To: **András Tóth, Policy Officer, DG Energy/European Commission**

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Date: 29 June, 2011

Re: **Comments on Working Documents on Directional Lamps and Household Luminaires Working Documents and Ecodesign requirements for directional lamps, LED lamps and halogen lighting converters[2]**

Thank you for the opportunity to review and comment on the draft Working Documents. This memo summarises our review of:

1. Energy Labelling Working Document 1: Explanatory note on possible energy labelling requirements for general lighting lamps (revised requirements) and household luminaires.
2. Energy Labelling Working Document 2: Draft Commission Delegated Regulation … implementing Directive 2010/30/EU with regard to energy labelling of general lighting lamps and household luminaires
3. Ecodesign Working Document: Ecodesign requirements for directional lamps, light emitting diode lamps and halogen lighting converters

With the notable exception of a few issues, we find the Commission has done a good job bringing together an extensive amount of material and proposing regulations that will support the adoption of energy-efficient lighting technologies. We do however have some concerns about the various proposals you put forward. These are detailed in the attached.

We look forward to the Consultation Forum on the 5th of July when Michael Scholand will attend and participate in the discussion as an expert on behalf of eceee and CLASP Europe. These comments should be taken as our initial contribution to the consultation on the draft working documents, and we hope to have the opportunity for further discussions with you following the meeting.

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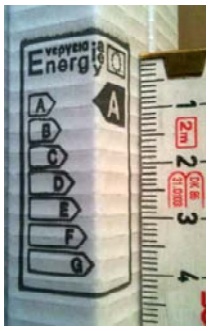
[2] Note: These comments were developed by CLASP's technical expert Michael Scholand in cooperation with eceee's Executive Director, Nils Borg. They should primarily be seen as input for discussion and do not necessarily reflect the final views of eceee as an organisation.

1. **Energy Labelling Working Document 1: Explanatory note on possible energy labelling requirements for general lighting lamps (revised requirements) and household luminaires.**

Section	Comment
1.1 Professional Lighting	The Commission is proposing to extend the existing energy label to all professional lamps. HID and LED lamps are not currently labelled. We strongly support this proposal as we believe all directional lamps should be labelled, in recognition of the fact that there may be different directional lamp technologies but all of them are used in directional applications – both in homes and commercial businesses. We also note that fluorescent lamps are labelled and they are used in both professional and home lighting, and thus we strongly support the inclusion of HID and LED lamps in the proposed label. We are concerned, however, and do not agree with the following aspects: • The decision not to re-allocate today's range of lamps across the A to G scale. While we understand the constraint the Commission is under with respect to the NDLS label being implemented now, we regret this decision as a lost opportunity to establish one consistent labelling approach for all lamp types. We note that the F and G classes are not used and D and E classes will soon be phased out, thus there will be four redundant categories, G, F, E, D – which is more than half of the scale of the original A to G label. Professional lamps, the Commission rightly notes are already class A or B. However, rather than reallocate the universe of lamps across the A to G scale, the Commission proposes to add new classes A+ and A++. We are concerned that the existing label categories are uneven in their bands of performance and that the public may perceive "A" as highly efficient, and the temporary measure of adding multiple "+" marks after "A" will fail to stimulate demand for highly efficient lamps. Furthermore, this approach is not 'future-proof' in that light emitting diode (LED) and ceramic metal halide technologies both have a lot of potential for efficacy gains, and these should be recognized and encouraged through the lamp label. • We are concerned that the Commission is proposing not to require labelling of professional lamps but only require that a letter be included in catalogues, on-line material, brochures and technical literature. We are concerned that some professional lamps are sold in professional and retail sales channels where lamps are displayed and some electrical contractors may purchase professional lamps from these retail sales channels. Just as the Commission now requires labelling of fluorescent tubes (see photo to the right, for a T5 lamp), we firmly believe the label will assist European consumers, domestic and professional, in making the right choices in the lamps they buy.  T5 Lamp Label

