

# Towards Higher Energy Efficiency of IT-Products: The German / European Approach

## *1. Introduction*

The purpose of this paper is to provide information on the policy approach taken in Germany and on the EU level for increasing the energy efficiency of IT products. We will first **describe the existing or planned policy mix** addressing the minimum or average energy efficiency of products that belong to the core infrastructure of the internet, like computers (workstations, servers, desktop PC, laptops/notebooks) including monitors, keyboards; printers; mobile phones; modems, as far as information is available.

The paper will then analyse **the ecological effectiveness and the economic efficiency** of the various instruments. Finally, the paper will **describe reasonable and desirable policy coordination** on an international level.

## *2. Description and Analysis of the German/European Policy Approach Towards Higher Energy Efficiency of IT Products*

### **2.1 Possible Elements of the Policy Mix**

A policy mix aimed at increased energy efficiency of IT products can contain various instruments, targeting one or more of the three main types of market actors involved: manufacturers/importers; retail trade; and buyers/users of IT equipment.

Policy measures targeting **manufacturers and importers directly** include:

- voluntary commitments, e.g. voluntary industry standards,
- binding industry standards, e.g. defined by negotiated agreements,
- laws and guidelines, e.g. defining mandatory minimum efficiency standards.

Policy measures targeting **buyers and users** of IT equipment (and maybe the **retail trade** as an intermediary), **indirectly** also have an impact on **manufacturers and importers**. These include:

- mandatory or voluntary energy labels, either as energy classification labels applied to all models (e.g., the EU label for domestic appliances), or as endorsement labels that are only applied to, e.g., the 25 % most efficient models on the market, or to those models that fulfil certain minimum efficiency criteria;
- mandatory or voluntary Eco-labels, which have energy efficiency criteria among other environmental criteria (e.g., toxic substances; recyclability);
- accompanying measures such as information campaigns, databases of models fulfilling the label criteria, software tools for life-cycle cost analysis or other supports for buyers, maybe financial incentive programmes for energy-efficient models;
- energy-efficient or green procurement programmes, including technology procurement.

**This discussion paper** will describe and analyse the policy measures targeting the manufacturers directly, as well as the energy labels and accompanying measures. Eco-labels and their accompanying measures, as well as green procurement programmes will be described and analysed in **another discussion paper** on "Eco-Labeling and Green Procurement for IT products in Germany/Europe".

## 2.2 Guiding Questions for the Evaluation of the Policies

For the **evaluation of the ecological effectiveness** of each of these measures we will use a simplified criterion: does the proposed measure offer sufficient incentives for the **producers**? This should be incentives to reduce energy consumption to the level of the best available technology or lower during a) the "on" mode, b) the "power save" mode, c) the "stand by" mode and d) the "off" mode (as far as they exist for the product under consideration) as well as the yearly energy consumption.

Furthermore, for those measures that primarily target the **buyers/users** of IT equipment, we will use a second simplified criterion for evaluating the ecological effectiveness that is related to the questions: are the criteria for labelling/ procurement of products ecologically sound? Does the label truly change the decision of buyers to purchase more efficient

products? Does the label/procurement help to bring about technology shifts towards energy efficient new technologies (e.g. LCD Monitors)?

For the **evaluation of the economic efficiency** of the various measures, we use the following evaluation questions related to **producers**: is it cost-effective to reach the minimum or average energy efficiency target set by the policy (this question shall be answered as far as information exists)? Does the measure cover all market participants (e.g. producers, importers, traders). Are there market distortions (e.g. unequal impacts on companies operating at different scales)? Does the proposed measure provide a clear framework for producers? Which administrative effort is necessary to achieve the stated environmental goals of the proposed measures?

Furthermore, we will use the following evaluation questions that apply only to those measures, which primarily target the **buyers/users** of IT equipment: do labelled products provide a good balance between the savings from reduced energy consumption and extra-costs for energy efficient technology components of the labelled product? Do the labels and procurement schemes significantly increase the market for green IT-products? Are there measures (information campaigns, database, software or other supporting materials for decision-makers etc.) that support the label/procurement scheme?

## **2.3 Description and Analysis of the Policies Active or Planned in Germany and on the EU Level**

### *Overview*

IT equipment like computers (workstations, servers, desktop PC, laptops/notebooks) including monitors, keyboards, printers, mobile telephones, modems etc. are highly standardised, tradable goods. Therefore, the market for these appliances is not only European-wide, but often world wide. The European Union level thus has priority for any policy regulating the energy efficiency of IT products, i.e. in principle has the right to set harmonised minimum requirements. Where mandatory EU policies exist, the Member States may not set up conflicting mandatory requirements; they may, however, create additional voluntary policies or programmes.

