



EUROPEAN COMMISSION  
DIRECTORATE-GENERAL JRC  
JOINT RESEARCH CENTRE  
Institute for Prospective Technological Studies (Seville)  
**Sustainable Production and Consumption**

# **1<sup>st</sup> Meeting of the AHWG for the Development of the Commission Decision establishing the Ecological Criteria for the Award of the Community Ecolabel for Imaging Equipment**

**Sevilla 21 March 2011**

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## EU Ecolabel and Green Public Procurement criteria development

Rugile Balzekaite  
DG Environment EU Ecolabel  
Coordinator

### EU Ecolabel

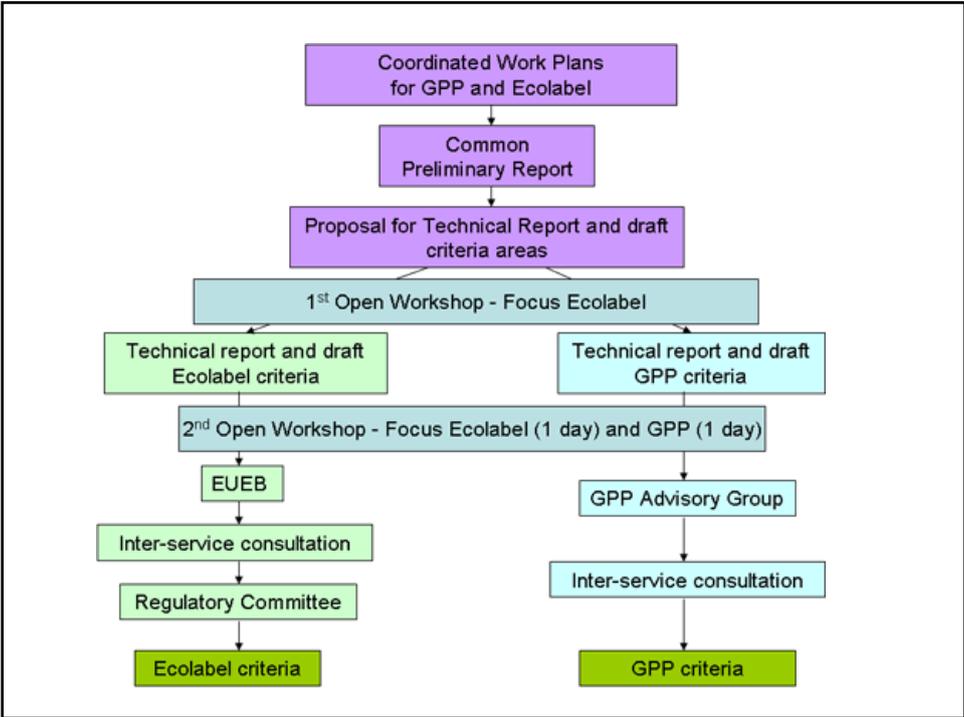
- Established in 1992
- New Regulation 66/2010 on EU Ecolabel
- Voluntary scheme aiming at promoting the products with a lower environmental impact
- Multi-criteria
- Life-cycle based
- Third party verified
- So far – 26 product groups, ~ 25 000 products labelled

## Green Public Procurement

- European Commission Communication of 2008 in the framework of Sustainable Consumption and Production Action Plan
- Promote procurement that addresses environmental considerations into account
- So far – criteria for 18 product groups

## Criteria development

- Until now – criteria developed by EU Ecolabel competent bodies or with help of contractors
- Today marks a start of a new period – Joint Research Centre of the European Commission (JRC/IPTS) develops criteria for EU Ecolabel and GPP



Joint Research Centre (JRC) -

# Ecolabel and Green Public Procurement Criteria - Process Description

Agenda point 2.

**IPTS - Institute for Prospective Technological Studies**

Seville - Spain

[www.jrc.ec.europa.eu/](http://www.jrc.ec.europa.eu/)



1<sup>st</sup> AHWG Imaging Equipment – 21<sup>st</sup> March 2011



**IE – Petten, The Netherlands**  
*Institute for Energy*



**IRMM – Geel, Belgium**  
*Institute for Reference Materials and Measurements*



**ITU – Karlsruhe, Germany**  
*Institute for Transuranium Elements*



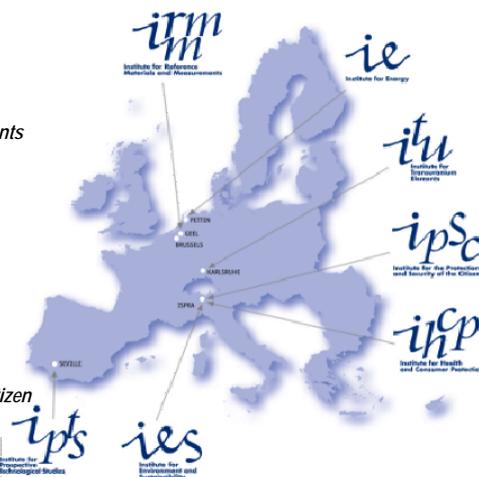
**IES/IHCP/IPSC – Ispra, Italy**  
*Institute for Environment and Sustainability*

*Institute for Health and Consumer Protection*

*Institute for the Protection and Security of the Citizen*



**IPTS – Sevilla, Spain**  
*Institute for Prospective Technological Studies*



## Product Policy Support Activities

Within the European Commission IPTS supports the development and implementation of environmental product policies, amongst them the Ecolabel Regulation and the Green Public Procurement Communication.