1.3 Luminaire Labelling	The Commission considers a few options pertaining to labels for consumer and professional luminaires. We are concerned that none of the labelling approaches presented address any aspect of the efficiency of the luminaire or any electronics that are permanently incorporated to the luminaire such as a ballast or transformer. We do not support the Commission's proposal to label the performance of lamps capable of being operated in the sockets of the luminaire – we do not believe this type of label will have any beneficial impact on purchasing decisions. For example, in luminaires which incorporate E27 or B22 sockets, the label will simply provide the range of compatible lamps (e.g., A to E) and not provide any information that enables the consumer to make a comparison or a more informed choice between two luminaires. Although we understand the intention of the Commission's "B" proposal, proposal "A" would do less harm since it would actually only apply to luminaires if a lamp is supplied in the same package. We recognise the difficulties associated with adopting a luminaire efficiency rating for the label, however, we consider the proposed labelling of compatible lamps to be ineffective, potentially confusing and counterproductive.
2.2 Levels	We support the proposal to have distinct energy efficiency indexes (EEI) associated with non-directional lamps and directional lamps. However the Commission's proposed class limits in the table are problematic because they are unclear, naming some possible lamp technologies which themselves have a range of efficacy levels (e.g., triphosphor lamps or metal halide HID) – and yet are lumped into the same labelling band. To facilitate discussion at the Consultation Forum meeting, we have prepared some possible rescaling of the class thresholds for the A to G lamp label. In order to maintain an approach of two types of labels for non-directional and directional lamps, we would like to discuss the option that within those two categories of lamps there are subgroups which use different equations to arrive at the EEI metric. In our table, we consider the reality consumers face when purchasing a lamp – that they need to select a lamp with the right voltages and sockets on which they are designed to operate. However even with this proposal, a rescaling appears to be unavoidable.
2.3 Calculation Methods	We agree with the statement made by the Commission: "If all technologies are treated equally, the only parameter that matters for the energy efficiency of lighting is how much light is obtained from a given energy input. In principle, it would be appropriate to set a single lumen/watt requirement for each class." That said, it is also true that the range of efficacy ratings offered to the various market segments (i.e., domestic vs. professional) are different and this proposal to have the same scale for all lighting technologies would either force the wrong technology onto one market segment or compromise the other. While we understand the practical issues surrounding the Commission's selection of Option C, we would encourage the Commission to consider a rescaling of products across the A to G scale using efficacy as the metric of measurement. We find that efficacy is a better metric for classifying lamps into labelling categories as it is transparent, accessible and widely-reported in the literature. We would encourage further discussion around a modified version of Option B, namely changing to an

	efficacy (lumen per watt) requirement that varies for different lamp types within the NDLS and DLS families of lamps. Fundamentally, the A to G label is best based around sockets where a range of possible lamps can be installed, not on its technology type or group.

2. Energy Labelling Working Document 2: Draft Commission Delegated Regulation … implementing Directive 2010/30/EU with regard to energy labelling of general lighting lamps and household luminaires

Page	Section	Comment
3	Paragraph (4)	The last sentence says "and lamps exclusively used in professional lighting, such as high-intensity discharge lamps." Suggest changing "exclusively" to "frequently".
4	Article 1	No changes, it seems reasonable to include the open-ended (c) for special purpose lighting products to be defined.
4	Article 2, para. 3.	The definition of a "lamp" requires that a lamp "includes any additional components necessary for starting, power supply or stable operation of the unit…." – but this is not the case with fluorescent or HID lamps, or indeed low-voltage halogen lamps. All of these are commonly sold without those additional components. Should this be revised?
5	Article 2, para. 5	Suggested revisions to the definition of a "filament lamp". These suggested revisions are shown as red strikeout deleting existing text: "filament lamp" means a lamp in which light is produced by means of a threadlike conductor which is heated to incandescent by the passage of an electric current~~. The lamp may or may not contain gasses influencing the process of incandescence~~;
5	Article 2, para. 7	Suggested revisions to the definition of a "tungsten halogen lamp", these are shown as blue underline adding new text and red strikeout deleting existing text: "tungsten halogen lamp" or "halogen lamp" means a filament lamp in which the filament ~~is made of tungsten and~~ is surrounded by gas containing halogens or halogen compounds. Tungsten halogen lamps are supplied either with or without integrated power supply;
7	Article 7	Article 7, Revision, states: "The Commission shall review this Regulation in the light of technological progress no later than four years after its entry into force. The review shall in particular assess the verification tolerances set out in Annex V." We suggest that Article 7 be revised to clarify whether this review will be *completed by* the four year mark (our preference) or whether it will be *initiated within* four years. Also, we suggest adding the requirement to review and revise the energy classes in the label unless our recommendation to abandon multiple "+" marks is adopted and a structure around Classes A to G is established.

