

Common efforts between an energy authority and the IT industry on promotion of energy efficient computers and monitors

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Abstract

IT products are assumed to be a main factor of the increase in electricity consumption in the domestic and service sectors in Denmark. Before 2004, very few activities towards energy efficient IT equipment had taken place in Denmark. In 2004, the DEST (Danish Electricity Saving Trust) and partners in the IT sector took the initiative to establish a voluntary agreement for promoting energy-efficient computers and monitors.

The result today is that most of the computers and monitors from the IT partners, covering more than 80 percent of the Danish computer market, are declared according to power consumption in on, sleep, and standby modes. In addition, campaigning activities significantly have strengthened the attention on energy-efficiency of IT equipment and have focused on the advantages of efficient notebooks and flat panel LCD monitors. Furthermore, the manufacturer partners have also become more focused on power consumption at the design level.

This paper describes the content of the voluntary IT agreement, the campaigning activities, and summarises the results and the main factors for the results.

Increasing use of IT in homes and offices

The growth in the Danish electricity consumption in domestic and service sectors is assumed to be partly due to increased use of IT in the homes and at the offices. The number of IT appliances (computers, monitors etc.) is increasing and the appliances are supposed to be switched on during longer periods.

The total electricity consumption in the Danish public and private service sectors grew by 15 percent from 1995 to 2004. The consumption in the domestic sector grew by 1.8 percent in spite of many saving efforts for instance for white goods and lighting. The tendency of increased use of IT appliances is assumed to continue in near future.

The area had only little focus by the energy authorities before the IT activities described in this paper.

Efficient technologies available

There are large differences in electricity consumption of the computers and monitors on the market. The DEST has calculated that it is possible to save up to about 140 EUR in TCO (Total Cost of Ownership over the lifetime) per PC and per monitor. In offices, additional savings for air-conditioning and ventilation systems will be achieved.

Examples of possible large savings are:

- An inefficient 17" CRT monitor (170 kWh/year) is replaced with an efficient 17" TFT monitor (50 kWh/year) and savings of 70% are achieved.
- An inefficient desktop and monitor (total 350 kWh/year) are replaced with an efficient notebook (35 kWh/year) and savings of 90% are achieved.

Even though these selected examples show savings above average, they give a clear indication of the large variety of electricity consumption among the product types and the products. This makes it worth promoting the most energy efficient products.

The IT agreement between DEST and suppliers

In 2004, the Danish Electricity Saving Trust (DEST) initiated a dialogue with Danish representatives of five larger IT manufacturers, Apple, Dell, Fujitsu Siemens, Hewlett-Packard and IBM (now Lenovo);

the IT industry organisation (IT-BrancheForeningen) and a public procurement organisation (SKI, National Procurement Ltd) regarding improvement of energy efficiency of computers and monitors. The main idea was to establish a win-win situation between DEST and the IT industry by basing the agreement on a common goal of higher sale shares of efficient computers and monitors and particularly notebooks and LCD monitors, which was supported by the industry organisation and the public procurement organisation.

As a result of the dialogue, the DEST and the IT manufacturers entered a voluntary agreement [1] with these basic subjects:

- The energy declaration: All desktop computers, notebooks and monitors shall bear a declaration on power consumption in advertisements, brochures, web sites, technical information etc. showing the power consumption in on, sleep and standby and showing if the product is “energy-efficient” according to DEST requirements.
- Product lists: DEST maintains product lists of computers and monitors sold by the agreement partners and the partners shall update the list with available models on the market and power consumption of the products.
- Promotional effort of energy-efficient products: The IT industry carries out promotional efforts for the energy-efficient products.
- Campaigning activities: DEST carries out campaigning activities to support the agreement. In 2004 and 2005, two larger kick start campaigns were carried out.
- Public information: Information is provided on energy efficiency of computers and monitors, both regarding the purchase and the use of the products

The expected savings over three years amount to 100 GWh.

Power consumption levels and the declaration

Computers

When establishing the declaration and the power levels for “energy-efficient”, the DEST and the partners wanted to base the definitions, test methodology, and power levels on existing schemes internationally recognised.