**Objective: Concentrate product policy implementation support to harmonise methodologies and procedures**

## Product Policy Support Activities

### Activities:

**Identification of priority product groups according to environmental assessment**

**Development of workplans for the different instruments**

**Scientific analysis of environmental aspects and impacts of each product group**

**Develop criteria and implementing measures until the stage of voting in committee**

## Criteria development step by step (1)

### Technical Analysis

Task 1 – Product scope and definition

Task 2 – Market analysis

Task 3 – Technical analysis

Task 4 – Improvement potential

Preliminary Report

*Published on the dedicated website*

Draft Criteria Proposal  
+ Technical Report

*Published on the dedicated website*

## Criteria development step by step (2)

### Stakeholder consultation

Preliminary Report

Draft Criteria Proposal  
+ Technical Report

Input to 1<sup>st</sup> AHWG

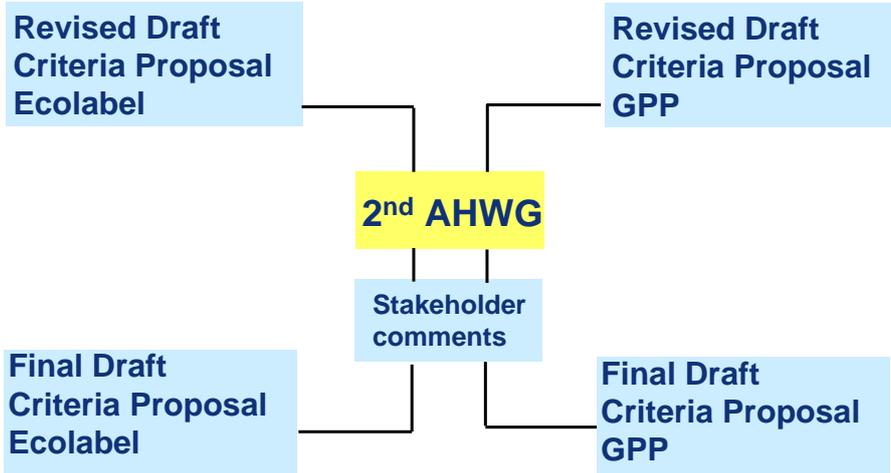
Today!

Stakeholder  
comments

Revised Draft  
Criteria Proposal  
Ecolabel

Revised Draft  
Criteria Proposal  
GPP

## Criteria development step by step (3)



## Criteria Development for Imaging Equipment (1)

**Specific planning for Imaging Equipment:**

Initially “Shortened Procedure” according to Regulation 66/2010 Annex I was foreseen – develop criteria on established Member State criteria, in this case Blue Angel.

Due to administrative reasons it was necessary to change to “Standard Procedure”.

Contentwise however no change: Blue Angel criteria are model for criteria areas as first choice, where possible and reasonable.

## Criteria Development for Imaging Equipment (2)

Stakeholders can comment on working document up to 4 weeks after the meeting (mid/end April)

Separate draft criteria proposals for Ecolabel and GPP will be prepared and published 4 weeks ahead of next AHWG

Second AHWG to take place in 2<sup>nd</sup> half of 2011

Again 4 weeks to comment on draft criteria proposals

End 2011 final draft criteria available

## 1<sup>st</sup> AHWG - Today

Today discussion serves the following purposes:

- Agree on analysis
- Agree on identified criteria areas
- Discuss criteria areas and sub-criteria one by one
- Decide on approach to take for the respective criteria

**Thank you!**

## Joint Research Centre (JRC)

### Ecolabel and GPP criteria for Imaging equipment

1st AHWG meeting  
21st March 2011

#### Agenda point 3.

**IPTS - Institute for Prospective Technological Studies**

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## Content

1. Ecolabel and other Product policy tools on Imaging Equipment products
2. Product Definition
3. Ecolabel schemes with criteria on imaging equipment product group
4. Market analysis
3. Conclusion on product scope

**EU Ecolabel Criteria**



**EU Ecolabel  
Regulation 66/2010**

**EU Product Policy tools applied on Imaging Equipment**

- **Green Public Procurement (GPP) IT toolkit**
- **Ecodesign ErP Directive 2009/125**
- **EU Energy label – Energy Star**

**EU Ecolabel Regulation 66/2010**



**Promotes the best 10-20 %  
environmentally performing products**

**Ecolabel**



**Voluntary scheme. Focuses on the  
best in terms of environmental  
performance practices**

**EU Ecodesign Directive 2009/125**



**Sets minimum environmental  
performance requirements**

**Ecodesign**



**Mandatory. Aims to exclude the  
worse performing products.  
Investigates typical average  
products**

**A Self-Regulation Industry Voluntary  
Agreement has been proposed  
(15. February 2011)**

**EU energy Label – Energy Star  
EU-US Agreement 2006/1005/EC**



**Promote the best 25 % energy  
efficient products**

Energy Star is a well recognized label. More than 1339 imaging equipment are currently labeled by Energy Star

**EU Green Public Procurement  
Communication (2008) 400**



**Public authorities procure green  
goods, services and works**

Imaging equipment devices are currently included in the larger group of IT-products

- Personal Computers
- Notebooks
- Monitors
- Imaging equipment

GPP Criteria  Core  
Comprehensive

Use criteria  
as given in



**Seek harmonization among the different EU product policy tools**

**➔ Propose the product definition as it is used in Energy Star,  
GPP and Ecodesign**

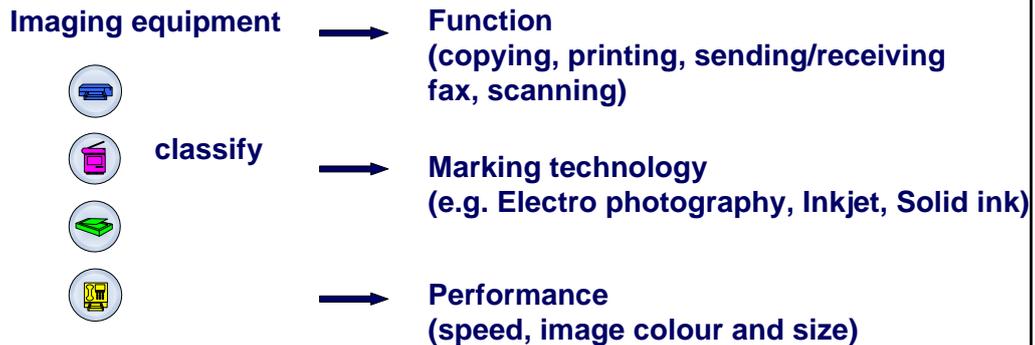
This definition covers products which are marketed as printers, copiers, fax machines, (document) scanners, digital duplicators, mailing machines and multifunctional devices (MFD).

### Product Definition

A product is included in the imaging equipment product category if it is used in the office (private or professional) and its main function is:

- to produce a printed image (paper document or photo) through a marking process either from a digital image (provided by a network/card interface) or from a hardcopy through a scanning/copying process.
- to produce a digital image from a hard copy through a scanning/copying process.

## Technical Analysis



## Ecolabels on imaging equipment

### Member States



**Blue Angel (630 products)**



**Nordic Swan (116 products)**



**Austrian Umweltzeichen  
(39 products)**

### non-European countries

- EcoMark Ecolabel from Japan
- EcoLogo CM from Canada
- Ecolabel Korea
- Environmental Choice Australia
- Environmental Choice New Zealand
- China Env. United Certification Center HBC
- Green Mark Taiwan
- Singapore Green Labelling Scheme
- Green Label Thailand

Overview of the products covered in the Ecolabeling schemes, the Ecodesign Preparatory Study and the Energy labels regarding the 'imaging equipment' product group.

