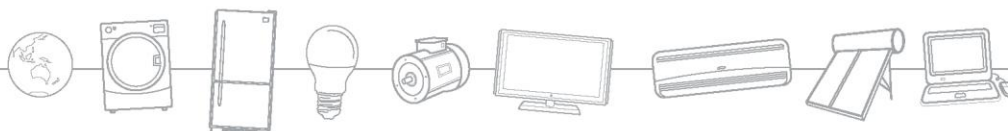




# Equipment Energy Efficiency Program Issues Paper

**Televisions, Computer Monitors  
and Digital Signage Displays**

**February 2022**



A joint initiative of Australian, State and Territory  
and New Zealand Governments.

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This document is available at [the Energy Rating website](https://www.energyrating.gov.au/).

# 1. Introduction

Televisions and computer monitors are subject to minimum energy performance standards (MEPS) and energy rating labelling requirements in Australia and New Zealand. The Commonwealth Department of Industry, Science, Energy and Resources (DISER) – on behalf of the Equipment Energy Efficiency (E3) Program – is planning to release a consultation regulation impact statement (RIS) on the MEPS and labelling requirements for televisions, computer monitors and digital signage displays.

E3 is considering whether to update Australia and New Zealand's television and computer monitor MEPS and labelling requirements and harmonise these requirements with prevailing international standards. E3 is also considering whether to extend energy efficiency labelling to include digital signage displays to align with the new European requirements for electronic displays. The EU Ecodesign regulations include MEPS for televisions and computer monitors, and mandatory labelling for electronic displays including televisions, computer monitors and signage displays. Europe included all 3 types of display, because of the increasing overlap in functions between different display types.

One policy option under consideration by E3 is to adopt the 2021 or 2023 EU Ecodesign efficiency levels as MEPS levels for televisions and computer monitors, using the Ecodesign test method. Another policy option under consideration is a 2 stage approach of adopting the 2021 EU Ecodesign levels first, followed by adoption of the 2023 levels several years later.

For energy rating labelling, E3 is considering two policy options. One is to adopt a similar approach to the EU to develop a star rating metric for Australia and New Zealand, using the Ecodesign test method<sup>1</sup>. The other labelling option is to use the US ENERGY STAR® TV V9.0 metrics and test method to underpin the star ratings on the E3 energy rating labels for televisions, computer monitors and digital signage displays. This option would require two different test sequences for MEPS and labelling but one single test set-up.

The consultation RIS will examine the costs and benefits of these and other issues discussed in this Issues Paper. E3 is seeking stakeholders' views on what regulatory changes would be appropriate to examine during the RIS process. Public consultation and submissions will assist in determining which issues should be explored through the RIS process and which issues do not need detailed consideration or should not be pursued.

## 2. Regulatory Framework

The Equipment Energy Efficiency (E3) Program enables collaboration between the Australian Government, states and territories and the New Zealand Government on an integrated program of energy efficiency standards and energy labelling for appliances and

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<sup>1</sup> CENELEC EN 62087 Parts 1 to 3 (2016), which is an adoption of IEC 62087 Parts 1 to 3 (2015)

equipment. The E3 Program operates under the *Greenhouse and Energy Minimum Standards Act 2012* (the GEMS Act) in Australia and the *Energy Efficiency (Energy Using Products) Regulations 2002* in New Zealand, to improve the energy efficiency of appliances and equipment sold in Australia and New Zealand.

The E3 Program is overseen by the Energy National Cabinet Reform Committee and advised on energy efficiency matters by the E3 sub-committee of the Energy Technology Working Group (ETWG) which is made up of officials from participating jurisdictions. The Commonwealth Department of Industry, Science, Energy and Resources (the Department) prepared this issues paper on behalf of E3/ETWG.

In Australia, televisions are regulated under the provisions of the *Greenhouse and Energy Minimum Standards (Television) Determination 2013 (No. 2)* and computer monitors under the *Greenhouse and Energy Minimum Standards (Computer Monitors) Determination 2014*. In New Zealand, televisions and computer monitors are regulated under the Energy Efficiency (Energy Using Products) Regulations 2002 ('the Regulations'). The Regulations generally mirror the requirements in GEMS determinations. References to a *determination* in reference to the GEMS Act are assumed to apply in the equivalent manner under the Regulations in New Zealand. In this paper, determinations and the Regulations are collectively referred to as 'efficiency regulations'.

## 3. Why Government Action is Required

### 3.1 Televisions

Mandatory energy labelling and MEPS for televisions was introduced in Australia in 2009 and in New Zealand in 2012. The stringency of both was increased in 2013<sup>2</sup> in Australia and New Zealand. Television technologies and features have changed and advanced significantly since 2013. The current regulatory framework is out of date and unable to deal adequately with some of the new products on the market. In particular, the test method used in Australia and New Zealand was published in 2010 and is based on a superseded international standard<sup>3</sup>. This international test method is under revision and a new standard is expected to be published in April 2023<sup>4</sup>, meaning that the Australian and New Zealand test method standard will become even more out of date.

Energy use per television has been increasing since 2014<sup>5</sup>. This is due, in part, to an increase in the average size and resolution of screens. Energy consumption is linked to screen area, and resolution, which determines the number of pixels.

