Switched Maintained Emergency Luminaire apply only if the existing lighting end-user equipment is an Un- Switched Maintained Emergency Luminaire.

[l] This includes any person or company an ACP is working with that is involved directly in the implementation of any aspect of the RESA.

4 Energy savings

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 Commercial Lighting method can be calculated using:

- equations 6, 9 and either equation 7 or equation 8 from the ESS Rule
- the relevant tables from Schedule A to the ESS Rule, and
- the regional network factor from Table A24 of Schedule A to the ESS Rule.

All inputs to the equations are explained in detail in the Evidence Manual for the method.

4.2 Gas savings

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

4.3 Calculation tools

ACPs are responsible for ensuring any spreadsheets and tools used to calculate energy savings are maintained so that they are up to date with the most recent requirements of the ESS Rule. For example, ESS Rule factors, including deemed activity electricity and gas savings factors, are updated from time to time.

The *Commercial Lighting - Calculation Tool* is available on the ESS website to assist ACPs in calculating energy savings under the method. ACPs should use the *Commercial Lighting - Calculation Tool* when equation 7 of the ESS Rule is applicable to the calculation of the baseline energy consumption of the lighting upgrade, i.e.:

- **Use the *Commercial Lighting - Calculation Tool* if**:
  - the lighting upgrade is part of a refurbishment that would **not** otherwise have been required to comply with the BCA Part J6, or
  - the lighting upgrade is part of a refurbishment that **would** otherwise have been required to comply with the BCA Part J6, and the existing lighting has an IPD that is less than or equal to the maximum IPD allowed under the BCA Part J6.
- **Do not use the *Commercial Lighting - Calculation Tool* if**:
  - the lighting upgrade is part of a refurbishment that **would** have been required to comply with the BCA Part J6, **and**
  - the existing lighting has an IPD that does not meet the IPD requirements under the BCA Part J6.

In this last instance, the ESS Rule requires the use of equation 8 to determine the baseline energy consumption of the lighting upgrade, which is not supported by the *Commercial Lighting - Calculation Tool*.

ACPs can develop their own calculation tool if they wish, but the Scheme Administrator recommends ACPs calibrate its outputs against the Scheme Administrator tool. Energy savings must be calculated in accordance with the relevant equations in the ESS Rule.

The *Commercial Lighting - Calculation Tool* is not compatible with all systems and is provided by the Scheme Administrator on an unsupported basis. Accordingly, IPART will not be able to assist with all queries or issues encountered when using the tool.

4.4 Calculating energy savings from upgrades that involve both building and road/public space lighting

If a particular implementation includes a combination of building lighting and lighting for roads and public spaces, ACPs must calculate energy savings for each space separately.

If ACPs are using the calculation tool provided by the Scheme Administrator, they must use the different functionality provided by the tool for the implementation separately:

- one version of the tool with the functionality to calculate energy savings from all spaces classified as building lighting, and
- another version of the tool with the functionality to calculate energy savings from all lighting for roads and public spaces areas.

Spaces classified as building lighting must comply with the requirements for building lighting, and areas classified as lighting for roads and public spaces must comply with the requirements for lighting for roads and public spaces. Where an upgrade is both building lighting and lighting for roads and public spaces, the requirements of both spaces apply.

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.[19]

Equation 1

$$Number\ of\ Certificates = \sum Implementations\ (Electricity\ Savings\ x\ Electricity\ Certificate\ Conversion\ Factor + Gas\ Savings\ x\ Gas\ Certificate\ Conversion\ Factor)$$

5.1 Applying to register ESCs

Certain information must be submitted to the Scheme Administrator by an ACP to apply to register ESCs.[20] ACPs must provide the required information by uploading the Implementation Data in a csv file format on our online system, TESSA.

5.1.1 Implementation data

The implementation data upload must 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).[21]

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.

More information about the implementation data that needs to be provided for the Commercial Lighting method is set out in the *CSV Specification* guide.