Definitions and test methodology were therefore based on “Energy Star Computer Memorandum of Understanding (Version 3.0)”, which was the current version at the time of establishment of the agreement.

The Energy Star qualifying levels were, however, not sufficiently strict to be used as levels for “energy-efficient”. The DEST therefore agreed with the partners to use the values in the GEEA (Group for Energy Efficient Appliances) scheme for standby (2 W) and sleep (5 W after maximum 30 minutes without use).

In addition, the DEST and the partners wanted to include the active mode as part of the “energy-efficient” criteria and decided to use an idle-on definition. The main idea was to introduce the idle-on concept and to prevent the most energy consuming computers to achieve the “energy-efficient” stamp. Therefore the requirement was set at 80 W.

The idle mode was a new concept for energy specifications at that time and it was seen as the most practical way of including on mode consumption of computers. It was defined as the mode, in which the computer is immediately after it has been switched on and started the operating system, drivers, etc., which are delivered with the computer, and has reached a stable level for computer activity without other user activity. For notebooks with a rechargeable battery, no charging must take place. Integrated desktop computers with monitor built-in were allowed in the on-mode to consume 80 W plus the corresponding level for the monitor.

About half of the computers on the market could comply with the requirements for “energy-efficient”.

Monitors

The Energy Star specifications had recently been revised and the DEST and the partners felt that the Tier II criteria of the specifications were sufficiently strict for the “energy-efficient” compliance of the IT agreement and they were therefore adopted.

The energy requirements are:

- Off/standby mode: Max. 1 W
- Sleep/low power which is achieved after 30 minutes without use: Max. 2 W
- Active mode: Max. 23 W for resolutions (megapixels) of less than 1 and max. 28 W * resolution (megapixels) W for resolutions greater than or equal to 1. The resolution is calculated as the horizontal resolution multiplied by the vertical resolution in megapixels.

About 25 percent of the monitors on the market could comply with the requirements for “energy-efficient”.

The declaration

The partners and the DEST agreed on a common format to declare the electricity consumption comprising a graphical or a text based declaration. The declaration is not a physical label to stick on the products. Instead the declaration should be included in publicity material aimed at potential buyers and points of sale, such as advertisements, brochures, retailer circulars and newsletters. Wherever possible, this also applies to web sites, electronic media, other technical information and other similar media where product data is given.

See examples in the following:

On	Sleep	Standby	Energi-effektiv
23,0W	2,0W	1,0W	

The graphical declaration

On/sleep/standby: 55W/5W/2W (energi-effektiv) (energy-efficient)

The text-based declaration

The power consumption data are provided by the manufacturers including a declaration of the accuracy of the data. Data are subject to possible spot checks by the DEST.

Partner declarations and activities

Partners in the agreement

The IT agreement was established between the DEST and seven partners:

- Five manufacturers: Apple, Dell, Fujitsu Siemens, Hewlett-Packard and IBM (now Lenovo)
- Danish SKI (National Procurement Ltd), which is an organisation that enters framework contracts with suppliers of products and services and offer them to their customers in the public sector. Typically, energy and environment considerations are part of the evaluation criteria.
- IT-B (IT-Brancheforeningen), which is an industry organisation for manufacturers and suppliers of IT products.

Since then, three more manufacturers (Acer, Philips, Samsung) have entered the IT agreement with the DEST.

In 2005, the DEST decided to open the activities for the retail sector with an agreement similar to the manufacturer agreement. Two retailers have entered the agreement: ComputerCity, which is a large retail chain and B.J. Trading, which is an internet shop.

Use of the declaration

The partners have actively participated in all the activities. They managed to get the power consumption data for their products even though data was not always available for the manufacturers and some of those had a difficult task to get the correct data from their main office.

The partners also managed to include the energy declarations in most of the advertisements, brochures, etc. Often, space is very limited and it is difficult to include more information.

The following figures show a sample of the declarations used.