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<sup>2</sup> *Greenhouse and Energy Minimum Standards (Television) Determination 2013 (No. 2)*

<https://www.legislation.gov.au/Details/F2013L01500>

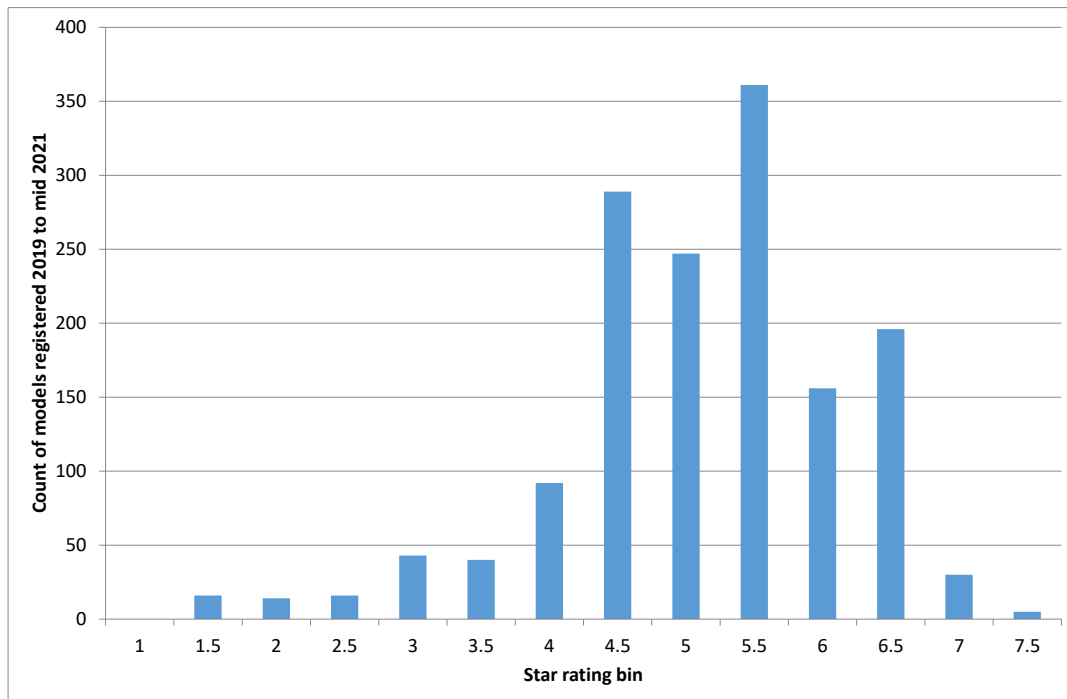
<sup>3</sup> IEC62087 Edition 2 published in 2008

<sup>4</sup> IEC information on forecast publication date <https://webstore.iec.ch/publication/22583#workinprogress>

<sup>5</sup> For example, see New Zealand's sales and efficiency data for computer monitors and televisions

<https://www.eeca.govt.nz/insights/eeca-insights/e3-programme-sales-and-efficiency-data>

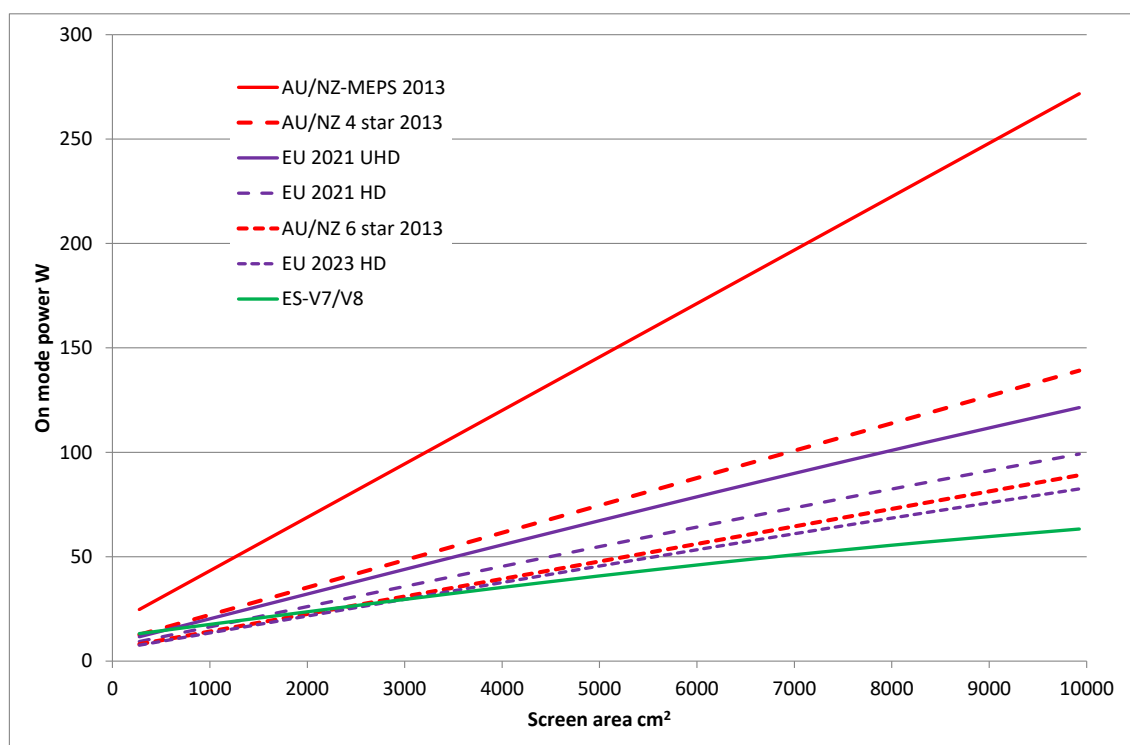
Figure 1 (below) shows the distribution of television star ratings from E3 model registration data from 2019 to 2021. The ratings range from 1 star, which is the MEPS level, up to 7.5 stars. The most common star ratings are in the range of 4.5 to 5.5 stars.



