



Energetics

Review

**MEPS for Lamps
Addendum to
"The Ellis Report"**

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For

***Australian Greenhouse
Office***

Canberra



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Executive Summary

The National Appliance and Equipment Energy Efficiency Committee (NAEEEC) is collecting information for consideration by the Australian and New Zealand Minerals and Energy Council (ANZMEC). NAEEEC is exploring the benefit of mandating minimum energy performance standards (MEPS) for linear tube fluorescent lamps and supporting MEPS with a range of measures for these and other lamp types.

MEPS is a government regulatory program stipulated in state and territory law that excludes from the market, products which do not meet minimum energy performance levels. NAEEEC comprises energy efficiency officials and regulators that implement the MEPS program in Australian and New Zealand. ANZMEC comprises the Minister of State from each Australian jurisdiction and New Zealand, responsible for energy matters.

A study was commissioned by NAEEEC (through the Australian Greenhouse Office) to investigate options for MEPS on lamps. The study was carried out by Mark Ellis and Associates and a report was published in March 2001 (The "Ellis Report") titled "Analysis of Potential for Minimum Energy Performance Standards for Lamps".

As the report is now over 15 months old, this addendum was commissioned to review and update (if necessary) the Ellis report prior to issuing a public statement and seeking submissions from interested parties.

The "Ellis Report" and this addendum will be available at the following web sites:

[HTTP://www.greenhouse.gov.au/](http://www.greenhouse.gov.au/)

[HTTP://www.energetics.com.au/](http://www.energetics.com.au/)

Energetics was commissioned to carry out the review and specifically to review the recommendations and ensure that basic assumptions made in the report have not changed significantly in the interim period.

We can confirm that recommendations for MEPS for linear fluorescent tubes are appropriate and that the levels of efficacy will basically ensure that lower efficiency halophosphate tubes will not qualify and be removed from the market. The Ellis Report recommended MEPS levels consistent with established MEPS levels in relevant trading partners. The Ellis Report also foreshadowed potential development of New Zealand MEPS for linear fluorescent lamps. New Zealand has subsequently developed and published NZHB 4782, establishing linear fluorescent lamp MEPS for in that country. Given the close economic ties Australia enjoys with New Zealand, it is appropriate to consider NZHB 4782 in the establishment of Australian MEPS levels.

This brief addendum report confirms the recommendations in the Ellis Report. We have commented wherever appropriate on critical factors that may have changed in the past 15 months. It is recommended that the MEPS program for lamps proceeds to the public statement and the recommended efficacy levels are set out on the following pages.



Market Overview

The Ellis Report sets out the basic lighting types and the “lamps” commonly used in domestic, commercial and/or industrial applications namely:

- Incandescent types, including tungsten filament and tungsten halogen lamps;
- Fluorescent types, including linear (double-ended) and compact (single-ended); and
- High Intensity Discharge types, including metal halide, high and low pressure sodium, mercury discharge and others.

Linear tube fluorescent tubes account for over half (58%) of the combined lighting energy consumption and greenhouse gas emissions in Australia’s industrial, commercial and residential sectors. The next largest contributor is GLS or “general lighting service” at 18% followed by HID, “high intensity discharge” generally used throughout industry). GLS and HID are made up of a multitude of diverse lamp types and specifications, which suggests that it may be more difficult to apply MEPS successfully in the short term.

For this reason the “Ellis Report” has concentrated on tubular fluorescent lamps and these are the only lamps for which MEPS are recommended.

This assessment remains valid at the time of this addendum.



Discussion of Recommendations

The Ellis Report makes two main recommendations:

- MEPS are recommended for linear fluorescent lamps
- A voluntary trial of a standardised labelling program for all domestic lamp types in Australia based on EU programs. Mandatory labelling to be considered if the trial does not achieve significant market change.

Both recommendations remain valid and are supported.

PROPOSED AUSTRALIAN MEPS LEVELS

The Ellis Report identified relevant Minimum Energy Performance Standards relating to linear fluorescent tubes existing at the time of writing in Canada and USA.

Since the Ellis Report was published, New Zealand has published NZHB 4782, providing for MEPS on linear fluorescent tubes in that country. These are broadly consistent with the MEPS established in the other countries reviewed in the Ellis Report and with the recommended MEPS levels established in the Ellis Report itself.

