



## **BUY SMART**

Green Procurement for Smart Purchasing

### **Procurement and Climate Protection**

Guideline for procurement of  
appliances, lighting, vehicles, and power  
with criteria of energy efficiency and environment

Office Equipement

Supported by

**Intelligent Energy**  **Europe**

[www.buy-smart.info](http://www.buy-smart.info)

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## 1. Introduction

The energy consumption for Information Technology (IT) increased relevantly in the last years. A further rising of about 40 % within the next 10 years is predicted [ISI 2003]. Thus, office equipment becomes one of the most relevant energy consuming sectors in office buildings – and ranges commonly between 20 % and 40 %. On the other hand savings about 40 up to 50 % are economical feasible and will reduce the energy costs about 200 € per workplace within the 5-year lifetime of the equipment [Energy-Star]. Alone in Germany three percent of the total power consumption is accounted for office equipment, information technology (IT) and communication systems.

According to the EU Commission the energy consumption of office devices due to standby modus are 47 TWh per annum. This equates costs of 6,4 mio € and an emission of 19 megatons CO<sub>2</sub>. Without any measures the energy consumption would increase constantly. Therefore the Ecodesign Regulatory Committee endorsed the Commissions proposal for a regulation, reducing standby energy consumption of households and office devices. These Ecodesign Directive applies to electric devices. It specifies a maximum power consumption which is allowed for instance for office devices in standby. The intended admissible energy consumption in 2010 will allow 1 Watt for devices which are switched off or “are offline” (da fällt mir auch nichts besseres ein, aber “off modus” hört sich komisch an!) and 0, 5 Watt in 2013. The directives goal is to save 35 TWh energy per year until 2020. [Ecodesign Directive]



Foto: pixelio

It is the aim of this guideline to achieve a reasonable and process-efficient purchase and additional a reduction of energy costs through the procurement of office equipment. By an efficient energy use a contribution to climate protection can be given on one hand and on the other hand a contribution to sustainable economics can be done. The success achieved here can be used in corporate communications as well.

In the present module of the guideline, first the most important energy-relevant technological developments in the individual equipment categories are outlined, as well as the standard yearly

energy consumption as calculation basis for the saving potentials. In the following, different relevant environmental and energy labels are introduced, their criteria are compared and potential savings considering the different criteria are shown. Practical references to the purchase of office equipment and their use in practice as well as concrete suggestions on the integration of energy efficiency criteria into the tender form the emphasis of this guideline.

**1.1 Groups of Equipment and Energy Consumption**

Servers, datacenters, copiers, computer and monitors are the most important energy consumers of information and communication technology (ICT) devices. Some appliances make up the largest part of energy in sleep mode, for example printers and fax machines. Furthermore some appliances use power also after switching off (pseudo-off/standby).

