

COMMERCIAL LIGHTING

IPART Response to Consultation

9 August 2013

1 Introduction

This paper sets out actions IPART will take in response to the report by Beletich Associates into commercial lighting activities in the Energy Savings Scheme (ESS). These actions include recommendations to the government policy agencies responsible for the ESS and a number of administrative changes to be implemented by IPART.

The Beletich Report, IPART Issues Paper and submissions received are available from the ESS website¹.

Beletich Report

We commissioned Beletich Associates, working with lighting consultants Light Naturally, to explore a wide range of commercial lighting issues under the NSW Energy Saving Scheme (ESS). Our objective in commissioning the 'Beletich Report' was to examine the administrative arrangements supporting commercial lighting activities, to ensure that:

- ▼ Installed lighting meets or exceeds the requirements of Australian Standard AS/NZS 1680 and/or other relevant standards;
- ▼ Lighting upgrades are carried out by trained and qualified persons; and
- ▼ An effective process is in place for assessment and acceptance of conventional and emerging lighting technologies.

The consultant recommended several changes to the way we manage commercial lighting activities, in each of the following areas:

- ▼ Lighting standards and compliance with the *Energy Savings Scheme Rule of 2009* (the ESS Rule),
- ▼ Training,
- ▼ Performance of lighting equipment, and
- ▼ Safety and Electromagnetic Compatibility requirements.

¹http://www.ess.nsw.gov.au/Projects_and_equipment/Lighting/Commercial_Lighting_Issues_Paper

Issues Paper

We released an Issues Paper in March 2013 to accompany publication of the Beletich Report. The Issues Paper highlighted key recommendations from the report and asked stakeholders for comment.

Appendix A lists the Issues Paper questions.

Submissions

We received 20 submissions and a wide range of views were put forward. The following key issues were identified:

- ▼ A minimum level of lighting knowledge for installers is supported;
- ▼ Retaining LED tubes in the ESS has strong support;
- ▼ Publishing a list of accepted emerging lighting technologies is supported; and
- ▼ Clarifying Accredited Certificate Provider (ACP) requirements and aligning with the Victorian Energy Efficiency Target (VEET) scheme² is supported.

2 Analysis of Lighting Issues

We analysed each of the submissions with the following questions in mind:

1. Energy Savings – are they being made?
2. Functionality – are service levels being maintained?
3. Safety – will it be improved?

In each section below, we review the Beletich Report's recommendations and summarise the submissions received in response to our Issues Paper. We highlight the issues IPART faces when dealing with the issues raised and outline 11 actions IPART intends to take.

2.1 Lighting standards and compliance with the Rule

The consultant's recommended that we:

- ▼ Define AS/NZS1680 requirements to include: minimum illuminance, uniformity and disability glare;
- ▼ Require the use of lighting design software for commercial lighting activities; and
- ▼ Establish tiered requirements for compliance based on the size of lighting projects and the standards involved.

² Essential Services Commission, Victorian Energy Efficiency Target
<https://www.veet.vic.gov.au/Public/Public.aspx?id=Home>

2.1.1 Lighting standards

(Issues Paper questions 1 – 3)

Submissions

Some submissions agreed that we should require ACPs to meet AS/NZS1680 requirements for average maintained illuminance, uniformity of illuminance and disability glare. However most ACPs were against any additional requirements, or supported only limited changes.

Some submissions accepted that a maintained illuminance requirement is justified by the long deeming periods for commercial lighting energy savings. Other submissions considered that maintained illuminance requirements are unnecessary. A small number of submissions suggested that lighting professionals would need to be more involved if requirements regarding glare were to be introduced.

There was no support for IPART setting requirements in addition to AS/NZS1680. The wide range of existing lighting standards is considered sufficient.

IPART Response

The ESS Rule requires that commercial lighting upgrades meet or exceed the relevant requirements of AS/NZS1680. We already require upgrades to meet the minimum illuminance requirements of AS/NZS1680.

Having considered the issue, we have concluded that lighting upgrades should be required to meet the average maintained illuminance, uniformity of illuminance and disability glare requirements of AS/NZS1680. This requires a Rule change and therefore will require action by the policy agencies.

IPART Action

- 1 We will recommend to the policy agencies that the requirement to meet AS/NZS1680 should be clarified to include specific requirements for average maintained illuminance, uniformity of illumination and disability glare.