**Figure 1: Distribution of television star ratings from GEMS registrations 2019 to mid-2021**

Some countries and regions, such as the European Union (EU), have tightened their MEPS levels for televisions and expanded the scope of coverage. Consequently, Australia's and New Zealand's MEPS levels are lagging behind prevailing international standards and there is the potential for less efficient products to dominate in the market. Australia and New Zealand have a long-standing policy of adopting international test methods, wherever it is possible and reasonable to do so.

Figure 2 (below) shows where Australia and New Zealand's current MEPS level, 4 star rating and 6 star rating sit compared with the EU Ecodesign levels and US ENERGYSTAR v7/v8.



**Figure 2: Comparison of Australian/New Zealand MEPS and labelling levels with EU EcoDesign MEPS<sup>6</sup> and US ENERGY STAR v7/v8 levels**

The levels in this figure are:

Coloured line	Label in Figure 3	MEPS or labelling level
Red	AU/NZ-MEPS 2013	Australian/New Zealand MEPS level
Red dash	AU/NZ 4 star 2013	Australian/New Zealand 4 star rating level
Purple	EU 2021 UHD	Europe MEPS level 2021 for resolution > 2 Megapixels
Purple dash	EU 2021 HD	Europe MEPS level 2021 for resolution ≤ 2 Megapixels (also Europe MEPS level 2023 for > 2 Megapixels)
Red dash closely spaced	AU/NZ 6 star 2013	Australian/New Zealand 6 star rating level
Purple dash closely spaced	EU 2023 HD	Europe MEPS level 2023 for resolution ≤ 2 Megapixels
Green	ES-V7/V8	US ENERGY STAR minimum efficiency V7 (2015) & V8 (2019) specification

Figure 2 shows that the current MEPS level in Australia and New Zealand (solid red line) is quite weak, when compared to the Ecodesign MEPS levels (solid purple line). This is not surprising for a regulation that is 9 years old and for a product that is evolving rapidly.

While Australia's and New Zealand's MEPS levels were appropriate for the market conditions in 2013, they have since become out of date because:

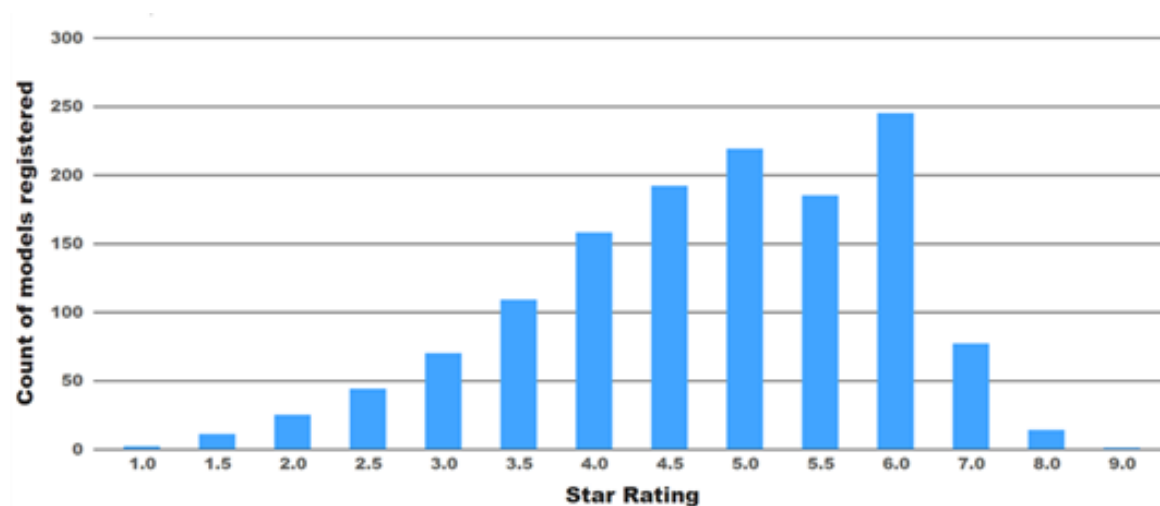
<sup>6</sup> The EcoDesign and European energy labelling regulations provide for a flat 10% reduction in measured energy where the television has a qualifying Automatic Brightness Control mechanism that is active. EU EcoDesign for UHD in 2023 is the same as the HD level in 2021, so only the latter has been shown. EU EcoDesign 2023 levels are approximately one third of the power level set under the current Australia/New Zealand MEPS level.

- Large markets such as the EU have tightened their MEPS and energy labelling levels.
- The products supplied on the Australian and New Zealand market have changed significantly in terms of technology, features, screen size and energy efficiency.
- Australia and New Zealand's test method standard is out of date and is no longer used internationally.

## 3.2 Computer monitors

Mandatory energy labelling and MEPS for computer monitors were introduced in Australia and New Zealand in 2013. The computer monitors determination was reviewed<sup>7</sup> by DISER in 2021, because it is due to sunset (expire) on 1 October 2024.

The review found that the determination is still effective and efficient and the benefits of the regulation are greater than its cost. While the savings per monitor purchased are small, compared with the average purchase price of the monitor, there is still a benefit to the community in cumulative energy savings, because of the large number of monitors sold each year.