In 1997, a study for the German environmental agency (Umweltbundesamt, 1997) revealed that the total stand-by electricity losses in Germany in 1995 were 20.5 TWh/a, roughly 4 % of the total electricity consumption in Germany. Of this, roughly 8 TWh/a were attributable to IT and telecommunications technology.

Following this study, reducing stand-by losses became a priority for German energy efficiency policy. On Sept. 9, 1998, the Bundestag passed a decision, which called upon the government to

- work for the improvement and extension of voluntary energy labelling schemes of electric appliances, including stand-by losses, e.g. in the framework of the German and EU Eco-labels;
- work with the European Commission on the harmonisation and extension of national and EU energy labelling schemes, and to examine whether the energy consumption, including stand-by losses, of consumer electronics, communications and IT technology could be included in such schemes;
- work for an extension of the negotiated agreement with EACEM on the stand-by losses of TVs and VCRs to other types of consumer electronics, as well as to communications and IT technology;
- include, if possible, the German association of electric and electronic goods manufacturers, ZVEI, into the voluntary self-commitments for climate protection of the German industry, with the aim of a commitment by ZVEI to reduce the electricity consumption of their products;
- purchase more energy-efficient products in government procurement;
- ask producers/suppliers and trade of electric appliances to increase their information and advice to customers;
- implement, in co-operation with industry associations and environmental NGOs, a competition for the development of particularly energy-efficient electrical appliances.

Looking at this decision of the Bundestag, the focus of German energy efficiency policy with regards to electric and electronic equipment is clearly on voluntary or negotiated policy actions.

For IT equipment, this approach appears to be well justified because of the rapid technological change. The technologies to provide a specific service are changing rapidly and so are the features and services offered by the appliances, e.g., through the advent of integrated appliances combining the functions of two or three previously separated appliances into one. Voluntary or negotiated policies are much more flexible than, e.g., mandatory

minimum efficiency requirements, since the latter usually take several years before being adopted. With a voluntary or negotiated policy scheme once in place, the requirements can be changed on a yearly basis, if necessary. For the same reason the European Commission has put a focus on voluntary and negotiated actions in the field of IT technology.

However, of those policy measures called for in the resolution of the German Bundestag, little has been implemented to date. Most activity has taken place in the field of energy- or Eco-labelling (see the discussion paper on "Eco-Labelling and Green Procurement for IT products in Germany/Europe"), both on the German and EU level. In contrast, no national voluntary or negotiated agreement has been concluded; on the EU level, only an agreement on power supplies of appliances in general has some effect on the electricity consumption of IT equipment.

However, the Umweltbundesamt has run an information campaign together with the German section of Friends of the Earth, BUND, on stand-by consumption. Furthermore, the Umweltbundesamt has published a well-known guidebook on green procurement (Umweltbundesamt, 1999). Stand-by consumption of IT and other office equipment is playing a prominent role in green procurement schemes in Germany (see the discussion paper on "Eco-Labelling and Green Procurement for IT products in Germany/Europe").

A particular focus of German policy is on the problem that appliances even in the "off" mode often consume small amounts of electricity (cf. the cartoon). Therefore, the government has at several occasions asked industry to produce appliances for which "off = off", which means that the consumption is really 0.0 W after turning the "off" switch, and has tried to raise awareness for this problem on the international level.

Mr. Toilsome had a TV set without off-switch. Therefore he always followed the advice to pull the plug after the last programme...



idea: C. Mordziol, Berlin  
realization ©: Egge Freygang, Berlin

...but sometimes he thought that there should be a better way.

In the following, German or EU policies, which are institutionalised and have been running for a number of years, will be described and analysed according to the criteria given in chapter 2.2.

## 2.4 The EU Agreement on Power Supplies

### *Description*

Power supplies are widely used, both inside all IT, telecommunications or consumer electronic equipment, and as stand-alone equipment to charge batteries or to provide DC voltage to some IT or consumer electronic equipment. Poor design and the need to limit the power supply cost result in off-mode consumption of a few Watts. Technical solutions exist to limit the off-mode consumption to less than 1 Watt.

Power supplies are produced in large quantity and supplied to Original Equipment Manufacturers (OEMs) of, for example, mobile telephone suppliers. Technological change is moderate and large quantities of power supplies are produced in the Far East and imported in the EU.

