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REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

on the voluntary ecodesign scheme for imaging equipment

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1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Organisation and timing

This is an impact assessment study on possible policy measures, including self-regulation, for imaging equipment (copiers, printers, multi-functional devices, fax machines) under the Ecodesign Directive 2009/125/EC[1], possibly in combination with measures under the Energy Labelling Directive[2].

Legal basis of the Ecodesign Directive is Art. 114 TFEU (*internal market*)[3] and the Energy Labelling Directive is based on Art. 194 TFEU on energy policy, aiming amongst others at ensuring *security of energy supply* in the Union and *promoting energy efficiency and energy saving*.

Ecodesign and energy labelling requirements for products constitute an important instrument for meeting the policy objectives under the '*Resource-efficient Europe - Flagship Initiative*'[4], the 'E*nergy 2020*'[5] strategy paper and the Commission's '*Energy Efficiency Plan 2011*'[6]. The Ecodesign Directive references the objectives of the *EAP6* [7] and *ECCP*[8].

At an operational level the *'20-20-20'* target is relevant, which aims amongst others at a 20% reduction of energy consumption and carbon emissions in 2020 with respect of the reference year 1990 (or1995).[9] For (non-energy) resources efficiency it is important that measures address materials reduction, recycling and re-use.

Horizontal legislation covers aspects as chemicals[10] and waste[11]. Imaging equipment is part of the holistic energy accounting in the *Energy Performance of Buildings Directive (EPBD)*[12]

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[1] Directive 2009/125/EC of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (recast). OJ L 285, 31.10.2009, pp. 10-35.

[2] Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products (recast). OJ L 153, 10.6.2009, pp. 1-12.

[3] Treaty on the European Communities (TEC) was replaced by the Treaty on the functioning of the European Union (TFEU) which entered into force on 1st of December 2009, following the Treaty of Lisbon 13 Dec. 2007. The content of article 95 TEC was moved to article 114 TFEU.

[4] A resource-efficient Europe – Flagship initiative under the Europe 2020 strategy, EC, 26.1.2011, COM (2011)21.

[5] Energy 2020, A strategy for competitive, sustainable and secure energy, EC, 10.11.2010, COM(2010) 639 final

[6] Energy Efficiency Plan 2011, EC, 8.3.2011, COM (2011) 109 final.

[7] Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July laying down the Sixth Community Environment Action Programme OJ L242/1 10.9.2002.

[8] European Climate Change Programme. http://ec.europa.eu/clima/policies/eccp/index_en.htm

[9] Formulated in 'Energy Policy for Europe', Presidency conclusions, European Council, March 2007

[10] RoHS Directive 2011/65/EC (recast)

[11] WEEE Directive 2012/96/EC (recast)

[12] EPBD Directive 2010/31/EC (recast)

and the upcoming *Energy Efficiency Directive (EED)*[13]. It is also included in the carbon accounting of the *EU Emission Trading Scheme* (ETS)[14].

Core of the product-specific EU policy measures on energy efficiency and paper saving features of imaging equipment is the voluntary *EU ENERGY STAR programme*[15], with upcoming support from the voluntary *Green Public Procurement (GPP)*[16] and *EU Ecolabel* which largely duplicate energy and paper saving requirements. More details are provided in par. 2.2.

Imaging equipment ('Lot 4') is a product group in the first tender for a series of ecodesign preparatory studies, issued by the Commission late 2005[17]. The preparatory study was performed by Fraunhofer IZM in collaboration with Öko-Institut between early 2006 and concluded May 2008.[18] The study concluded that the product group was eligible for ecodesign measures and proceeded accordingly (see par. 2.5, Legal basis).

Subsequently, in preparing a draft implementing measure and in accordance with recital 18, 19 and Art. 15(3) of the Ecodesign Directive, the Commission investigated the possibility of *'self-regulation, such as voluntary agreements, which, following an assessment in accordance with Article 17, are expected to achieve the policy objectives more quickly or at lesser expense than mandatory requirements.'*[19]

In the Ecodesign Consultation Forum of 12 Oct. 2009, the imaging equipment industry presented a first draft proposal for a voluntary agreement (hereafter 'VA'). Initial reactions to the VA are listed in par. 1.4. This led to a series of negotiations in the VA Steering Committee meetings, open to all stakeholders, resulting in better compliance with the generic requirements for a voluntary agreement in Article 17 and Annex VIII of the Ecodesign Directive (see par. 2.5, 4.2, Annex 11 of this IA). The last VA Steering Committee meeting was held in Dec. 2011 (see Annex 1), which prompted the Commission services to proceed with preparations for a policy decision, including an Impact Assessment ('*IA*').

As part of the IA, the Commission services with technical assistance of external consultants[20] updated certain aspects treated in the preparatory study. Analysis of the most recent energy

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[13] Draft directive on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC [COM(2011)370, 22/06/2011]. Political consensus on EED reached in July 2012. Signature and publication in the OJ expected Oct. 2012 (see http://ec.europa.eu/energy/efficiency/eed/eed_en.htm)

[14] Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (OJ 25.10.2003, L 275, p.32-46) with amendments.

[15] The EU ENERGY STAR programme entails an US-EU agreement, regulation with public procurement clause, product-label/logo, international co-ordination of test & calculation methods, equipment database at www.eu-energystar.org. Key reference: REGULATION (EC) No 106/2008 of the European Parliament and of the Council of 15 January 2008 on a Community energy-efficiency labelling programme for office equipment (recast version), OJ 13.2.2008, L39, p.1-7.

[16] Directives 2004/17/EC and 2004/18/EC. see also http://ec.europa.eu/internal_market/publicprocurement/other_aspects/index_en.htm

[17] Tender No. TREN/D1/40 lot 4-2005

[18] Stobbe, L. (Fraunhofer Institute IZM, contractor), Preparatory Study "Imaging Equipment"(Lot 4), Report for Tender No. TREN/D1/40 lot 4-2005 (Öekoinstitut and Fraunhofer), Task reports 1 (Nov. 2007) to 8 (May 2008).

[19] cit. Art. 15(3) of Directive 2009/125/EC

[20] Van Holsteijn en Kemna (VHK)

efficiency data in the EU ENERGY STAR database[21] was performed (status Feb. 2012) and additional literature search revealed recent sources that allowed to fill in the blanks on the year 1995, a reference year for policy objectives such as the '20-20-20' target. (see par. 4.2 and Annex 7 of this IA).

The underlying report gives the outcomes of the IA.

