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## **Energy Efficiency – what can I do?**

*Do you know how much energy is used by electronic equipment left on stand-by? Up to 10% of household consumption – about €15b per year – is being wasted in this way. The Commission promotes voluntary standards to reduce stand-by consumption in European households which will yield potential savings of up to 30 billion kWh of electricity*

### **More Home-electronics in Europe need more electricity**

Consumption of electronics in European households will soon become a major part of the domestic/household electricity bill. Modern equipment, such as multimedia, personal computer with printer, scanners and permanently connected modems and cellular phone chargers can amount already to 20% of household consumption. About half of this figure is due to stand-by losses, when the equipment is still connected to the grid but not in use.

### **Useless Energy we pay for**

Standby consumptions of such equipment may result in up to 100 W continuously for each of Europe's 100 Mio household units, or one hundred billion kWh per year. It would require 10 large power stations of 1 GW each to deliver this electricity, and as it is, European citizens are paying € 15 billion yearly for this large consumption without being aware of it.

### **Making efficient use of electricity**

The Commission, through its Joint Research Centre (JRC) has focused its activities in electricity end uses on consumer electronics and IT equipment, in addition to domestic appliances and lighting: all very much part of every day life and part of today's level of comfort. Better equipment efficiency is the fastest and most cost-effective response to limiting growing demand for electricity and to reduce CO<sub>2</sub> emissions. Every unit of energy saved on electricity corresponds to about 3 units of primary energy avoided.

Recently, DG JRC assessed "standby losses" of electronic devices such as computers, printers, TVs, DVDs, hi-fi systems, modems, satellites receivers and decoders, and battery chargers for mobile and cord-less telephones. The conclusion was that there is a large, untapped potential to save on electricity and reduce CO<sub>2</sub> emissions, whilst fostering new technologies in power supply electronics.

## **Voluntary efficiency standards, now adopted by industry**

With advanced design solutions and technologies, the standby consumption can be reduced to near zero, at minimal additional price increase. The Commission has set up a stakeholder forum to promote reduction of stand-by losses in external power supplies, digital TV decoders and satellite receivers and broadband communication equipment. Through the active participation and collaboration of manufacturers, chip providers, OEMs, and Member States' researchers and experts, leading manufacturers have adopted voluntary standards to reduce standby consumption:

- for battery chargers this will result in a reduction of about 5 W per household, saving 10 billion kWh of electricity per year by 2010 across the EU and;
- even more important will be the reduction of future consumption of Digital TV set-top boxes. This action is promoted by DG JRC and will result in at least 20 billion kWh savings by the year 2010.

Other devices such as DVD players, hi-fi systems, printers, computers and other electronic equipment, will follow.

## **Don't waste precious renewable electricity**

The Commission considers it important to link the development of photovoltaic solar electricity with the efficient use of electricity. The idea is to avoid a situation whereby expensive renewable electricity would only compensate for the increased demand of electricity due to home-electronics, rather than substituting for more polluting electricity generation sources. To produce 100 W of just stand-by consumption needs in mid-Europe, a 1 kW photovoltaic roof-top system would be required.

## **Examples**

### **Set Top Boxes example:**

Digital TV decoders (Satellite/Terrestrial/Cable) on the market consume 28 W all the time.

This results in 245 kWh per year or about 37 Euro per year per model (this is also equivalent to the consumption of a 200 litre refrigerator in class A+). A recently introduced model by a manufacturer that follows the voluntary standards to reduce consumption uses only 5 W while on standby. In a normal household this will result in savings of 200 kWh or 30 Euro per household per year.

If 100 Million households were to have such low-consumption decoders (and this will soon be reality with the phase out of the analogue TV broadcast), this will avoid 20 Billion kWh per year as indicated in the background information note.

### **External Power Supply Example:**

There are still models on the market to charge kitchen appliances, cordless telephones, answering machines, and mobile telephones that use 2 W all the time.

This results in 17 kWh per year or almost 3 Euro per year per model. Recently introduced models by manufacturers that follow the voluntary standards to reduce consumption, use only 0.2 W while in standby. In a normal household use this will result in 1.8 kWh or costs of only 0.3 Euro, a savings of more than 2 Euro per external power supply per household per year.

Assuming an average of 6 external power supplies in 100 Million European households, if all the external power supplies followed the voluntary standard this would result in another 10 Billion kWh.

**Broadband Equipment Example:**

Some recent measurements of broadband equipment (modem + WLAN router) have identified a worse situation consumption of permanent consumption of 20 W even when not in use, this corresponds to 175 kWh per year or around 5% of the average household consumption. This represents a cost of 26 Euro per year per household.

The best performing equipment (modem WLAN router) consumes 4 W, only when it is in use. This corresponds to 35 kWh per year, i.e. a saving of 80% .

If 100 million households adopted the best solution this would be a additional saving/avoidance potential of about 14 Billion kWh.

The total of the above described savings/avoidance potential of 44 Billion kWh would amount to 17 Mt less CO<sub>2</sub> emissions in Europe. This corresponds to 1.5% of all electricity-related emissions, and about 7% of the Kyoto Targets, achieved through better technology of the above appliances only.

**For more information:**

[http://energyefficiency.jrc.cec.eu.int/html/standby\\_initiative.htm](http://energyefficiency.jrc.cec.eu.int/html/standby_initiative.htm)

<http://www.jrc.cec.eu.int>

Type of Equipment	Standby Consumption	Annual Energy Consumption	Annual Electricity Cost (€)
Old TV Set	6 W	43.6 kWh (20 hours per day in standby)	5,6 €
New TV Set*	2 W	14.6 kWh	1,9 €
DVD	2 W	17.5 kWh	2,3 €
VCRs Old	8 W	70 kWh	9,1 €
VCR New*	3 W	26 kWh	3,4 €
Hi-Fi system	3 W	26 kWh	3,4 €
Hi-Fi system new*	1 W	8.7 kWh	1,14 €
ADSL modem	2 W to 10 W	73 kWh (20 hours in per day standby)	9,5 €
Set Top Boxes	5 W to 20 W	146 kWh (20 hours in per day standby)	19 €
PC (soft off-mode)	1 W to 5W	36.5 kWh (20 hours in per day standby)	4,7 €
Printer (sleep mode)	2 to 10 W	87.6 kWh	11,4 €
External Power Supply	0.2 to 2 W	17.5 kWh	2,3 €
Microwave Oven	2 W	17.5 kWh	2,3 €
<b>Total (Worst case and with 5 external power supplies, one new and one old TV)</b>	<b>81W</b>	<b>646.8 KWh</b>	<b>84 €</b>

\* standby power reduction due to Voluntary Commitment by the European Trade Association EICTA