Page	Section	Comment
8	Article 10	Potential editorial issue? For consistency with Article 9, it appears that paragraph 2 in Article 10 has omitted the following statement: "However, Articles 3 and 4 shall not apply to luminaires before [date to be inserted: 24 months after entry into force of this Regulation]."
9	Annex I, Label	The three images below present the past and proposed lamps energy label, followed by a cynical view of the future energy label.  Past  Proposed  Future We are concerned that products with average performance are given an "A" will mislead consumers into being satisfied they are purchasing top-quality products when there are better ones available on the market. We are concerned that the approach of adding plus marks undermines the effectiveness of the label, the impact it could have on the purchasing decision and the ambition it is meant to instil in the market. CLASP is carrying out a study in the second half of 2011 that will test this and other aspects of consumer comprehension of the energy label.
13	Annex I, Sect. 2 (p.12-13)	In this section, the Commission presents its proposal associated with Option B from section 1.3 of the Explanatory Note. This proposal is to have a label for household luminaires that conveys the range of efficiency values of the possible lamps that can be installed in the luminaire. As stated earlier in our comments, we do not believe this type of label will have any beneficial impact on purchasing decisions. For example, in luminaires which incorporate E27 or B22 sockets, the label will simply provide the range of compatible lamps (e.g., A to E) and not provide any information that enables the consumer to make a comparison or a more informed choice between two luminaires. Although we understand the intention of the Commission's proposal to adopt "Option B", the Commission's choice to adopt "Option A" where only luminaires supplied with a lamp would be labelled would be a less harmful option. In our view, the proposal to adopt "Option B" represents a lost opportunity for the Commission's labelling programme, and we do not support it. One option the Commission may wish to investigate is the voluntary label for domestic luminaires within the TopTen programme, described in this paper: http://www.topten.eu/uploads/File/056_Eva_Geilinger_final_Luminaires.pdf.
17	Annex III	Consistent with our comment on Annex II, in the "Technical Documentation" required by the Commission, we recommend that the important parameters of efficacy and lamp lifetime be added to the technical parameters listed in paragraph (f).

Page	Section	Comment
18	Annex IV	Consistent with our comment on Annex II and III, we recommend that efficacy and lamp lifetime be added. We want to ensure that in cases where the final owners are not able to see the product displayed, they are still able to benefit from these critical pieces of information when making the purchasing decision.
19	Annex V, item 1	The second paragraph in item 1 on Verification procedure for general lighting lamps allows for a 10% variance relative to the limit, threshold or declared value before being considered in non-compliance. The Commission does not provide any evidence or rationale for selecting 10%, and from our perspective it seems excessive. We believe a 10% variance is too large because of improvements in technology, quality standards in manufacturing, and corporate programmes to improve quality and consistency in manufacturing. We are concerned that in allowing such a wide variance the Commission is essentially establishing a performance requirement that is 10% below the published levels. As a starting point for negotiation, we recommend discussing the possibility of setting 5% as the maximum variance and require independent test data before increasing the allowable variance, as this would benefit quality manufacturers.
21	Annex VI	Table 1: energy efficiency classes for lamps. As per our earlier comment, we recommend a rescaling of the requirements associated with the letters demarcating the energy efficiency classes, such that they conform to an A to G scale and the metric should be changed to be efficacy. The Commission may consider establishing labels for classes of lamps based on the sockets in which they are designed to operate. This classification approach would be consistent with how end-users (household or electrical contractors) would select lamps for installation – based on the socket they need to fill – and this approach would provide information on the relative performance between substitute lamp types at the time of purchase. This proposal may not be without problems, and we would be prepared to discuss it further at the Consultation Forum meeting.

Page	Section	Comment
21	Annex VII	The EEI metric is calculated as the power corrected for control gear losses divided by the reference power. The corrected power is simply the "rated power" for models without external control gear and the corrected rated power for models with external control gear. We are concerned that the term "rated power" is not defined in this draft working document and that it could be interpreted as different values by different manufacturers (e.g., the nominal rated wattage, the measured wattage). Thus we suggest t that the Commission define this term for inclusion in the definitions section of the Implementing Measure to remove any ambiguity. Regarding the calculation methodology, we are concerned that the existing A to G scale would not adequately differentiate between poor performing and top-performing fluorescent lamps in a given subset. In other words, are all rare-earth ("tri-phosphor") lamps treated the same, or are efforts made by manufacturers to improve products and develop more efficacious replacement lamps rewarded through a higher label?