Products	Ecodesign	European Ecolabels			GPP	Energy label	Non-European Ecolabels									
		Nordic swan	Blue Angel Germany	Umwelt zeichen Austria			EcoLogo Canada	Env. Choice Austr.	Env. Choice New Zealand	Eco Mark Japan	Eco- Label Korea	China label	Green Mark Taiwan	Sing. Green Label	Green Label Thail.	
Copiers	X	X	X	X	X	X	X	X	X	X	X					X
Printers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Multifun.Dev. (MFD)	X	X	X	X	X	X	X	X	X				X	X		
Digital duplicators	(X)	X				X				X			X			
Fax machines	(X)	X			X	X	X	X	X		X	X	X	X	X	X
Scanners	(X)	X			X	X		X								
Mailing machines	(X)					X	X									

## Market Analysis



Data source: EUROSTAT

Calculations were made: [ for each product / for the period 2000-2010 / for EU-27 and/or each Member State / based on value and on quantity ]

## Market Analysis

- Production
- Extra-EU exports and imports
- Intra-EU exports and imports
- Overall EU-27 Apparent Consumption

Source: Market consumption data

### Investigated:

- EU-stock per product for two reference years (2005 and 2010)
- Sales for the period 2003 to 2009
- Future market trends
- Potential market penetration of Ecolabelled imaging equipment devices

## Market Analysis

### Important results of market analysis

- European production is low and decreases (today 5 million devices per year)
- Imaging Equipment sector is dominated by non-European manufacturers
- Trade balance is for EU-27 negative (imports>exports)
- Printers, MFDs and copiers are the most important IE products in terms of: sales & production volumes, and apparent consumption followed by fax machines. Digital duplicators have very low market volumes

## Market Analysis

### Analysis of market distribution data

- Overall European stock is app. 146 million  
MFDs ( 54 % )   printers ( 39 % )   copiers & fax machines: ( 3 - 4 % )
- Sales of Printers (MFD & SFD) 25 – 29 million

### Market trends

- MFDs tend to substitute SFDs
- increasing sales of colour printing/copying devices

## User Behavior    Differences in image creation (prints/copies)

### Working Environment   -   Private Use

Volume  
of  
images:

Working environment	>>>	Private use
EP-printers (75%)	20 : 3	InkJet Printers (86 %)
Copiers (20 %)		

**Market share** → **A few companies dominate the market**  
**All of them have national Ecolabelled products**

**Potential Market Penetration of EU Ecolabelled IE** → **Applications on a Member State level indicate sufficient market penetration potential of an EU Ecolabel on IE**



**Blue Angel 630 products**



**Nordic Swan 116 products**  
No applications on scanners and digital duplicators



**Austrian Umweltzeichen 39 products**

## Conclusion on scope of the study

### Imaging Equipment

**Most important products**  
**Definitely within the scope** →  
**of the study**

1. Printers

2. Copiers

3. MFDs

**followed by:** →

4. Fax machines

Include ?

## Scope of the study

### Remaining products

1. Single functioning scanners
2. Digital duplicators
3. Mailing machines

Exclude ?

#### Considerations:

- The use of email substitutes the use of fax machines
- MFDs substitute the SFDs and include faxing and scanning
- The MS Ecolabel applications for fax machines are low
- There are no applications for scanners and digital duplicators in the Member State Ecolabel and no MS Ecolabel scheme includes mailing machines
- Market share is very low. Fax machines stock is decreasing

**Thank you for your attention**

**Discussion session is open**

## Joint Research Centre (JRC)

### Ecolabel and GPP criteria for Imaging Equipment

#### Agenda point 4.

1st AHWG meeting

21st March 2011



### IPTS - Institute for Prospective Technological Studies

Seville - Spain

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## 1<sup>st</sup> AHWG Ecolabel and GPP criteria for Imaging Equipment

### Agenda point 4. Key Environmental Areas for Ecolabel Criteria for Imaging Equipment

#### Content

1. General approach of Ecolabel criteria development
2. Approach for identifying the Key Environmental Areas for Imaging Equipment
3. Environmental performance of Imaging Equipment products
4. Identification of Key Environmental Areas

## General approach of Ecolabel criteria development

1. Environmental Assessment of Imaging Equipment devices
  - Life cycle assessment of Imaging Equipment
  - Product oriented environmental performance assessment
2. Identify Key Environmental Areas
  - Quantitative indication of environmental performance of the product group
3. Determine and develop Ecolabel criteria options
  - Ecolabel criteria are linked to key environmental areas
4. Define Ecolabel criteria
  - Quantify environmental improvement potential

## Approach for identifying the key environmental areas

### Framework requirements of EU Ecolabel Regulation 66/2010

The criteria should be based on scientific evidence and taking into consideration the latest technological developments.

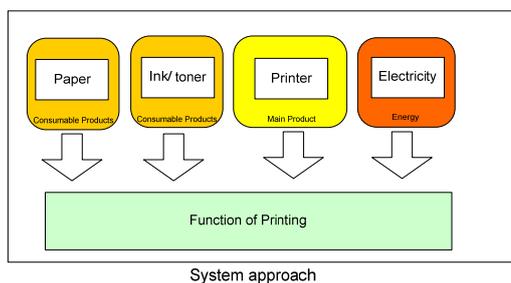
In determining Ecolabel criteria the following shall be considered:

- ➔ The most significant environmental impacts (e.g. impacts on climate change, energy and resource consumption, use and release of hazardous substances)
- ➔ The substitution of hazardous substances by safer substances, as such or via the use of alternative materials or designs, wherever it is technically feasible
- ➔ The potential to reduce environmental impacts due to durability and reusability of products

## Approach for identifying the key environmental areas



## Environmental Life Cycle Assessment of Imaging Equipment devices



Refer to function of printing

from one product → to a product system

### 1. Stand-alone LCA

Assess overall life-cycle performance of imaging equipment product

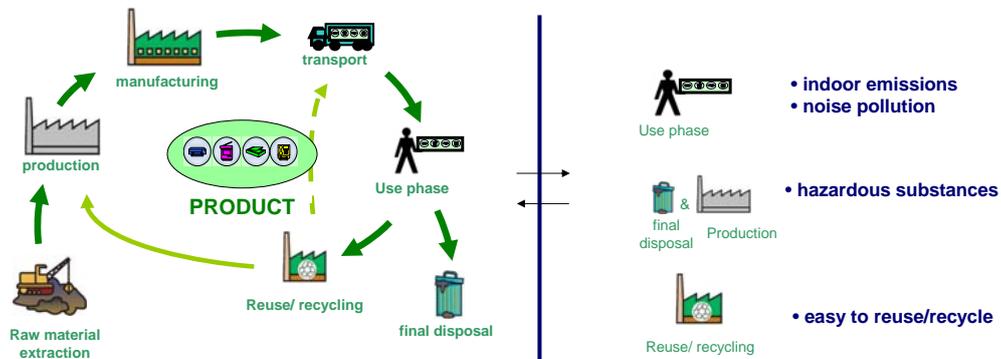
e.g. overall life cycle env. impacts of a typical average MFD-copier used in Europe