OEMs in general have no interest or incentive to reduce stand-by consumption. The Commission has prepared a Code of Conduct to reduce stand-by consumption of power supplies. This Code of Conduct has already been published and discussed with all interested parties. The proposed targets for stand-by consumption are given in the following table. They will have to be met by at least 80 % of the models sold by one manufacturer; this threshold has been chosen to avoid lengthy lists of exempt articles, for which the use of the more energy-efficient switch-mode technology would still be too costly (Bertoldi et al. 2000).

Table 1: Proposed Standby (No-Load) Targets for External Power Supplies

Rated Input Power	Maximum No-load Power Consumption		
	Phase 1 01.01.2001	Phase 2 01.01.2003	Phase 3 01.01.2005
$\geq 0,3 \text{ W}$ and $< 15 \text{ W}$	1.0 W	0.75 W	0.30 W
$\geq 15 \text{ W}$ and $< 50 \text{ W}$	1.0 W	0.75 W	0.50 W
$\geq 50 \text{ W}$ and $< 75 \text{ W}$	1.0 W	0.75 W	0.75 W

### *Analysis of ecological effectiveness*

The power consumption caused by the external power supplies is mainly important for the stand-by or "off" modes, because an inefficient power supply can cause a relatively high share of the total consumption. Therefore, an agreement between the EU and manufacturers on external power supplies will have a considerable impact on the power demand in the stand-by and "off" modes of, e.g., notebooks, printers, and mobile phones, as well as on their annual electricity consumption. It has, however, less impact on the consumption in the "on" or "power save" modes.

A conventional linear power supply consumes on average 3 W, even if the "off" switch has been used. In contrast to this, modern switch-mode power supplies, or circuitry using switch-mode power supplies, can use as little as 0.1 W for appliances with a maximum load of 20 W (Molinder et al., 1997).

According to study prepared for the European Commission (Molinder et al., 1997), in a baseline scenario the switch-mode technology would be used for most power supplies in new equipment by 2010, leading to an average stand-by power consumption of 1 W at no extra cost. However, in a minimum efficiency scenario 0.1 W on average was achieved. In this minimum efficiency scenario, total stand-by power consumption of the stock of installed external power supplies was estimated to reduce by 40 % between 2000 and 2010, while in the baseline scenario (1 W average stand-by of new power supplies), the total consumption would only stabilise.

Looking at these numbers, the EU negotiated agreement would not achieve the full energy efficiency potential associated with a 0.1 W consumption, but give ambitious signals to manufacturers to approach this target particularly for the smaller input power appliances. Therefore the ecological efficiency of the agreement can be rated as good, regarding the "stand-by" and "off" modes of equipment using external power supplies.

### *Analysis of economic efficiency*

For an analysis of the economic efficiency of the negotiated agreement on power supplies, the questions listed in Chapter 2.2 can be answered as follows.

- The measure should be cost-effective for society as well as for most consumers. The study cited above (Molinder et al., 1997) estimates that the market trend itself would lead

to an average of only 1 W by 2002 at no additional cost. Even under the assumption that a switch-mode supply would cost 1 or 2 EUR extra to manufacture, or with the usual markup 3 to 5 EUR for the final consumer, this would nevertheless be cost-effective: assume 2 W average savings. This is equivalent to roughly 17 kWh/year. With a levelisation factor of 30%, the annual levelised costs are roughly 0.45 EUR/year for society (at the manufacturing level), or 1.0 to 1.5 EUR/year for the customers (depending on customer size and the respective markup). Therefore, the cost of conserved energy would be ca. 0.03 EUR/kWh for society, or 0.06 to 0.09 EUR/kWh for the customers. These costs of conserved energy compare to marginal electricity supply system costs of 0.04 to 0.05 EUR/kWh, and customer electricity prices between 0.06 and 0.10 EUR/kWh for most customers (except very big industrial customers).

- The measure does, as a negotiated agreement, not cover all market participants, but probably most of the manufacturers and importers.
- The measure has been designed to avoid market distortions by the provision that only 80 % of the power supplies distributed must comply with the maximum stand-by power level requirement.
- The measure does provide a clear framework for producers.
- The administrative effort is expected to be minor for the government side, and moderate for the industry side. This is, apart from the greater flexibility, a major advantage of negotiated agreements over mandatory minimum efficiency standards.

