

IT Equipment: Procura⁺ Key Criteria - Extended version

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1 Introduction

IT equipment, as dealt with here, encompasses a range of different product groups including: desktop PCs and laptops (notebooks), monitors, printers, photocopying machines, multifunctional devices (MFDs¹), scanners and fax machines.

European public authorities spend high amounts each year on IT equipment. In 2000 Zürich, for example, spent €19 million, or 4% of total annual procurement. This is not only important in terms of the city budget, but also important for the market as a whole – over 10% of the European market according to calculations carried out in the RELIEF project². This shows the possible impact of public sector procurement in guiding the market towards producing ever greener products.

In fact, the recent improvements in the energy efficiency of IT products was to a large extent because of a US Federal regulation that all PCs purchased by public authorities must comply with the standards designated by the Energy Star label. Today virtually all PCs meet the original standards, with the label constantly raising the standard to further drive the market.

1.1. Key environmental impacts

Impact	→	Approach
<ul style="list-style-type: none"> The consumption of electricity and resulting CO₂ emissions 	→	Purchase energy efficient models

For IT products the most significant environmental impact relates to the amount of electricity they consume³. Most IT products now come with energy saving modes (“sleep”/“standby”), however most of us are not aware that such products also consume electricity even when they have been turned off, but are still plugged in. A study by the Swiss Federal Energy Agency

¹ Multifunctional devices (MFDs) combine several functions (like printing, copying, faxing and scanning) in a single device. For more information see Section 3.9.

² Pierrard (2003) “Results of the European calculation“ in Erdmenger (ed.) „Buying into the Environment – Experiences, Opportunities and Potential for Eco-Procurement“, Greenleaf

³ Schmidt & Fryendal (2003): Methods for Calculating the Environmental Benefits of 'Green' Products in Erdmenger (ed.) Buying into the Environment – Experiences, Opportunities and Potential for Eco-Procurement, Greenleaf

(Bundesamt für Energie), for example, showed that printers consume 43% of their energy in “off” mode.⁴

Whilst substantial improvements have been made in the energy saving modes of IT products, the same cannot be said for ‘active’ mode requirements, i.e. when the machine is in active use. Large variations in active energy use exist between different models on the market (some devices consume twice as much energy as others), and the active mode is in most cases responsible for the majority of total energy consumption.

Products offered on the market differ quite significantly in their energy consumption in the different modes (“on”/“sleep”/“off” etc.), and introducing some simple requirements to procurement can make a big difference. Product labels, especially Energy Star,⁵ provide useful guidance on the setting of appropriate standards.

As the overriding environmental consideration, the Procura⁺ key criteria below focus solely on energy consumption, however there are several other important environmental impacts, for example, relating to substances used in production. A number of substances can be used in the production of IT products with damaging effects on human health and the environment, including lead, mercury, cadmium, brominated and chlorinated flame retardants (PBB, PBDE), PVC, though many of these will be phased out in electrical and electronic equipment, no later than by July 1st, 2006 following an EU Directive.

Electromagnetic radiation given off by electronic equipment may also have damaging health effects, and a number of product labels (TCO, EU Flower, Nordic Swan) set specific emission limits.

It is also helpful to consider the future availability of spare parts to ensure a long product life-span, as the IT sector is responsible for a considerable amount of waste generation from quickly obsolete products. Noise levels during use can also vary greatly and impact on the working environment.

1.2. Procurement considerations

The procurement of IT products is dealt with in different ways by different authorities. In many cases all IT responsibilities, including installation, maintenance and equipment purchasing are out-sourced to a private contractor. In some authorities, IT procurement is dealt with by a different department from other purchases, mainly due to the technical complexity of the product group.

In cases where procurement is carried out by an external contractor, the public authority can make clear in the contract conditions that all IT equipment purchased/leased must meet the criteria outlined below.

The consumption of certain models is heavily dependent on the type of performance required by the product – for a PC, for example, the power supply, the processor and the graphics card, can make a significant difference to energy consumption. Thus, an exception may need to be made where high-performance models are required, energy consumption will necessarily be higher.

⁴ Meyer & Schaltegger (1999): Bestimmung des Energieverbrauchs von Unterhaltungselektronikgeräten, Bürogeräten und Automaten in der Schweiz, St. Gallen

⁵ www.energystar.gov

1.3. Cost implications

As with any electricity-using product, purchasing energy efficient models is a win-win option – reducing running costs, and also reducing environmental impacts. Generally, the energy efficiency of the product also has little impact on the purchase price, certainly if you are aiming for a model within the 25% most efficient on the market. This means buying energy efficient models will almost always be the cheapest option over the computer's lifetime.

The EU Energy Star website has a useful tool for calculating the possible financial savings of buying a more efficient product: <http://www.eu-energystar.org/calculator.htm>

1.4. Relevant European legislation

Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive), required the phasing out of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) in such equipment by 1st July 2006, with a few exceptions. Batteries are not covered by this Directive and are instead covered by Directive 91/157/EEC on batteries and accumulators containing certain dangerous substances, which has again contributed to phasing out certain substances, including mercury, cadmium and lead.