3. Ecodesign Working Document: Ecodesign requirements for directional lamps, light emitting diode lamps and halogen lighting converters

Page	Section	Comment
3	Article 2, para. 5.	The definition of a "lamp" requires that a lamp "includes any additional components necessary for starting, power supply or stable operation of the unit…." – but this is not the case with fluorescent or HID lamps, or indeed low-voltage halogen lamps. All of these are commonly sold without those additional components. Should this be revised?
3	Article 2, para. 7	Suggested revisions to the definition of a "filament lamp". These suggested revisions are shown as red strikeout deleting existing text: "filament lamp" means a lamp in which light is produced by means of a threadlike conductor which is heated to incandescent by the passage of an electric current~~. The lamp may or may not contain gasses influencing the process of incandescence~~;
3	Article 2, para. 9	Suggested revisions to the definition of a "tungsten halogen lamp", these are shown as blue underline adding new text and red strikeout deleting existing text: "tungsten halogen lamp" or "halogen lamp" means a filament lamp in which the filament ~~is made of tungsten and~~ is surrounded by gas containing halogens or halogen compounds. Tungsten halogen lamps are supplied either with or without integrated power supply;
5	Article 7	Article 7, Revision, states: "The Commission shall review this Regulation in light of technological progress no later than three years after the entry into force and present the result of this review to the Consultation Forum." Given this second requirement, we understand that this review should be completed no later than three years after entry into force, thus we propose replacing the first word "review" in that sentence with the words "complete a review of".

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6	Annex I, para. 1(c)	Paragraph 1 proposes not to cover 'special purpose products' and subparagraph (c) focuses on defining (for exclusion) directional lamps which have ultraviolet light emissions. It reads: "6% or more of total radiation of the range 250-780 nm in the range of 250-400 nm, – the peak of the radiation between 315 - 400 nm (UVA) or 280 - 315 nm (UVB)." We are concerned about two issues: 1) the paragraph is missing a word that would clarify whether a lamp must meet both ("AND") or either ("OR") of these criteria in order to be exempt. We suggest inserting the word "and" after the first criterion, thus necessitating that both conditions be met in order to be excluded. 2) We are concerned that the requirements as defined may allow mercury-vapour lamps or UV-driven white-light LEDs that have a poorly distributed phosphor layer and thus have a spike in UVA or UVB with 6% of their radiative power in that range to be excluded. Worse, this could become an incentive for lamp designers to develop a design that will circumvent the Ecodesign regulation for directional lamps through UV emissions. Thus, we suggest discussing the possibility of increasing the 6% of total radiation to 25% or some other value that is sufficiently high that this does not become a loop-hole. The Commission may also consider requiring lamps exempted under the UV emission criteria to be labelled as having potentially dangerous and harmful UV emissions, and that the lamp is not suitable for general illumination.
8	Annex II, (q)-(s)	Paragraphs (q) "no-load condition", (r) "active mode" and (s) "active mode efficiency" contain definitions for these terms, however they refer exclusively to halogen lighting converters: (q) "no-load condition" means the condition in which the input of a halogen lighting converter is connected to the mains power source, but the output is not connected to any primary load; (r) "active mode" means a condition in which the input of a halogen lighting converter is connected to the mains power source and the output is connected to a load; (s) "active mode efficiency" means the ratio of the power produced by a halogen lighting converter in active mode to the input power required to produce it; While we applaud the Commission's proposal to regulate halogen control gear, we are concerned that the definitions exclude the possibility of establishing coverage and efficiency requirements for CFLni ballasts, LED drivers or other lamp operating gear. As more energy-efficient alternatives to halogen permeate the general lighting market, these drivers will too, and the Commission has an opportunity to step into this emerging market and protect consumers from poor-quality drivers. We suggest that the Commission consider defining these terms more broadly, because the "no-load condition", "active mode" and "active mode efficiency" are not unique operating states for halogen lighting converters. Instead, the definitions could be made technology-neutral, and the regulations would phase in the various lamp driver technologies as appropriate over the three-tier time period.