### 2. Comparative LCA

Compare the overall life-cycle env. impacts of alternative products

e.g. printer versus printer with remanufactured components

## Environmental performance of Imaging Equipment devices



### 1. Life Cycle Assessment

- identify the environmental hot spots in the life cycle
- avoid shifting environmental burdens from one life cycle phase to another

### 2. Product oriented environmental performance assessment

- focus on performance per life cycle product phase
- identify additional environmental impacts

## Environmental performance of Imaging Equipment

### Life Cycle Assessment studies

#### 1. Ecodesign Preparatory study

- Six streamlined LCA case studies of Imaging Equipment devices
- Representative average products
- Scope of the study was EU-27 consumption

#### 2. Danish environmental protection agency

- Streamlined LCA study related to consumption of EU-27
- Application of LCA software, use of Ecoinvent database, investigation of 15 environmental impact categories

## Life Cycle Assessment results

➔ High env. impacts are in the use phase and the manufacturing phase

➔ Key Environmental Areas:

1. Paper Consumption
2. Energy consumption in use phase
3. Env. Impacts associated with ink and toner

Example of MFD-copier

- Product lifetime of 6 years
- 439 kg / year office paper

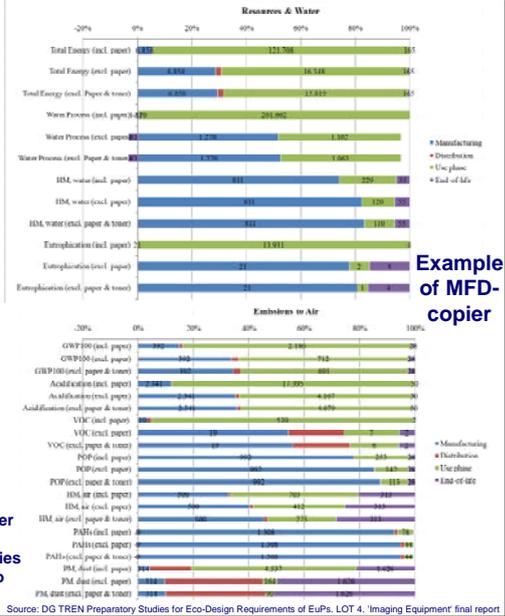
Contribution of paper:

- total energy 81 %
- eutrophication 99 %
- acidification 66 %

Example of MFD-printer (excl. paper)  
Energy consumption in use phase contributes:

17 000 MJ out of 20 800 MJ  
in GWP impact category over 85 %

Danish LCA study :  
Analyzing the impacts of a laser printer  
per kg printed paper:  
In the majority of env. impact categories  
over 50% of impacts are associated to  
toner consumption



## Furthermore, background information from Comparative LCA studies

### 1. On remanufacturing copiers and 2. On reuse of toner cartridges

➔ Overall environmental performance of Imaging Equipment improves due to Reuse, Recycling and sound End-of-life management

Environmental savings by the remanufacturing of copiers

Environmental impact aspect	Photocopier non-modular design	
	Product life cycle with remanufacturing compared to product life cycle without remanufacturing	Environmental savings %
Materials consumption (kg)	25	1.3
Energy consumption (MJ)	27	1.4
Water consumption (L)	19	1.2
Landfilled waste (kg)	35	1.5
CO <sub>2</sub> equivalents (kg)	23	1.3

e.g. Remanufacturing phase in copier life-cycle

Environmental savings in: energy consumption 27 % and GWP: 23 % CO<sub>2</sub>-equiv

e.g. Environmental savings due to reuse of toner cartridges<sup>2</sup>

reuse of toner printer cartridges<sup>2</sup>: savings 25-40 % CO<sub>2</sub>-equiv

**Key Environmental Area:**  
**Design of Product:**  
**Promotion of Reuse, Recycling and sound End-of-life management**

<sup>1</sup>Source: Wendy Kerr, Chris Ryan, "Eco-efficiency gains from remanufacturing A case study of photocopier remanufacturing at Fuji Xerox Australia", Journal of Cleaner Production, 9, 2001

<sup>2</sup>Source: M. Gell, "Carbon footprints and Ecodesign of toner printer cartridges", Xanfon on behalf of UKCRA, 2008

### Product oriented environmental performance assessment

**Scientific evidence** → Imaging Equipment products emit in low concentrations harmful volatile organic substances, ozone and particulate matter

→ Imaging Equipment products contribute to indoor noise pollution in the use phase

→ Imaging Equipment products contain hazardous substances in several parts

**Indoor emissions**

Imaging equipment products emit:

- VOCs
- Benzene
- Styrene
- Ozone
- Dust
- operating mode
- standby mode
- temperature affects emissions rates

**Indoor noise pollution**

Main impacts are:

- Annoyance / stress
- Loss of Productivity

Quantification of impacts is difficult.  
Limits are set in MS Ecolabel schemes

### Product oriented environmental performance assessment

**Hazardous substances**

➤ The release of hazardous substances takes often place in the product post consumption life cycle phase.

➤ Environmental sensitive substances can be also formed as products of chemical reactions e.g. dioxins in incineration of halogenated plastics

**Main hazardous substances:**

- Heavy metals
- Halogenated plastics
- Organic halogenated plastic additives
- Dyes

**Hazardous substances are found in:**

- Casings
- Printed circuit boards
- Ink/toners
- Photoconductor drums
- Batteries

**Key Environmental Areas:**

➔

1. Indoor air emissions
2. Noise emissions during operation
3. Design of product: Preventing the use of hazardous substances and materials

**Complementary elements of information**

MS Ecolabel schemes and Manufacturers cover all the aforementioned environmental areas

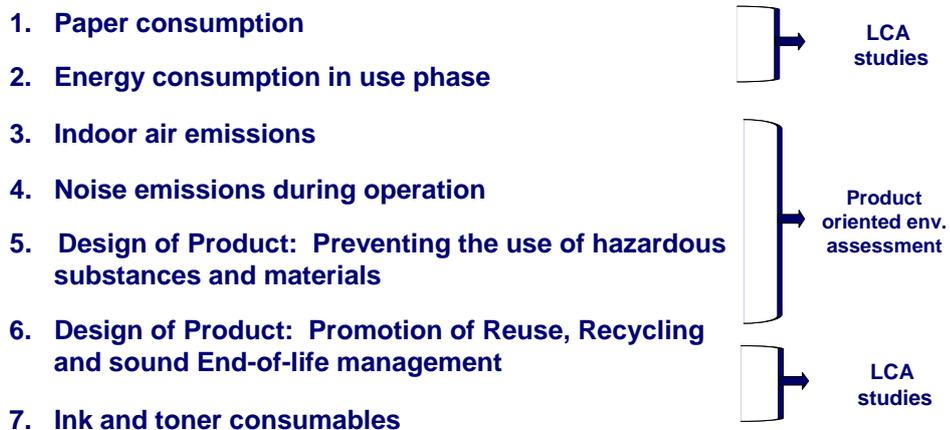
Environmental performance labelling schemes