Also relevant is the Directive on waste electrical and electronic equipment (WEEE)⁶ which requires Member States to ensure that systems are in place providing the free take-back and appropriate waste treatment of electrical and electronic equipment by suppliers.

⁶ Directive 2002/96/EC on waste electrical and electronic equipment and amending Directive 2003/108/EC

2 Procura⁺ Key Criteria – IT products

The Procura⁺ key criteria for IT product purchases focus on

- **Energy performance:** The newly updated Energy Star standards for computers and imaging equipment (covering printers, photocopiers, MFDs, scanners), (both included in this CD-ROM) can currently be met by 25-35% of products on the market. Most product-labelling bodies already (or will soon) unify energy performance requirements around these standards. As such they provide a highly straightforward, ambitious, and also market friendly set of requirements, which can be used as minimum standards.

Direct purchase of IT products

Subject matter: *Purchase of environmentally friendly PCs (or printers, MFDs etc. as appropriate)*

Specifications: *All products offered must meet the latest Energy Star standards for energy performance, available at www.energystar.gov, or equivalent.*

The Energy Star label will be accepted as proof of compliance, as will reliable technical documentation provided by the supplier that the criteria are met.

Implementation notes



Specifying standards: There is no requirement to specify exact limits in the tender documents – referring to product label standards is fine as long as the ecolabel meets certain conditions (see Chapter III). The standards themselves are relatively complex and technical (especially for imaging equipment), but have been attached in this CD-ROM for information.



Verification: Both the specifications and the award criteria have been developed in line with product labelling standards. Most products offered will carry the label however other forms of proof must be accepted.

3 Further ideas

Many other environmental considerations can be taken into account when purchasing IT products, as listed below. The most straightforward way to address these any of these issues is by using the criteria behind one of the internationally recognised and independent product labels and systems – TCO, Nordic Swan, Blue Angel, EU Flower, EPEAT. For several of the issues, the wording used by the EU Ecolabel (Flower) has been included for reference. Links are provided to all the mentioned product labels in Section 4 below.

3.1. Hazardous substances

A number of substances have traditionally been used in IT products which may be damaging to human health and the environment. Although the RoHS Directive⁷ way gone a long way to eliminating such substances, some exemptions remain, for example certain quantities of mercury in light sources used for computer monitors, or certain uses of lead and cadmium. Products exist on the market which go beyond the demands of the Directive.

EU Flower criteria:

⁷ Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment

“The background lighting of the LCD monitor shall not contain more than 3 mg of mercury on average per lamp.”

3.2. Durability

A key concern in the IT sector is the current limited life-cycle of many devices and the need for constant upgrading. In several LCAs (Life-Cycle Assessments) extended lifetime turned out to be of utmost significance for IT equipment. It is important to ensure that sufficient warranty and spare parts availability is provided. The design of the machine (i.e. how easy it is to simply upgrade parts) is also significant. This issue is examined in further detail below (see Lean-client system).

EU Flower criteria:

“(a) The computer shall be designed so that the memory is readily accessible and can be changed.

(b) The computer shall be designed so that the hard disk, and if available the CD drive and/or DVD drive, can be changed.

(c) The computer shall be designed so that graphic cards are easily accessible and can be changed.”

3.3. Take-back and disposal

The WEEE Directive⁸ should provide for appropriate channels for take-back and disposal of products at the end of life. Procurers can go considerably further in requiring certain characteristics which make the recycling of products easier, such as how easy it is to disassemble, limiting the mixing of different plastic types, and the use of easily recyclable materials.

EU Flower criteria:

“The manufacturer shall offer free of charge the take-back for refurbishment or recycling of the product, and for any component being replaced, except for items contaminated by users (e.g. in medical or nuclear applications). In addition, the product shall meet the following criteria:

(a) one qualified person alone shall be able to dismantle it;

(b) the manufacturer shall check the disassembly of the product and provide a disassembly report that shall be made available to third parties on request. Amongst other items, the report shall confirm that:

— connections are easy to find and accessible,

— connections are as standardised as possible,

— connections are accessible with commonly available tools,

— the background lighting lamps of LCD monitors are easily separable;

(c) hazardous materials shall be separable;

⁸ Directive 2002/96/EC on waste electrical and electronic equipment and amending Directive 2003/108/EC

- (d) 90 % (by weight) of the plastic and metal materials in the housing and chassis shall be technically recyclable;
- (e) if labels are required, they shall be easily separable or inherent;
- (f) plastic parts shall:
 - ...
 - be of one polymer or compatible polymers, except for the cover, which shall consist of no more than two types of polymers which are separable and uncoated with, for example, paint,
 - contain no metal inlays that cannot be separated by a single person using simple tools;”

3.4. Packaging and information

As with all consumer products, careful attention should be given to how the product is packaged, in terms of, for example, the avoidance of certain substances and re-acceptance of packaging materials by suppliers. Furthermore, instructions on the appropriate disposal of the product at the end of its life, and also on how users can ensure the best environmental performance should be provided.