1.2. Impact Assessment Board

The Impact Assessment Board gave its favourable opinion in the meeting of 19 September 2012 under the condition that report should be improved in a number of respects, in particular regarding clarification and expansion of certain elements. In response, the underlying report has addressed the issues mentioned. Paragraph 1.1 has been expanded regarding policy context and targets. The content of other paragraphs in Chapter 1 has been clarified. The introduction at the outset of Chapter 2 on the problem definition has been rewritten. In par. 2.1.4 the absence of independent EU-based manufacturing has been brought into better focus. The background to the definition of the baseline as well as the use of this baseline in the evaluation of options, have been clarified (par. 2.1, par. 5.10 and chapter 6). In par. 2.2, in particular the existing voluntary measures in the EU –with a leading role for EU ENERGY STAR programme—have been described more extensively and also the targets and ambition levels of current and future requirements have been highlighted. The explanation of the scope (par. 2.1.1) has been expanded regarding the exemptions. Chapter 3, in line with Impact Assessment Guidelines for comitology-decisions and self-regulation[22], has been kept compact on policy context already given in Chapter 1 but does expand on exact operational targets. Chapter 4 was expanded particularly in its description of the mandatory options. The impact analysis in chapter 5 now clarifies aspects of consumer impacts, administrative burden and industry competitiveness. In Chapter 6, the relative importance of the baseline has been better explained; improvements and targets have been put into perspective vis-à-vis the policy objectives.

Before the Impact Assessment Board meeting, the impact assessment report was subject to the consultations of the Ecodesign Inter-service Impact Assessment Group (2 August 2012). During the consultations, the impact assessment was amended according to the comments received from DG MARKT (clarification in Chapter 2.2.4 that GPP apply to the best products in terms of environmental performance) and from DG COMP (correction of the numbering in Annex 9 and in a footnote on page 22). Furthermore, DG COMP provided three comments on the text of the voluntary agreements that will be considered during its next review.

None of the members of the Group accepted an invitation to a meeting to discuss the impact assessment report.

Moreover, on 18 June, the draft impact assessment report was sent for consultations to DG ENTR (Unit B4) to obtain its preliminary comments on the report and in particular from the 'competitiveness proofing' angle. This version of the report includes comments received from DG ENTR.

[21] www.eu-energystar.org

[22] European Commission, IMPACT ASSESSMENT GUIDELINES, 15 January 2009, SEC(2009) 92

1.3. Transparency of the consultation process

Consultation of the representatives of EU Member States and stakeholders (industry and NGOs) constituted an important part of the process of establishing ecodesign requirements for imaging equipment and of analysing impacts of possible measures.

Expertise was gathered in particular through:

- The preparatory study[23], where stakeholders were actively participating including through multiple stakeholder meetings[24]. The preparatory study hosted a dedicated website[25] where the interim results and further relevant materials were published regularly for timely stakeholder consultation and input. The preparatory study provided the European Commission with the technical and market data supporting the establishment of eco-design requirements for imaging equipment in accordance with the methodology defined in Annexes I and II to the Ecodesign Directive;

- Opinions of stakeholders gathered consistently throughout the whole process of establishing ecodesign requirements for imaging equipment and specifically through the Ecodesign Consultation Forum of 12 October 2009, in accordance with the stipulations of Article 18 of the Ecodesign Directive, as well as through bi and multilateral meetings, amongst others in the VA Steering Committee meetings, open to all stakeholders. Minutes of these meetings can be found in Annex 1.

- Additional analysis (hereafter 'Research 2012') based on a public database of EU registered models that are compliant with ENERGY STAR requirements, accessible to and with results verifiable by all stakeholders and other interested parties.

Thus the Commission's standards on public consultation have been met.

1.4. Outcome of the consultation process

Positions of the main stakeholders on the key features of the proposal for the VA presented at the meeting of the Consultation Forum of 12 October 2012, can be summarised as follows:

- The Member States supported in principle the industry proposal but would welcome a further improvement of the level of ambition. The industry was asked to provide further information/evidence on the level of market coverage of the agreement and further clarification on the governance of the VA.

- NGOs would prefer a Regulation over a self-regulation. NGOs acknowledged that the industry proposal on imaging equipment had certain merits however it needed to be improved in terms of the representativeness and targets.

- The industry pointed out the advantages of the presented self-regulation, i.e. fast entry into force of the requirements, greater flexibility, availability of data, and possibility of all market actors to work together towards greater energy efficiency of imaging

[23] ibid 15.

[24] Stakeholder meetings were organised during the study and at the start of the project, two industry contact meetings were organised in Berlin on 7-8 March and 20-21 March 2006.

[25] http://www.ecoimaging.org/

equipment. The industry committed to providing the Consultation Forum with an independent assessment of the market coverage of the VA.[26]

In the context of the VA, two meetings of the Steering Committee established under this VA were held. At both meetings, representatives of the Commission, EU Member States and stakeholders have discussed the application of the VA[27] (see Annex 1).

As mentioned in par. 1.1, the negotiations prompted the industry to formulate a more stringent compliance rate, larger market coverage as well as –anticipating ENERGY STAR version 2.0 requirements likely to be introduced in 2013– addressing other environmental issues, such as design for recycling and re-use of cartridges.

The full text of the final VA is given in Annex 9.

Following the revision clause in the VA, already at the last meeting of the Steering Committee it was agreed that the signatories of the VA (hereafter 'Signatories') would establish a working group in 2012 that would prepare a new proposal for the next version of the VA that will be discussed with the Commission and other stakeholders in 2013.

2. PROBLEM DEFINITION

If it is accepted that a limited level of market imperfection is unavoidable (see par. 2.3), there are *no major ecodesign problems* for the imaging equipment sector in comparison to other product groups subject to ecodesign regulations.

It should be stressed that the improvement in the IE sector has been realised in recent years by the industry on a voluntary basis. The preparatory study identified electricity consumption and indirect energy in the form of paper use as the most important environmental impacts.

- The latest 2012 research by the Commission estimates that over the last 15 years *a direct electricity saving of 87%* has been realized, i.e. from 27 TWh in 1995 to 3.5 TWh in 2010 (see table 4, p. 29 'Voluntary' scenario), despite the fact that market penetration of equipment has continuously grown. Different from other sectors where voluntary agreements are proposed, this product sector has shown a long term proven track record of over 5-6% compound average annual efficiency improvement, which constitutes a significant achievement compared even to other sectors that have been extensively approached through mandatory policies such as the so-called 'white-goods'.

- Indirect energy saving, in the form of using less paper due to duplexing[28] and N-printing[29], has been put on the agenda a few years ago and the use of N-printing and duplexing is progressing satisfactorily. Approximately 80% (colour) to 92% (monochrome) of typical office printers, i.e. with speeds above 19 images per minute ipm (colour) or 25 ppm (monochrome), now feature duplexing as a standard**.**

[26] The independent assessment is obtained by an Independent Inspector (ERA Technology ltd.) according to the specifications set out in the VA (chapter 6 and Annex C of voluntary agreement version 3.5).