2.1.2 Tiered approach to compliance

(Issues Paper questions 4 – 6)

Submissions

Many submissions supported the use of accredited lighting professionals and lighting design software for complex lighting upgrades. But these were seen as unnecessary for simple lighting upgrades. Many submissions argued that a requirement to use modelling software for all upgrades would increase costs and add unnecessary complexity to simple upgrades. However, the voluntary use of lighting software was generally seen as desirable.



Some ACPs were concerned that additional requirements might jeopardise the cost effectiveness of some projects.

Some submissions supported the approach adopted under VEET of requiring ACPs to identify the relevant lighting standards for each upgrade and demonstrate that those standards have been met.

IPART Response

We agree that ACPs should be required to set out the relevant lighting standards for an upgrade, and demonstrate how they have been met. This may require an increased level of lighting knowledge among ACPs and their partner organisations (see Section 2.2 below).

To address the issue of consistency, and to help align our processes with VEET, we are developing a 'Document Pack' for use by all commercial lighting ACPs (in the first instance). This is similar to the 'Assignment Form' used in the VEET scheme.

The Document Pack will include a template for original energy saver nominations, and declarations that lighting standards have been identified and met. It will also specify the minimum information ACPs must collect to support energy savings claims. The Document pack may be extended to other Rule methodologies at a later date.

IPART Actions

- 2 IPART will develop a 'Document Pack' to clarify the information requirements for all commercial lighting upgrades. This is to align with the VEET scheme and to clarify the documentary requirements for all commercial lighting upgrades. The information requirements will be consulted on prior to implementation.
- 3 IPART will encourage the use of lighting software models to demonstrate compliance with ESS Rule requirements.

2.2 Training

(Issues Paper questions 7 – 9)

The consultant's recommendations are summarised as follows:

- ▼ Qualified lighting professionals should have a role in the design and verification of commercial lighting upgrades, and
- ▼ ACPs should have a minimum level of competence in lighting design through completion of an introductory lighting course.

Submissions

Most submissions did not support the consultant's recommendation that ACPs must have in-house specialist lighting knowledge. They argued that the people responsible for lighting upgrades should be required to demonstrate lighting

competency. In their submissions, ACPs preferred the option of managing these requirements through commercial relationships with lighting service providers.

Many of the submissions stated that training requirements should be:

- ▼ Increased for people doing lighting designs or declaring compliance with standards, and
- ▼ Decreased for people doing the final installation of lighting upgrades.

Further discussion of requirements for lighting installers is included in the Section 2.4.1.

Most submissions agreed that the Illuminating Engineering Society's (IES) 'Enlightenment' course, or an equivalent, could provide the minimum level of competence in lighting design.

IPART Response

We agree that a minimum level of lighting knowledge should be held by people declaring that lighting standards have been met. We will investigate introducing a minimum training requirement that recognises different training courses, industry experience, and other lighting knowledge.

The Document Pack will record the competency level of those declaring lighting standards have been met. Should our requirements change in relation to training, we will advise of this through changes in the Document Pack.

IPART Action

- 4 IPART will investigate requiring a minimum level of lighting specific knowledge for people declaring that lighting standards have been met. The Document Pack will record the competency level of those declaring standards have been met.

2.3 Performance of lighting equipment

The consultant made numerous recommendations relating to equipment performance. The key recommendations we considered in the Issues Paper are summarised as follows:

- ▼ Product performance should be considered when accepting products for use in the ESS;
- ▼ Evidence of Minimum Energy Performance Standards (MEPS) should be required for the lamps used in T5 adaptor kits;
- ▼ Lighting upgrades should be 'permanent', requiring Luminaire replacement. The retrofit of existing lamps with T5 adaptor kits and LED tubes should not be allowed;
- ▼ Voltage Reduction Units should no longer be eligible products;

- ▼ IPART's process to accept Emerging Lighting Technologies (ELTs) could be streamlined; and
- ▼ IPART should publish a list of accepted ELTs and issue a single acceptance per product.

2.3.1 Requirements for Emerging Technologies

Equipment Performance

(Issues Paper questions 10 - 11)

Submissions

Most submissions considered that IPART should not be involved in the setting of performance requirements for lighting. Providing evidence to support product performance claims was preferred. However, submissions varied on the level of detail required to prove performance – from manufacturer's data sheets to NATA accredited laboratory test reports.