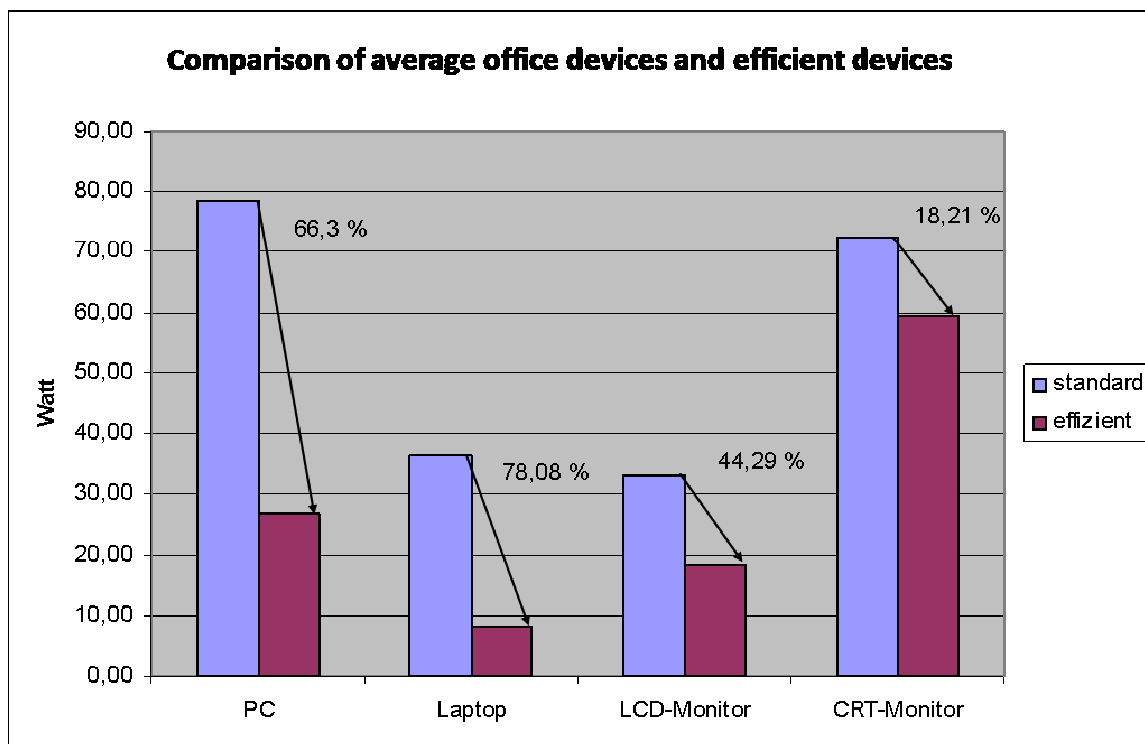


Figure 1: Energy consumption 2007. Comparison between average devices and efficient devices.

Figure 1 points out how much energy can be saved if energy efficient office devices are used. In the following the average energy consumption of office equipment on the basis of typical power consumption and utilisation periods is presented. They are divided into product groups. That is the basis for the calculation of the operating costs. By comparing the average values and the requirements of individual energy labels the saving potentials by using energy-efficient appliances can be determined.

## 1.2 Definition of Operating Conditions

The definition of the modes is relevant to define power consumption and utilisation phases. The following terms are generally used.

- On Mode/Active Power/Operating Mode: The appliance fulfils its main function, e. g. to print or to copy. In this condition is the power consumption highest.
  - Ready Mode/Idle State: Special definition for imaging equipment (ready mode) and computers (idle state). The imaging equipment is not producing output but has not yet entered in any lower power modes. For Computers the operating system and other software have completed loading in this state, the machine is not asleep, and activity is limited to those basic applications that the system starts by default.
- No Load Mode: No-load mode arises if an appliance does not fulfil its actual function but nevertheless uses energy. This concerns especially the energy consumption in stand-by and in pseudo-off.
  - Sleep Mode: A low power state that the device is capable of entering automatically after a period of inactivity or by manual selection. A device with sleep capability can “wake” in response upon sensing a request from the user. However, there may be a delay.
  - Standby Mode (Pseudo Off<sup>1</sup>): The power consumption level in the lowest power mode that may persist for an indefinite time when the appliance is connected to the main electricity supply. Due to the fact that a lot of devices cannot be switched off (influenced) by the user via “hard off switch”, but seem to be in off mode, this mode is also named “pseudo-off”.
- Off Mode/Hard Off Mode: Hereby is meant the real-off-mode via “hard off switch”. The appliance is completely separated from the net and, thus, uses no energy,

At the moment there are no uniform terms and classifications of the different operating conditions. There is a large number of different expressions only for standby modes. These expressions partly have the same meaning and partly different. Often the terms are also used contradictory, as in case of the off-condition. In this guideline applies the above-mentioned definitions.

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<sup>1</sup> In the Energy Star program it is defined as stand by level or off mode.

**1.3 Energy Consumption of the Most Relevant Office Equipments**

The values for the average energy consumption of computers and monitors in different operating conditions are based on the preparatory study for the Ecodesign directive for EuP (energy using products) 2005/32/EC, published March 2007. The values for the imaging equipment are taken from Energy Star. The mentioned average power consumptions and energy consumptions are based on the assumption of a typical office use.<sup>2</sup>

**1.3.1 Computer**

The energy consumption of PCs has changed strongly in the past years. It does not depend just on the main processor, but also on individual components like drives, videocards, hard drives CPU. The increased energy requirement can be detected by the increasing use of fans in PCs, which should prevent a possible overheating. Mostly the disk drives and CD-Rom drives are seldom in use. So they have only little influence on the energy requirement.