**Figure 3: Distribution of computer monitor star ratings from GEMS registrations**

Figure 3 shows the number of GEMS registrations at each star rating for computer monitors. The most common star rating for registered computer monitors is 6 stars with a small number registered above 8 stars and a few below 2.5 stars<sup>8</sup>. There has been little variation in the energy efficiency of registered monitors over the life of the determination, except for a moderate increase in 5, 7 and 8 star monitors in the last few years. New Zealand data<sup>9</sup> shows a similar trend.

<sup>7</sup> Sunsetting review of computer monitors determination <https://consult.industry.gov.au/equipment-energy-efficiency-e3-program>

<sup>8</sup> Sunsetting review of computer monitors determination <https://consult.industry.gov.au/equipment-energy-efficiency-e3-program>

<sup>9</sup> New Zealand E3 Programme sales and efficiency data <https://www.eeca.govt.nz/insights/eeca-insights/e3-programme-sales-and-efficiency-data>

This data shows that the MEPS are too low to be effective, but the label is still providing consumers with useful information on energy efficiency. This means that, while the determination is still efficient and effective because of the labelling component, there could be value in increasing the MEPS levels for computer monitors. The review recommended a full analysis be undertaken to determine the costs and benefits of increasing the MEPS and reviewing the labelling requirements.

Computer monitors are included in the EU Ecodesign MEPS and labelling requirements for electronic displays, and the US ENERGY STAR program combines computer monitors and digital signage displays in its Monitors product category<sup>10</sup>.

### 3.3 Digital signage displays

Australia and New Zealand do not regulate digital signage displays for either MEPS or labelling. The EU, however, recently introduced an update to its MEPS and labelling regulations for computer monitors.<sup>11</sup> This update came into force on 1 March 2021 and the new regulations include labelling requirements for digital signage displays, but no MEPS levels.

The European Commission concluded that there was a need for the introduction of new energy efficiency requirements for televisions and that the same requirements should also apply to other displays, such as computer monitors and digital signage displays, because of the increasing overlap in function between these products.

Digital signage displays are included in the EU labelling requirements for electronic displays and the US ENERGY STAR program also combines monitors and digital signage displays in its Monitors product category<sup>12</sup>. For this reason, E3 have included digital signage displays in this issues paper to explore whether Australia and New Zealand should also regulate this type of display. While digital signage displays are sold commercially and are not for domestic use, E3 believes that energy rating labelling could be used by purchasers as specifications in procurement processes.

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<sup>10</sup> US Energy Star Computer Monitors <https://www.energystar.gov/products/monitors>

<sup>11</sup> European Commission Regulation 2019/2021 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R2021&rid=5>

<sup>12</sup> <https://www.energystar.gov/products/monitors>



## 4. International overview

### 4.1 United States of America

#### Energy efficiency policies

The United States of America (USA) has:

- Mandatory comparative labelling for televisions<sup>13</sup> (EnergyGuide label) and
- ENERGY STAR ® voluntary high efficiency endorsement label for televisions, computer monitors and digital signage displays.

The USA does not have a national MEPS level, but several states do set local MEPS requirements<sup>14</sup>. The ENERGY STAR program identifies products that have a higher level of energy performance than standard options. The current ENERGY STAR television specification is V8<sup>15</sup>, which has been in force since 1 March 2019. An updated specification V9.0 is under development with the final draft issued on 23 November 2021<sup>16</sup>. ENERGY STAR also has a single specification that covers both computer monitors and digital signage displays<sup>17</sup>.

#### Test Methods

The USA Code of Federal Regulations (CFR) in the USA Part 430 specifies a test method for the measurement of energy consumption of televisions, which is also used for ENERGY STAR certification. This method is based on IEC 62087 Edition 2 (2008) and Edition 3 (2011).

The Consumer Technology Association in the USA has approved an updated television test method (CTA-2037-C<sup>18</sup>), which is drawing from the work of the IEC, as well as including some advanced techniques for measurement of parameters, such as screen luminance, which are likely to be included in future IEC editions. CTA-2037-C is referenced as a test method for compliance determination in the ENERGY STAR Program Requirements for Televisions V9.0 Final Draft. E3 understands that a future version of the IEC test method standard is expected to have a similar approach to CTA-2037-C.

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<sup>13</sup> US EnergyGuide label is administered by the Federal Trade Commission under Code of Federal Regulations Part 305. See <https://www.federalregister.gov/documents/2015/03/27/2015-07070/energyguide-labels-on-televisions>

<sup>14</sup> For example, California sets MEPS for televisions.

<sup>15</sup> ENERGY STAR® Program Requirements for Televisions: Eligibility Criteria Version 8.0  
[https://www.energystar.gov/sites/default/files/Final%20V8.0%20TVs%20Program%20Requirements\\_o.pdf](https://www.energystar.gov/sites/default/files/Final%20V8.0%20TVs%20Program%20Requirements_o.pdf)

<sup>16</sup> ENERGY STAR ® Program Requirements for Televisions: Eligibility Criteria Version 9 (DRAFT)  
[https://www.energystar.gov/products/spec/televisions\\_specification\\_version\\_9\\_o\\_pd](https://www.energystar.gov/products/spec/televisions_specification_version_9_o_pd)

<sup>17</sup> ENERGY STAR ® Program Requirements for Displays Version 8  
<https://www.energystar.gov/products/monitors>

<sup>18</sup> The title is CTA-2037-C: Determination of Television Set Power Consumption.

