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ENERGY SAVINGS POTENTIAL FROM SIMPLE STANDBY REDUCTION DEVICES IN CENTRAL EASTERN EUROPE

Michaela Valentova[1], Benigna Boza-Kiss[2], Yulia Barabanova[2], Lloyd Harrington[3]
[1]Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic
[2]Centre for Climate Change and Sustainable Climate Policy, Central European University, Budapest, Hungary
[3]Energy Efficient Strategies, Warragul, Australia

INTRODUCTION

Standby consumption represents 11% of the total electricity demand in European households, mostly concentrated in entertainment and office equipment (1), meaning that an electricity bill of 1 month per year is paid for standby. Standby power levels of individual appliances are expected to decrease in the future due to technological change resulting from a range of regulatory measures internationally and within Europe, mainly under the Ecodesign directive (2). However, even until these measures are fully implemented (and later complementing them), users can contribute to the reduction of their energy consumption and therefore financial losses. The study thus assesses the attainable levels of electricity savings and economic benefits for consumers from using simple standby reduction devices.

METHODOLOGY

To determine this particular saving potential, the energy consumption of a **newly equipped site** was taken as a reference and **compared to the same site equipped with various simple standby reduction devices**. The national energy savings potential and economic benefits for the two main domestic appliance categories, which are the most significant in terms of standby: **home entertainment and office equipment**, were calculated in **Central and Eastern Europe (Czech Republic and Hungary)**. Willingness of the users to change their habits and/or appliance set-up by installing and using standby reduction devices was taken into account.

Saving potential of a reference site

$$P_S = N_{hh} \cdot (1 - P_{MS}) \cdot E_{site} \cdot P_{main}$$

$$E_{site} = E_{main} + \sum (E_{ap} \cdot P_{ap})$$

The total standby electricity consumption per site (**E_{site}**) is calculated as the sum of the standby electricity consumption of the parts: the total yearly consumption of the main appliance added to the consumption of the peripherals possibly connected to the main equipment, which were weighted according to their relative penetration. The total savings potential (**P_S**) is corrected by deducting the savings relative to households which have already been using standby reduction devices (**$1-P_{MS}$**).

Economic feasibility

$$CCE_{site}(EUR/kWh) = \frac{AC_{sk}}{\Delta E_{site}}$$

$$AC_{SK} = \frac{C \cdot d}{1 - (1+d)^{-n}}$$

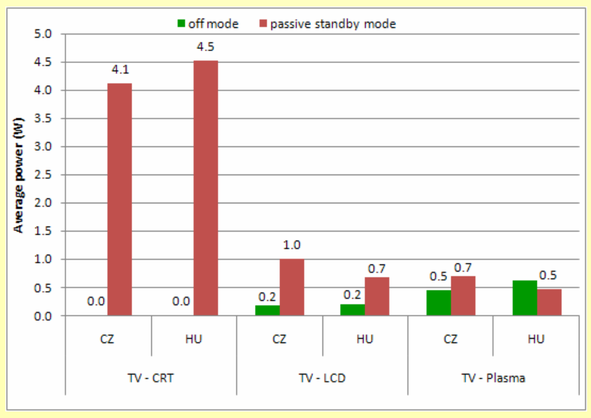
$$E_{site} = E_{main} + \sum (E_{ap} \cdot P_{ap})$$

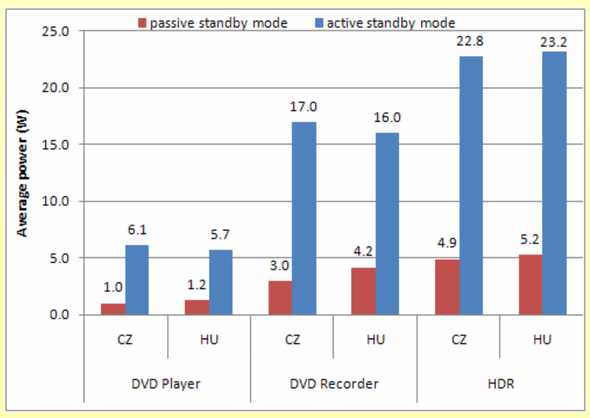
The **cost of conserved energy** means how much it costs per 1 kWh to introduce the electricity saving measure. The CCE is then compared to the electricity price. If the CCE is lower than the electricity price, it means that it is „cheaper“ to save the electricity, than to consume it.

