

Electronic home equipment - leaking electricity

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1. SYNOPSIS

This paper reports the power demand from TV-sets, CD-players and other electronic equipment in turned off position.

2. APPROACH

Simple measurements were conducted on 300 domestic items for sale in Swedish stores. They represent 16 different types of equipments. All these types are normally constantly connected to the electrical supply and demand power even when turned off.

The power demand was measured when the items were in "turned-off position" and in "stand-by position". Usually the remote controlled equipment had only "on position" and "stand-by position" ("red point"). The later sometimes was called "turn off".

Only a few of the items were truly turned off the supply. TV-sets though, are always possible to turn off the supply. According to rough estimates from the salesmen 60-70% remote controlled TV-sets are not turned off. Almost all new TV-sets have remote control. In the following figures the data represent the "stand-by position" for all remote controlled equipments. For portable radios, micro wave ovens etc the data represent the item connected to the supply, but not in work.

Sales figures have been taken from trade associations.

3. POWER DEMAND WHEN TURNED OFF

Figure 1 shows the variety of power demand for some big sale products. For TV-sets there was no actual difference between screen size and power demand. A very few CD-players and audio equipments had such a low power demand that it was not possible to measure when in "stand by position". The items with lower demand in the figure demonstrates the possible level for power demand in stand-by position.

The mean value of the 16 different equipment categories are shown in figure 2. A few of these categories do some minor "work" when connected, as showing a clock (clock-radio, video and micro wave ovens) or stand by for answering the telephone. Most audio equipment stand by for a remote control signal. The power loss is though very high at this position due to the losses in the voltage transformer.

4. INCREASE IN ENERGY CONSUMPTION

The energy losses from these apparatuses when not in use are multiplied with the amount of products sold 1991 and divided with the amount of households in Sweden. The extra impact on the average household from each category is shown in figure 2.

TV-sets and videos demand more power than the other items when not in use. No credits are made for the households which do turn their TV-sets off. They are already a minority and the coming systems connect different media and equipment in a way that relies on constant remote access.

Due to "leaking electricity" in products bought 1991 in Sweden power demand will increase by 12 MW and energy consumption by 108 GWh. For the average Swedish household the energy consumption thus will

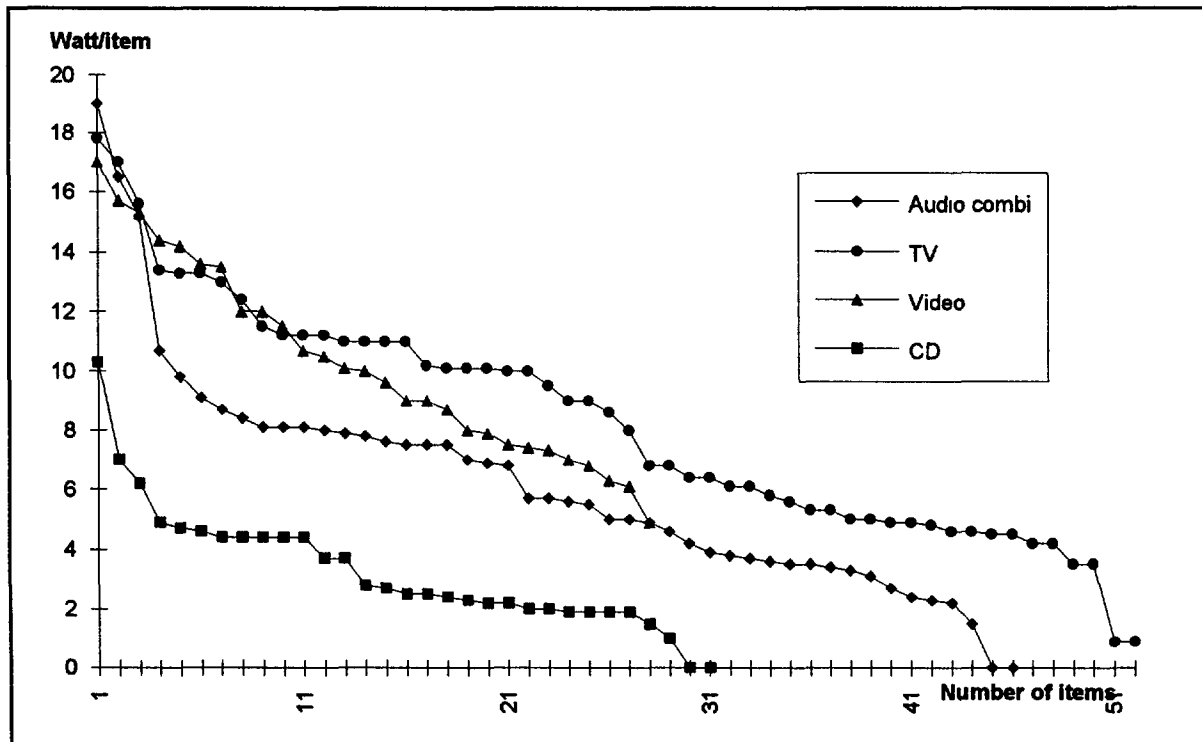


Figure 1. Electricity losses for different electronic products when not in use. The power measured at sale stores

increase with 27 kWh every year. In 15 years this will add up to 400 kWh/year per household.

