

Choosing an energy efficient TV made easy!

From 1-1-2002 GEEA-Label criteria for TVs will include on-mode
Better information for consumers and more flexibility for manufacturers



Summary

From 1-1-2002 the GEEA-Label criteria for TVs will be based on an energy efficiency index, which takes into account on-mode power consumption. This document offers manufacturers, importers and other interested parties answers to the following important questions:

- Why are energy efficient TVs important?
- What is the GEEA-Label?
- How does the GEEA-Label for TVs work from 1-1-2002?
- How can manufacturers and importers apply for the GEEA-Label?

1. Introduction

Televisions are amongst the most popular consumer electronic products in the world. In Europe almost every household has one TV and the number of second and third TVs is growing. Together, these TVs in Europe consume about 30 TWh per year, which equals the electricity consumption of 750.000 average European households!

The energy consumption of a TV is the sum of the energy consumption in the various modes: off, standby and on. Because the standby power consumption of TVs has been decreasing rapidly over the last years, the energy consumption of a new TV is dominated by the consumption in the on-mode.

At the moment, choosing an energy efficient TV is not easy. Manufacturers do indicate the power consumption in on and standby mode in the technical specifications part of their brochures. However, power consumption is related to the features of a TV: a 100 Hz, wide screen 66 cm stereo set consumes more power than a set with a 34 cm normal size screen. Thus choosing an efficient TV is very difficult when at the moment only power consumption figures are available.

From 1-1-2002 the GEEA-Label will make it very easy to choose an energy efficient TV: any TV granted the GEEA-Label after 1-1-2002 belongs to the top 30 % of most efficient TVs. From 1-1-2002 the GEEA-Label criteria for TVs will be based on a so called energy efficiency index which takes into account the energy relevant features of a TV.

2. What is the GEEA-Label?

The GEEA-Label is a voluntary labelling program, started in 1996. Organisations, most of them being energy agencies, from 8 European countries (Austria, Denmark, Finland, France, Germany, the Netherlands, Sweden and Switzerland) are members of the GEEA.

GEEA targets to give the label only to appliances that are within the top 20 to 30 per cent of all models available in the combined market of those countries taking part in the GEEA voluntary agreement. All awarded products can be

found on the database at www.efficient-appliances.org. There is an annual revision of the criteria used as the basis of the GEEA label. Preparatory work for the revision is done in working groups in which also industry is represented. Award of the GEEA label is based on manufacturer self declared product performance, but it uses measurement methods, testing and certification criteria that are harmonised with other initiatives like the Energy Star label, if appropriate.

Each country carries out activities to promote the awarded products, e.g. by maintaining a national website or distributing lists.

3. How does the GEEA-Label for TVs work from 1-1-2002?

As of 1-1-2002 the energy efficiency index is the criterion for TVs regarding the GEEA-Label. The energy efficiency index should be less than 0.75. This means that a TV with a GEEA-Label is (at least) 25 % more efficient than an average TV with the same features.

The energy efficiency index E_i is calculated as follows¹:

$$E_i = \frac{E}{E_R}$$

E is the energy consumption (kWh) per 24 hours based on measured power consumption values for on mode (P_{on}) and standby passive mode (P_{sb}) of the TV for which the energy efficiency index is determined: $E = 4 P_{on} + 20 P_{sb}$.

Already now P_{on} and P_{sb} are indicated in brochures of most manufacturers.

E_R is the reference energy consumption (kWh) per 24 hours. To calculate the reference energy consumption, information on the following features is needed (since this features are very important for the consumer, they are readily available in all brochures):

- screen size (in cm)
- screen format: 4:3 (conventional) or 16:9 (wide screen)
- scan rate: 50 Hz or 100 Hz
- digital signal processing: no or yes

The reference energy consumption is based on a formula (see technical documentation available from the website www.efficient-appliances.org). This formula has been used to calculate the following reference table (for screen sizes not covered by the table, please use the spreadsheet program).

screensize [cm]!	screen format		screensize [cm]!	screen format		screensize [cm]!	screen format	
	4:3 [kWh/24hr]	16:9 [kWh/24hr]		4:3 [kWh/24hr]	16:9 [kWh/24hr]		4:3 [kWh/24hr]	16:9 [kWh/24hr]
30	0.2392	0.2460	50	0.3116	0.3218	70	0.3910	0.4040
31	0.2427	0.2496	51	0.3154	0.3258	71	0.3951	0.4083
32	0.2461	0.2533	52	0.3192	0.3298	72	0.3993	0.4126
33	0.2496	0.2570	53	0.3230	0.3338	73	0.4035	0.4169
34	0.2531	0.2607	54	0.3269	0.3378	74	0.4077	0.4212

From the website www.gea-label.org you can download a small Excel spreadsheet that calculates the energy efficiency index for any TV.