Taken together, the economic efficiency of the proposed negotiated agreement for external power supplies can be regarded as good.

### *The "Energy Star" Label*

Energy Star has been developed in collaboration between the U.S. Department of Energy, the U.S. Environment Protection Agency and many companies. It is designed to prevent pollution by helping consumers to buy products that use less energy.

Under this label, the Federal government defines minimum standards for energy consumption for many consumer products, such as major appliances. In order for one of these products to receive an Energy Star rating, it must exceed the minimum Federal Standards by a certain amount, which varies from product to product. For other products there are no minimum energy use standards (such as office equipment), but products which qualify for the Energy Star label must have special features which enable them to use less energy than similar products.



The Energy Star will probably be introduced in the EU as well. A contract between the EU and the U.S. Government has already been prepared. European manufacturers/suppliers can apply for the label after it will have been introduced. The current requirements of the Energy Star label for IT equipment are provided in **Annex 1**.

However, particularly for PCs, the Energy Star label has been widely used in Europe even before it has officially been introduced.

#### *Analysis of ecological effectiveness*

As all labels in the field of IT technology, the Energy Star label does not address the energy consumption in the "on" mode, but instead was the first to create a "sleep" mode for times of absence of the user; for printers and scanners, the "stand-by" mode is targeted. The focus of the label is thus to reduce the "waste" of energy when the product is not used, although the "off" mode is not yet included here. As regards the "sleep" and "stand-by" modes, the requirements are not as strict as those of other voluntary endorsement labels. This limits the ecological effectiveness of the "Energy Star" label; on the other hand, the level, of participation by manufacturers and products is very high for PCs. This turns the Energy Star label **into a minimum efficiency standard**.

The high awareness among customers has certainly changed their purchasing behaviour; however, in the early years, even most of the PCs sold with an Energy Star label had the "sleep" mode disabled by default, and many users were not able or did not take care to enable the "sleep" mode. Problems also occurred with intranets and the "sleep" mode. In recent years, these problems have become fewer, and the enabling rates for the "sleep" mode have increased. Since the "on" mode is not subject to the criteria, they are not sufficient to bring about technology shifts to LCD monitors or notebook CPU technology.

Taken together, the Energy Star has had a high environmental effectiveness by promoting the "sleep" mode world-wide, and by acting like a minimum efficiency standard for the "sleep" and "stand-by" modes. However, the effectiveness can be further improved by making the threshold values more dynamic towards lower power consumption and, e.g. including the "on" and "off" modes in the future.

### *Analysis of economic efficiency*

No information is available about the cost-effectiveness of reaching the power requirements of the Energy Star label. However, since the requirements are the result of negotiations between government and industry, it can be assumed that they are cost-effective.

Although voluntary, the Energy Star label covers almost all market participants in the global IT market, which shows that it provides a clear framework for manufacturers, does not lead to market distortions, has a moderate administrative effort, and did significantly increase the market share of energy-efficient products. In the USA, additional marketing measures are offered by the government, which in the EU will still have to be created along with the official introduction of the Energy Star labelling scheme.

In sum, the economic efficiency of the Energy Star label can be rated high.

### *The GEA Label*

The German Group Energy-Label (GED, Gemeinschaft Energie-Label Deutschland) has several members (IMPULS-Programm Hessen, Berliner Energie Agentur GmbH, Energiestiftung Schleswig-Holstein, Bund der Energieverbraucher e.V., Energieagentur NRW, Umweltbehörde Hamburg, B.A.U.M., Bundesamt für Energie, BUND, WWF and ASEW). The GED is also a member of the Group for Efficient Appliances (GEA), a European organisation.

The GED aims to reduce the use of energy in the field of consumer and office electronic equipment. Moreover, the GED aims to stop the loss of energy connected with the stand-by function of electronic equipment. Therefore, the GEA energy label has been introduced to label products with a low energy use. In principle, the criteria for the GEA label are set as to endorse the 25 % most energy efficient products on the market. The current criteria are provided in **Annex 1**.

The GED has labelled personal computers, monitors, printers, and scanners. The producer can apply at the GED contact office, run by the Berliner Energie Agentur GmbH, for the label. Therefore, the GEA label is a voluntary endorsement label just as the Energy Star label.

The GED publishes a list of qualifying products, for which the manufacturers have applied and received the GEA label, and which are available in Germany. The list (<http://www.energielabel.de>) is updated every three months. As of September 2000, the list included

- 14 PCs without monitor from 3 manufacturers, no PC with integrated monitor;
- over 160 monitors from 22 manufacturers;
- 25 printers from 6 manufacturers.