Computer	On mode	Sleep Mode	Standby	Total
Power consumption [W]	78.2	2.2	2.7	--
Utilisation period [h/a]	2279	3196	3285	--
Energy consumption [kWh/a]	178	7	9	194

Table 1: Average values for computers, characterized by 3 GHz processor (or equivalent), built-in graphics card, 512 MB RAM and 80 GB HDD, 2007 [IVF]

**1.3.2 Laptop**

The power consumption of notebooks/laptops is considerable lower than of floor-mounted appliances. This lower power consumption is achieved by an energy efficient computer architecture, which makes a considerable working period independently from the net possible. The power consumption is reduced by a calculation frequency, which is adapted to the specific requirement. The complex computer- and processor architecture leads to the higher costs compared with floor-mounted appliances.

Concerning the fact that notebooks often are used as a substitution for desktop-PCs, the utilisation periods of notebooks in the office section are comparable with those of desktop-PCs. Compared with desktop-PCs relatively more time in the standby mode in relation to the normal mode

<sup>2</sup> They don't correspond to the average energy consumption of private households.

was assumed, because the power-management is clearly more often activated by notebooks.

Comparing the 30 W for a powerful notebook (including LCD screen, see example) with the 120 W desktop PC plus the 80 W CRT screen, savings could be up to 80 %. And even in the notebooks intended as 'desktop replacement', with a larger screen (up to 16-17") and less aggressive power management settings, the savings are still well over 50 %. [Energy Star]

Laptop	On mode	Sleep Mode	Standby	Total
Power consumptions [W]	32	3	1.5	--
Utilisation period [h/a]	2613	2995	3153	--
Energy consumption [kWh/a]	84	9	5	98

Table 2: Average values for laptops, characterized by mobile 1.7 GHz processor (or equivalent), good 3-dimensional graphic performance, 15"-screen, 512 MB RAM and 60 GB HDD, 2007 [IVF]

### 1.3.3 Monitor

Generally there are two different technologies on the market. CRT-monitors (Cathode Ray Tube) represented the classic variant. They are very rarely sold now, mostly for designer needs. The newer alternative are LCD-monitors (Liquid Crystal Display). There is a big difference between the energy requirement of both types of appliances (see table 2). CRT-monitors have a power consumption between 65 and 120 Watt in the normal mode (depending on the size). LCD- screen have a powerconsumption of just 17 – 31 Watt in normal mode. A technology change from CRT-monitors to LCD- screens can achieve a saving potential up to 75 % in the normal mode. Also in standby mode on average LCD-devices are more efficient than CRT-devices. The following figure shows a comparison of the annual energy consumption of the monitors.



Foto: CRT Monitor  
[computermonitors] (on  
top); LSD Monitor (be-  
low)