## 4.2 European Union

### Energy Efficiency Policies

The European Commission introduced mandatory energy labelling for televisions in 2009. MEPS levels (called Ecodesign requirements) were also introduced in 2009. A review concluded that there was a need for Ecodesign energy-related requirements for televisions and that the same requirements should also apply to other displays, such as computer monitors, because of the increasing functional overlap between these different display types. Digital signage displays do not have MEPS in Europe, but must comply with mandatory labelling requirements. Computer monitors and televisions also have mandatory labelling.

Updated MEPS and energy labelling regulations were introduced in 2019<sup>19</sup>. These new regulations came into force on 1 March 2021. They define separate MEPS levels for:

- high-definition (HD) electronic displays (all electronic displays with 2,138,400 pixels or less, including standard definition (SD)),
- electronic displays with pixel count 2,138,401 to 8,294,400 pixels, and
- UHD-4k (more than 8,294,400 pixels) and microLED displays.

No specific MEPS levels are set for UHD-4k and microLED displays in 2021.

More stringent Ecodesign requirements will come into force on 1 March 2023. The 2023 regulations will reduce the categories of digital displays to 2 and the HD category will remain the same. Electronic displays with a pixel count from 2,138,401 to 8,294,400, UHD-4k and microLED displays will have the same MEPS level, effectively merging them together into a single UHD (pixel count 2,138,401 or more) category. This has the effect of assigning a MEPS level to the UHD-4k and microLED categories.

The 2023 MEPS level for HD electronic displays will have an increased stringency of 17% compared to the 2021 level, while the MEPS level for UHD displays (for products where a pre-existing limit was in place) will be made more stringent by 18%.

### Test Methods

For televisions, the test method is CENELEC EN 62087 Parts 1 to 3 (2016), which is an adoption of IEC 62087 Parts 1 to 3 (2015). The same test method is used for televisions, monitors and digital signage displays as specified in Annex III and Annex IIIa of the EU regulation. The EU regulations modify two elements of the published IEC test method (2015). This reflects forthcoming changes in the revision of the IEC test method expected in 2022.

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<sup>19</sup> Commission Regulation (EU) 2019/2021 of 1 October 2019 laying down Ecodesign requirements for electronic displays <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02019R2021-20210501>

## 4.3 China

### Energy Efficiency Policies

China has specified MEPS for televisions since 1989, with the most recent update coming into effect on 1 August 2021<sup>20</sup>. The updated labelling grades are based on how efficiently the television generates light in terms of watts per square meter per unit of luminance. China also specifies MEPS and labelling for computer monitors<sup>21</sup>.

In addition to mandatory MEPS and energy labelling, China also has a voluntary endorsement labelling scheme for high efficiency products, including televisions and monitors.

### Test methods

The current test method in China is GB 24850:2020 (effective 1 August 2021) *Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Flat Panel Televisions*. For computer monitors, the test method and requirements are defined in GB 21520-2015 *Minimum Allowable Values Of Energy Efficiency And Energy Efficiency Grades For Computer Monitors*.

## 4.4 Japan

### Energy Efficiency Policies

Japan does not set MEPS for televisions, computer monitors and digital screens, but under the Top Runner program, the energy efficiency of televisions across the market is assessed and the government sets a future, sales weighted target based on the best available products in the initial assessment year. Once a target is set, all suppliers are required to lift their fleet weighted average to reach the specified target level over five years. While Top Runner is not mandatory, penalties for non-compliance and public reporting of data means that high levels of compliance are achieved.

The last time a Top Runner target was set for televisions was in 2008 for implementation in 2012. In addition to Top Runner, televisions are also required to carry an energy consumption label. Computer monitors and digital signage displays are not included in the Top Runner program.

### Test method

Japan uses JIS C 6101-1:1998, but local energy programs such as Top Runner also reference IEC62087 Edition 2 (2008) for SDR dynamic video media content for energy consumption measurements.

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<sup>20</sup> GB 24850-2020 Minimum allowable values of energy efficiency and energy efficiency grades for flat panel televisions and set-top boxes <https://www.chinesestandard.net/PDF/English.aspx/GB24850-2020>

<sup>21</sup> Chinese MEPS, labelling requirements and test method for monitors <https://www.chinesestandard.net/PDF.aspx/GB21520-2015>

## 5. Issues for inclusion in the RIS process

### 5.1 Scope of efficiency regulations

In Australia, the current determination for television MEPS and labelling does not include computer monitors or digital signage displays, although computer monitors are regulated through a separate determination. In New Zealand, televisions and computer monitors are included in the Energy Efficiency (Energy Using Products) Regulations 2002 as separate product classes. Due to the convergence of these technologies and international trends to regulate these products together, E3 is considering whether it makes sense for Australia and New Zealand to apply the same energy efficiency requirements to these products as applied overseas.

#### Questions for stakeholders:

- 1) What issues need to be considered if the scope of the existing television MEPS and labelling is expanded to include digital signage displays and computer monitors?***
- 2) What data is available for televisions, computer monitors and digital signage displays that could be used in the consultation RIS?***
- 3) Are there any particular products or categories that should be excluded, for example specialist medical displays?***
- 4) One option to expand the scope could be to regulate 'digital screens' and use exclusions to remove specific products. Are there any concerns with this approach?***
- 5) Are there any other technologies that should be considered for inclusion or exclusion in the scope?***

### 5.2 MEPS levels

The consultation RIS will examine an increase in the stringency of MEPS levels, focusing on international harmonisation. This could be an adoption of an equivalent level to the 1 March 2021 EU Ecodesign level or the more stringent 1 March 2023 level, with an appropriate transition period for Australia and New Zealand. These Ecodesign MEPS requirements cover televisions and computer monitors, but not signage displays.