IBM ThinkCentre A50 SFF
 Funktionalitet og fleksibilitet til virksomheder



Systemspecifikationer:

- Intel® Pentium® 4 Processor 2.80 GHz
- Microsoft® Windows® XP Professional
- 256 MB RAM, 40 GB harddisk
- 48x cd-drev
- Ethernet
- Lille formfaktormodel (skærm ikke inkluderet)
- Garanti: 3 års service på kundens adresse

Varenummer: PZC77DK

Kr. 4.885 ekskl. moms
 Kr. 6.107 inkl. moms
 Leasingydelse kr. 136 ekskl. moms i 36 mdr.
 Kun gældende for virksomheder og ved køb for over 100.000 kr.*

On	Sleep	Standby	Energi-effektiv
18W	2W	2W	***



Kan det hele, over det hele

AMILO Pro Edition V2000:
 FAP:DAN-148250-003

- Intel® Centrino™ - mobil teknologi
- Intel® Pentium® M-processor 725 (1,60 GHz, 2 MB cache, 400 MHz FSB)
- Intel® 855GME Chipset, Intel® PRO/Wireless 2200
- Microsoft® Windows® XP Professional MUI

On	Sleep	Standby	Energi-effektiv
18W	2W	2W	***



HP COMPAQ BUSINESS
 NOTEBOOK nx9030

7.799 kr. ekskl. moms, ekskl. lev.*
 9.769 kr. inkl. moms, ekskl. lev.* [Order ref.: POS70E1]

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M processor 725
- Intel® Pro/Wireless LAN 802.11b/g
- Intel® 855PM Chipset
- Microsoft® Windows® XP Professional
- 15" XGA TFT skærm
- 256 MB DDR RAM
- 40 GB harddisk
- Combo DVD/CD-RW
- Op til 64 MB grafik

HP Care Pack: 3 års totalbikring, afhentning og returnering [U4400A/E] 2.828 kr.

On	Sleep	Standby	Energi-effektiv
61,6W	0,13W	0,76W	

Sample of advertisement by three of the partners with the declarations.

Other partner activities

Many partners carried out additional activities as part of the campaigns, for example:

- Parallel campaign on the partner's web site towards the consumers
- Many information activities towards the retailers (direct mail, newsletters, tools, product information meetings etc.) in order to help them being better able to guide the consumers in finding the efficient products. The retailers are important because there have the direct contact to the consumers.
- Participating in press releases with the DEST
- Publishing information in newsletters

Some of the manufacturers also included the "energy-efficient" requirements as part of the design specifications for new computers and monitors. This does not have an immediate effect; however, when implemented in the new models, the effect is considerable.

One example is HP Denmark who noticed that the external power supplies for the notebooks had a much lower standby consumption level (under 1 Watt) than similar external power supplies for the monitors (above 2 Watt). After a dialogue with the main office design department, the specifications for the power supplies for monitors have been globally adjusted in order to achieve less than 1 Watt in standby.

Product lists and the web site

The web site www.it.sparel.dk established by the DEST is a focal point for the information. The web site contains:

- The product lists of the partners' computers and monitors with technical data and power consumption data. The technical data are provided by the company CNET Channel, which continuously update the models and the data. The partners' task is through a web interface to select the models on the Danish market and enter the consumption data. The web site users can personalise the data by changing default values for usage time and electricity price.
- A calculator that the consumers can use for calculating the savings by changing the current computer and/or monitor to one of the products on the product lists.
- Information on the declaration, financial benefits, advantages of notebooks and LCD monitors, technical details on energy efficient products, impact on working environment, energy efficient use etc.
- TV spots from the advertisement campaigns and a game.
- A partner section where the partners can log in and download material, declaration graphics etc.

The main goal of the DEST information on the web site and in the campaigns, is to inform consumers about the lifetime costs (ie. TCO: Total Costs of Ownership), which is the electricity costs during the assumed lifetime of the products.

Kick start campaigns

DEST and the partners carried out two kick start campaigns during the autumns of 2004 and of 2005 using TV spots, advertisements, web site, product lists, direct mails, PR activities, information at the retailers etc.

