

Q & A on Ecodesign for displays

Tier 2 of the EU Ecodesign Regulation for electronic displays, including TVs, from 1 March 2023

From 1 March 2023, tier 2 of the Ecodesign Regulation for electronic displays, e.g., TV sets, will come into force. This will be accompanied by new, stricter minimum requirements for the energy efficiency of the devices. The manufacturers represented in the ZVEI are committed to sustainability and environmental goals and support energy efficiency and Ecodesign requirements. Accordingly, manufacturers are taking all necessary measures within the scope of development and production.

In general

1) What is Ecodesign and what does it mean for televisions?

The EU has set itself the goal of promoting sustainability and using existing resources more sparingly. In order to become more sustainable and environmentally friendly, programmes such as the "Green Deal" and goals such as the development towards a circular economy have been formulated. Ecodesign aims at developing products that require as few resources and energy as possible. Emissions and waste should also be avoided, which is why products should be designed to be as durable and environmentally friendly as possible. Since 2005, the EU has therefore been making corresponding requirements on Ecodesign that products must at least fulfil in order to be sold in an EU country.

The current framework for uniform minimum requirements for products within the EU is the Ecodesign Directive 2009/125/EC, which has been in force since 2009. The requirements apply to all products relevant to energy consumption, i.e., electrical and electronic devices. The requirements specifically applicable to electronic displays and TV sets are defined in the product-related EU Regulation (EU) 2019/2021. Among other things, it contains specifications on the energy efficiency of displays, regulations on reparability and the availability of spare parts.

2) Who is obliged to Ecodesign and what is to be done?

It is mandatory for manufacturers of televisions or displays to comply with the provisions of the Ecodesign rules. Appliances that do not comply with the Ecodesign requirements cannot be sold in the EU. For example, the Ecodesign Regulation for displays sets the minimum energy efficiency value for TVs. Every TV set that is to be sold in the EU must at least meet this value. In order to ensure reparability and longevity, manufacturers must also keep spare parts such as internally installed modules in stock for at least seven years (after the last appliance in a product series has been placed on the market). In addition, it must be possible to remove or install spare parts with standard tools.

3) So Ecodesign includes the energy consumption of devices. What is the significance of the energy label in this context?

The energy label classifies the consumption of electrical and electronic appliances. It is another, separate regulation of the EU. However, the label also refers to the energy consumption of appliances, so the regulations correspond. By indicating the energy consumption of appliances by means of the label, manufacturers create transparency for consumers and enable customers to make a well-informed purchasing decision.

More information on the energy label can be found in the section "Information on the energy label since 2021" below.

4) How is the energy efficiency of TV sets calculated?

The energy efficiency of a device depends on the power consumption of the device in the normal configuration as well as on the size of the screen. It is calculated using a formula that applies equally to all displays or TV sets.

The minimum requirements refer to the device setting in the so-called normal configuration (also called "home mode"). Users are free to choose other settings at home – for example, to increase the brightness to achieve a

brilliant picture impression even in bright rooms with intense daylight, or to reduce the brightness if they find this more comfortable. In practice, this can lead to different consumption values.

Changes from March 2023

5) What will change from March 2023 and what does it mean?

From 1 March 2023, tier 2 of the Ecodesign Regulation for displays will come into force. This means that the maximum values for the energy consumption of TV sets, for example, will become even stricter. The higher requirements have already been set in the EU regulation that has been in force since 2021, which means that tier 2 will now automatically come into force. The energy label will remain valid unchanged and the individual levels (from A to G) will not change either. However, manufacturers have to comply with stricter specifications regarding the energy efficiency of their appliances than before.

Basically, the energy efficiency of flat-screen TVs has already been improved enormously in the last 10 to 15 years. This improvement is mainly due to technical progress in general and the conversion of (background) lighting to LED in particular. As of today, manufacturers are exploiting the savings potential of developments in display technology very comprehensively. Research and work on the development of further savings potentials is ongoing. However, further savings on the scale of the past decade cannot be expected or assumed. Nevertheless, industry will ensure that all devices placed on the European market after 1 March will meet the stricter maximum values of tier 2 of the Ecodesign Directive for displays.

6) Which devices are covered by the limits that will apply from March 2023 and what are the implications?