[27] For minutes of the two Steering Committee meetings please see Annex I to this impact assessment.

[28] 'duplexing' or double-sided printing is printing on both sides of the paper (F. 'retro-verso')

[29] 'N-printing' is printing multiple down-sized document pages (typically 1:2) on one sheet of paper. This is only possible if font-size allows downsizing whilst maintaining good readability.

These developments have been made possible through R&D spending –as a percentage of turnover– well above general industry average and a portion of R&D spending on resources and environmental issues is estimated to be large (see p. 31 and Annex 3). Voluntary measures around the globe like ENERGY STAR, Japanese Top Runner, procurement, etc. have been measure drivers, not only for the achievements but also for globally harmonized test & calculation methods, revising them at a pace of once every 3-4 years, whereby these revisions increasingly also tackle new concerns like cartridge re-use. This level of harmonisation and the pace of revision is rarely achieved in mandatory measures.

The EU plays an important part in this global effort of voluntary measures, through the EU-US agreement on ENERGY STAR (see p. 15), confirmed in regulations and governed by the EU ENERGY STAR Board (EUESB) with representation of all Member States, through the Green Public Procurement GPP, the EU Ecolabel, etc. A recent Commission communication COM(2011) 337 has once again stipulated and quantified the success of these measures for the office equipment sector as a whole.

The only significant concern in the case of imaging equipment is that the above mentioned could significantly slow down or stop.

The VA provides a guarantee to maintain a similar pace of improvement. The VA fulfils all requirements for this type of agreement and the monitoring mechanisms are deemed satisfactory. The construction of the VA is similar to other ecodesign VAs that had already been subject to the impact assessment.

Nevertheless, stakeholders from Member States and NGOs have been debating the acceptance and content of the VA. Three important reasons can be mentioned:

1. The nature of the voluntary instrument inherently provides less ex-ante certainty than mandatory instruments. Stakeholders have thus sought assurances as much as possible.
2. The initial VA proposals by the industry were not very ambitious in providing the minimum degree of certainty that stakeholders were after. Throughout the negotiation process of the last three years the ambition level of the VA has been raised.
3. The poor data availability and incomplete analysis at the time of the preparatory study led to some incorrect messages, e.g. that improvements would stop at 2005 level and savings could only achieved with mandatory measures, which only in the underlying report could be corrected through additional analysis.

The key question of the underlying report is whether the current trends of energy efficiency improvements for this sector, with an extensive set of voluntary instruments –backed up by the VA as a guarantee– should continue *'as is'* or whether there is a merit in introducing mandatory ecodesign and energy labelling measures.

2.1. Baseline scenario

The following sections describe in a greater detail the inputs used to define the baseline (hereafter 'BAU'[30]) scenario for calculating economic and environmental impacts.

The BAU scenario is linked to the 'no EU action' option (see Chapter 4) and means that no new measures will be implemented. With most product-groups being investigated under the

[30] 'Business-as-Usual'

Ecodesign Directive, this means that an on-going – negative or at least suboptimal – trend continues. However, in the case of imaging equipment, where the on-going trend is very positive and the industry is proposing a VA as an extra guarantee for continuity instead of mandatory measures, the 'no EU action' scenario actually means a rupture in current EU policy relying on voluntary policy measures and a considerable risk of the on-going trend slowing down, stopping or reverse.

The implications of prolonged uncertainty over mandatory measures can of course not be fully predicted. Uncertainty provokes cautious behaviour, i.e. postponing investments, avoiding risks at all levels, keeping up with a minimum compliance with known voluntary efficiency levels but nothing more, preparing for reaction instead of taking action, focussing on areas –geographically or otherwise—where there are less risks. This is exactly the type of behaviour that has been assumed in the preparatory study concluded in May 2008. Therefore, and also because it provides the comprehensive set of data that has been used all through the consultation process, the IA report takes their 'average case' with reference year 2005, with some minor corrections, as the baseline.

2.1.1. Scope of appliances covered

The scope of the future measure was decided on the basis of Articles 15 and 16 of the Ecodesign Directive and was later refined during the preparatory study in search for a functional approach[31].

The scope of the future measure (defined in the preparatory study) covers monochrome or colour output imaging equipment that uses Ink Jet (hereinafter 'IJ'), Electro photographic (hereinafter 'EP' or 'laser') and Solid ink (hereinafter 'SI'; SI will be included in the EP category marking technologies. Moreover, EP equipment is split between copiers, printers and facsimile machines and IJ is expressed in multi- and single function devices.

It is estimated that the products covered constitute more than 90% of imaging equipment sales. Products that are exempted include printers for special applications such as large size printers (e.g. for technical drawings) and printers with legacy marking technology such as DT (dot matrix), TT (thermal transfer) and DS (dye sublimation). The latter have survived, for reasons of compactness, robustness or other features, in retail (cash-receipts, price labels), outdoor applications (e.g. ATM receipts, parking tickets) and official document printing (e.g. passports and ID cards). Setting up test & calculation methods for these specialty printers would be time-consuming without any noticeable environmental gain.

Also exempted are high speed printers with speeds >66 images per minute ipm (monochrome) and >51 ipm (colour). They are used in professional print-shops, where the purchaser has a high-interest in keeping running costs low. Consequently they are the most energy efficient around and all have duplexing capabilities. It is believed that the economic interest of market forces will continue to regulate these models and it is not necessary to include them explicitly in the scope.

2.1.2. Sales and stock

The sector is economically significant. In 2010 the unit sales of imaging equipment in the EU27 amounted to approximately 31 million units[32] of which 25.5 million IJ units and 5.5

[31] Ecodesign Directive Article 15, Point 2(ii).

million EP units. In 2020, estimated sales (based on the preparatory study) will reach approximately 37 million units of which 30.5 million IJ and 6.5 million EP units. Sales projections for 2030 have some degree of uncertainty[33]; a linear projection would suggest that in 2030 the EU27 unit sales would reach around 41 million units, of which 34 million IJ units and 7 million EP units.

This proves that imaging equipment meets the first criterion of Article 15(2) of the Ecodesign Directive, i.e. that the product group represents a significant sales volume (sales over 200 thousand units/a).

Furthermore, the sales data results in a combined annual turnover of the imaging equipment industry (manufacturers, wholesale and retail) in the EU25 of 5 billion Euro (2004 data[34]).