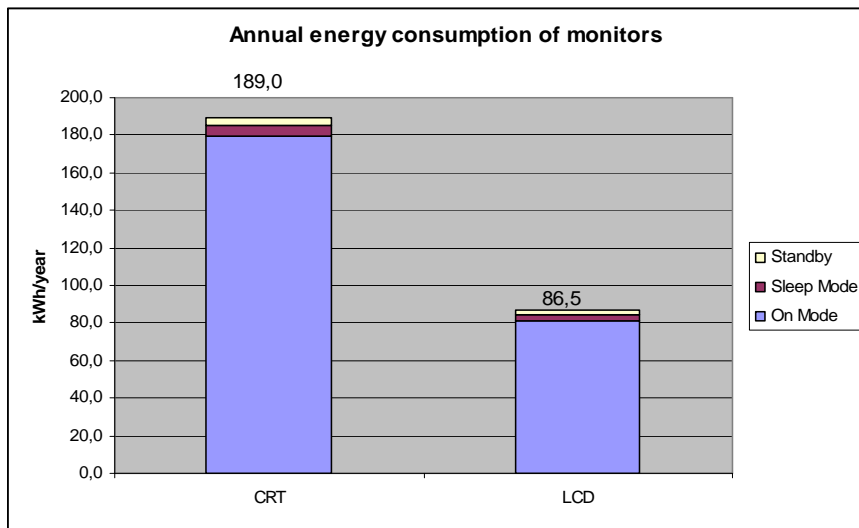


Figure 2: annual energy consumption of monitors, 2007 [IVF]

The LCD-monitor market is characterised by relevant price reductions in the last years. The comparison between the full costs of CRT-monitors and modern LCD-monitors shows, that LCD-technology is the more economical alternative. Apart from the energy costs the comparison also includes different capital and energy costs for air-conditioning, uninterrupted power supply devices as well as electrical connecting to the cable network. [BECKER]

Over the last years the LCD Monitor became more popular. In 2003 for the first time more LCD Monitors were sold as CRT Monitor [Heise].

LCD-Monitors, 17" (low-priced)	On mode	Sleep Mode	Standby	Total
Power consumptions [W]	25	1,2	1,2	--
Utilisation period [h/a]	2586	3789	2375	--
Energy consumption [kWh/a]	52,2	4,3	3,6	60,4
CRT-Monitors, 17"	On mode	Sleep Mode	Standby	Total
Power consumptions [W]	73	3	3	--
Utilisation period [h/a]	2586	3798	2375	--
Energy consumption [kWh/a]	153,3	10,9	9	173,2

Table 3: Average values for average monitors 2009 [Energy Star]

### 1.3.4 Printer

There are two predominated types of printers: inkjet printers and laser printers in the office sector. Laser printers become more popular in offices as a desk unit on the one hand but on the other hand they are higher in energy consumption. They are mainly used as network printers with expected high print volumes. They offer a good print quality and the noticeable operating costs (toner) are relatively small. The constant heating of the drum in pre-operation and operation requires the biggest energy consumption. With that the toner is burned-in after lay on at the print medium. Decreasing the temperature by an energy saving mode in standby can avoid considerable energy costs.

Inkjet printers often are used for colour printouts or as workstation printers. A considerable price decrease can be observed with these printers in the last years. As a result of the cost pressure for producers, off-switches are mainly build-in on the low-voltage side of the power supply. This leads to the dissemination of appliances with unnecessary high energy consumption in pseudo-off, which amounts a large share of power consumption during the use.

Inkjet Printer, 11/4 ipm	Operating	Sleep Mode	Standby	Total
Power consumptions [W]	15	1	-	--
Utilisation period [pages/a]	3 000 b/w 1 000 colour			--
Energy consumption [kWh/a]	0,1	8,7		8,8
Laser Printer, 32 ipm, b/w	Operating	Sleep Mode	Standby	Total
Power consumptions [W]	650	40	-	--
Utilisation period [pages/a]	100 000 b/w			--
Energy consumption [kWh/a]	33.8	350.4	-	384.2

Table 4: Average values for exemplarily printers 2009 [ENERGY STAR]

### 1.3.5 Multifunction Device (MFD)

A commercially-available imaging product which is a physically integrated device or a combination of functionally-integrated components that performs two or more of the core functions of copying, printing, scanning, or faxing. The copy functionality as addressed in this definition is considered to be distinct from single sheet convenience copying offered by fax machines. The unit must

be capable of being powered from a wall outlet or from USB connection.