The EU 2021 regulations define separate MEPS levels for:

- high-definition (HD) electronic displays (all electronic displays with 2,138,400 pixels or less, including standard definition (SD)),
- electronic displays with pixel count 2,138,401 to 8,294,400 pixels,
- UHD-4k (more than 8,294,400 pixels), and
- microLED displays.

No specific MEPS level is set for UHD-4k and microLED displays.

For the EU 2023 regulations, the MEPS levels for electronic displays will be reduced to 2 categories. The HD category will remain the same. Electronic displays with pixel count 2,138,401 or more will be combined into the other category. This has the effect of assigning a MEPS level to the UHD-4k and microLED categories. The MEPS level for HD electronic displays will be lowered by 17%, and for UHD displays, where a pre-existing limit was in place, will be lowered by 18%, compared to the EU 2021 levels.

The EU Ecodesign levels are comparable to the current AU/NZ star ratings for televisions (excluding Automatic Brightness Control allowances):

- EU 2021 Ecodesign for displays with pixel count 2,138,401 to 8,294,400 is approximately 4.5 stars
- EU 2021 Ecodesign for SD and HD is approximately 5.5 stars
- EU 2023 Ecodesign for UHD is approximately 5.5 stars
- EU 2023 Ecodesign for SD and HD is approximately 6.3 stars.

**Questions for stakeholders:**

***6) What issues need to be considered if the 2021 or 2023 EU Ecodesign levels were adopted for televisions and computer monitors?***

***7) The EU Ecodesign regulations do not include MEPS levels for signage displays. Should Australia and New Zealand apply MEPS to this product?***

***8) Are there more appropriate MEPS levels that should be considered in the RIS process?***

## **Screen resolution**

The screen resolution of televisions has increased over time, with 8k televisions being the most recent development. While there is minimal 8k content and 8k televisions don't yet have much market presence in Australia and New Zealand, this may change in the future. The consultation RIS will examine 8k televisions in case future-proofing of the energy efficiency regulations is needed.

**Questions for stakeholders:**

***9) What level of MEPS would be appropriate for 8k televisions? Are there any issues in including 8k televisions in a new efficiency regulation?***

***10) Do you have any data or information about the expected future market for 8k televisions?***

## **Automatic brightness control for digital screens**

Automatic brightness control (ABC), sometimes called dynamic backlight control, automatically adjusts a screen's overall backlight intensity to account for ambient light conditions. When ABC is active, it enables the screen to adjust to better match the ambient light level. As the ambient light drops, the screen should compensate by making the picture less bright. As energy consumption of digital screens is strongly linked to screen brightness, ABC saves energy. It also improves the viewing experience for consumers who are unlikely to regularly adjust the settings to match their ambient lighting conditions.

When providing credit for energy savings from ABC, E3 may need to take a range of local factors into account such as the distribution of typical lighting levels in households and businesses, the number of Preset Picture Settings that have ABC functions on each model where applicable, the likelihood that modes with ABC will be selected, and whether ABC is likely to persist and be active during normal use.

The EU EcoDesign requirements provide for a 10% reduction in measured energy consumption where a digital screen has a qualifying active ABC mechanism. This option will also be examined in the consultation RIS.

#### **Questions for stakeholders:**

- 11) What issues need to be considered if the 10% reduction in measured energy consumption is adopted for digital screens with active ABC?***
- 12) Which local factors for ABC should be considered in the consultation RIS?***
- 13) Are there any other allowances that should be considered for different types of screens?***

### **5.3 Energy Rating Labelling**

E3 is exploring 2 options for energy rating labelling for televisions, computer monitors and signage displays that could be considered in the consultation RIS. The first option would be similar to Australia and New Zealand's current approach, where the 1 star line would be set at the new MEPS level and then additional stars would be added for each specified reduction in energy consumption. The current efficiency regulations require a 20% reduction in energy consumption per additional star for both televisions and computer monitors. If this approach was taken, E3 proposes the use of the EU test method.

A second option is to base the star ratings on the USA's ENERGY STAR® TV V9.0, which considers energy consumption across 3 Preset Picture Settings (including HDR) and camera to measure screen-average dynamic-luminance, while measuring power during video clip play. ENERGY STAR® also uses the latest approach for the measurement of the effect of ABC controls on energy consumption. The strength of this approach is that the average screen luminance when playing the standard test clip is linked directly to the energy measurement. Another advantage of this approach is that E3 understands that a

future version of the IEC test method standard is expected to be similar to CTA-2037-C. Adopting CTA-2037-C for labelling could help to future-proof energy efficiency regulations in Australia and New Zealand.

The underlying metric for this new approach is the efficiency of light production of the screen itself and the metric would be effectively watts per square metre per candela. This is a novel basis for energy labelling and there are a number of elements that need to be investigated and analysed to get a robust star rating scheme from this type of data. It would also mean labelling would be based on a different approach to MEPS, if the MEPS levels were based on the EU Ecodesign levels. This would require two different test standards (CTA-2037-C and CENELEC EN 62087 Parts 1 to 3 (2016)). However it would only require a single test set-up with two test sequences. E3 understands that the CTA-2037-C approach could be adopted more widely in the future.