Sustainability reports of manufacturers

- Energy efficiency
- Prevention and /or restriction of hazardous substances
- Develop product design for reuse and recycling of materials
- Use or recyclable components
- Product end-of-life management
- Ink and toner design
- Acoustics
- Paper consumption

**Identification of Key Environmental Areas**



Thank  
you for your attention

Discussion session is open

## 1<sup>st</sup> AHWG Ecolabel and GPP criteria for Imaging Equipment

### Agenda point 5. Energy efficiency

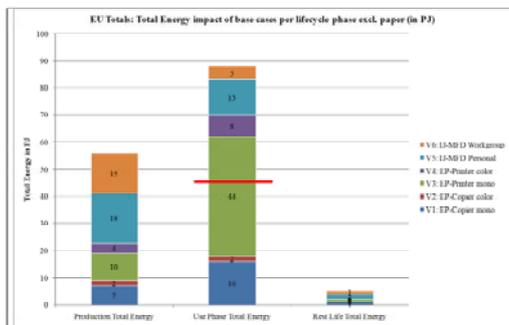
#### Content

1. Importance of energy efficiency
2. Criteria options

### Key environmental area: Energy Efficiency

#### Importance of energy efficiency

LCA results  $\longrightarrow$  High env. impacts are associated with Energy efficiency during use phase



Source: DG TREN Preparatory Studies for Eco-Design Requirements of EuPs. LOT 4. 'Imaging Equipment' final report

#### Example of MFD-printer

Contribution of energy in use phase to overall\*:

- in terms of total energy 81 % (17 000 MJ out of 20 800 MJ)
- in GWP impact category over 85% associated with energy consumption in use phase

\*(exc. paper)

## Key Environmental Area Energy Efficiency

### Criteria options

**Option 1. Compliance to Energy Star v 1.1. requirements**

**Option 2. Compliance to Blue Angel requirements**

**Option 3. Compliance to New Energy Star v 2.0. requirements**

**Option 4. Develop new energy efficiency requirements**

### Option 1. Compliance to requirements of Energy Star v.1.1.

**Main features  
and parameters  
of Energy Star**



- measurement of total energy consumption values (TEC)
- measurement of operational mode (OM) values

**Imaging equipment are  
classified based on:**



- Functionality
- Image creation speed
- Image colour
- Image size

## Option 1. Compliance to requirements of Energy Star v.1.1.

### Market data of Energy Star v 1.1

Unit Shipment Data and Market Penetration for 2008 and 2009

Equipment Type	2008 ENERGY STAR Qualified U.S. Shipments ('000s)	2008 ENERGY STAR Market Penetration	2009 ENERGY STAR Qualified U.S. Shipments ('000s)	2009 ENERGY STAR Market Penetration	Year-Over-Year Growth in ENERGY STAR Shipments
<b>Imaging Equipment</b>	<b>14,256</b>	<b>43%</b>	<b>14,279</b>	-	0%
Copiers - TEC	-	-	149	-	-
Copiers - OM	-	-	0	-	-
<b>Copiers - Total</b>	<b>140</b>	<b>91%</b>	<b>149</b>	<b>78%</b>	<b>6%</b>
Fax Machines - TEC	-	-	256	-	-
Fax Machines - OM	-	-	0	-	-
<b>Fax Machines - Total</b>	<b>144</b>	<b>4%</b>	<b>256</b>	<b>7%</b>	<b>78%</b>
MFDs - TEC	-	-	1,704	-	-
MFDs - OM	-	-	7,258	-	-
<b>MFDs - Total</b>	<b>9,656</b>	<b>49%</b>	<b>8,962</b>	<b>47%</b>	<b>-7%</b>
Printers - TEC	-	-	3,128	-	-
Printers - OM	-	-	1,336	-	-
<b>Printers - Total</b>	<b>3,779</b>	<b>43%</b>	<b>4,463</b>	<b>67%</b>	<b>18%</b>

Source: Energy Star Imaging Equipment Version 2.0 Specification Revision, Discussion Document, March 2011

#### Market penetration\* is high

- 78 % for copiers
- 47 % for MFDs
- 67 % for printers

#### Voluntary Agreement (Ecodesign Directive 2009/125)

by Jan. 2012: 90% of the products placed by a Signatory on the market comply with Energy Star v 1.1

\* the data refer to both EU-27 and US market

## Option 1. Compliance to requirements of Energy Star v.1.1.

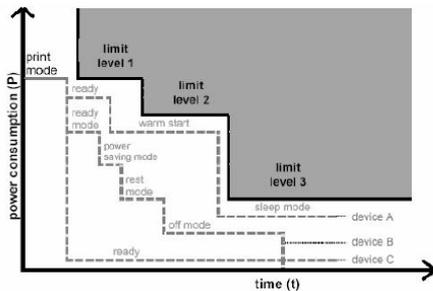
### Important points for Option 1:

- ➡ Energy Star is a successful label, well recognized with high number of applications
- ➡ Harmonization with EU policy tools. Energy Star is the EU Energy Label
- ➡ The majority of the Ecolabels worldwide refer to Energy Star
- ➡ The market penetration of Energy Star v 1.1 products is very high
- ➡ Revision of Energy Star v 1.1 is ongoing

## Option 2. Compliance to requirements of Blue Angel

### Main features and parameters of Blue Angel methodology

Blue Angel Limit Curve for Equipment Power Consumption during the Time that elapses after the end of the Printing Process



- Limit for the power consumption  $P_i$  (e.g. based on the three level limit curve are defined limits per level  $P_1$ ,  $P_2$  and  $P_3$ ).
- Limits on return times ( $t_{iR}$ ) between energy saving mode to ready mode (as defined in the method  $t_{1A}$ ,  $t_{2A}$  and  $t_{3A}$ )
- Limits on activation times  $t_{aA}$ ,  $t_{bA}$  which is defined as the time between the end of the printing process and the start of the device's sleep mode.

Source: Blue Angel. Office Equipment with Printing Function (Printers, Copiers, Multifunction Devices) RAL-UZ 122. RAL.gGmbH.