As of 1 March 2023, new energy efficiency values will be set for all display types, so basically all displays are covered regardless of their resolution (HD, 4K, 8K, etc.), although different maximum values will be set for the different display types. Devices with 8K resolution or microLED displays were previously exempt from the Ecodesign requirements for minimum energy efficiency. From 1 March 2023, they will now have to comply with certain limit values just like other displays. For displays up to 4K, stricter requirements apply than before. The manufacturers of TV sets have been working for years on improving energy efficiency and have already oriented themselves to tier 2 of the Ecodesign Directive at an early stage.

The minimum energy efficiency requirements that will apply from March vary in challenge depending on the type of device. TVs with 8K resolution or microLED have not had to meet the minimum requirements so far, for good reason. A study by the EU Commission provided for in the regulation, which was to check whether the limit values set in the future were adequate by the market with a view to tier 2 of the Ecodesign Regulation for displays, was not carried out as planned. An analysis by the European association DigitalEurope had shown at the beginning of 2022 that the 4K and especially 8K televisions on the market at that time would not yet all meet the limit values that would apply from March 2023.

The new limits are also challenging for devices with smaller screen diagonals and premium or additional hardware such as multiple tuners, audio systems, wireless interfaces or digital video recorder, as the calculation of energy efficiency is based on the screen area and additional features built into the device, which thus replace e.g. external, energy-consuming devices, are not taken into account.

Overall, however, it can be assumed that all TV sets placed on the European domestic market after the deadline will also comply with the new limit values.

7) Why were the limit values set in this way and what are the possible consequences?

The limit values for electronic displays depend, among other things, on the resolution. For devices up to HD resolution, a different maximum value applies than for higher resolutions (4K, 8K/microLED) due to different technical requirements. The values set in the EU regulation are based on data from 2012 and 2017, a point in time when many 4K and 8K TV sets in particular were not yet available on the market. The assumptions made at that time about the speed of technological progress have since turned out to be incorrect. In order to take the lack of data into account, the EU regulation stipulated a review of the requirements by the end of 2022.

Unfortunately, this did not take place as planned due to a lack of commissioning by the Commission. Nevertheless, tier 2 will automatically come into force as of 1 March 2023.

8) Will the range of TV sets available for consumers change in the future?

Probably not. It is true that TV sets that do not meet the new minimum energy efficiency requirements may no longer be placed on the EU market from March 2023. However, appliances that have already been placed on the EU market can be sold without a time limit. The regulation from March 2023 only affects new TV sets placed on the market. Accordingly, manufacturers shall ensure that all appliances placed on the EU market from 1 March 2023 comply with the new, stricter energy efficiency requirements.

Practical info for consumers

9) How energy-intensive is television?

The energy demand of televisions depends on many factors. Basically, technological developments such as the change from tube TVs to flat screens and innovations such as LED TVs have led to TV sets becoming more and more energy efficient over the years. In individual cases, energy consumption depends on various features of the TV set itself – e.g. display diagonal, resolution, screen technology, etc. In addition, the individual use of the TV set plays an important role, i.e., which content, which type of use and which device settings are selected by the viewer.

Content can have a significant influence on energy consumption. Classic television is generally less energy-intensive than streaming. The resolution of the content shown also has an impact on energy consumption: 4K or 8K content, for example, requires more energy than HDTV.

10) What can I do to use less energy while watching TV?

The energy consumption of a TV can be influenced by the way it is used. Users can adjust the TV settings, e. g. the brightness settings. Some models, for example, offer a pre-configured “eco mode”. One way to save energy is, for example, to use linear TV programmes via satellite, cable or terrestrial, as the use of streaming offers consumes more energy in comparison – however, the offer of UHD content via streaming is currently still more extensive.

It is often recommended to disconnect the device completely from the power supply when it is not in use. This can also have a negative effect, as important software updates, which keep the device and security settings up to date, are also run in standby mode. The energy consumption of TV sets in standby mode is already – due to another EU Ecodesign Regulation – regulated to less than 0.5 watts, i. e. between one and two euros per year, for a standard 55- or 65-inch TV and is thus very low.

11) How do TVs compare to other appliances in terms of energy consumption?

Since the last reform of the energy label for displays (March 2021), most TV sets on the EU market are in the energy efficiency classes D to G. There are currently hardly any sets in the higher classes (see also questions 12 and 15). This is because technological developments in the display segment are not keeping pace with the regulatory requirements. In other words, the political requirements set higher standards than the leaps in innovation actually make possible. This is regrettable, among other things, because consumers can hardly differentiate between TV sets on the basis of their energy efficiency class. However, this does not automatically mean that TVs are particularly energy-intensive appliances, because the energy efficiency classes are calculated individually depending on the type of appliance and can hardly be compared with each other. For example: a typical TV set consumes 0.1 kW per hour, which is roughly equivalent to two cups of coffee from a fully automatic coffee machine.