Page	Section	Comment
9	Annex III, Table 1	This table defines "useful luminous flux" as the measured luminous flux in a defined cone. We have concerns about the methodology proposed in this table and the logic behind it. Our view is that all directional light emitted by a directional lamp is useful and should be measured. Indeed, it is common to find directional lamps (e.g., MR-16 lamps) being used in general service illumination applications such as kitchens and bathrooms, as well as in commercial settings such as restaurants and elevators. We therefore hesitate to agree with the Commission's proposal to ignore light output from the lamp which falls outside of a defined 90 degree or 120 degree cone. The most accurate measurement of luminous flux from narrow and wide-beam directional lamps is to measure the total downward flux emitted from the lamp. That is, the measurement of light emitted in a 180° cone, or half a sphere. Take, for example, two directional lamps, which have the same or different beam angles (i.e., point where lamp is at 50% of the optical axis intensity). These lamps could emit different amounts of light outside of the measured cone, due to their photometric properties – and as such, one lamp would be unnecessarily disadvantaged. Expanding the measurement of light to a 180° cone will also have the advantage of allowing the light output from the lamp to be measured in an integrating sphere (less expensive test method), rather than requiring use of a goniophotometer or a photosensitive wall. This approach will reduce the costs of market monitoring and regulatory enforcement for the Member States. However, we also believe it is important that narrow-beam lamps perform as advertised on the box, and there is a need to ensure they do for the sake of consumer protection and fair competition. If it can be shown that there are low-cost methods, we would welcome a continued discussion on these issues.
10	Table 2	We are concerned about the ambition of the Commission's proposal in Table 2. We suggest that the Commission consider adopting a level that would require halogen infrared reflective coating (IRC) technology for low-voltage halogen lamps. This is a cost-effective, commercially available, proven technology, and it would be possible for the Commission to adopt this requirement starting in 2013. Furthermore, we recommend establishing a cap on the rated wattage of these lamps, such that a 35W IRC LV halogen reflector lamp maintains the light output of the 50W baseline lamp it's replacing. We make this suggestion because we are concerned that the market may start to carry 50W IRC LV halogen lamps which produce more lumens and will not save any energy. In Annex A, we present a proposal that was considered in Australia to look at the combination of an efficacy and wattage cap for certain lamp types to prevent the risk of eroded energy savings.
10	Table 3	This table presents some "correction factors" that adjust the maximum rated power in Watts of the measured lamp. These adjustments either make the

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		regulation for lenient by dividing by a number less than 1 (as for high CRI lamps) or make it more stringent by dividing by a number greater than 1 (as for HID lamps with external lamp control gear). Table 3 inserted below is from the 244/2009 regulation:

Table 3

Correction factors

Scope of the correction	Maximum rated power (W)
filament lamp requiring external power supply	$P_{max}/1,06$
discharge lamp with cap GX53	$P_{max}/0,75$
non-clear lamp with colour rendering index ≥ 90 and P ≤ 0,5 * (0,88√Φ+0,049Φ)	$P_{max}/0,85$
discharge lamp with colour rendering index ≥ 90 and Tc ≥ 5 000 K	$P_{max}/0,76$
non-clear lamp with second envelope and P ≤ 0,5 * (0,88√Φ+0,049Φ)	$P_{max}/0,95$
LED lamp requiring external power supply	$P_{max}/1,1$

Table 3 pasted below is from the draft working group document:

Table 3

Correction factors	
Scope of the correction	**Maximum rated power (W)**
filament lamp requiring external lamp control gear	P_{max} / 1.06
LED lamp requiring external lamp control gear	P_{max} / 1.20
fluorescent lamp requiring external lamp control gear	$P_{max} / \frac{0.24\sqrt{\Phi} + 0.0103\Phi}{0.15\sqrt{\Phi} + 0.0097\Phi}$
high-intensity discharge lamp requiring external lamp control gear	P_{max} / 1.10
lamps other than filament lamps with colour rendering index ≥ 90	P_{max} / 0.85
LED lamp with 15° ≤ beam angle < 20°	P_{max} / 0.9
LED lamp with 10° ≤ beam angle < 15°	P_{max} / 0.85
LED lamp with beam angle < 10°	P_{max} / 0.80

We have no objection to any of the correction factors which are greater than 1, as we acknowledge the value these denominators offer by accounting for losses in the control gear. We do, however, have some concerns about two aspects of proposed Table 3.