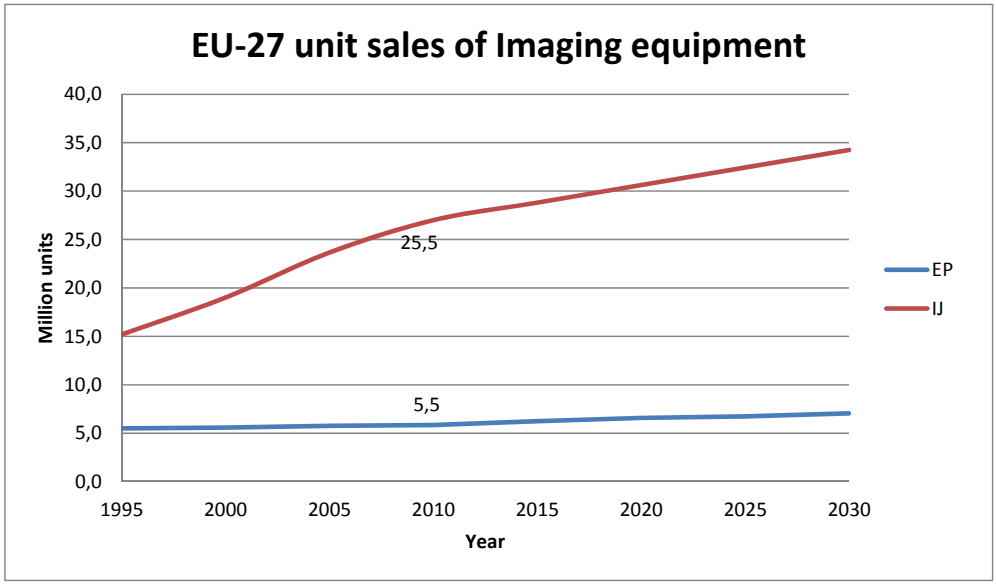

Figure 1: EU-27 sales for imaging equipment

2.1.3. Environmental impact

The preparatory study and the research 2012 identified the main environmental impacts of imaging equipment over their life cycles. The corresponding environmental parameters of imaging equipment are:

- electricity consumption during use phase;
- paper consumption during use phase;
- toner/ ink consumption during use phase.

Electricity consumption and related greenhouse gas emissions

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[32] Apparent sales value: production + import - export, production value fax machines is estimate.

[33] For many years the rise of the 'paperless office' and widespread introduction of E-paper (re-usable electronic sheets) has been predicted to revolutionize the imaging equipment market. So far this has not happened, but especially in very long term projections the impact of these possible market and technology shifts cannot be excluded.

[34] EU sales value equipment in 2004: production value €1 billion, import value €7.8 billion, export value €3.8 billion euro and apparent sales €5 billion (All in MSP excl. VAT)

On the basis of the preparatory study data and the research 2012 data, the total electricity consumption in the period 2005-2022 of the stock is calculated. For the period 1995-2005, the preparatory study supplies no data and this was derived from the Top Runner trend (see Chapter 2.2.3) using 2005 as a stationary point. In 2022 there has been a full stock change of products subject to measures proposed here. For 2022-2030 there is some degree of uncertainty of the technological trends and no new measures are calculated.

The total electricity consumption of the stock of imaging equipment amounts to 9 TWh/a in 2010. This corresponds to a total of around 3.4 Mt CO_2 eq. emissions (0.07% of the total CO_2 emissions in the EU27[35]). The electricity consumption in 2020 will be around 9.5 TWh/a, and in 2030 it is estimated to be 10.4 TWh/a. Electricity projections between 2020 and 2030 have some degree of uncertainty, as already mentioned in Chapter 2.1.2.

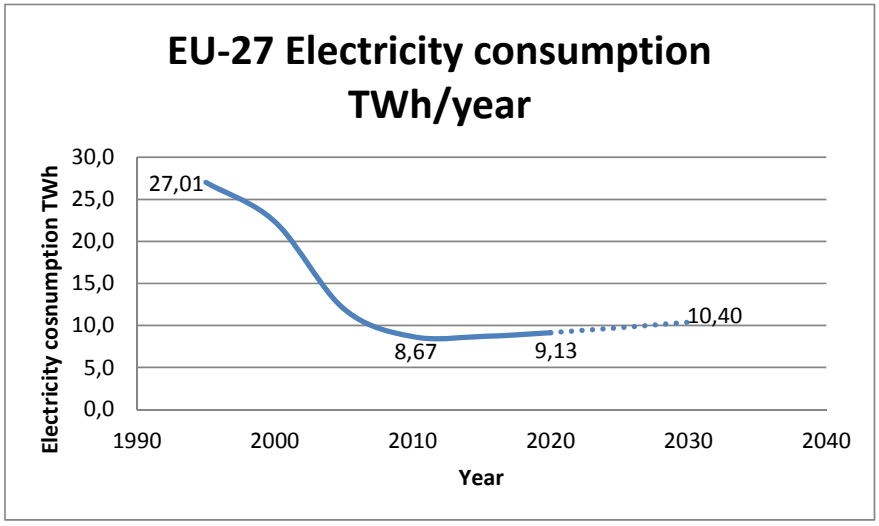

Figure 2: Electricity consumption EU-27 (baseline)

Table 1: Electricity consumption, Greenhouse gas emissions (in CO_2 equivalent), EU-27, 2010

	Avg. Installed 2010 (kWh/year. unit)	Avg. Sold 2010 (kWh/year. unit)	Total electricity consumption in 2010 (stock) TWh/year	Total GHG emissions in 2010 (Mt CO_2 eq.)[36]
Electricity avg./total	67	70	9	3.4
of which ink jet	21	21	2.3	0.9
of which EP (‘laser’)	286	289	6.7	2.5

Paper consumption

Indirectly, paper is the most energy consuming component of the imaging equipment unit. The equipment is not responsible for the volume of document pages (‘*images*’) that the user wants to print or copy, but it is at least half responsible for the physical amount of paper that is required, i.e. if it does not provide the possibility of double-sided printing (‘*duplexing*’) or

[35] According the 2010 Statistical Pocketbook "EU Energy & Transport" the EU-27 emissions in 2005 are 4 521 Mton CO_2. 9 Mton are 0.2% of that.

[36] Electricity 384 kg CO_2/ MWh, Paper 0.6 kg CO_2/kg, Toner/ ink 2.0 kg CO_2/kg

'*N-printing'* (2 or more reduced-size document pages per paper page). For reasons of clarity and because the important issue is the marginal improvement and not the absolute figure, it was decided not make a partitioning between the paper use that is the responsibility of the user and the paper use due to limitations of the equipment, but instead report on the total paper use of imaging equipment as it becomes apparent from e.g. ENERGY STAR duty cycles.