A single printer or scanner or fax machine or copier will normally use less energy than a multifunction device with similar performance but a multifunction device will use less than 50 % of the summarised energy consumption of separate printer, scanner, fax machine, and copier together. This general rule not only applies to the smaller 'all-in-one' machines for the home or small office, but also for volume production in larger offices. Standby-power of a multifunction device will be much lower than the sum of the standby-power for all four appliances. However, if just one of the functions is needed, it is advisable to buy the single device, because it will use less energy. [Energy Star]

MFD, duplex, 6 -12 ipm	Operating	Sleep Mode	Standby	Total
Power consumptions [W]	500	15	-	--
Utilisation period [pages/a]	5 000 b/w 1 000 colour	-	-	--
Energy consumption [kWh/a]	4,8	131.4	0	136,2

Table 5: Average values for exemplarily MFD 2009 [ENERGY STAR]

### 1.3.6 Fax Machine/MFD with main Fax Function

Fax machines still belong to the basic part of business communication in offices. The average normal mode periods are typically very short and thus the standby mode is the relevant mode. The electrostatic loading and the burn-in of the toner cause high power consumption in the normal mode. Nevertheless the warm keeping of the burn-in fuser in the constant standby mode generally causes higher energy consumption than in the operating mode. Appliances with energy saving modes can achieve thereby extraordinary saving potentials. A pseudo-off mode is not relevant concerning these appliances.

MFD + Fax, 6 -12 ipm( color laser MFD 6-12 ppm)	Operating	Sleep Mode	Standby	Total
Power consumptions [W]	600	15	-	--
Utilisation period [pages/a]	5 000 b/w 1 000 colour	-	-	--
Energy consumption [kWh/a]	4,8	131.4		131.9

Table 6: Average values for exemplarily fax machines 2009 [ENERGY STAR]

### 1.3.7 Copier / MFD with main Copy Function, Digital Duplicator

The most important parameters for the energy consumption are the dimensioning of the drum and the temperature of the drum in standby-mode. The first factor enables more copy power; the second factor prevents annoying waiting periods for warming up the fuser. Energy saving buttons for these appliances make a lower drum temperature possible in standby mode. This results in less waste heat and lower power consumption. The disadvantages are possible longer heating periods, which mean a loss factor concerning the comfort for the users. Therefore energy saving functions are often avoided or not used. Innovative efficient copiers strike a good balance between low stand by consumption and short heating periods. It is suspected that only every fourth appliance gets into the standby mode. So they furthermore consume energy. [Fraunhofer ISI]

A Digital Duplicator is a commercially available imaging product that is sold in the market as a fully-automated duplicator system through the method of stencil duplicating with digital reproduction functionality. [Energy STAR]

MFD + Copier, duplex	Operating	Sleep Mode	Standby	Total
Power consumptions [W]	1 000	10	-	--
Utilisation period [pages/a]	80 000 b/w 20 000 colour	-	-	--
Energy consumption [kWh/a]	53.3	87.6	0	140.9

Table 7: Average values for exemplarily copiers 2009 [ENERGY STAR]

### 1.3.8 Scanner/ MFD with Scanner Function

Flatbed scanners are the most common scanners presently. The original is put on a glass plate similar to a photocopier. Then the original is calibrated by a combined unit of lamp and scanning sensor. In this process it is scanned.

In most cases the appliances are offered without off-switches to offer prices as small as possible. Therefore the appliances constantly run in standby mode if the external plug mains adapter is not pulled from the socket. The appliances exhibit thereby high no-load losses that stand in no relation to the rare use. Almost all MFD have a scanner function included.



#### 1.4 Future Development of Energy Consumptions

A light reduction of power consumption is basically awaited for devices if the market for office equipments is relatively saturated and the development of technological performance features is extensively exhausted with making most of the efficiency increase. In contrast a considerable increase is avoided only because of the technological development of the office-infrastructure. All in all an increase of 42 % is expected up to the year 2010. [Fraunhofer ISI] If a restriction for the energy consumption of IT devices is aimed at instead of an increase, all possibilities in the sector of devices have to be utilised in each case against the mentioned background. At the moment that does not apply for the quantifiable efforts for example with servers. There are national saving potentials for devices of nearly 25 %. Savings of up to 50 % can be realised in individual cases. [Fraunhofer ISI; Splitter]

## 2. Labels for Energy and Environment

Labels for energy and environment serve to maintain concrete standard values which are established by specialists for lower power consumption in different operating conditions. Concrete saving potentials and realistic target figures can be given by this information.