5.1.2 Submitting your Implementation Data

Implementation data must be saved in the csv file format. This must be completed before uploading to TESSA at the time of registering certificates.

Implementations can be bundled together in an Implementation Data upload. However:

- ACPs must apply to register all ESCs included in an implementation data upload in a single application
- ACPs cannot split energy savings calculated from a single implementation across two or more implementation data uploads, and
- each implementation data upload 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 upload, ACPs should consider:

- the ESC creation limit specified in their Accreditation Notice, as they must be able to register all the ESCs in the upload at the same time, and
- the cost of registering certificates.

More information on registering certificates can be found on the ESS website.

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 in writing by the Scheme Administrator.[22]

ACPs must retain records for at least six years, in a form and manner approved by the Scheme Administrator.[23] Each ACP's Accreditation Notice may include a condition requiring that the ACP's record keeping arrangements are consistent with the *Record Keeping Guide*.

The *Evidence Manual* defines the minimum documents ACPs are required to keep as a record of the energy savings achieved from a project. ACPs must collect the required documents for each implementation.

The *Evidence Pack* that accompanies the *Evidence Manual* can be used to record and store data to meet these requirements.

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.

Term	Definition
Glare	Difficulty seeing in the presence of a very bright light and possibly causing discomfort or inability to see
Illuminance	The amount of light that falls on a surface per unit area, which is sometimes referred to as the "Lighting Level" (measured in Lux)
Lumen	The unit of luminous flux, which is a measure of the total amount of visible light emitted from a light source
Lumen depreciation	The decrease in lumen output from a lamp over time
Lux	The unit of Illuminance (1 lux equals 1 lumen per square metre (lm/m^2))

Appendices

A Building Code of Australia (Part A3 – Classification of Buildings and Structures)

Part A3 of the BCA – Volume 1 – 2016 classifies buildings and structures. Under the ESS Rule, only premises in the following BCA classes are eligible for commercial lighting upgrades:

- Class 3, 5, 6, 7, 8, 9, 10(a) or 10(b) buildings, or
- the **common areas**[a] of a Class 2 building.

Under Part A3.3 of the BCA 'Multiple classification', different areas within the same building may be classified in different BCA classes.

This appendix provides a transcript of Part A3 of the BCA.

PART A3 – Classification of Buildings and Structures

A3.1 - Principles of Classification

The classification of a building or part of a building is determined by the purpose for which it is designed, constructed or adapted to be used.

A3.2 - Classifications

Buildings are classified as follows:

Class 1: one or more buildings which in association constitute –

a. **Class 1a** – a single dwelling being –
   i a detached house; or
   ii one of a group of two or more attached dwellings, each being a building, separated by a fire-*resisting* wall, including a row house, terrace house, town house or villa unit; or

b. **Class 1b** –
   i A boarding house, guest house, hostel or the like –
      A. with a total area of all floors not exceeding 300 m2 measured over the enclosing walls of the Class 1b; and
      B. in which no more than 12 persons would ordinarily be resident; or

[a] Cl 10.1 of the *Energy Savings Scheme Rule of 2009* defines 'Common Areas' as
- for buildings owned under strata title, the common property as defined in either the *Strata Schemes (Freehold Development) Act 1973* (NSW), or *Strata Schemes (Leasehold Development) Act 1986* (NSW). or
- for buildings not owned under strata title (eg, under company title), the non-residential property of BCA class 2 buildings.

ii 4 or more single dwellings located on one allotment and used for short-term accommodation,

which are not located above or below another dwelling or another Class of building other than a *private* garage.

Class 2: a building containing 2 or more *sole-occupancy units* each being a separate dwelling.

Class 3: a residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons, including -

a. a boarding-house, guest house, hostel, lodging house or backpackers accommodation; or
b. a residential part of a hotel or motel; or
c. a residential part of a school; or
d. accommodation for the aged, children or people with disabilities; or
e. a residential part of a health-care building which accommodates members of staff; or
f. a residential part of a *detention centre*.