Several submissions suggested that we align with VEET scheme requirements for NATA laboratory testing of LED lamp lifetime. Some submissions also agreed that lamp lifetime is a good proxy for lamp quality - especially in the case of LEDs where the results from lifetime testing are used to calculate the reduction in light output over time.

A number of submissions supported the recognition of overseas schemes such as 'Energy Star' and 'DesignLights' as a good way to reduce transaction costs.

Some submissions proposed that IPART align the information requirements for the fluorescent tubes used in T5 Adaptor kits with those of the VEET scheme and current Commonwealth Government requirements. This would require evidence of MEPS registration where those lamps require MEPS registration as a condition of sale³.

A number of submissions also supported the introduction of a warranty on products and lighting installations as a means of ensuring lighting outcomes are maintained. Warranty periods between 2 and 5 years were suggested for lighting upgrades, especially where 10 years of energy savings are claimed at the time of installation.

IPART Response

Having considered these issues we support the consultant's recommendations for:

- ▼ Product performance data to be provided for ELTs, supported by laboratory test results. This includes alignment of LED lamp lifetime testing requirements with the VEET scheme as a priority;

³ <http://www.energyrating.gov.au/products-themes/lighting/linear-fluorescent-lamps/meps/>

- ▼ The use of data from product accreditation schemes such as Energy Star and DesignLights;
- ▼ Consideration of a minimum warranty on installed lighting equipment; and
- ▼ Requiring MEPS certification for T5 fluorescent lamps used in ELTs.

Each of the points listed above requires a Rule change and therefore will require action by the policy agencies. The exception is evidence of MEPS certification, which will be implemented through a change to the ELT portal.

IPART Actions

- 5 We will recommend to the policy agencies that lamp lifetime testing and equipment performance requirements for emerging lighting technologies (including the use of warranties) be included in the Rule.
- 6 IPART will require that all fluorescent lamps used in T5 Adaptor kits are supported by evidence of MEPS registration. The requirement will be implemented through the ELT Portal.

LED Tubes, T5 Adaptors and Voltage Reduction Units

(Issues Paper question 12)

Submissions

The consultant recommended that luminaire retrofits be excluded from the ESS, based on inferior lighting outcomes, installation permanence issues, and potential safety concerns. This recommendation would remove the use of T5 adaptors and LED tubes in the ESS.

LED Tubes

All of the submissions expressed support for retaining LED tubes in the ESS. The majority of submissions focussed on the potential for increased energy savings from LED technology. Some noted that safety concerns for LEDs have already been addressed by the IPART requirement for a Certificate of Suitability.

Submissions did not address the consultant's suggestion that lighting outcomes may be reduced as a result of using LED tubes (and T5 adaptors) in traditional fluorescent luminaires.

T5 Adaptors

Many submissions identified the potential for safety issues and reduced energy savings resulting from incorrect installation as reasons for removing the use of T5 Adaptors from the Rule. In particular, one submission supporting their removal came from a major supplier of T5 Adaptors, who noted that the technology was being superseded (mainly by use of LED tubes).

Some submissions supported the continued use of T5 adaptors in certain situations as the lowest cost energy savings measure.

Voltage Reduction Units

Some submissions suggested that it is hard to determine the actual energy savings from Voltage Reduction Units (VRUs), especially when energy savings are deemed. They recommended removing this technology from the commercial lighting method. Other submissions supported the continued use of VRUs, especially in situations where lighting upgrades are not feasible, or where the energy savings from voltage reduction may be the only viable energy savings measure.

IPART Response

We agree that any lighting technology should be eligible for use in the ESS, as long as good lighting outcomes, real energy savings and product safety can be demonstrated.

IPART Action

- 7 We will recommend to the policy agencies that a technology neutral position be taken on the eligibility of lighting equipment. IPART supports the continued use of any technology, as long as satisfactory lighting outcomes, real energy savings and product safety can be demonstrated.

2.3.2 Process for accepting emerging technologies

(Issues Paper questions 13 – 15)

Submissions

Many of the submissions commented that IPART's new web-based 'portal' for accepting the use of emerging lighting technologies (ELT) has resulted in a significant improvement to scheme administration.