The main target groups were IT and financial officers in public and private institutions and consumers in the domestic sector.

The main objective of the 2004 campaign was to focus on the differences in power consumption of products and the use of the declaration as an easy tool for finding the efficient products. The differences in power consumption was narrowed down to a simple message of possible savings of up to about 1000 DKK (~ 140 EUR) during the lifetime of a computer or a monitor by selecting the most energy efficient types compared to the least efficient ones.

The main objective of the 2005 campaign was to clearly communicate that notebooks and LCD monitors are efficient products and that the consumers should consider buying notebooks next time instead of a desktop computer and consider changing the old CRT monitor to a new LCD type.

The possible savings and use of the declaration were underlying messages.

Public procurement

The DEST's definition of "energy-efficient" computers and monitors is part of the DEST Purchasing Guidelines [2]. During 2005, a Government circular [3] was issued stating that the Government institutions must only purchase energy-efficient products complying with the DEST Purchasing Guidelines.

This circular is assumed to support the IT agreement by allowing the Government only procuring computers and monitors complying with the requirements for "energy-efficient".

Results

Main results of the activities include:

- The partners are very active in using the declaration of the computers and monitors in advertisements etc. facilitating the identification of the efficient models by the consumers.
- The manufacturers in the agreement cover more than 80 percent of the computers sold at the Danish market. The partners' market share of monitors is not known, but it is assumed to be between 60 and 80 percent.
- During 2004 and 2005, the share of notebooks of the total computer sale has significantly increased from 37 percent in 2003 to close to 55 percent by end of 2005. CRT monitors have now very little share of the monitor sales. This is not only because of the DEST's and the partners' campaigns, but it is assumed that the campaigns have given an additional push in the right direction.
- Electricity savings for IT equipment were almost an untouched issue before the IT agreement was entered, but in less than two years, the attention has increased significantly by the consumers. After the 2005 campaign, 68 percent of the IT managers knew about the declaration and about 60 percent said that they would choose efficient models next time.
- The DEST and the partners have initiated a very fruitful collaboration that can be used in many other areas.

Main factors for the results

Main factors for the positive results are:

- Dedicated IT partners who went seriously into the work and allocated many resources.
- A close collaboration between DEST and the partners where flexibility was given from both sides and where a win-win situation could be established.
- The most efficient products, i.e. notebooks and LCD monitors give many additional advantages for the consumers and the employees.
- Being a public authority, DEST works as a rubber-stamp for the declaration and the campaign messages level setting.

Perspectives and future activities

The DEST and the partners will continue working with the declaration and energy-efficiency of computers and monitors and will include other related activities, such as:

- Energy-efficient power supplies
- Servers
- Thin clients
- Software for improved automatic power management of computers and monitors
- Development of a self-help web tool for analysing the electricity consumption of IT and office equipment (computers, monitors, imaging equipment and other office appliances).

About Danish Electricity Saving Trust

DEST, (Danish Electricity Saving Trust "Elsparefonden" in Danish), is an organisation under the Ministry of Transport and Energy. It is independent and with own board. It focuses on market transformation by influencing both supply and demand and uses often new and creative instruments.

It works primarily with the household and public sectors, however, the activities can be extended to the private sectors. The goal is to save 0.8 TWh/year over ten years with a budget of 12 millions EUR/year. A recent evaluation showed that the trust is 28 percent ahead of the planned savings.

References

- [1] *Voluntary agreement between the Danish Electricity Saving Trust and Producers of IT equipment concerning electricity savings for standard computers and computer monitors 2006* . Can be downloaded from www.sparel.dk/english
- [2] The Danish Electricity Saving Trust: *Purchasing Guidelines 2006*. Can be downloaded from www.sparel.dk/english
- [3] *Circular on improving energy efficiency in Danish state institutions*". Unofficial translation of the original Danish circular: "*Cirkulære om energieffektivisering i statens institutioner*". Can be downloaded from www.sparel.dk/english