## Option 2. Compliance to requirements of Blue Angel

### Important points for Option 2:

- ➡ Blue Angel requirements are more ambitious than the Energy Star
- ➡ Blue Angel together with Austrian Umweltzeichen have 669 applications
- ➡ Revision of Blue Angel energy requirements is ongoing
- ➡ Two different approaches at EU level will lead to inconsistency of EU policies

### Option 3. Compliance to requirements of NEW Energy Star v.2.0

- Energy Star v 2.0 →
- ambitious level high
  - aims to the top 25 % products in the market

Main features and parameters of Energy Star remains  
(measurement of TEC, OM, etc.)

#### Working plan Energy Star v 2.0

- ↓
1. Draft version 2.0 in Q3 2011
  2. Final version 2.0 in Q4 2011
  3. Final version effective Q3 2012

In the possible issues for revision are:

- Calculation of recovery times in TEC and OM
- Limited changes in scope of Energy Star
- Limited changes in testing methods
- Inclusion of life cycle impacts (related to GHG)

### Option 3. Compliance to requirements NEW Energy Star v.2.0.

#### Important points for Option 3:

- Energy Star v 2.0 aims to the top 25 % in terms of energy efficiency
- Energy Star is a well recognized label with high number of applications
- Harmonization with EU policy tools. Energy Star is the EU Energy Label
- The majority of the Ecolabels worldwide refer to Energy Star

In principle, new Energy Star v.2.0 is the preferable option

- Timing is a question

#### Option 4. Develop a new method for setting energy efficiency requirements

- Goal →
- Develop a method explicitly for the needs of Ecolabel
  - Set stricter energy efficiency requirements than Energy Star v.1.1
- Approach →
- Use Energy Star methodology
  - Use market data in order to address the best 10-20 % performing products
  - Set Ecolabel Energy efficiency requirements expressed so far as possible with percentage reductions to current Energy Star v1.1. and with energy limits for Energy Star v. 2.0
  - Consider possible inclusion of other relevant aspects e.g. issues covered in Blue Angel methodology

#### Option 4. Develop energy efficiency requirements based on Energy Star v 1.1

##### Important points for Option 4:

- ➔ Revision of Energy Star v.2.0 is ongoing
- ➔ Harmonization of EU Ecolabel and EU Energy Label is desirable
- ➔ Will the developed method have a dynamic link to Energy Star  
i.e. will the percentage reductions refer to the latest version of Energy Star?
- ➔ Need to form Technical Working Group for developing the energy efficiency method
- ➔ Data input from stakeholders would be needed

**Thank you for your attention**

**Discussion Session is open**

# 1<sup>st</sup> AHWG Ecolabel and GPP criteria for Imaging Equipment

## Agenda point 6. Paper consumption criteria

### Content

1. Importance of paper consumption
2. Criteria options proposal

## Key environmental area: Paper Consumption

### Importance of paper consumption

LCA results  High env. impacts are associated with Paper consumption

Incl. Paper	Excl. Paper
<b>Table - Summary Environmental Impacts EU-Stock 2005. Base_Case_V1_EP-Copier_MFD-mono (Incl. Paper)</b>	<b>Table - Summary Environmental Impacts EU-Stock 2005. Base_Case_V1_EP-Copier_MFD-mono (excl. Paper)</b>
main life cycle contribution	main life cycle contribution
value unit	value unit
Total Energy (OER)	24 PJ
of which, electricity	1,7 TWh
Water (process <sup>1</sup> )	2 m <sup>3</sup> /m <sup>2</sup>
Waste, non-haz./ landfill <sup>2</sup>	120 kilon
Waste, hazardous/ incinerator <sup>3</sup>	17 kilon
Emissions (Air)	
Greenhouse Gases in GWP100	3 mt CO <sub>2</sub> e
Acidifying agents (AP)	29 Mt SO <sub>2</sub> e
Volatile Org. Compounds (VOC)	1 kt
Persistent Org. Pollutants (POP)	1 g / Tm
Heavy Metals (HM)	3 ton / Mt
PM10	1 ton / Mt
Particulate Matter (PM, dust)	8 kt
Emissions (Water)	
Heavy Metals (HM)	1 ton / Mt
Eutrophication (EP)	14 Mt PO <sub>4</sub>
*caution: low accuracy for production phase	

#### Example of MFD-copier

- Product lifetime of 6 years
- 439 kg / year office paper

#### Contribution of paper:

- total energy 81 %
- eutrophication 99 %
- acidification 66 %

Consumption of paper depends on user behavior and product design

Ecolabelled products → ways to reduce paper consumption

**Key Environmental Area Paper Consumption**

**Criterion 1. Double sided paper printing and/or copying**

**Criterion 2. Capability of using recycled paper**

**Possible criterion 3. Immediate cancelation of printing and/or copying**

**Criterion 1. Double sided paper printing and/or copying**

Requirements for double sided printing/copying:

- automatic unit
- manual and/or software option

depending on speed of image creation

**Criterion is found in:**



Propose formulation of Blue Angel

## Criterion 2. Capability of using recycled paper

Paper recycling contributes to the reduction of resource depletion

Imaging equipment devices are the main office products in which paper is used

Propose formulation of Blue Angel

## Possible Criterion 3. Immediate cancelation of printing/copying

The user often needs to cancel the printing or copying process

Immediate cancelation → Avoids paper consumption  
but also energy consumption  
Ink or toner consumption

Possible relevant parameter on immediate cancelation criterion:

- total consumption of paper after the user activated the cancelation
- image creation speed (ipm)

Other possible relevant parameters

- reaction time between activation of print/copy cancelation and of final stop of the process
- differentiation between double sided printing and/or copying
- cancelation of a print and/or copy job when additional print/copy jobs are pending
- cancelation when the image device is operating in a network
- cancelation using a hard on-button or via software
- differentiation between black/white and colour prints and/or copies

Possible formulation of this criterion option

→ number of page(s) consumed after cancelation

**Thank you for your attention**

**Discussion Session is open**

## 1<sup>st</sup> AHWG Ecolabel and GPP criteria for Imaging Equipment

### Agenda point 7. Indoor Air Quality and Noise Criteria

#### Content

1. Importance of environmental area of “indoor air emissions”
2. Criteria options proposal
3. Importance of environmental area of “noise emissions”
4. Criteria options proposal

## Key environmental area: Indoor air emissions

### Importance and impacts of Indoor air emissions

Scientific evidence  Imaging Equipment emit in low concentrations harmful volatile organic substances, ozone and particulate matter