Single print

According to the preparatory study, an average unit is producing 24 400 images per year (122kg/ unit at 80 g/m^2) single page print only. On the basis of a single page printing, the stock would consume 16 100 million kg (16.1 Mt) of paper per year of which 1 700 million kg (1.7 Mt) in the IJ equipment and 14 400 million kg (14.4 Mt) in the EP equipment. Energy consumption to produce this paper would be 645 PJ primary energy[37] and GHG emissions 9.6 Mt CO_2 eq. per year.

Duplexing

In the real life duplexing will be used. Assuming 65% duplexing rate and 15% N-printing[38] in 2005, this results in the paper consumption of around 15 000 pages (approximately 75 kg/unit at 80g/m^2). Thus, it is estimated that imaging equipment in the EU27 consumes almost 10 000 million kg (10 Mt) of paper annually, of which 1 700 million kg (1.7 Mt) in IJ equipment and 8 300 million kg (8.3 Mt) in EP equipment. Energy consumption to produce this paper is 400 PJ in primary energy (equivalent to around 40 TWh electricity) and the related greenhouse gas emissions amount to 6 Mt CO_2 equivalent per year.

The indirect energy consumption (in electricity equivalent) in 2020 will be around 42.75 TWh/a and in 2030 it is estimated to be 47 TWh/a, as can be seen in the figure below. The projections between 2020 and 2030 have some degree of uncertainty, as already mentioned in Chapter 2.1.2.

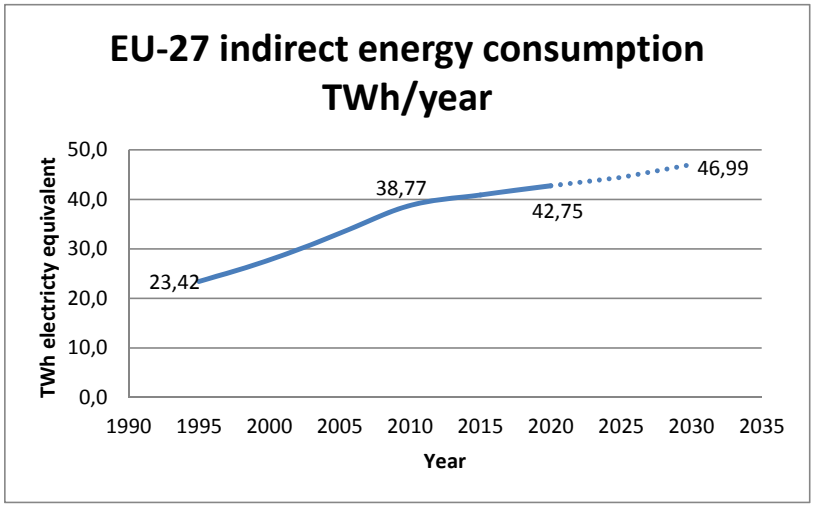

Figure 3: Indirect paper energy consumption EU-27 (in electricity equivalent TWh)

[37] According to MEErP Office paper 40 MJ/kg

[38] 90% of images are produced by EP equipment, of which 74% has duplex capabilities (according to EU-ENERGY STAR database) that are used in 90% of all prints. 10% of images are produced by IJ equipment, of which 21% has duplex capabilities (according to Energystar database) that are used in 90% of all prints. N-printing (2 images per page) is assumed relevant for medium volume equipment (20-40 ppm, workgroup printing) and for legal documents or similar (large font, large line space, few graphs).

Ink consumption

The average unit consumes 662 g toner/ ink per year. In total 87 million kg toner (ink)/yr is consumed, of which 23.1 million kg ink for IJ equipment and 63.9 million kg toner for EP equipment. The total energy consumption to produce this toner/ink is 3.5 PJ[39] primary energy (equivalent to around 0,35 TWh electricity) and the related greenhouse gas emissions amount to 0.17 Mt CO_2 equivalent per year.

Figure 4 clearly shows that paper consumption is the biggest energy consumer compared to electricity use and ink.

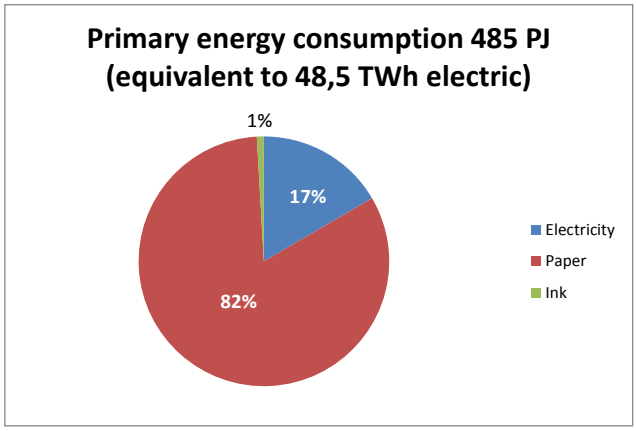

Figure 4: Primary energy consumption of environmental parameters of imaging equipment in 2010

Total energy consumption

The table below presents the total energy consumption for imaging equipment over the period 1995-2030. The indirect energy (energy consumption to produce paper) is calculated in electricity equivalent so that the direct and indirect energy can be compared. This is the business as usual scenario that will be used in the evaluation of different policy options in Chapter 5.

Table 2: Total energy consumption imaging equipment in EU-27 (TWh)

	1995	2000	2005	2010	2015	2020	2025	2030
Direct energy (Electricity in TWh)	27.01	22.33	11.97	8.67	8.69	9.13	9.74	10.40
Indirect energy (Paper in electricity equivalent TWh)	23.42	27.74	33.14	38.77	40.89	42.75	44.43	46.99
Total energy consumption (TWh)	50.43	50.07	45.11	47.44	49.58	51.88	54.18	57.39

[39] According to MEErP toner 50 MJ/kg

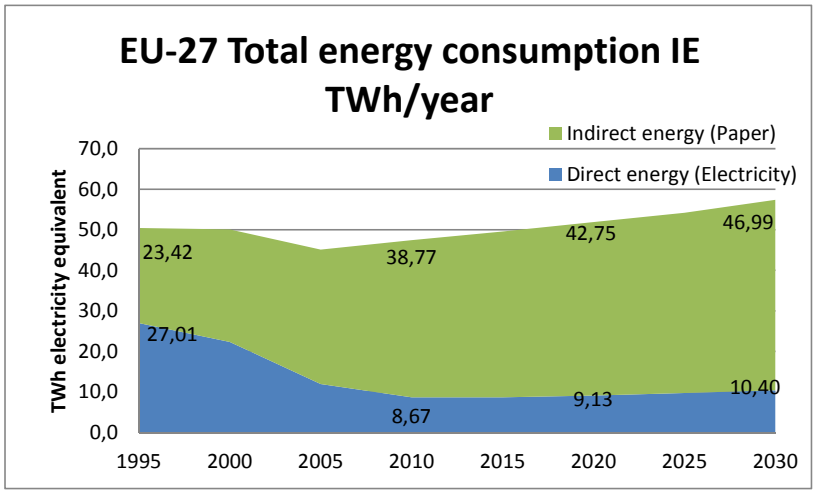

Figure 5: Total energy consumption imaging equipment in EU-27 (direct + indirect energy consumption)

This proves that imaging equipment meets the second criterion of Article 15(2) of the Ecodesign Directive, i.e. significant environmental impact (see Chapter 2).

