22 January 2018

Mr David Boughey
Assistant Director
Energy Division
Department of the Environment and Energy
GPO Box 787
Canberra ACT 2601

Energy Networks Australia – Response to Draft Minimum Energy Performance Standards for LED Lighting

Dear David,

Thank you for the opportunity for Energy Networks Australia to provide a submission to the Department of the Environment and Energy regarding the proposed Draft Minimum Energy Performance Standards (MEPS) for LED Lighting.

Energy Networks Australia is the national industry association representing the businesses operating Australia's electricity transmission and distribution, and gas distribution networks. Member businesses provide energy to virtually every household and business in Australia.

Energy Networks Australia recognises that MEPS are required to support the uptake of more efficient and effective lighting products. As such, we understand that the intent of the draft MEPS is to specify minimum performance levels, whilst still being practical and aligned with existing international and national standards as appropriate.

Energy Networks Australia and our members also appreciate the approach the Department of the Environment and Energy has taken in consulting with industry stakeholders.

However, while generally supporting the measures outlined in the MEPS for LED lighting, Energy Networks Australia, in consultation with our members, have identified several issues that we consider require further consideration by the Department, which are outlined below.

Power Factor requirements

As the Department is aware, the fundamental power factor ("True PF") is defined as the ratio of the active power (P) to the apparent power (S) with the ideal value being 1.0.. Low fundamental power factor from LED lighting imposes real costs on an electricity network, and therefore consumers, in terms of underutilised capacity, extra network power losses, additional voltage drop, and the potential requirement for wide scale installation of capacitor banks.

Energy Networks Australia supports the application of international standards when specifying power factor requirements, specifically IEC 61000. When setting minimum standards, Energy Networks Australia suggests that any requirements specified within Row Reference Number 14 (Attribute: 'Fundamental Power Factor'; page 13) should

clearly state that the True Power Factor is to be measured and complied with – noting that the present version refers *to Displacement Power Factor*. Energy Networks Australia further recommend that LED lights with power ratings less than 5 watts should also be required to meet higher PF limits (actual value to be decided in consultation with industry. Furthermore, it is also prudent for large LED installations to consider local service and installation rules, to ensure effective and efficient service from the network.

Harmonics requirements

Electricity network service providers expressed concern regarding the contributions of LED lighting (particularly with commercial lighting installations) to additional harmonic disturbance on the network. Additional harmonic disturbance can lead to potential overheating and damage to distribution transformers and customer devices, waveform interference causing mal-operation of control equipment and audible noise in customer equipment (e.g ceiling fans).

More measurement and assessments of harmonics in the network is required to fully understand the impact of changing loads with the increased introduction of new appliances including LED lighting, solar power inverters and switch mode power supplies. Harmonic distortion, particularly triplen odd harmonics (e.g 3^{rd}, 9^{th} harmonics) may also contribute to and exacerbate current problems being experienced with unbalanced networks and high flows into the neutral circuit return current.

Measurement of harmonics in the past has focused on large installations with known harmonic impacts, with heavy reliance on product performance standards being set appropriately for smaller sized equipment to control network impacts. Thus, there is currently limited knowledge about the evolving residential power use.

Energy Networks Australia believes that minimum performance standards should be aligned with the IEC standard 61000-3-2. As such, we suggest that any requirements specified within Row Reference Number 15 (Attribute: 'Harmonics'; page 14) should comply with IEC 61000-3-2.

Overall, the proposed MEPS for LED lighting, when combined with our suggestions above, has the potential to be a practical and reasonable approach to this important issue. Energy Networks Australia looks forward to working with the Department, to ensure that the final version of the MEPS exhibits the practical and reasonable approach outlined above.

Should you have any additional queries, please contact our Senior Program Manager – Asset Management, Heath Frewin on (02) 6272 1555 or hfrewin@energynetworks.com.au

Sincerely,

Stuart Johnston
Executive Director – Assets and Network Transformation