Australia and New Zealand enjoy close economic relations and established The Trans Tasman Mutual Recognition Act (TTMRA) in 1996. The purpose of the TTMRA is to “implement mutual recognition principles between the parties regarding the sale of goods... consistent with the protection of public health and safety, and the environment”. The objective of the TTMRA is to “eliminate regulatory barriers to the movement of goods and service providers between Australia and New Zealand, promoting trade between the two countries”.

In effect this means that goods meeting New Zealand’s standards will automatically be accepted in Australia also. It is therefore sensible to adopt parallel standards where no mitigating circumstances apply.

It is recommended that Australian MEPS levels be aligned with the newly published New Zealand standard NZHB 4782.

The proposed MEPS will result in the effective elimination of halophosphate lamps from the Australian market.

The NZ Standard had not been issued prior to the Ellis Report. We have therefore recommended that the proposed MEPS be brought into line with NZHB 4782, which means that the proposed MEPS must specify minimum values for both initial and maintained, average lamp efficacy figures.

The proposal should closely follow the NZ Standard, which includes specifications for lamp sizes up to and including 1500mm but does not include 1800mm. The Canadian and USA standards also do not include specifications for 1500mm and 1800mm sizes, which are used in Australia. The Ellis Report recommends a level of MEPS for 1500mm lamps (which is the same as that for 1200mm lamps). We agree with this recommendation and note that it may be possible to increase the efficacy figures further following inputs from the lighting manufacturers (because longer tubes are inherently more efficient).



The following table shows our revised proposal for MEPS for linear tube fluorescent lamps.

Definitions from IEC 60081 include "Initial Efficacy" measured on a new lamp after 100 hours in lumens/Watt and "Maintained Efficacy" measured 70% of the lamp rated life. These two outputs have been included in the suggested MEPS.

Nominal Lamp Length	Minimum Average CRI	Minimum Average Lamp Efficacy (Initial lm/W) 100 hours	Minimum Average Lamp Efficacy (Maintained lm/W) 70% life
600mm	69	>= 70	>= 57.5
1200mm	69	>= 85	>= 70
1500mm	69	>= 85	>= 70
1800mm	69	>= 85	>= 70

Note: NZHB 4782 allows for four classes of efficacy (P, Q, R, and S). Here we have recommended minimum allowable efficacy that would qualify for the NZ MEPS in class Q or R.

Testing of lamps is specified by Australian Standards (AS1201), which also specifies "lumen maintenance levels"; based on the ratio of output at 2,000h (or 70% of rated life as appropriate) to initial output. AS1201 is identical to IEC 60081 and is the proposed basis for testing under MEPS.



Discussion of Other Factors

TECHNICAL ISSUES

It has been identified that some triphosphor lamps may not be applicable in selected applications. For example, some triphosphor lamps may not provide appropriate colour rendition for clinical diagnosis on hospital wards.

It is noted that:

- Some manufacturers confirm that suitable lamps are available (but must be specified);
- NZHB 4782 specifically does not apply to lamps for medical applications and the Australian MEPS could incorporate a set of exclusions that allows specific applications to be exempted from MEPS.

ECONOMIC IMPLICATIONS

Halophosphate lamps are available in two tube diameters: T12 (38mm diameter tube) and a newer (more efficient) T8 (26mm diameter tube). Triphosphor lamps are not available in the old T12 size, but are available in the T8 size and a new T5 (16mm diameter tube) size. The T5 is highly efficient but is not directly interchangeable with pre-existing T12 or T8 halophosphate installations.

The Ellis Report provides a preliminary financial comparison between T8 triphosphor lamps and T12 halophosphate lamps, showing a favourable (less than 2 year) payback period for triphosphor lamps. Since the time of this report, the more efficient T8 lamp has become the dominant standard in the market. Energetics conducted a brief financial analysis comparing triphosphor T8 lamps with halophosphate T8 lamps. This confirmed that the use of triphosphor lamps is still financially viable under these conditions.

Energetics ran a model using the SEDA "energy smart" web site that showed up to 37% savings on energy when air conditioning was taken into account. Simple payback within three years is highly likely and possibly within two, which suggests that returns to purchasers are both reasonable and acceptable.

Labour cost for lamp replacement is reduced proportionately and in the case of new installations and refurbishment, the higher light output from Triphosphor lamps allows the same lighting task to be achieved with fewer lamps

This may result in reduced luminaire numbers leading to additional savings in installation costs

We agree that preliminary indications are that moving to exclude halophosphate linear tube fluorescent lamps from the market will be approximately cost neutral in terms of installation, operating and maintenance costs.

A more detailed analysis of the potential economic impact of the introduction of MEPS will be conducted at a later stage in the MEPS development process.