EU Flower criteria:

“Packaging shall meet the following requirements:

- (a) all packaging components shall be easily separable by hand into individual materials to facilitate recycling.
- (b) where used, cardboard packaging shall consist of at least 80 % recycled material.”

3.5. Electromagnetic emissions

Concerns have been growing that the electromagnetic radiation emitted by IT products, and to which many of us are subjected to in heavy loads, may have a damaging health impact. To combat this possibility several product labels (notably TCO. Now also the EU Flower and Nordic Swan) have set limits on acceptable levels.

EU Flower criteria:

The personal computer monitor shall meet the requirements set out in EN50279, Category A.

3.6. Noise

Noise emissions are another factor to consider when thinking about providing a healthy working environment as this can cause stress for those sensitive to such sounds.

EU Flower criteria:

The ‘Declared A-weighted Sound Power Level’ (re 1 pW) of the personal computer system unit, according to

paragraph 3.2.5 of ISO 9296, shall not exceed:

- 4,0 B(A) in the idle operating mode (equivalent to 40 dB(A))
- 4,5 B(A) when accessing a hard-disk drive (equivalent to 45 dB(A)).

3.7. Consumable materials

A number of IT devices, notably those involving printing (printers, photocopiers and multi-functional devices), also consume large quantities of other materials, especially paper and ink/toner. It can be specified that devices must be suitable for recycled paper and be equipped with a duplex function. Inks/toners should not contain certain substances such as cadmium, lead, chromium or mercury, and ink/toner cartridges should furthermore be refillable and ideally manufactured from at least 75% recycled materials.

3.8. Training on efficient use

Most IT devices are now equipped with energy-saving functions, however it is important for the staff using such devices to understand how these functions work, and also, more importantly, the environmental and financial benefits to be gained by using these effectively. Staff should therefore be provided with regular basic training on the efficient use of IT devices. This would include simple instructions such as turning off monitors when not in use, avoiding the use of screen savers as they prevent the monitor and computer from entering the low power modes, and, ensuring that energy-saving functions are actually turned on.

3.9. Innovative products and future trends

Multi-functional devices (MFD):

By combining several necessary functions (like printing, copying, faxing and scanning) in a single device there are significant environmental and organisation benefits to be had. Material consumption for production can be reduced in this way but one should be aware that the limits of the criteria for energy consumption for MFDs are less strict than for stand-alone devices.

Lean client Systems:

Currently most computer network systems consist of a set of powerful computers. Each of these is able to run all programmes on its own and with its own resources. In lean (or thin) client systems this concept is altered in the way that only one central server runs the programmes and does all processing, while the clients basically consist of a keyboard, a monitor, and a small processing unit. Modern operating systems like Linux or Windows XP make this development possible.

The advantage of these systems in terms of environmental performance is twofold. Firstly, the client computers do not need to be updated as often and thus current computer systems can run at least one generation (five years) longer. Apart from avoiding the impact of the production of new computers and the discarding of the old ones, this also saves significant amounts of money. Secondly, the less powerful systems need less electricity for their operation: Old CPU systems like 80486 processors need as much energy as the most energy-efficient modern ones. Furthermore, no hard disk needs to be run, etc. A number of public authorities across Europe are currently looking into this approach. Kolding, for example, successfully introduced a lean client system in 2002.

Open source software

The current software produced by Microsoft and other computer companies is protected from being altered by hiding the “source” of the programming codes. Open source software means

that the software can basically be altered by any programmer to adapt it to their individual needs. To a certain extent this leads to a more efficient use of system resources. Functionality results from the requirements of the users and does not follow marketing strategies. This leads to efficient software appliances, which also enable “low-performance” systems. In combination with the lean client approach, reduced hardware requirements allow the longer use of existing installations which also results in an extension of the computer’s lifetime. Furthermore, using open source software leads to huge financial benefits through saving on purchasing the software licenses.

Computer take-back and reuse

Currently, the European second-hand computer market is virtually non-existent. But a couple of companies now specialise in refurbishing and reselling computers. By doing this, the lifetime of the products is increased and therefore the environmental impacts of manufacturing further products are avoided.

4 Relevant product labels



European Flower

PCs, laptops
www.eco-label.com



Nordic Swan

PCs, copying machines, printers, fax machines and MFDs
www.svanen.nu/Eng/default.asp
Energy Star



German Blue Angel

PCs, notebooks, monitors, printers, copiers, MFDs
www.blauer-engel.de/englisch/navigation/body_blauer_engel.htm



PCs, monitors, printers, copiers, MFDs, fax machines, and mail machines, scanners
www.energystar.gov



Group for Energy Efficiency Appliances (GEEA)

PCs, monitors, printers, copiers, mailing machines, MFDs, scanners
www.efficient-appliances.org



TCO
PCs, notebooks, printers, monitors
TCO:
www.tcodevelopment.com



EPEAT (Electronic Product Environmental Assessment Tool)
www.epeat.net