Class 4: a dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.

Class 5: an office building used for professional or commercial purposes, excluding building of Class 6, 7, 8, or 9.

Class 6[b]: a shop or other building for the sale of goods by retail or the supply of services direct to the public, including -

a. an eating room, café, restaurant, milk or soft-drink bar; or
b. a dining room, bar, shop or kiosk part of a hotel or motel; or
c. a hairdresser's or barber's shop, public laundry, or undertaker's establishment; or
d. market or sale room, showroom, or service station.

Class 7: a building which is -

a. Class 7a - a *carpark*; or
b. Class 7b - for storage, or display of goods or produce for sale by wholesale.

Class 8: a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.

Class 9: a building of a public nature -

a. **Class 9a** - a *health-care building*, including those parts of the building set aside as a laboratory; or
b. **Class 9b** - an *assembly building*, including a trade workshop, laboratory or the like in a primary or secondary school, but excluding any other parts of the building that are of another Class; or

[b] NSW uses an alternative definition for class 6 to that specified in Part A3. Refer to Appendix 'New South Wales' for more information on NSW specific amendments.

c. **Class 9c** - an *aged care building*.

Class 10: a non-habitable building or structure -

d. **Class 10a** – a non-habitable building being a private garage, carport, shed, or the like; or
e. **Class 10b** – a structure being a fence, mast, antenna, retaining or free-standing wall, swimming pool, or the like.
f. **Class 10c** – a private bushfire shelter.

A3.3 - Multiple Classifications

Each part of the building must be classified separately, and –

a.

i where parts have different purposes – if not more than 10% of the *floor area* of a *storey,* being the minor use, is used for a purpose which is a different classification, the classification applying to the major use may apply to the whole *storey*; and

ii the provisions of (i) do not apply when the minor use is a laboratory of Class 2, 3 or 4 part; and

b. a plant room, machinery room, lift motor room, boiler room or the like must have the same classification as the part of the building in which it is situated; and
c. if a building has parts of different classification, each part must comply with all the relevant provisions for its classification.

Part A3.4 – Parts with more than one classification

a. Notwithstanding A3.3, a building or part of a building may have more than one classification applying to the whole building or to the whole of that part of the building.
b. If a building or part of a building has more than one classification applying to the whole building or part in accordance with (a), that building or part must comply with all the relevant provisions of the BCA for each classification.

Terms in Italics have a specific meaning defined in the BCA.[c]

[c] The Building Code of Australia is also referred to as the National Construction Code (NCC).

B List of relevant standards in the AS/NZS Series

B.1 AS/NZS 1680 Series – Building Lighting

A list of standards making up the AS/NZS 1680 series, and the areas specifying design values are provided below:

AS/NZS 1680.0 – Safe Movement

AS/NZS 1680.1 – General Principles and Recommendations

- Section 3 – Task Visibility

AS/NZS 1680.2.1 - Specific Applications, Circulation Spaces and other General Areas

- Appendix D – Specific Recommendations for Circulation Spaces and Other General Areas

AS/NZS 1680.2.2 - Specific Applications, Office and Screen-based Tasks

- Appendix E – Specific Recommendations for Office and Screen-Based Visual Tasks

AS/NZS 1680.2.3 - Specific Applications, Educational and Training Facilities

- Appendix D – Specific Recommendations for Educational and Training Facilities

AS/NZS 1680.2.4 – Interior Lighting, Industrial Tasks and Processes

- Appendix E – Specific Recommendations for Industrial Tasks and Processes

AS/NZS 1680.2.5 – Interior Lighting, Hospital and Medical Tasks

- Appendix F – Specific Recommendations for Hospital and Medical Tasks

Please note that any values contained in any AS/NZS 1680.2 series Standard take precedence over AS/NZS 1680.1