1) The correction factor for "lamps other than filament lamps with colour rendering index > 90", the Pmax is divided by 0.85. We suggest replacing the phrase "lamps other than filament lamps" with "integrally ballasted compact fluorescent lamps". We accept that the phosphor layering can increases losses at very high CRI ratings,
2) however this does not apply to other technologies and we are concerned that the loose language of 'lamps other than filament

Page	Section	Comment
		lamps' could result in a loop-hole. This should not apply, for instance to emerging LED products are combining white light LEDs with amber and red LEDs, as well as any RGB colour mixing LED lamps designed to achieve a desired CRI. For the LED technology, there is no reason the efficacy of the lamps should be any lower at high CRI values. Thus we recommend confining this relaxing of the regulation to CFLi lamps. 3) The last three rows in the table propose to have lower and lower efficiency regulations for LED lamps with tighter and tighter beam angles. The rationale given under the table states that this is due to the absence of spill light and thus because they achieve a more precise optical output in the beam, they should be held to a lower efficiency standard. We have concerns with this proposal for LED lamps. In our view (expressed in our comment on Table 1) all forward lumens emitted by a lamp are useful. There is no justification for having a lower standard because the LED is producing a more precise optical output. For most directional lighting applications in the market, precision optics are not critical, and very often spill light serves a useful purpose. Therefore, we question the logic behind the proposal to have lower and lower regulatory requirements for LED lamps that have tighter and tighter beam angles. Having little or no spill light is not a reason to relax the regulation for LED lamps – indeed, the EEI calculation takes into account light output and wattage input. If the LED has less spill light, then presumably it will have lower wattage consumption, and thus its EEI would otherwise be the same as if it had poor optics and lots of spill light. We would welcome more discussion on this issue and rationale behind the Commission's recommendation in the context of the regulatory metric.
14	Table 7	We have reviewed and support the values presented in the table. The L70F50 values are good, and we understand the thermal issues that would require a lowering of the operating hour requirement for retrofit LED lamps. The colour consistency requirement is one MacAdam ellipse step tighter than the European Quality Charter (EQC), and we believe this both appropriate and reasonable given recent improvements in manufacturing of good quality LEDs. We also support your decision to establish power factor values for LED lamps that are higher than the EQC. The EQC requires only a PF of 0.5 for 2 – 25W which will constitute most of the LED products sold. This requirement is no better than CFLs, and is an unfortunate lost opportunity to improve the power factor and reduce losses in the distribution networks. Perhaps our only comment would be to raise the 2W-5W group from >0.4 to >0.5 PF.
15	3.1.2	We suggest that efficacy, provided in lumens per watt, should be reported on the websites and in technical information accompanying the lamps sold.

Page	Section	Comment
18	Table 9	We find the Commission's Table 8 to be somewhat confusing. We do not find it intuitive and it is difficult to grasp. We request that the Commission make its proposal clearer and more readily understood. We are struggling to understand the rationale behind a declining multiplication factor in Table 9 for LED lamps that have increasingly narrow beam angles. By having a lower "luminous flux multiplication factor", the Commission is proposing to reduce the stringency of the requirement on these lamps. We are concerned about this proposal for the following reasons: 1. First, it is important to note that Table 8 is structured around lamp types and wattages, not beam angles. Thus consumers purchasing LED lamps will be matching the shape and application, not the number of degrees of beam angle. 2. Second, LEDs do not use large reflectors like halogen, CFL or HID reflector lamps. Thus, there is no shadowing effect, re-adsorption of light, or reflector losses that cause a reduction in efficacy, particularly with increasingly narrow beam angles. LED packaging is designed in such a way that they are naturally a directional light source and should remain as such. 3. Third, the beam angles presented in Table 9 are all well within the measurement beam angle 90 degrees (or indeed, our proposal of 180 degrees), the total luminous flux from each of these LED lamp types will be captured in the test method. For all of these reasons, we see no technical justification for a declining multiplication factor and recommend either no correction (see our comment on Table 3 above), or one factor for directional LED lamps.
18	3.1.3	We believe that efficacy, provided in lumens per watt, should be reported on the websites and in technical information accompanying the lamps sold.
20+	Annex IV	Market Surveillance – all of the tolerances in this section allow for 10% variance from the required values. We feel that the 10% variance is excessive, with all the other adjustments embedded in the regulation for the covered products. We would appreciate being able to review hard data that justifies the 10% level, to help clarify why the Commission has chosen this potentially arbitrary level. As we stated earlier, we are of the understanding that manufacturer quality has improved in recent years and thus process control and tolerances have narrowed. Reducing the allowable variance to 5% may be an option that is acceptable to all parties and would result in greater energy savings for Europe.