Chemical	Laser printers(*)		Ink-jet printers(*)		All-in-one office machines(*)	
	Chamber concentration (ppbv)	In operation	Chamber concentration (ppbv)	In operation	Chamber concentration (ppbv)	In operation
<b>VOCs</b>						
Freon 12	0.48–0.52	0.61–0.66	0.36	0.43	0.3	0.45
Methyl chloride	0.53–0.60	0.71–0.82	0.48	0.55	0.52	0.62
Freon 11	0.24–0.29	0.25–0.28	0.23	0.24	nd	0.27
Methylene chloride	0.38–0.42	0.46–0.58	0.57	0.61	0.69	0.74
Chloroform	0.96–1.07	1.17–1.31	0.81	0.94	0.74	0.86
Benzene	0.52–0.57	0.77–0.84	0.42	0.41	0.52	0.52
Toluene	14–15	15–16	6.22	6.43	7.9	8.2
Tetrachloroethene			0.23	0.21	0.52	0.43
Ethylbenzene	1.4–2.1	2.0–3.0	1.2	1.26	1.5	1.6
m,p-Xylene	1.2	1.6–1.7	0.86	0.92	0.9	0.9
Styrene	2.7–4.0	3.2–5.3	1.14	1.43	1.2	1.9
o-Xylene	0.9–1.0	2.0–2.3	0.69	0.66	0.58	0.58
1,4-Dichlorobenzene			0.34	0.32	0.34	0.35
1,3-Dichlorobenzene			0.34	0.32	0.34	0.35
1,2-Dichlorobenzene			0.21	0.21	0.26	0.22
1,2,4-Trichlorobenzene			0.86	0.63	0.23	0.2
Hexachlorocyclopentadiene			0.37	0.36	0.88	0.64
SVOC		300–1400 (20–60m)				
Ozone				5–6		
Aerosol particles						6
PM <sub>10</sub>		65		20–38		41

Main emissions:

- VOCs
- Benzene
- Styrene
- Ozone
- Dust

Imaging equipment emit when:

- operating
- standby mode

When available, the duration of operation (min) is indicated in parenthesis.  
 (\*)Lee, S.C., Lam, S., Fai, H.K., 2001. Characterization of VOCs, ozone, and PM10 emissions from office equipment in an environmental chamber. Building and Environment 36, 2001  
 (†) Smola, T., Georg, H., Hohensee, H., Health hazards from laser printers? Gefahrstoffe Reinhaltung der Luft 62, 2002

Source: Hugo Destalatas, Randy L. Maddalena, Brett C Singer, Alfred T. Hodgson, Thomas E. McKone, " Indoor pollutants emitted by office equipment: A review of reported data and information needs", Atmospheric Environment, 42, 2008

## Key Environmental Area Indoor emissions

### Criterion 1. Indoor Emissions of Imaging Equipment



and



have the same requirements

**Propose Blue Angel criterion**

Blue Angel criterion is the reference for Nordic Swan and other Ecolabel schemes

## Indoor Emissions of Imaging Equipment

### Criterion of Blue Angel limits emission rates of:



- **Total Volatile Organic Compounds (TVOC)**
- **Benzene**
- **Styrene**
- **Ozone**
- **Dust**

Limit values are given depending on:

- marking technology (EP and Inkjet)
- colour and black/white printing
- operating and ready phase mode

Extension of the pollutant list can be expected:

Ultra fine particle



Respiratory exposure and health risk

Difficulties for immediate inclusion:

- no reference limit value has been yet determined
- laboratories for testing are limited

## Key environmental area: Noise emissions

### Importance and impacts of Noise emissions

Evidence → Imaging Equipment contribute to indoor Noise pollution

Noise pollution effects are very difficult to quantify

Noise emissions → • Ecolabel schemes  
• Manufacturers

#### World Health Organization impacts of noise are:

- Annoyance
- Loss of Productivity → For attention and memory, a 5 dB(A) reduction in average noise level results in appr. a 2 – 3 % improvement in performance
- Physiological effects
- Nervous system
- Sleeplessness

20 % of the population is exposed to levels exceeding 65 dB(A) during the daytime

Noise exposure time → Working environment e.g. copy/print centres

## Key Environmental Noise emissions

Option 1. Noise emissions requirements of Blue Angel 

Option 2. Noise emissions requirements of Nordic Swan 

In both options is measured the declared A-weighted sound level  
The limits are calculated with the same formula but:

- in Blue Angel the limits values are expressed in dB → More precise
- in Nordic Swan in B

Propose the option of Blue Angel criterion as being more strict

**Thank you for your attention**

**Discussion Session is open**

## 1<sup>st</sup> AHWG Ecolabel and GPP criteria for Imaging Equipment

### Agenda point 8. Hazardous substances related criteria

#### Content

1. Identification of hazardous substances
2. Criteria proposal
3. Comparison with MS Ecolabels
4. Discussion points

### Key environmental area: Hazardous substances

#### Importance of hazardous substances

Scientific evidence  Imaging Equipments contain hazardous substances in several parts

Environmental sensitive materials	Casing	Printed circuit	Batteries	Photoconductor drums	Ink and toners
Cd and their compounds			x	x	x
Cr <sup>6+</sup> and their compounds			x		x
Pb and their compounds			x	x	x
Hg and their compounds			x	x	x
Se and their compounds				x	
Heavy metals (Co and Ni and their compounds)			x		x
Halogenated plastics	x	x			
Organic halogenated compounds	x	x			
-flame retardants	x	x			
Dyes and azo dyes					x

#### Main hazardous substances:

- Heavy metals
- Halogenated plastics
- Organic halogenated plastic additives
- Dyes
- Others

## Hazardous substances

### 1. Hazardous substance criteria must in principle fulfill Article 6(6) of the Ecolabel Regulation EC No 66/2010

The EU Ecolabel may not be awarded to goods containing substances or preparation/ mixtures meeting the criteria for classification as

- Toxic
- Hazardous to the environment
- Carcinogenic
- Mutagenic
- Toxic for production (CMR)

Regulation EC No 1272/2008  
Classification, labelling and packaging  
of substances and mixtures

- Not goods containing substances of very high concern and referred to Art 57 of Regulation EC No 1907/2006 (REACH)

### 2. Hazardous substance derogation only possible if fulfilling the requirements of Article 6(7) of the Ecolabel Regulation EC No 66/2010

Derogations from Article 6(6) may be adopted if:

- Not technically feasible to substitute substances as such, or via the use of alternative materials or designs
- Products which have a significantly higher overall environmental performance compared with other goods of the same category

No derogations should be given concerning substances that :

- meet the criteria of Article 57 and identified according to the procedure described in Article 59(1) of Regulation EC No 1907/2006
- and present in mixtures, in an article or in any homogeneous part of a complex article in concentrations higher than 0.1% (weight to weight)

## Comparison with MS Ecolabels

Conditions Article 6(6) of the Regulation EC 66/2010 differs from MS Ecolabels in different aspects.