A clear majority of submissions supported IPART publishing a list of accepted ELT products to further streamline the process of ELT acceptance. The submissions noted that publication of a list of accepted ELTs would reduce duplication, increase transparency and reduce processing times. Some submissions suggested that ACPs be given the option to choose which products are listed (in order to maintain competitive advantage).

Most submissions from ACPs were against changes to the current process of allowing only ACPs to apply for ELT product acceptance. Lighting suppliers advocated to be allowed to apply directly for ELT product acceptance, or be 'sponsored' by an ACP.

Most of the responses from lighting suppliers suggested that opening up the ELT acceptance process would reduce the burden on ACPs and increase IPART's engagement with suppliers. A number ACP submissions identified that allowing suppliers to apply directly would be likely to increase IPART's workload for products that may never be used in lighting upgrades.

Some submissions supported the outsourcing of ELT product acceptance, on the proviso that it save time and increase certainty. However, a majority of submissions supported continued use of the ELT portal and the publication of a list of products as the best way to improve processing times and reduce red tape.

IPART Response

Having considered these issues, we have decided to publish a list of all ELTs accepted for use in the scheme. This will streamline the ELT application process and align with the VEET scheme which currently publishes a list of all accepted lighting products.

We will continue to process ELT applications in-house, using our web based portal. ACPs will continue to notify us through the portal of ELTs used in their energy savings activities.

IPART Action

- 8 IPART will publish a list of accepted emerging lighting technologies (ELT) through the ELT Portal on the ESS website.

2.4 Safety and Electromagnetic Compatibility requirements

The consultant's recommended that :

- ▼ A *Certificate of Compliance Electrical Work* be collected by ACPs whenever one is issued for work undertaken as part of a lighting upgrade, and
- ▼ T5 Adaptors and LED tubes are removed from the Rule for safety reasons, or a more thorough investigation of their safety be undertaken if these products are retained in the scheme.

2.4.1 Electrical compliance

(Issues Paper question 16)

Submissions

Most submissions agreed that where an electrician is required to produce a *Certificate of Compliance Electrical Work*, it could be collected as supporting evidence of a lighting upgrade. Some submissions noted that although not all lighting upgrades would require this certificate, it can be an excellent source of information to confirm the details of lighting upgrades. A small number of submissions suggested that this certificate would add little value.

Some submissions recommended the mandatory use of qualified electricians for all lighting upgrades as a way to reduce safety concerns. These submissions highlighted that the VEET scheme requires the use of electricians for all commercial lighting upgrades. They also suggested that the increased use of electricians would help to ensure that electrical safety requirements are met, regardless of the type of lighting upgrade conducted.

IPART Response

We have decided to require collection of a *Certificate of Compliance Electrical Work* whenever the certificate is produced for a lighting upgrade. We recognise that this certificate will not be produced for all lighting upgrades. However, where it is required, it must be collected as part of the evidence to support the creation of ESCs.

IPART does not support requiring an electrician to do all lighting upgrades. Instead, we will recommend that the policy agencies strengthen electrical safety requirements in the Rule.

IPART Actions

- 9 IPART will require that the *Certificate of Compliance Electrical Work* is collected by ACPs for all lighting upgrades where an electrician generates the certificate. This will be introduced as part of the Document Pack.
- 10 We will recommend to the policy agencies that the Rule include references to electrical safety legislation, and not require the use of electricians for all commercial lighting upgrades.

2.4.2 Luminaire retrofits

(Issues Paper question 17)

Submissions

Retrofit installations, where a T5 Adaptor or LED Tube is used to replace an existing fluorescent lamp, are increasingly popular in the ESS. The consultants raised safety concerns and light output issues relating to retrofit installations.

Many of the submissions proposed that IPART should specify installation requirements where luminaire retrofits are carried out to ensure electrical safety is not compromised. Specific suggestions included:

- ▼ ACPs being required to provide clear information about how existing luminaires will be modified in order to install T5 Adaptors or LED Tubes (including removal and installation of capacitors and fuses);
- ▼ Strengthening the requirement that the Electrical Regulatory Authorities Council (ERAC) guidelines be adhered to, instead of suggesting that ACPs take them into account; and
- ▼ Ensuring that no accepted ELTs can be 'live' with only one end plugged in.