Annex A. Directional Lamp Cap on Wattage

This report was prepared by Beletich Associates, for use by governments in regulating 12V directional fittings and lamps. The Australian Government is currently considering this initiative.

Worldwide, 12V directional lamps have become exceedingly popular for general purpose illumination in homes and businesses, particularly in a 50W, MR16 format. However these lamps were originally intended for the purpose of spot lighting - their misapplication to general purpose illumination of open space results in the need to use large quantities of fittings, with significant impacts on energy consumption.

For the existing installed stock of MR16 fittings, the only suitable replacement energy-saving lamp is currently a 35W IRC lamp. Known CFL, CCFL and LED lamps in M16 format do not generate enough light to be a viable like-for-like replacement for 50W MR16 halogen lamps. This is largely due to the size restriction of the MR16 envelope, which hinders the light output of CFL/CCFL lamps and the heat transmission from LEDs.

An effective path for dealing with this problem is as follows:

- Fittings: require all new fittings to meet a "luminaire efficacy" target that effectively eliminates MR16 halogen fittings, in favour of CFL and LED. For general purpose illumination of open space, these fittings are acceptable. This initiative could be delayed to allow LED fittings to improve in price and performance in the near future.
- Lamps: eliminate 50W MR16 lamps in favour of 35W IRC lamps. This proposal is discussed below.

Luminous Flux and Voltage

The latest generation of high quality 35 Watt IRC halogen lamps are able to generate luminous flux equivalent to conventional 50 Watt models, and can be readily substituted at the time of lamp failure, or earlier.

Testing of a wide range of MR16 lamps and transformers, recently carried out by Beletich Associates reveals that:

- The most common 50W lamp models generate between 450 and 750 downward lumens.
- High quality 35W IRC models generate between 500 and 700 downward lumens.
- Loading of 50W electronic transformers with 35W did not cause an appreciable voltage rise at the secondary terminals.
- Loading of 50W ferro-magnetic transformers with 35W lamps did cause a slight voltage rise but did not exceed 12 Volts.

These results, together with preliminary discussions with major lamp companies and the existence of large-scale utility-driven 35W lamp replacement programs, indicate that 35W IRC lamps are a suitable alternative to 50W halogen lamps on a large scale.

Proposal – Mandatory Flux and Wattage Limits

In order to eliminate 50W lamps in favour of 35W IRC lamps, the following mandatory limits could be imposed for MR16 lamps:

- Maximum rated wattage of 35W (with tolerance).
- Minimum luminous flux of 500 (downward) lumens (for 35W lamps).
- Minimum lifetime of 4000 hours (all tested IRC lamps were rated 4000-5000 hours).

The incrementally higher consumer cost of IRC lamps, at the time of lamp replacement, is expected to be repaid within 12 months for residential dwellings[3] and within a shorter period for businesses (whose operating hours are longer).

Other Risks and Benefits

Energy savings of 30% would result from the phasing out of 50W MR16 lamps. Including transformer losses, power savings from replacement of 50W lamps with 35W lamps are around 19W (ferro-magnetic transformer) and 16W (electronic transformer).

MR16 lamps are available in 20, 35, 50 and 71W. Eliminating 50W MR16 lamps from the market would allow 71W MR16 lamps to continue to be used, although the market for these lamps is thought to be almost non-existent. In addition, 71W lamps cannot be substituted for 50W lamps as this would exceed the rating of the connected 50W transformer, causing triggering of its thermal overload protection. 71W lamps and fittings could also be eliminated if required in order to prevent an increase in their popularity.

Reduction of MR16 lamp wattage would reduce the insulation fire risk that has become apparent from their use.

[3] Incremental lamp cost of AUD$2.50 from market survey by Beletich Associates; electricity cost of AUD$0.20/kWh; residential operating hours of 2.25 hours/day for MR16 lamps; source: Syneca 2008, Regulatory Impact Statement Consultation Draft, Proposal to Phase-Out Inefficient Incandescent Light Bulbs, Discussion draft for stakeholder comment issued under the auspices of the Ministerial Council on Energy, September 2008, Prepared by Syneca Consulting for DEWHA.