### Some examples are:

Substance name	CAS / ACRONYM	Blue angel	Nordic Swan	Reg EC 66/2010
Hexabromocyclododecane and further FR	25637-99-4 and 3194-55-6 HBCDD and further FR	Halogenated compound	Halogenated compound	
Medium-chained chlorinated paraffin (C <sub>14-17</sub> )	MCCP	Chlorinated paraffin	Chlorinated paraffin	
Polyvinyl chloride (PVC)	9002-86-2	Halogenated polymer	Chlorinated polymer	
Triphenylphosphate	115-86-6			R50-53
Decabromodiphenyl ether Decabromodiphenyl ethane	1163-19-5 / deca-BDE 61262-53-1	Halogenated compound	Organohalogen compound: decaBDE	
Naphathenic acids, copper salts, copper naphathenate				R50-53

## Comparison with MS Ecolabels

Conditions Article 6(6) of the Regulation EC 66/2010 differs from MS ecolabels in different aspects.

### Examples are:

- **Reactive flame retardants which lose their R-Phrases by chemically reacting with the molecules of the polymers** could be allowed under Article 6(6) of Regulation EC 66/2010

- Bromophenols
- Anhydride phthalic tetrabromide
- TBBPA

} **Organic halogenated compounds are not allowed under MS Ecolabels conditions**

- Article 6(6) of the Regulation EC 66/2010 **does not allow derogations depending on the weight** of the piece/part, but they can be included in accordance to Article 6(7) of the same regulation

## Discussion points

### 1. Should there be any additional derogations??

- **Need to justify the derogation** under the conditions of Article 6(7) of the Regulation EC 66/2010
- **Invitation to all participants to provide us the information**
- If necessary a sub-working group might be set up to evaluate the proposals

### 2. Should there any other requirements from MS Ecolabels be included?

- For example, **PVC** due to the formation of dioxin when it is burnt

[Thank you for your attention](#)

[Discussion Session is open](#)

## 1<sup>st</sup> AHWG Ecolabel and GPP criteria for Imaging Equipment

### Agenda point 9. End-of-life related Criteria

#### Content

1. Importance of key environmental area of “Design of product: Promotion of reuse, recycling and sound end-of-life management”
2. Criteria proposal regarding imaging equipment devices
3. Criteria proposal regarding ink and toner consumables

## Key Environmental Area: Design of Product: Promotion of Reuse, Recycling and sound End-of-life management

### Importance of Reuse, Recycling and sound End-of-life management

Scientific evidence  Overall environmental performance of Imaging Equipment improves due to Reuse, Recycling and sound End-of-Life management

Environmental savings by the remanufacturing of copiers

Environmental impact aspect	Photocopier non-modular design		Photocopier modular design	
	Product life cycle with remanufacturing compared to product life cycle without remanufacturing	Environmental savings %	Product life cycle with remanufacturing compared to product life cycle without remanufacturing	Environmental savings %
Materials consumption (kg)	25	1.3	49	1.9
Energy consumption (MJ)	27	1.4	68	3.1
Water consumption (L)	19	1.2	38	1.6
Landfilled waste (kg)	35	1.5	47	1.9
CO <sub>2</sub> equivalents (kg)	23	1.3	65	2.9

e.g. Remanufacturing phase in copier life-cycle

Environmental savings:  
Energy consumption 27-68 %  
GWP: 23-65 % CO<sub>2</sub>-equiv

Environmental savings due to reuse of ink and toner cartridges

e.g. reuse of toner printer cartridges\*:  
savings 25-40 % CO<sub>2</sub>-equiv

Source: Wendy Kerr, Chris Ryan, "Eco-efficiency gains from remanufacturing A case study of photocopier remanufacturing at Fuji Xerox Australia", Journal of Cleaner Production, 9, 2001

\*Source: M. Gell, "Carbon footprints and Ecodesign of toner printer cartridges", Xanleon on behalf of UKCRA, 2008

**Key Environmental Area: Design of Product: Promotion of Reuse, Recycling and sound End-of-life management**



**A. Criteria regarding Imaging Equipment Devices**

**B. Criteria regarding Ink and Toner consumables**



Blue Angel and Nordic Swan have several criteria which are very similar but structured differently

**A. Criteria regarding Imaging Equipment Devices**

Set of criteria

reference: Blue Angel & Nordic Swan

- **Recyclable design**
  - **Structure and joining technique**  
–12 requirements
  - **Selection and marking of materials**  
–9 requirements
  - **Longevity**  
– 2 requirements

Several parts are covered:

- Subassemblies
- Casing parts
- The chassis
- Electric/Electronic subassemblies (and components)
- Mechanical parts

Indicatively

- Avoidance of non-separable connections between different materials
- Easily separable mechanical connections
- plastic casing parts of more than 25 gr must consist of a single polymer or polymer blend
- Design of large size casings must ensure recycling of the plastic parts by existing recycling technologies.
- Galvanic coatings of plastic parts shall not be permitted
- 50% of the device components must be identical in construction to those of other devices of the same manufacturer
- components and materials (e.g. toner modules, mercury containing lamps, liquid crystal displays) must be easily identifiable and removable

➤ **Marking of plastics**

- Plastic parts with a weight greater than 25 grams and a plane surface of at least 200 square millimeters, must be permanently marked according to ISO 11469:2000

➤ **Product take-back requirements**

- after use the applicant undertakes to take back the product after use in order to channel it for reuse or recycling

➤ **Guarantee of repairs and maintenance of equipment**

- Regarding supply of spare parts for a period of at least 5 years after the end of production

➤ **Packaging requirements**

- Plastics used for product packaging may not contain halogen-containing polymers



Additional requirements?

## B. Criteria regarding Ink and Toner consumables

### Set of criteria

#### ➤ Reuse / Recyclable design of Ink and toner cartridges and modules

- Design must ensure their channelling to reuse or material recycling
- Reuse shall be given preference over recycling
- No parts designed to prevent the reuse of toner or ink modules may be attached to the modules
- Selection and Marking requirements: use of recyclable material and compounds (at least 5% recycled plastic)

Products must accept remanufactured toner and/ ink cartridges

#### ➤ Take-back requirements for Ink and toner cartridges

- The applicant accepts the return of toner and /or ink modules and containers in order to channel it for reuse or material recycling
- Non-recyclable product parts shall be properly disposed

#### ➤ Requirements for products with combined toner cartridges

- In combined toner cartridges the drum, developer and toner is in one unit.
- Cartridges must be designed in order not to prevent reuse



Additional requirements?

Thank you for your attention  
Discussion session is open