AS/NZS 1680.3 – Measurement, calculation and presentation

AS/NZS 1680.4 - Lumen Maintenance

B.2 AS/NZS 1158 Series – Lighting for Roads and Public Spaces

AS/NZS 1158.0 - Introduction

AS/NZS 1158.1.1 – Vehicular Traffic (Category V) lighting – Performance and design requirements

AS/NZS 1158.1.2 – Vehicular Traffic (Category V) lighting – Guide to design, installation, operation and maintenance

AS/NZS 1158.2 – Computer procedures for the calculation of light technical parameters for Category V and Category P lighting

AS/NZS 1158.3.1 – Pedestrian Area (Category P) lighting – Performance and design requirements
AS/NZS 1158.4 – Lighting for Pedestrian crossings

AS/NZS 1158.5 – Tunnels and underpasses SA/SNZ TS 1158.6 Luminaires - Performance

In order to demonstrate compliance with the standard, ACPs must refer to the following parts:

- Appendix D of AS/NZS 1158.1.1 specifies the documentation required to demonstrate vehicular lighting (category V lighting) is compliant with the standard
- Appendix E of AS/NZS 1158.3.1 specifies the documentation required to demonstrate pedestrian lighting (category P lighting) is compliant with the standard, and
- Appendix D of AS/NZS 1158.4 specifies the documentation required to demonstrate pedestrian crossing lighting (category PX) is compliant with the standard.

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1 Cl 98(2) of Schedule 4A, *Electricity Supply Act 1995*.
2 Cls 151(2) and 153(2) of Schedule 4A, *Electricity Supply Act 1995*.
3 Cl9.4.1(a) of the *Energy Savings Scheme Rule of 2009*.
4 Cl 10.1 of the *Energy Savings Scheme Rule of 2009* (definition of 'distributor').
5 Cls 9.4A.1 and 9.4A.3 of the *Energy Savings Scheme Rule of 2009*.
6 Cl 10.1 of the *Energy Savings Scheme Rule of 2009* (definition of 'Building Lighting').
7 Cl 10.1 of the *Energy Savings Scheme Rule of 2009* (definition of 'Lighting for Roads and Public Spaces').
8 Cl 9.4.1(b) of the *Energy Savings Scheme Rule of 2009* requires that the lighting upgrade meets or exceeds the relevant lighting standard for each upgrade, to the satisfaction of the Scheme Administrator.
9 Cl 10.1 of the *Energy Savings Scheme Rule of 2009* (definition of 'Purchaser').
10 Cl 9.4.1(e) of the *Energy Savings Scheme Rule of 2009*.
11 Cl 9.4.2 of the *Energy Savings Scheme Rule of 2009*.
12 Cl 10.1 of the *Energy Savings Scheme Rule of 2009* (definition of 'Site').
13 Cl 2.1 of the *Energy Savings Scheme Rule of 2009*.
14 Cl 5.4 of the *Energy Savings Scheme Rule of 2009*.
15 Cl 5.3A(b) of the *Energy Savings Scheme Rule of 2009*.
16 Cl 9.4.1(d) of the *Energy Savings Scheme Rule of 2009*.
17 Cl 5.3Ab) of the *Energy Savings Scheme Rule of 2009*.
18 Cl 9.4.1(g) of the *Energy Savings Scheme Rule of 2009*.
19 Cl 6.5 of the *Energy Savings Scheme Rule of 2009*.
20 Cl 6.8 of the *Energy Savings Scheme Rule of 2009*.
21 Cl 130(1)(a) of Schedule 4A, *Electricity Supply Act 1995*. Cl 130(3) of Schedule 4A, *Electricity Supply Act 1995* provides this may be amended by regulations.
22 Cls 46(1) and 46(2) of the *Electricity Supply (General) Regulation 2014*.
23 Cls 46(3)-(4) of the *Electricity Supply (General) Regulation 2014*.