Energy labels and energy orientated criteria of environmental labels are on the focus of this guideline including the attached performance sheets. Environmental or ergonomic labels - for instance the European eco label or TCO - additionally consider criteria like low-radiation, long-life cycle, ergonomics or the use of environment damaging materials. An integration of these additive features is desirable and an addition of the performance sheets is meaningful in this respect.

### 2.1 Label Descriptions

#### 2.1.1 Energy Star

Internet: [www.eu-energystar.org](http://www.eu-energystar.org)

The "Energy Star" is a programme of the US-Department of Energy and the Environmental Protection Agency (EPA). Office-equipments with low energy consumption are world wide labelled with this sign. An EU Energy Star Programme for office equipment has been created since 2002 due to an international agreement between the European Commission and the US-EPA. EC and US-EPA define together the criteria for the covered appliances.



The criteria have been recently adapted to the technological development - respectively are still in the adaptation process:

- For monitors they took effect in January 2005
- For imaging equipment they will take effect in June 2009
- For Computers they will take effect in June 2009

With the new criteria the Energy Star presents dedicated requirements to distinguish the best 25 % of the appliances per product group<sup>3</sup>. The new requirements include total energy consumption beneath idle, standby and sleep mode. Due to the relevance of the Energy Star on the European and world wide market it can be assumed, that enough appliances will fulfil the requirements. Thus, the Energy Star criteria are strongly recommended as minimum requirements for every procurement decisions – as it is obligatory for public procurement of the US federal ministries.

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<sup>3</sup> The previous criteria have been much less dedicated and covered a range of about 80% of the market.

### 2.1.2 EU – Eco Label

Internet: [www.eco-label.com](http://www.eco-label.com)

This label is assigned in the member states of the EU as well as any other European states since 1992. Publisher is the European Commission.

The environmental label is assigned in 23 product groups, in the sector of office equipments only for PCs and laptops. The comprehensive criteria include the whole range of environmental aspects. More guidelines are in work. Nevertheless only a few appliances are registered officially.



### 2.1.3 TCO

Internet: [www.eco-label.com](http://www.eco-label.com)

The Swedish environmental and ergonomic label TCO refers solely to office equipments. The label comprises requirements concerning ergonomics, power consumption, emission and ecology. The emphasis lays on the sector of safety at work. The energy criteria orientate themselves more or less at those of the Energy Star.



According to TCO'99 (criteria of 1999) nearly all groups of office equipments can be labeled. In Europe almost all monitors bear the label so far. Catalogues of criteria have been compiled for LCD monitors and mobile phones in 2001 for the first time. These products can achieve the label TCO'01. The product group of office equipments (TCO'99) was expanded to notebooks and desktop-PCs with the label TCO'05 in 2005. TCO'06 has been developed for multi-functional monitors and TVs.



#### 2.1.4 CE-Marking

Internet: <http://ec.europa.eu/enterprise/newapproach/legislation/guide/document/chap07.pdf>

The CE marking is primarily not an environmental or energy label. It stands for the agreement of the appliances with the requirements of the Electromagnetic Compatibility (EMC) directive 2004/108/EC and all further relevant Community directives. It is binding for all manufacturers of appliances in the sense of the directive. Processor, keyboard, mouse, monitor and printers as well as their packing have to wear the mark - also the individual components have to fulfil the CE standards. The mark stands also for the compliance with the device-specific European measuring standards, e. g. for the determination of the power consumption.



Only appliances with the CE marking are allowed to enter the market in all EU countries. The label should guarantee an acceptable operation of the appliances.

The manufacturers provide their products themselves with the mark. The Federal Office for Post and Telecommunication and the Federal Office for Job Safety just carry out sporadic spot checks. The manufacturer assures in a declaration of conformity that his product is up to the standards of all relevant EC directives. Considering the EuP-Directive 2005/32/EC (Energy using Products) studies for office equipment are under development to be used as the basis for the definition of the most appropriate European policy measures for this product group.