Furthermore, the GED publishes a list with "progressive buyers", institutions which buy products with the GEA Label.

#### *Analysis of ecological effectiveness*

The principle used to determine the criteria for the GEA label is to endorse the 25 % most energy-efficient models on the market. Based on this principle, the GEA Label would give sufficient incentives to manufacturers to reduce the consumption of desktop PCs, monitors, printers and scanners in the "power save" and "off" modes towards the limits that are regarded feasible at present. The high number of monitors fulfilling the GEA label criteria indicates that restricting the consumption of a monitor in "sleep mode" to 3 W does not pose a problem to manufacturers today. The requirements for printers are much tighter than those of the "Energy Star" label, yet at least the 25 models listed fulfil them. However, some GEA label requirements could be tightened as well: the new "power save" requirements of the "Energy Star" label for desktop PC processing units are stricter than those of the GEA label at present.

However, as with all other labels, no requirements are given for the consumption in the "on" mode.

As the GEA label is not a general Eco-label but a pure energy label, the criteria are limited to electricity consumption, but they are ecologically sound with respect to this issue. Since the "on" mode is not subject to the criteria, they are not sufficient to bring about technology shifts to LCD monitors or notebook CPU technology.

The GEA label can be assumed to change the purchasing behaviour at least of those "progressive buyers" that have entered an agreement with the GED, but also of others who are

aware of the label. However, the list of "progressive buyers" could be more inclusive, and the awareness of the label among purchasers could be improved.

Considering the short time the GEA label has been introduced in Germany, we conclude that this label has a potentially high ecological effectiveness for the energy efficiency.

#### *Analysis of economic efficiency*

It is not possible to judge the cost-effectiveness (for society and for the final customers) of reaching the electricity consumption requirements for the EU Eco-Label, since information on extra costs or purchase prices of licensed relative to other models is not available. However, for those GEA label criteria that are similar to those of the "Energy Star" label, which are subject to cost-effectiveness assessments, it can be assumed that the requirements can be reached in a cost-effective way. Where requirements are stricter (monitors and printers), the number of licensed appliances provides an indication that costs are not too high, if any.

Being a voluntary endorsement label, the GEA label does not cover all market participants, but it also avoids market distortions. It does provide a clear framework for producers. The administrative effort appears moderate for both public licensing agencies and the equipment suppliers, which is underlined by the high number of licensed products.

The GEA label has the potential to significantly increase the market for energy-efficient IT products, but it lacks other environmental criteria. The organisations behind the label – in Germany the GED – have the power to steadily increase the awareness of consumers about the label during the next years; they operate a well-designed website with downloadable or easily accessible and well-structured lists of licensed products. However, other tools like a life cycle cost analysis tool for decision-makers are still missing.

All in all, the potential economic efficiency of the GEA label in the coming years is considered high.

### ***3. Conclusions and International Policy Co-ordination***

In conclusion it appears that the "Energy Star" label has taken the role of a world-wide minimum efficiency standard for IT products, particularly for PCs. With the planned

introduction of the "Energy Star" label in the EU, this will also be official EU policy. No further negotiated agreements on minimum efficiency requirements are planned in the EU, as they do not seem necessary.

However, some national governments would prefer higher standards for the requirements of the EU Energy Star scheme. For instance, the German Bundesrat decided in April 2000 that it considered the requirements of the "Energy Star" too easy to achieve. The Bundesrat called upon the German government to engage in the EU deliberations for stricter power limits, e.g. that only the 25 % of models with the lowest consumption should be able to qualify for the label, i.e. the principle used by the GEA label.

Therefore, it might be appropriate to use **international policy co-ordination** in an attempt to reach agreement on **stricter requirements** for an **international "Energy Star" label** used at least by the EU, Japan, and the USA. Such a label could, e.g., combine the requirements of the "Blue Angel" for the "off" mode, the requirements of the GEA label for the monitors and printers, and the new requirements of the "Energy Star" label for the processing unit of a desktop PC (cf. Annex 1). Such strengthened and harmonised minimum efficiency requirements could also be the basis for the energy efficiency requirements of more comprehensive Eco-labels. There is, however, still room for more ambitious energy labels to endorse the most energy-efficient products, e.g., a dynamic GEA label, in those EU Member States who wish to proceed faster.