¹ Please note that this section does not cover TVs with auto power off. To calculate the energy efficiency index for TVs with auto power off, use the spreadsheet program.

screensize [cm]!	screen format		screensize [cm]!	screen format		screensize [cm]!	screen format	
	4:3 [kWh/24hr]	16:9 [kWh/24hr]		4:3 [kWh/24hr]	16:9 [kWh/24hr]		4:3 [kWh/24hr]	16:9 [kWh/24hr]
35	0.2567	0.2644	55	0.3308	0.3418	75	0.4119	0.4255
36	0.2602	0.2681	56	0.3346	0.3458	76	0.4162	0.4299
37	0.2637	0.2718	57	0.3386	0.3499	77	0.4204	0.4342
38	0.2673	0.2756	58	0.3425	0.3540	78	0.4247	0.4386
39	0.2709	0.2793	59	0.3464	0.3580	79	0.4290	0.4430
40	0.2745	0.2831	60	0.3504	0.3621	80	0.4333	0.4474
41	0.2781	0.2869	61	0.3544	0.3663	81	0.4377	0.4519
42	0.2818	0.2908	62	0.3584	0.3704	82	0.4420	0.4563
43	0.2854	0.2946	63	0.3624	0.3745	83	0.4464	0.4608
44	0.2891	0.2984	64	0.3664	0.3787	84	0.4508	0.4653
45	0.2928	0.3023	65	0.3705	0.3829	85	0.4552	0.4697
46	0.2965	0.3062	66	0.3745	0.3871	86	0.4596	0.4743
47	0.3003	0.3101	67	0.3786	0.3913	87	0.4640	0.4788
48	0.3040	0.3140	68	0.3827	0.3955	88	0.4685	0.4833
49	0.3078	0.3179	69	0.3868	0.3997	89	0.4730	0.4879

Look for the energy consumption value in the table that matches screen size and screen format.

If the TV has a scan rate of 100 Hz, add 0.1115 kWh/24hr.

If the TV has digital signal processing, add 0.0480 kWh/24hr.

Example

(The following data are taken from measurements on TVs to validate the technical model.)

TV A

- measured data: $P_{on} = 102 \text{ W}$, $P_{sb} = 2.1 \text{ W}$, so $E = 0.4500 \text{ kWh/24hr}$
- features: 82 cm wide screen, 100 Hz and digital signal processing, so $E_R = 0.4563 + 0.1115 + 0.0480 = 0.6158 \text{ kWh/24hr}$
- energy efficiency index $E_i = 0.4500/0.6158 = 0.73$

TV B

- measured data: $P_{on} = 30 \text{ W}$, $P_{sb} = 4.9 \text{ W}$, so $E = 0.2180 \text{ kWh/24hr}$
- features: 34 cm conventional screen, 50 Hz scan rate, so $E_R = 0.2531 \text{ kWh/24hr}$
- energy efficiency index $E_i = 0.2180/0.2531 = 0.86$

According to this example TV A would comply with the GEEA criterion of $E_i \leq 0.75$ and TV B would not. It further shows the difference between using a duty cycle and a single value (i.e. standby power consumption). With the current GEEA criterion for TVs (valid till 31-12-2001) TV A would not get the GEEA-Label. Using a duty cycle gives manufacturers more flexibility on how they achieve the criteria.

4. How can manufacturers and importers apply for the GEEA-Label?

Applying for the GEEA-Label is as easy as using the GEEA-Label. Contact your National Registration Office (NRO, see www.efficient-appliances.org for addresses etc.) and ask for the information package. You can also download the application form and other relevant documents from the website.

Fill in the form(s), sign them and send them back to the NRO. After notice of the NRO that your product fulfils the GEEA criteria and has been registered, you



can use the GEEA-Label for the registered product(s). Furthermore, your product is entered into the central GEEA database. To use the GEEA-Label in Europe, you have to register your product only once. Registration is free of charge.

Please note that you are not obliged to use the GEEA-Label, i.e. to put it on registered products. You can also use the GEEA-Label in brochures or sales promotion material. One important restriction² regarding the use of the label is that it must be clear to the consumer that the label is linked to a specific model. The use of the label in general company promotion is prohibited.

5. January 1st, 2002 seems far away, but

The date on which the new GEEA criterion for TVs enters into force – January 1st, 2002 – seems far away. However, the following preparatory activities are useful.

- ◆ Please check the measurement method that is used to measure the power consumption of your TVs. Power consumption should be measured according to the (new) European standard EN50301 “Methods of measurement for the power consumption of Audio, Video and related equipment”.
- ◆ To gain experience with the energy efficiency index, manufacturers are offered from October 1st, 2000 to give information on the energy efficiency index of their models to be included in the central GEEA database.
- ◆ If you want to know more about the energy efficiency index and the technical background, please download the paper ‘Criteria for TVs (duty cycle)’ from the GEEA website (www.efficient-appliances.org).

If you have any questions about registration, do not hesitate to contact your National Registration Office. If you have any technical questions about the energy efficiency index, please contact the chairperson of the GEEA working group on Consumer Electronics: Hans-Paul Siderius (phone: +31 30 2393609; e-mail: h.siderius@novem.nl).

² Please see the General Rules (available from www.efficient-appliances.org) for details on the use of the label.