#### **Questions for stakeholders:**

- 14) What issues need to be considered when assessing these two options for energy rating labelling? Will these options work equally well for signage displays and computer monitors?***
- 15) Should multiple Preset Picture Settings in an overall efficiency metric be included to give a more balanced measure of television performance? If so, should these Preset Picture Settings be evenly weighted?***
- 16) Are there any issues with using efficiency of light production from the television screen as the key measure?***
- 17) Should ABC controls be rewarded in an energy rating labelling algorithm? Should each illuminance level be equally weighted (as per ENERGY STAR) or is there a more relevant weighting to reflect usage conditions in Australia and New Zealand? (Note: local weighting would not change the measurement method.)***
- 18) Which local factors for ABC should be considered in the consultation RIS?***
- 19) Are there any other allowances that should be considered for different types of screens?***
- 20) Are there any other star rating issues that need to be considered?***

## Hours of operation

The algorithm for the televisions and computer monitors energy rating label in Australia and New Zealand assumes 10 hours in on mode per day. Signage displays can be on for up to 24 hours per day, 7 days a week.

### Question for stakeholders:

***21) What hours of operation should be considered for televisions, computer monitors and signage displays? Please supply information or data to support your answer.***

## Displaying labels

It is mandatory for energy labels to be displayed on televisions and computer monitors in showrooms and shops. The new EU labelling regulations<sup>22</sup> for electronic displays allows suppliers to choose to display either a physical label or an electronic label, as long as the display is kept in on-mode when visible to customers. However, this is not currently an option in Australian and New Zealand efficiency regulations. E3 is open to this as an option, but will need to undertake further analysis to see if the legislative frameworks can enable this.

### Question for stakeholders:

***22) How should labels be displayed in show rooms and shops?***

## 5.4 Test method standard

International harmonisation with test method standards reduce costs and trade barriers for manufacturers and suppliers. The test method standard for televisions used in Australia and New Zealand was last updated in 2010 and is based on a now-superseded international standard, IEC62087:2008 (Edition 2). This standard is under revision and a new standard is expected to be published in December 2022<sup>23</sup> with further revisions expected in 2023 or 2024. The test method standard for computer monitors is AS/NZS 5815.1:2012 Part 1 and is also out of date, because it is based on ENERGY STAR v5 (2009)<sup>24</sup>.

The history and next steps for IEC standards is outlined in Appendix A. It is expected that the test method standard used in Europe for the Ecodesign MEPS levels will approximately align with the IEC standard, due to be published in late 2022. Similarly, it is likely that the US Consumer Technology Association's latest television test method CTA-2037-C will be

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<sup>22</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02019R2013-20210501>

<sup>23</sup> <https://webstore.iec.ch/publication/22583#workinprogress>

<sup>24</sup> [https://www.energyrating.gov.au/sites/default/files/documents/201011a-consult-ris-computers\\_1.pdf](https://www.energyrating.gov.au/sites/default/files/documents/201011a-consult-ris-computers_1.pdf)



fully equivalent to the following revision of the IEC standard, expected to be published in 2023 or 2024.

One of the policy options that E3 would like to consider in the consultation RIS is adoption of the current European Ecodesign electronic displays test method for MEPS and labelling. An alternative option under consideration is adoption of the CTA-2037-C test method standard to underpin a metric for energy labelling in Australia and New Zealand, while MEPS levels would use the EU Ecodesign test method. This would require two different test standards (CTA-2037-C and CENELEC EN 62087 Parts 1 to 3 (2016)), However it would only require a single test set-up with two test sequences.

**Questions for stakeholders:**

***23) What issues need to be considered if the European Ecodesign test method (CENELEC EN 62087 Parts 1 to 3 (2016)) was adopted by Australia and New Zealand for both MEPS and labelling?***

***24) What issues need to be considered if the US CTA-2037-C test method was used to underpin energy rating labelling in Australia and New Zealand, and the EU Ecodesign test method (CENELEC EN 62087 Parts 1 to 3 (2016)) for the MEPS levels?***

## **5.5 Cost benefit analysis**

The consultation RIS will include a cost benefit analysis (CBA) that will examine the net benefits of changes that will be proposed to the energy efficiency regulation of televisions, computer monitors and digital signage displays. Appendix B details the approach that will be used to develop the CBA model.

**Questions for stakeholders:**

***25) Are there any modelling assumptions listed in Appendix B with which you disagree? If so, what assumptions should be used instead? Please provide any supporting information or data.***

# Appendix A – IEC standards history

The history of IEC publications are as follows:

- IEC62087 Edition 1 was published in 2002
- IEC62087 Edition 2 was published in 2008 (AS/NZS62087.1-2010)(identical)
- IEC62087 Edition 3 was published in 2011
- IEC62087 was then published in parts as follows:
  - IEC 62087-1:2015 *Audio, video, and related equipment - Determination of power consumption - Part 1: General*
  - IEC 62087-2:2015 *Audio, video, and related equipment - Determination of power consumption - Part 2: Signals and media*
  - IEC 62087-3:2015 *Audio, video, and related equipment - Determination of power consumption - Part 3: Television sets*
  - IEC 62087-4:2015 *Audio, video, and related equipment - Determination of power consumption - Part 4: Video recording equipment*
  - IEC 62087-5:2015 *Audio, video, and related equipment - Determination of power consumption - Part 5: Set-top-boxes (STB)*
  - IEC 62087-6:2015 *Audio, video, and related equipment - Determination of power consumption - Part 6: Audio equipment*
  - IEC 62087-7:2018 *Audio, video and related equipment - Methods of measurement for power consumption - Part 7: Computer monitors*

IEC62087 Parts 1 to 3 is currently under revision and the current work plan indicates a planned timetable for publication by mid-late 2022. It is expected that a further revision will be commenced immediately with potential release in 2023 or 2024.