The effectiveness of all labels for IT products, particularly with private consumers, could be improved by additional information campaigns, while for professional buyers an easy tool for life-cycle cost assessments would be helpful.

Furthermore, international co-ordination should try to reach an agreement on a measurement standard and an energy efficiency index for the **"on" mode** of PCs and printers. At least for the monitors, an energy efficiency index could be used as a basis, which has recently been proposed for TVs (Siderius and Harrison, 2000). This energy efficiency index targets the annual consumption, based on a mix of the "on" and "stand-by" modes.

*Author:*

*Stefan Thomas  
Wuppertal Institute for Climate Environment  
with support from Kerstin Liebsch*

*Address Correspondence to:*

*Wuppertal Institute for Climate Environment Energy  
Energy Division  
Stefan Thomas  
Döppersberg 19  
42103 Wuppertal, Germany  
Phone: +49/202-2492-143  
Fax: +49/202-2492-198  
Email: stefan.thomas@wupperinst.org*

## References

- Bertoldi, Paolo; Flavio Conti, and Vincent Berruto (2000): The European Strategy for Reducing Stand-By Losses in Consumer Electronics: Status and Results, in: Proceedings of the ACEEE Summer Study 2000, Efficiency and Sustainability, Panel 7: Information and Electronic Technologies, ACEEE, Washington, D.C..
- Siderius, Hans-Paul, and Robert C. Harrison (2000): An Energy Efficiency Index for TVs, in: Proceedings of the Second International Conference on Energy Efficiency in Household Appliances and Lighting, Naples, 27-29 September, 2000.
- Umweltbundesamt (1997, ed.): Klimaschutz durch Minderung von Leerlaufverlusten bei Elektrogeräten – Sachstand/Projektionen/CO<sub>2</sub>-Minderungspotentiale, study prepared by Ingenieurbüro für Energieberatung, Haustechnik und ökologische Konzepte (ebök), UBA-Texte 45/97, Berlin.
- Umweltbundesamt (1999, ed.): Umweltfreundliche Beschaffung – Handbuch zur Berücksichtigung des Umweltschutzes in der öffentlichen Verwaltung und im Einkauf, 4. Neuauflage, München: Verlag Franz Vahlen.

## Annex 1: Requirements of Energy Labels and Eco-Labels in the EU and Germany

	Blue Angel	EU Eco-label	GED label	Energy Star label
<b>Desktop PCs</b>				
<b>1. "Off" mode</b> a) Processing Unit b) Monitor	a) max. 1 Watt; if able to communicate: max. 5 Watt	a) max. 5 Watt	a) max. 5 Watt	
<b>2. sleep mode</b> a) Processing Unit b) Monitor c) w. integrated Monitor	a) max. 30 Watt b) max. 10 Watt	stand alone modus a) max. 27 Watt b) max. 10 Watt	a) max. 30 Watt b) max. 3 Watt c) max. 33 Watt	<b>low power state</b> a) max. 15 to 30 Watt <sup>a</sup> b) max. 15 Watt c) max. 35 Watt
<b>3. deep sleep mode</b> a) Processing Unit b) Monitor	b) max.5 Watt	b) max. 3 Watt		b) max. 8 Watt
<b>Portable PCs</b>				
<b>1. "off" mode</b>	max. 2 Watt; with communication interface: max. 5 Watt	max. 3 Watt		
<b>2. sleep mode</b>	max. 7 Watt	max. 5 Watt		

a: depending on the continuous rated capacity of the power supply: max. 200 Watt rated capacity = max. 15 Watt in sleep mode; > 200 ≤ 300 = max. 20 W; > 300 ≤ 350 = max. 25 Watt; > 350 ≤ 400 = max. 30 Watt; > 400 = 10 % of the continuous rated capacity



	<b>Blue Angel</b>	<b>EU Eco-label</b>	<b>GED label</b>	<b>Energy Star label</b>
<b>Printers</b>				
<b>1. "off" mode</b>	max. 2 Watt		max. 3 Watt	
<b>2. sleep mode</b> printing speed: a) 1 to 7 pages / Minute b) 8 to 14 pages / Minute c) above 14 pages / Minute and colour printers	a) max. 15 Watt b) max. 30 Watt c) max. 45 Watt		<i>stand-by</i> a) max. 6 Watt b) and c) max. 16 Watt	a) max. 15 Watt b) max. 30 Watt c) max. 45 Watt
<b>Scanners</b>				
<b>Sleep mode</b>			max. 12 Watt	max. 12 Watt