#### 2.1.5 Blue Angel (Blauer Engel)

Internet: [www.blauer-engel.de](http://www.blauer-engel.de)

The Blue Angel is the first and oldest environment-related label in the world for products and services. It was created in 1977 in Germany on the initiative of the Federal Minister of the Interior and approved by the Ministers of the Environment of the national government and the federal states. Only those products are distinguished, which are clearly less damaging to the environment compared with not labelled products on the market. It's the aim to popularise the environmentally friendly product alternatives and to achieve therewith a contribution for the environmental improvement.



The label is assigned by the Environmental Labelling Jury. This committee decides on the assignment bases in cooperation with experts and the Federal Environmental Agency. The catalogues of criteria are adjusted to the state of the art in intervals of two to four years.

For almost all office devices criteria exist except for scanners. The criteria are quite strict and predominantly the standby mode is considered.

### 2.1.6 ECO-Kreis (Eco Circle)

Internet: [http://www.tuv.com/de/eco\\_kreis.html](http://www.tuv.com/de/eco_kreis.html)

The “ECO-Kreis” shows the consumer that products, which comply with current technology, adhere to all current requirements in terms of safety, ergonomics and the environment. These requirements, which have been created in accordance with ISO 14024:1999 (Environmental labels and declarations -- Type I environmental labelling -- Principles and procedures), are subject to continuous revision by adjusting them to new technologies and normative rules and regulations.



The aim of this is to reduce nuisance factors such as noise, poor picture quality and poor ease of use and to protect resources and the environment. For this reason, products are obliged to be constructed so that they can be reused or recycled. TÜV Rheinland Product Safety GmbH has testing laboratories with highly qualified specialists for carrying out tests on IT products. All the properties on IT products that have an impact on humans and the environment can be tested in the laboratories.

The participation of producers of IT appliances in the “ECO-Kreis” is voluntary and available to products that are distributed internationally. Products labelled with the “ECO-Kreis” also fulfil the requirements for the Ecolabel scheme of the European Union.

## 2.2 Comparison of Label Criteria

The most important features and criteria of the different energy labels are compared in table 8. It is noticeable that there is no obligatory label for office equipments so far, like the EU label for household appliances. The new Energy Star requirements present minimum requirements for power consumption in operating condition for the first time.

	Energy Star	Blue Angel	EU eco label	TCO
Product Groups	In the EU Only Office Equipments	Almost every- thing	Household Ap- pliances, Office Equipments	Office Equipments, furniture, phones
Power Consump- tion				
In Operating Mode	yes	no	yes	no
In Sleep	yes	yes	yes	yes
In Standby	yes	yes	yes	partly
Safety at Work	no	yes	yes	yes
Noise Emission	no	yes	yes	yes
Duty / Voluntary	voluntary	voluntary	voluntary	voluntary
Costs for Registration	no	yes	yes	yes
Diffusion Rate	world-wide	Germany, open for foreign pro- ducers	Europe-wide	Europe and North America

Table 8: Comparison of label criteria. [different label-internet pages]



### 3. Practical Instruments

#### 3.1 General Tips for Procurement of Appliances

The following technical specifications should be considered basically for the procurement of appliances.

##### **a. Buying appliances which meet the real demands**

The demand should be checked carefully before each purchase, in particular concerning the productivity of the appliances. Important information for the procurement offices are for example the number of copies for each employee or the required screen size. As a result of the basic correlation between productivity and power consumption, unnecessary power of appliances should be relinquished. If several different devices are needed, the purchase of a multifunction device should be considered instead.

The calculation of the energy related operating costs informs about how advantageous alternatives are (e.g. flat screens instead of CRT monitors). On the basis of the comparison with the label criteria saving potentials are clarified. They differ depending on the "strictness" of the label criteria.

##### **b. Prefer appliances with active energy management**

In obtaining new appliances those should be preferred, which have an energy management system respectively an "auto power-off". If the appliances are equipped with an energy management, then attention should be paid that the function is activated and optimised.