The electricity consumption of these appliances will turn into heat and effect heating costs of the buildings during the winter period. This has to be taken into account. In Sweden about 25 per cent of the households are heated with electricity.

5. EQUIPMENT ENERGY DEMAND

The energy demand for the equipment at "stand by/turn off position" vary between 4 - 10 kWh/year/item for light portable audio equipment, up to 60 - 90 kWh/year/item for TV-sets and videos. For each category there is a wide spread of performance depending on technologies and manufacturers design.

To get a more efficient technic or an opportunity to turn the apparatus off the net, an extra investment cost for the product is not to exceed the life time costs for the electricity losses. If counting on 10 years and 6 per cent real interest an extra investment 7 times the yearly energy cost could be accepted.

There are lots of different technical solutions to minimize or eliminate the energy losses when the apparatuses are not in use, if demanded. It is up to the manufacturers to find the most cost-effective solutions.

6. EFFICIENCY STANDARDS

Obviously, market mechanisms will not by itself face the problem with leaking electricity. Here are a few propositions to consider.

- A. Compulsory declaration of the no load losses. This will probably not give any impact on the choice

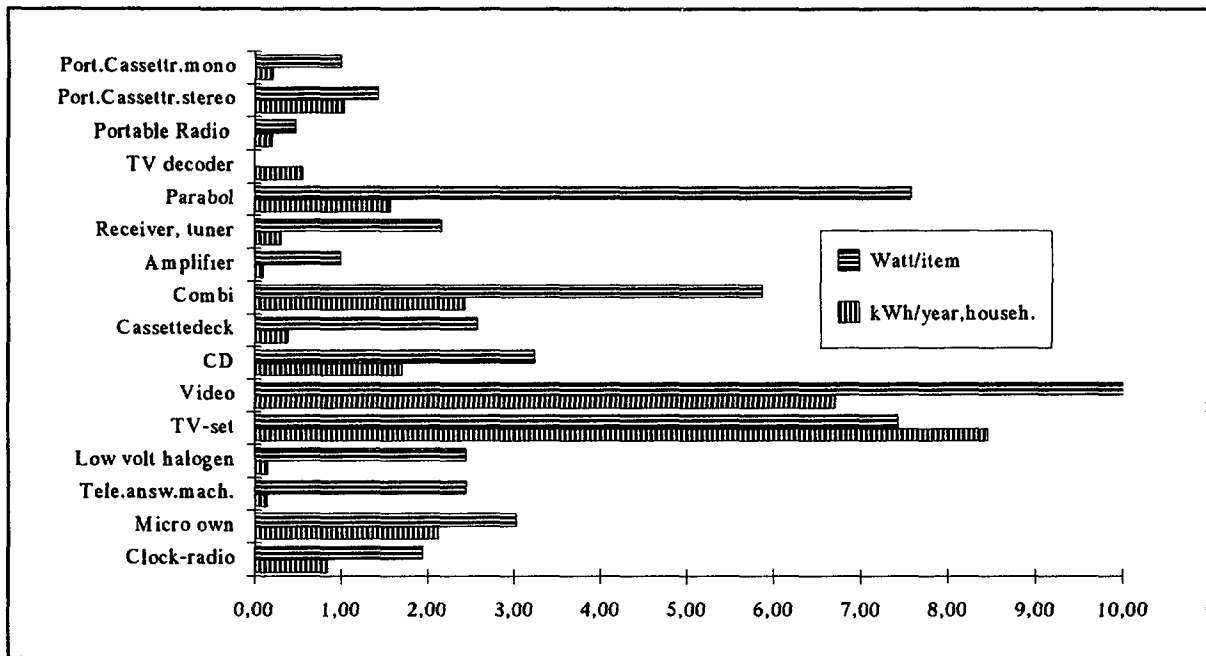


Figure 2. Household equipment. Mean power demand when not in use and extra energy consumption in an average swedish household based on 1991 purchases of equipment

of the customers.

- B. Compulsory standard demanding a true "turn off" the supply position. This will also minimize the fire risk. Still a lot of the customers will only use the remote control (compare with the TV-sets). Still it gives the customer a chance to control energy cost for equipment not in use. It's a good standard for equipment that don't have any remote control (portable stereo cassettes etc).
- C. Energy standard for the no load losses. If no item would take more than 2 Watt in no load losses as an example, the average losses would go down with 60 per cent to 1,6 watt/item.

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