

# ECO Design regulations:

Possible effects on the entertainment lighting industry.

Call to arms to manufacturers, sellers and installers of entertainment and specialist lighting equipment.

## Précis version.

The ECO Design regulation proposals are set to cover all light sources and luminaires in a universal and general way. The technical teams working on this have taken some industries into consideration – for instance, video projection and sports field lighting – but provisions for entertainment lighting are vague and without clarity of scope and, as drafted, present a risk to our industry. None of the impact assessment or comparative data looked at a theatre stage and the particulars of our industry.

There are at least three aspects of the proposals that will burden our industry, either with cost or, more seriously, with ‘impossibility’, i.e. some technologies might no longer be permitted at all.

The three main controversial issues are:

### 1 Making a lensed, focusable spotlight and étendue:

This is a matter of physics and not of design. Until LED sources can be made as small as tungsten sources with equivalent output, étendue will be a dominant factor in the maximum achievable efficiency in an LED spotlight. LEDs of that power density do not exist and may never do, but certainly not any time in the next ten or more years.

This leaves spotlight designers with two choices: use a tungsten or arc source of the smallest possible size and étendue, or use LED arrays and expect to lose about half the possible source output.

Because of this, the proposed efficiency limits can never be met in a focusable spotlight, and it doesn't matter what the source is, none are even slightly close to the proposed requirements.

### 2 Additive colour mixing:

The regulations are devised for white light uses, and they contain useful and worthwhile improvements that define what white light means. The definition will help to improve the quality of General Lighting Service lamps and luminaires and stop the supply of lamps with terrible white light quality, so they are a good thing in principle.

Additive RGB (multicoloured) light, which may have a similar appearance to light from a pure white LED, cannot meet the proposed regulation limits, even though for any colour other than white it is more efficient. Subtractive colour, using filters over a white source, is less efficient than additive colour for any saturated shade, and yet the regulations would allow the white source and not the RGB (multicolour) source.

It does not make sense that a white source would be acceptable, but another source, that also looks white at some settings, is not allowed. The regulations do not take into account colour mixing at all.

3 Standby power/quiescent load:

The regulations propose to limit the off-state quiescent power to 500mW. In a simple lamp this is achievable. In a theatrical spotlight it is highly unlikely to be achievable. It is necessary to keep a processor running and listening to DMX for level data. There is no affordable technology now that can keep a power supply running, feeding a computer which may need to be high performance to assure reasonable dimming quality, and all with less than half a Watt. There are probably some unaffordable solutions, i.e. several power supplies in a product and some power switching components.

This requirement, if applied to theatrical lighting, is either impossible or expensive to achieve.

Those are three technical reasons why these regulations need to be modified for application to our industry.

There is also another consideration that has not been given much attention:

4 Theatrical stage lighting is a quite small proportion of the power consumed in a theatre.

Several studies have been carried out in working theatres that show consumption due to stage lighting in the range 5-10% of the consumption of the theatre building. Making even quite large savings in stage lighting consumption, assuming that is actually even technically possible, would have very little impact, and for an extremely high and unjustifiable cost.

The people writing the regulation text do not have malign intentions for our industry, but they do not understand it or know about it either. This is a call to manufacturers of luminaires to get together and produce a technical and market-led rationale for an exemption for lighting used in our industry. The potential risk is to all stage lighting, and is not really about the debate of tungsten vs LED, as both are threatened if the regulations are poorly drafted.

The threats are varied and mostly unknown. We do not know:

- If tungsten will continue to be permitted
- If it is permitted, if anyone will still make tungsten lamps of the kind we need
- If additive colour mixing will be either permitted or allowed to follow a different rule
- If the efficiency limits will be modified for spotlights
- If the apparent exemption granted for stage lights of 82,000 lumens and above will be modified down to a sensible level (i.e. some twenty or more times less)
- If an 'Only for professional use' exemption policy could be acceptable

...and so on.

Right now there is a real problem for investment in next generation spotlight design with no clarity about what will or will not be allowed.

We need to mobilise support from key players in our industry to present a coherent objection with a strong rationale that includes a good dose of real defensible science. One lone manufacturer cannot get this done, nor can PLASA alone – we must work together.

There is a fundamental issue about leaving our industry alone because:

- a) It doesn't matter anyway, nothing we do or don't do will really have any impact on future electricity consumption.
- b) We do not make 'ordinary lighting products' for General Lighting Service.
- c) An artist's tools should not be prescribed or proscribed by governments, unless there is a justification for a greater good backed by evidence.

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