Information on the energy label since 2021

12) Why is there an energy label and which benefits does it offer?

Energy labelling for televisions has been mandatory in the EU since 2011. Since then, TV sets placed on the market must be labelled with an energy label. On 1 March 2021, the energy label was changed. In particular, the plus classes were deleted and the efficiency scale A to G was reclassified. In contrast to the previous label, the requirements of the classes as well as the gradations between them have been tightened.

The energy label for televisions is intended to serve as an orientation aid for consumers when making purchasing decisions. It remains manufacturer-neutral, takes into account the most important basic values of energy consumption and thus creates an objective possibility for comparison.

13) What does energy efficiency describe and how is it calculated for TVs?

The energy efficiency is the decisive parameter for the classification into an energy efficiency class. The energy efficiency of a device depends on the power consumption of the device in the normal configuration as well as on the size of the screen. It is calculated with a formula that basically applies equally to all appliances; this ensures comparability of the results.

In contrast to the previous label, the annual energy consumption is no longer indicated in relation to a use of four hours per day. Instead, the power consumption is now indicated in relation to a use of 1,000 hours, which corresponds to 2 hours 45 minutes per day calculated over a year.

14) Does the label indicate the real power consumption in practical use?

The information on the label refers to the appliance setting in the so-called “home mode”. Users are free to choose other settings at home – for example, to increase the brightness to achieve a brilliant picture impression even in bright rooms with intense daylight, or to reduce the brightness if they find this more comfortable. In practice, this can lead to different consumption values. Of course, a longer period of use also leads to higher annual energy consumption values. The value indicated on the label is calculated based on a typical consumption pattern prescribed by law.

15) Why are there only a few devices in efficiency class A?

In order to keep the new label up to date for as long as possible, the EU has designed the efficiency classes in such a way that no products reach energy efficiency class A at the time of introduction. The introduction of the new label was also accompanied by new procedures for measuring energy consumption and determining the label class. This circumstance leads to high-efficiency appliances being listed in classes that at first glance do not stand for high efficiency. There is no procedure for converting the previous energy efficiency classes into the new classes.

16) What information does the label provide beyond the energy efficiency class?

The energy label

- states the manufacturer and the model designation of the device,
- shows the efficiency class in a coloured bar chart,
- indicates the screen diagonal in centimetres and inches as well as the screen resolution with the number of horizontal and vertical pixels.
- indicates the energy consumption in kilowatt hours based on 1,000 hours of use, which corresponds to 2 hours 45 minutes per day.
- indicates the energy efficiency class and the power consumption for the replay of HDR content separately.
- QR code that leads to the energy label database.

17) What data can be accessed in the energy label database “EPREL”?

In addition to the energy label, there is also an energy label database. In EPREL (“European product registry for energy labelling”) the label data and data sheets of all appliances subject to the label can be retrieved. This is to ensure improved transparency. Access to the database is possible via the internet or directly via the QR code on the energy label. The latter is linked to the corresponding product in the database.

18) Why is there a difference in power consumption between SDR and HDR mode?

HDR (High Dynamic Range) picture technology results in higher power consumption than SDR (Standard Dynamic Range). HDR offers a higher contrast range than SDR, which means it offers higher brightness. The result is a better picture overall. However, this also leads to slightly higher power consumption. This difference to SDR should be recognisable by the new label.

Interesting to know: the content used has a decisive influence on the power consumption of the device. Content with a higher luminosity also means higher consumption.

19) Do additional integrated hardware elements or additional functions (hard disks, additional tuners, internet function) also influence the energy balance of a device?

Hard disks and additional reception tuners have their own energy requirements to a certain extent. Additional functions or additional technologies for a better picture and sound quality are not taken into account in the classification for the energy label. Higher-quality devices or devices with a high range of functions are therefore often in a worse position than simple devices. In contrast: When functions are upgraded by external devices, the total power consumption is usually higher than with integrated solutions. Therefore, a classification of a unit in class C or below does not necessarily mean that it is a unit with poor energy efficiency. When buying, the complete range of functions of a unit should therefore always be taken into account. To conclude, a comprehensively equipped appliance can have a significantly more favourable energy balance than several individual appliances that have a similar range of functions.

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