STANDBY POWER LEVELS OF APPLIANCES ON ELECTRONICS STORE DISPLAY

Home entertainment

Average powers of off mode, passive and active standby mode of Home entertainment equipment (televisions, DVD players, DVD recorders and Hard Disk Recorders).

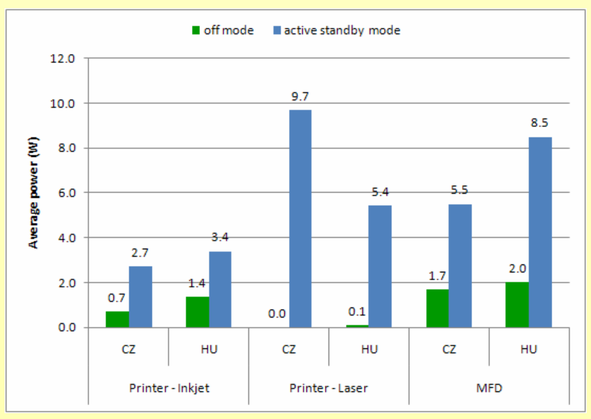


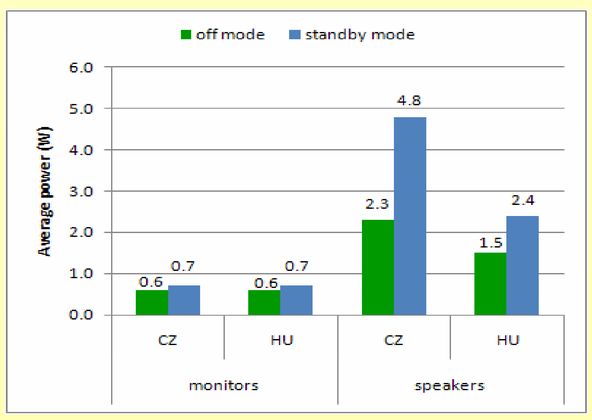


The penetration of set top boxes in households is increasing quickly. The average power in on mode and passive standby mode was very similar, **6.9W and 5.7W** respectively.

Office equipment

Average powers of off mode, passive and active standby modes of printers, Multi-function Devices (MFD), monitors and computer speakers





USE OF SIMPLE STANDBY REDUCTION DEVICES

Potential savings from using a simple standby reduction device at a television and office site in Hungary and the Czech Republic are the same as if all the respective country completely stopped using electricity for one whole day (including electric heating and water heating).

	Electricity savings - TV site (kWh/year)	Electricity savings - PC site (kWh/year)	Usage of standby reduction device in households (%)	Overall national potential savings from TV and PC sites (GWh/year)
Hungary	25.27	27.20	54.4	111
Czech Republic	36.66	29.95	51.3	131

~ 1 day total final electricity consumption

Both standby reduction devices are economically effective for both home entertainment and office equipment sites.

TV SITE	Cost of a standby killer (EUR)	Cost of switched socket power boards (EUR)	CCE for standby killer (EUR/kWh)	CCE for switched socket power boards (EUR/kWh)
Hungary	12	6	0.11	0.05
Czech Republic	12	6	0.07	0.04

OFFICE SITE	Cost of a standby killer (EUR)	Cost of switched socket power boards (EUR)	CCE for standby killer (EUR/kWh)	CCE for switched socket power boards (EUR/kWh)
Hungary	10	6	0.08	0.05
Czech Republic	10	6	0.07	0.04

Average electricity price in the Czech Republic and Hungary:

0.17EUR/kWh

At selected, appropriate set of appliances, households can effectively reduce their standby losses using simple standby reduction devices.
On national level, very moderate estimate of energy potential savings:
At least 1 day of total electricity consumption in both countries!

References:
(1)REMODECE 2008Residential Monitoring to Decrease Energy Use and Carbon Emissions. Final report.
(2)EC (European Commission) 2005, Directive 2005/32/EC on the Eco-design of Energy-using Products, EC 2008. Regulation 1275/2008/EC (on standby and off mode electric power consumption of electrical and electronic household and office equipment)

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