2.1.4. Market structure

There are no independent EU-manufacturers of the products in the scope that have a full manufacturing line for these products. And there are certainly no SMEs competing in this market of large multinationals. The 15-25 000 EU industry jobs are all with subsidiaries of Asian (mainly Japanese) and North-American companies.

Furthermore (see par. 2.1.4 and par. 5.4) none of these subsidiaries has a full production line, so there are also no local SME part suppliers. At best the European subsidiaries make spare parts but above all they are engaged in logistics and support activities (distribution centres, sales offices, service engineers, administrative regional headquarters, etc.).

The only independent EU-manufacturers of imaging equipment produce specialty-printers for cash-registers, passports, etc. (Olivetti, Compuprint, cab GmbH) that are not in the scope of the VA. Furthermore there are resellers with their own brand name or manufacturers that do not produce imaging equipment anymore in the EU (e.g. Philips). The preparatory study (Task 2, Table 6, p. 9) mentions that there were still a few independent German and Dutch producers in 2007, but in the meanwhile they are no longer independent: In 2008 Kyocera Mito (JP) has taken a majority share in UTAX (D) and TA Triumph-Adler(D). In 2009 Océ (NL) was taken over by Canon (JP).

A list of the current 17 Signatories of the VA (par. 4.2.2, p. 22) is believed to cover more than 90% of industrial market actors for the products in the scope (p. 23, 96% according to industry, see p.44).

The EU27 printer market is dominated by five producers, namely Hewlett- Packard (US), Canon (JP), Epson (JP), Lexmark (US) and Brother (JP) representing by up to 86 % of the

market (Figure 6).[40] These five manufacturers also control the total imaging equipment market in the EU 27, where they have a market share up to 70%.[41]

Geographically, the industrial employment is concentrated in the Netherlands (many European HQs, Océ R&D, total ca. 6 000 jobs) and Western European Member States like Germany, UK, France and Italy with each 1 000 – 3 000 jobs partitioned to imaging equipment industry. In other Member States the industrial employment is held at the level of 100-500 jobs.

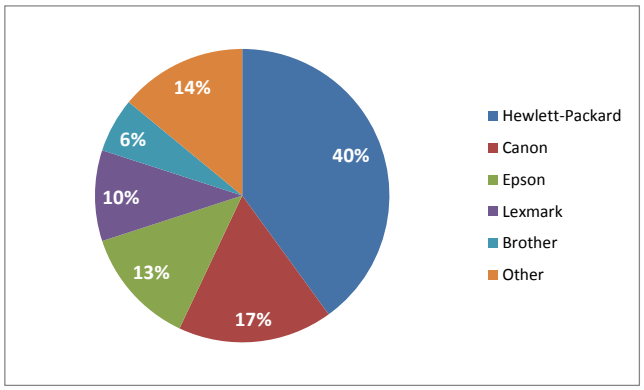

Figure 6: Companies with high market shares in printers unit sales in 2006 for the geographic region of Europe, the Middle East and Africa (source: Gartner market research 2006)

Retail activities include ink cartridge shops and office supplies dealers. Equipment retail takes place through specialist shops, supermarkets and internet.

[40] Development of European Ecolabel and Green Public Procurement Criteria for Imaging Equipment JRC IPTS Draft Preliminary Study. Draft Task 2: Economic and Market Analysis; Jiannis Kougoulis, Oliver Wolf February 2011

[41] The printer market sales share for the geographic region of Europe, the Middle East and Africa (EMEA) measured in sold units

2.1.5. Expenditure

The expenditure related to the use of imaging equipment is presented in Table 3 and Figure 7.

Table 3: Expenditure (billion euros) of the main environmental parameters of imaging equipment in 2010

	Purchase costs[42]	Maintenance costs	Electricity costs	Paper costs[43]	Toner/ ink costs[44]	Total consumer expenditure EU-27
Expenditure total	14.8	14.0	1.6	64.4	161.1	255.9
of which Ink Jet	5.1	0	1.2	6.7	16.8	56.2
of which EP ('laser')	9.7	14.0	0.4	57.7	144.3	199.7

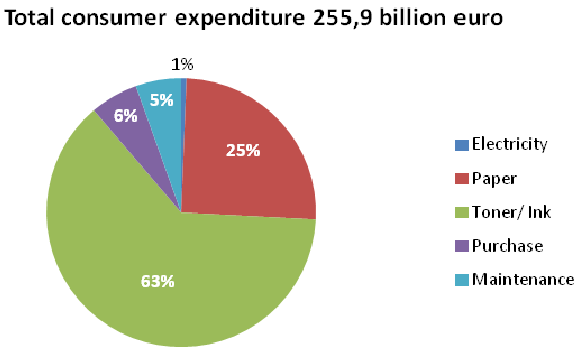

Figure 7: Total consumer expenditure of the main environmental parameters of imaging equipment

2.1.6. Improvement potential

The preparatory study states that for the reference year 2005 the existing cost effective technical solutions allow for improvement of the energy efficiency of imaging equipment. The total energy consumption of imaging equipment can be reduced up to 30% according to the best case scenario presented in the preparatory study. This statement will be moderated in the updated analysis described in Chapter 4.2, but it indicates that a significant improvement potential exists. The preparatory study concludes that savings can be achieved without excessive costs.

This indicates that imaging equipment meets the third criterion of Article 15(2) of the Ecodesign Directive, i.e. significant improvement potential without excessive costs.

[42] Consumer price incl. VAT

[43] Paper costs per page €0.02

[44] Toner/ ink costs per page €0.05

2.2. Relevant legislation

2.2.1. EU mandatory legislative measures

Currently there is no mandatory EU legislation on energy efficiency of imaging equipment. However, certain aspects of imaging equipment are partially regulated in the following EU laws:

- Regulation 1275/2008[45] lays down requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment. The impact of this Regulation can remain limited as imaging equipment are rarely in the 'off' or 'standby' modes as they need to be constantly in on mode or 'networked standby' mode to be able to operate.