IPART Response

We have concerns about the way luminaire retrofits are carried out and the resulting uncertainty surrounding the quality of post-upgrade lighting outcomes.

By adding a T5 Adaptor or LED tube to an existing light fitting, the modified luminaire can be thought of as being 'designed' on site rather than in a testing/design facility. The lighting characteristics of the modified luminaire may not be known, resulting in significant changes in the light output, light distribution and glare from the lamps.

Luminaire modifications may also lead to poor power factor in the upgraded lights. We note that only an electrician is qualified to assess the modifications that would be required to ensure the correct power factor is maintained.

Having considered these issues, we will investigate stronger requirements on the adequacy of information to support luminaire modifications. We will also consider a requirement for luminaire modifications to be treated as 'electrical wiring work' – which means an electrician or supervised apprentice would be required to install those products.

IPART Action

- 11 IPART will standardise the requirements for the installation of LED tubes and T5 Adaptors. ACPs will be required to provide clear information about the installation of their products (including removal and installation of capacitors and fuses) and any modification of existing luminaires.

3 Next Steps

We have identified 11 actions in response to the Beletich Report and the Issues Paper submissions.

Actions 1, 5, 7 and 10 require changes to the ESS Rule. We have notified the policy agencies of our recommendations relating to these actions.

We have identified how we will move forward with the remaining actions. The 'Document Pack' will be presented in August 2013 and implemented progressively during the remainder of 2013. Publication of a list of accepted ELTs will be completed as soon as possible.

A Issues Paper Questions

Lighting standards and compliance with the Rule

Lighting Standards

(Section 3.1.1)

1. Should the requirements for compliance with AS/NZS 1680 focus on average maintained illuminance, uniformity of illuminance and disability glare?
2. Should IPART specify minimum lighting requirements where the AS/NZS 1680 Standard does not apply? How could IPART do this? Is the general VEET approach reasonable?
3. Where AS/NZS1680 does not apply, what other standards could be applied in addition to AS/NZS 1680 in order to ensure the quality of lighting upgrades?

Tiered approach to compliance with lighting standards

(Section 3.1.2)

4. Should Accredited Certificate Providers be required to use lighting industry standard modelling software to ensure lighting installations comply with relevant lighting standards, in particular AS/NZS 1680?
5. Should Accredited Certificate Providers be required to use lighting industry professionals to confirm compliance with relevant lighting standards?
6. What other options are there to ensure that lighting upgrades comply with AS/NZS 1680, while minimising compliance costs, especially for smaller projects?

Training

(Section 3.2)

7. Should Accredited Certificate Providers be required to demonstrate an understanding of lighting design to ensure lighting installations are of a similar standard to those typically carried out by lighting professionals?
8. What level of training should be required for persons carrying out commercial lighting upgrades?
9. What level of training would be appropriate to ensure that a lighting upgrade meets AS/NZS 1680 (eg, is training required for taking illuminance measurements using a light meter)?

Performance of lighting equipment

Requirements for Emerging Technologies

(Section 3.3.1)

10. Is there a preference for IPART to require either absolute specifications or evidence of claimed performance to support emerging lighting technologies?
11. What evidence of product lifetime and lumen depreciation should be required to support emerging technologies?
12. Should T5 Adaptors, LED Tubes and Voltage Reduction Units be removed as eligible products in the ESS?

Process for accepting emerging technologies

(Section 3.3.2)

13. Should persons other than Accredited Certificate Providers, for example, product manufacturers, be able to apply to have an Emerging Lighting Technology accepted for use in the Energy Savings Scheme, if nominated by an ACP?
14. Should a list of accepted Emerging Lighting Technologies be collected and published by IPART, with only one acceptance per product?
15. Would Accredited Certificate Providers support out-sourced product acceptance, if it resulted in a more streamlined Emerging Lighting Technologies acceptance process? Would Accredited Certificate Providers be prepared to pay a fee for this?

Safety and EMC Requirements

Electrical compliance

(Section 3.4.1)

16. Is it feasible for Accredited Certificate Providers to collect the Certificate of Compliance for each lighting upgrade where the electrical works require the certificate to be created?

Luminaire retrofits

(Section 1.4.2)

17. If T5 Adaptors and/or LED Tubes are retained in the scheme, what further steps can IPART take to manage the risks of potential safety issues relating to those products?