The most comfortable energy management system on computers is the ACPI (Advanced Configuration and Power Management Interface) at the moment. If this interface between hardware and operating system is activated, than it permits effective power saving. Thereby all components are switched off with the exception of the main store. Nevertheless the PC returns to operation mode in the previous condition in approximately 10 to 30 seconds.<sup>2</sup> [IBM]

##### **c. Energy saving tips for the everyday office life**

An energy saving handling with the existing office equipments is recommendable in the everyday office life. Here only some examples of simple measures are mentioned, with which the power consumption can be reduced. It is recommendable to switch-off unused appliances for instance with switch able multiple sockets and to activate the energy management on appliances with that function.

## 3.2 Proposed Procedure

### 3.2.1 Performance Sheets

The website [www.buy-smart.info](http://www.buy-smart.info) provides performance sheets, which can be used for green procurement. The documents are available as worddocuments and therefore individually adaptable. Additionally there is a cost calculation sheet which allows calculating the life-cycle costs according to the different offers. With these results, the best and economical offer can be chosen easily.

The procurement of office equipment is described below in two different alternatives:

- Alternative A: Relatively simplified procedure only considering minimum requirements, the relatively low effort is directly linked to a relatively low energy efficiency effect. The performance sheet only consists of must-/minimum-criteria considering the actualised Energy Star requirements.
- Alternative B: Relatively comprehensive procedure by weighting of challenging environmental criteria versus life cycle costs, the relatively higher effort will result in a definite more effect and the identification of the best economic offer

### 3.2.2 Alternative A (simplified procedure)

For Alternative A only the respective performance sheet is used:

- Send the performance sheet as integral component of the call for tender, and indicate:
  - that the provider is obliged to complete the performance sheet
  - that products, which do not fulfil the criteria will be excluded
- The provider has to detail all requested information respectively to confirm the compliance with the must criteria
- The offers, in which single must criteria are not fulfilled, will be excluded

If desired, life cycle costs can be calculated with the according sheet of the calculation tool.

### 3.2.3 Alternative B (comprehensive procedure)

In Alternative B the following tools appropriate of:

- Performance sheet Alternative B with additional target criteria compared to Alternative A
- Calculation tool for the evaluation of the life cycle costs
- Evaluation tool to detect the best economical offer by combining both (included module within the calculation tool)

The performance sheets for Alternative B will be implemented in the procedure in the following manner:



- The performance sheet in Alternative B consists of must/minimum criteria as well as target criteria considering the Energy Star, EU eco label for PC's and laptops or the TCO label in all other categories.
- Send the performance sheet as integral component of the call for tender, and indicate:
  - that the provider is obliged to complete the performance sheet entirely
  - that products, which not fulfil the must criteria will be excluded
- Decide on a weighting share for environmental criteria (performance sheets), other criteria and life cycle costs and state it in the call for tender.
  - We recommend a share of 30 % for environmental criteria. It should not be higher than 45 %, to comply with European jurisdiction (Wienstrom Rs. C-448/01, 04.12.2003).
  - If points for other criteria are given, it should be taken care that the weighting share for the life cycle costs is over 50 % and thus remains the most important acceptance criteria.
- The provider has to detail all requested information (especially the target criteria) respectively to confirm the compliance with the must criteria
- The offers, in which single must criteria are not fulfilled will be excluded

The calculation tool will support the evaluation of the total life cycle costs and - based on this - the most economic offer:

- Fill in the product specific information given by the provider in the performance sheet as well as the number of target criteria points evaluated in the performance sheets into the calculation tool.
- Fill in the weighting share for environmental criteria if it is not 30 %.
- The cost calculation results in life cycle costs per year.
- The result is the evaluation of the best economical offer.

The files are available as word and excel documents on the Internet page:  
[www.buy-smart.info](http://www.buy-smart.info).

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## 5. Abbreviations

a	year
ACPI	Advanced Configuration and Power Management Interface
cpm	Copies per minute
CRT-Monitor	Cathode Ray Monitor
EI	Energy Efficiency Index
GEEA	Group for Energy Efficient Appliances
LCD-Monitor	Liquid Crystal Display-Monitor
ipm	images per minute
P	Power Consumption
TEC	Typical Electricity Consumption
W	Watt
WOL	Wake On LAN