- Directive 2012/19/EU on Waste Electrical and Electronic Equipment (hereinafter 'WEEE')[46] that applies to office imaging equipment under category 3 of Annex IA, IT and telecommunications equipment, stating that:

  - the rate of recovery shall be increased to a minimum of 75% by an average weight per appliances;

  - component, material and substance reuse and recycling shall be increased to a minimum of 65 % by an average weight per appliance.

  Annex II to the WEEE Directive provides selective treatment for materials and components of waste electrical and electronic equipment in accordance with Article 6(1) of the Directive. In case of office imaging equipment, the provisions apply to toner cartridges, liquid and pasty, as well as colour toner.

- The Directive 2011/65/EU on restriction of the use of certain hazardous substances in electrical and electronic equipment (hereinafter 'RoHS')[47] applies to the use of the heavy metals, such as lead, mercury, cadmium, hexavalent chromium, and brominated flame retardants (poly-brominated diphenyl ethers and poly-brominated biphenyls) in new electrical and electronic equipment placed on the market after 1 July 2006.

In part, also the voluntary ENERGY STAR programme discussed hereafter contains some mandatory clauses, in as much as Article 16 of Regulation 106/2008/EC enforces public procurement of office equipment to use the ENERGY STAR criteria.

2.2.2. EU voluntary measures

EU ENERGY STAR programme

[45] Commission Regulation (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment; OJ L 339/45 18.12.2008

[46] Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) OJ L 197/38-71, 24.7.2012

[47] Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment OJ L174/88 1.7.2011

On 19 December 2000 the *Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficient labelling programs for office equipment* was signed between parties. It was confirmed in the EU law in 2001. The objective is to set up a common labelling programme for energy-efficient office equipment, the ENERGY STAR.

The nature of the Agreement can be summarised as follows:

- ENERGY STAR is the name and the logo of the joint programme and is a US-registered service mark owned by the United States Environmental Protection Agency (EPA).
- Participation in the programme is voluntary, and the Agreement makes provision for manufacturers, vendors or resale agents of the products in question to register as participants in the programme and to be authorised to use the ENERGY STAR logo to identify their products, provided that these meet the requirements set out in Annex C to the Agreement (e.g. low-power 'sleep' mode option for monitors). The Agreement basically covers the office equipment listed in the Annex thereto (monitors, computers and operating systems, but also fax machines, scanners, copiers and printers).
- The products identified by the ENERGY STAR logo are tested at the participants' installations or by an independent testing laboratory. The management bodies designated by the two signatories may also test or examine products in order to verify whether they comply with the specifications set out in the Agreement.
- Each party designates a management body to be responsible for the management of the ENERGY STAR programme: on the one hand, EPA and, on the other, the Commission. The EC has assigned the task of setting and reviewing the technical specifications and of monitoring the application of the programme within the Community to an appropriate body, viz. the European Union ENERGY STAR Board. This body, which is made up, in part, of national representatives, will advise and assist the Commission in the management of the programme.
- The Agreement sets out guidelines on the proper use of the ENERGY STAR name. These guidelines cover not only the use of the logo as a label but also the use of the ENERGY STAR name in educational documents, advertisements, etc.
- The parties are free to amend the Agreement (e.g. addition of a new item of equipment) by mutual agreement of the two management bodies. They may also terminate the Agreement at any time by giving three months' notice, in which case the European Community will no longer be able to use the ENERGY STAR mark, since it is the property of the EPA.
- The Agreement is concluded for five years.

The EU participation in the ENERGY STAR programme was confirmed in Council Decision 2001/469/EC of 14 May 2001[48] and implemented through Regulation (EC) No 2422/2001 of 6 November 2001[49]. The Agreement has been renewed in 2006[50] and 2011[51]. In that context,

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[48] Council Decision 2001/469/EC of 14 May 2001 concerning the conclusion on behalf of the European Community of the Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficient labelling programs for office equipment; OJ L172 of 26/06/2001, p.1

[49] Regulation (EC) No 2422/2001 of the European Parliament and of the Council of 6 November 2001 on a Community energy efficiency labelling programme for office equipment. OJ L 332, 15.12.2001, p. 1.

Commission Communication COM(2011)337 on the implementation of the ENERGY STAR programme in the EU in the period 2006-2010[52] proposed certain adjustments for the prolongation of the Agreement, specifically on the requirements of third part testing.

Regulation (EC) No 2422/2001 has been recast in Regulation (EC) No 106/2008[53]. Article 6 of the latter regulation stipulates that Commission, other Community institutions and central government authorities of Member States shall specify energy-efficiency requirements not less demanding than the Common Specifications [i.e. ENERGY STAR specifications] for public supply contracts. Around mid-2012 a new EU ENERGY STAR Regulation is expected, dealing with the adjustments (or similar) suggested in COM(2011)337.

Since 2008 the ENERGY STAR equipment specifications have been incorporated in European law. Council Regulation 1275/2008/EC[54] has been issued on stand-by energy use. ENERGY STAR specifications for imaging equipment are described in Commission Decision 2009/347/EC of 20 April.[55] Commission Decision 2009/486/EC has been issued on the revision of computer specifications[56]. Commission Decision 2009/789/EC sets out ENERGY STAR specifications of displays.[57]

In its dealing with the EU ENERGY STAR the Commission, and the designated Management Entity, is assisted by the ENERGY STAR Board with full representation of the EU Member States. Commission Decision 2003/168/EC of 11 March 2003 establishes the European Community ENERGY STAR Board (ECESB).[58] Commission Decision 2003/367/EC sets the internal rules of procedure of the European Community ENERGY STAR Board.[59]

The official EU ENERGY STAR database of ENERGY STAR compliant office equipment can be found on www.eu-energystar.org. News, rules for registration and other ENERGY STAR related information are also published on this website. At the moment (Sept. 2012) around 5100 models of EU ENERGY STAR compliant imaging equipment are registered.

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[50] OJ, 28.12.2006, L381 p.26-30

[51] On 29th November 2011, the EU and the US initialled a new ENERGY STAR EU-US Agreement on the coordination of energy-efficient labelling programs for office equipment. (http://ec.europa.eu/energy/international/bilateral_cooperation/usa_en.htm)

[52] Commission communication COM(2011)337 final on the implementation of the ENERGY STAR programme in the EU in the period 2006-2010. Brussels, 9.6.2011.

[53] Ibid 12.

[54] Ibid 46.

[55] Commission Decision of 20 April 2009 determining the Community position for a decision of the management entities under the Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficiency labelling programmes for office equipment on the revision of the imaging equipment specifications in Annex C, part VII, to the Agreement

[56] Commission Decision of 16 June 2009 on the revision of the computer specifications (2009/489/EC). OJ 29.6.2009, L161, p.16-36

[57] Commission Decision of 26 October 2009 on the revision of the computer monitor specifications (2009/789/EC). OJ 29.10.2009, L 282, p. 23-40

[58] Commission Decision of 11 March 2003 establishing the European Community ENERGY STAR Board (2003/168/EC), OJ L67 12.3.2003, p. 22-24.