The US Consumer Technology Association has released its latest television test method CTA-2037-C. It is highly likely that the 2023/2024 IEC test method will be fully equivalent to CTA-2037-C.

## Appendix B: Modelling assumptions

The consultation RIS CBA is expected to evaluate the following costs and benefits over a 15-year period for Australia and New Zealand for televisions, computer monitors and digital signage displays.

### Costs:

- To the consumer due to the incremental price increases of the more efficient products supplied to the market as a result of the Policy Options, reflecting costs passed on by suppliers. For Australia, these will be based on retail prices and for New Zealand these will be based on wholesale prices;
- To governments for implementing and administering certain Policy Options – in addition to business as usual (BAU) costs; and
- To suppliers for complying with any new requirements of the Policy Options (e.g. administration and training for modified or new product categories).

### Benefits:

- To consumers for the avoided electricity purchase costs due to the increased average efficiency of the products supplied to the market, improvements which consumers could not otherwise access due to market failures. For Australia marginal retail electricity prices will be used and for New Zealand the long range marginal cost will be used; and
- To society from the greenhouse gas emission reductions which result from the reduced energy consumption, in order to value the reduction in this negative externality.

### The Model

A model will be developed to evaluate the impacts of potential policy options. The model will be a combined stock and energy model of the characteristics and use of televisions, by various categories. Computer monitors and digital signage displays will also be included in the modelling pending stakeholder feedback.

The stock model used for the cost-benefit analysis will incorporate data on the characteristics of televisions, computer monitors and digital signage displays sold in every year for each category included in the model, such as technology type, size or average size, and the efficiency of the units in any given year. This will be used to calculate average energy consumption for products. The stock model will then keep track of the data needed to calculate these average characteristics for each year, based on the characteristics and number of the new equipment sold in the year, as well as that of all previous years. This stock modelling will be done at the national level for Australia and New Zealand, and also at the state/territory levels for Australia.

The model will assume that the products are retired from the stock according to a “survival function” that reflects the typical lifespan. A complete stock model of the televisions, computer monitors and digital signage displays market will be developed by state/region and year, with additional details such as average efficiency and year of purchase taken into account. The outputs of the model the total energy consumption by state/region, category and the different Policy Options.

The key categories proposed are:

- Product type – televisions, computer monitors and digital signage displays
- Technology type – including OLED, Mini-LED, Micro-LED, LCD LED
- Screen resolution
- Screen size

The key inputs for the model will be:

- BAU Sales by category and year (historical and forecast)
- BAU Average efficiency by category and year (historical and forecast)
- Life by size range (if available)
- Price change for each change in average efficiency due to the various Policy Options

The proposed Policy Options will be:

- Increased MEPS to EU Ecodesign 2021
- Increased MEPS to EU Ecodesign 2023
- Scope of coverage to include televisions, computer monitors and digital signage displays
- Re-rating the energy rating labelling

### **Price vs efficiency relationship**

To determine the total costs of the Policy Options, the average incremental price of products that meet the policy will be estimated where possible. This relationship will be used in the model to assess the costs of increased efficiency (due to the policy options) for each category.

## Appendix C – Glossary

Term	Definition
4k televisions	A television with a horizontal resolution of approximately 4000, normally 3840
8k televisions	A television with a horizontal resolution of approximately 8000, normally 7680
ABC	automatic brightness control
Computer monitor	screen that displays visual information from a computer, workstation or server as its primary function
CTA	Consumer Technology Association (USA)
Digital signage display	Screen for public and/or non-focussed viewing, often long range. The European regulations define a digital signage display as an electronic display that is designed primarily to be viewed by multiple people in non-desktop based and non domestic environments.
EU Ecodesign 2021	MEPS levels defined in Regulation (EU) 2019/2021 in force from 1 March 2021 to 28 February 2023.
EU Ecodesign 2023	MEPS levels defined in Regulation (EU) 2019/2021 that come into force on 1 March 2023.
HD	high definition (1080 lines or more)
HDR	high dynamic range
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LCD	liquid crystal display
LED	light emitting diode
MEPS	minimum energy performance standards
Micro-LED	MicroLED is an emissive display technology where the light level of each red, green, or blue sub-pixel is a small LED light source that can be controlled individually.
Mini-LED	An LED display technology that uses a full-array of small backlights arranged in a grid to provide backlight for an LCD TV. Mini-LED displays differ from traditional LED displays in that they may have a couple of orders of magnitude (e.g. thousands) more backlights in the full-array backlight. This enables higher contrast ratios through more localised dimming.
Preset Picture Setting (PPS)	A preprogrammed factory setting with pre-determined picture parameters such as brightness, contrast, colour, sharpness, etc.
SD	standard definition (up to 728 lines)
SDR	standard dynamic range
Specialist display	screen with specific industry/professional applications (for example, in medical applications)
Televisions	an appliance <sup>25</sup> for the display and possible reception of television broadcast and similar services for terrestrial, cable, satellite and broadband network transmission of analogue or digital signals, and includes: (a) a display or monitor with an inbuilt television tuner; (b) a display or monitor without an inbuilt television tuner sold in modular form; and (c) a television that has additional functions which are not required for its basic operation as a television
UHD	Ultra high definition (usually more than 2 Megapixels and includes 4k and 8k displays)

<sup>25</sup> Definition from television determination <https://www.legislation.gov.au/Details/F2013L01500>

Public Consultation Paper: Review of the GEMS  
Computer Monitors Determination

[www.energyrating.gov.au](http://www.energyrating.gov.au)



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