[59] Commission Decision of 15 May 2003 establishing the Rules of Procedure of the European Community ENERGY STAR Board (2003/367/EC). OJ 21.5.2003, L125, p.9-11

COM(2011)337 concludes that the ENERGY STAR programme in the European Union is successful. Furthermore, it specifies that 'The dynamism and voluntary nature of ENERGY STAR make it a policy tool particularly well suited for ICT products'. It illustrates this by showing the expected impact of ENERGY STAR on the electricity consumption of computers and displays by 2020, where ENERGY STAR is expected to save 35% versus a baseline without policy. In the underlying report it will be shown that for imaging equipment similar savings can be expected. Furthermore, COM(2011)337 notes that the number of manufacturers participating in the programme has increased significantly from 16 companies in 2006 to 74 in 2010 with public procurement (since 2008) as a main driver.

The focus of the current ENERGY STAR version 1.1 criteria for imaging equipment is on (1) duplexing and N-printing, (2) the typical electricity consumption (TEC)[60], (3) the operational mode (OM)[61] and (4) the digital front end (DFE) requirements[62].

In the ENERGY STAR version 2.0 more stringent ambition levels on the above mentioned issues as well as additional requirements on (5) design for recycling and (6) cartridge re-use can be expected.

Draft 1 of ENERGY STAR requirements version 2 [63] shows TEC and OM requirements that are, depending on the print speed, 30-45% lower than in ENERGY STAR version 1.1 (see Annex 6). Stand-by values are 50% below version 1.1 level.

The aim is, verified with draft requirements and models currently on the market[64], to set the energy efficiency limits that would allow 25-35% of the models –depending on print speed– to pass (compare: today 90% of models in the scope passes ENERGY STAR v. 1.1 requirements).

Green Public Procurement

In 2004, the Council and the European Parliament adopted Directives 2004/18/EC and 2004/17/EC aimed at clarifying, simplifying and modernising existing European legislation on public procurement. Directive 2004/18/EC [65] is the most relevant for procuring imaging equipment and it contains specific reference to the possibility of including environmental considerations in the contract award process. The preamble to Directive 2004/18/EC identifies

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[60] TEC is a method of testing and comparing the energy performance of imaging equipment products, which focuses on the typical electricity consumed by a product while in normal operation during a representative period of time. The key criteria of the TEC approach for imaging equipment is a value for typical weekly electricity consumption, measured in kilowatt-hours (kWh). The maximum TEC is calculated for each individual product and takes into account the product's size format, marking technology, and monochrome product speed.

[61] OM (Operational Mode) is a method of testing and comparing the energy performance of imaging equipment products, which focuses on product energy consumption in various low-power modes. The key criteria used by the OM approach are values for low-power modes, measured in watts (W).

[62] Relates to network connectivity, mailbox functionality, job queue management, machine management, advanced graphic user-interface, ability to initiate communication with other host servers and client computers, ability to post-process pages.

[63] https://www.energystar.gov/ia/partners/prod_development/revisions/downloads/img_equip/Draft_2_Version_2_Imaging_Equipment_Specification.pdf?edd1-6b94

[64] https://www.energystar.gov/ia/partners/prod_development/revisions/downloads/img_equip/Draft_2_TEC_Qualification_Rates.pdf?edd1-6b94

[65] Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts. OJ, L134, 30.4.2004, p. 114-235

the objective of clarifying how contracting authorities '*...may contribute to the protection of the environment and the promotion of sustainable development, whilst ensuring the possibility of obtaining the best value for money for their contracts*.'

More detailed provisions permit the inclusion of environmental requirements in technical specifications (Article 23(3)b), the use of eco-labels (Article 23(6)), applying award criteria based on environmental characteristics (Article 53), etc.. The Directives thus offer a number of opportunities for GPP to be implemented, throughout the contract award process.

Currently GPP criteria for imaging equipment are being drafted and published for consultation. The criteria relate to energy efficiency and duplexing as well as design for recycling and cartridge re-use, in line with ENERGY STAR requirements.[66]

EU Ecolabel

The EU Ecolabel[67] is a voluntary label that helps identifying products and services that have a reduced impact on the environment throughout their life cycle, from the extraction of raw materials to production, use and disposal.

The draft Ecolabel criteria include requirements for energy, duplexing, N-printing, recycling and re-use, hazardous substances, indoor air pollution, noise, and criteria on ink and toner consumables. The requirements on energy anticipate upcoming ENERGY STAR version 2.0.[68]

2.2.3. Third country mandatory/ voluntary legislative measures

Japanese Top Runner

The Top Runner approach identifies the most efficient product on the market and on the basis of its specifications, establishes energy efficiency requirements that all similar products must meet by a specified date.

Copying machines became designated products for the Top Runner standard in 1999 with a target year 2006. During this period, many energy saving technologies were developed. In 2006 an improvement of 72.5% with respect of 1999 was reached (far beyond the originally anticipated improvement of 31.0%).[69] No new targets have been set for dedicated copiers due to the fact that multifunctional devices took over the market while the number of shipped copiers was significantly reduced.

Multifunctional devices and printers came in the scope of the Top Runner program in 2007. In that year, a calculation formula for target standard values was developed on the basis of the

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[66] http://susproc.jrc.ec.europa.eu/imaging-equipment/docs/GPP%20Imaging 20Equipment%20IPTS%202nd%20 revision_Clean.pdf

[67] Regulation (EC) No 66/2010 of the European Parliament and of the Council of 25 November 2009 on the EU Ecolabel. OJ L27, 30.1.2010, p. 1-19

[68] http://susproc.jrc.ec.europa.eu/imaging-equipment/docs/EU%20Ecolabel%20Criteria%20for%20Imaging%20Equipment%20legal%20text.pdf

[69] Final report by Copying Machine, etc. Evaluation Standards Subcommittee, Energy Efficiency standards Subcommittee of the Advisory Committee for Natural Resources and Energy. Dec 2011. http://www.eccj.or.jp/top_runner/pdf/tr_copying_machines_etc_dec2011.pdf

actual measurements of annual energy consumption of these appliances. The target year for the multifunctional devices and printers is 2017.

Figures 8 and 9 show that the Japanese Top Runner targets for monochrome and colour imaging equipment for 2017 are almost in line with what is expected for ENERGY STAR version 2.0. This confirms the role of ENERGY STAR as the *de facto* standard for energy efficiency of imaging equipment.

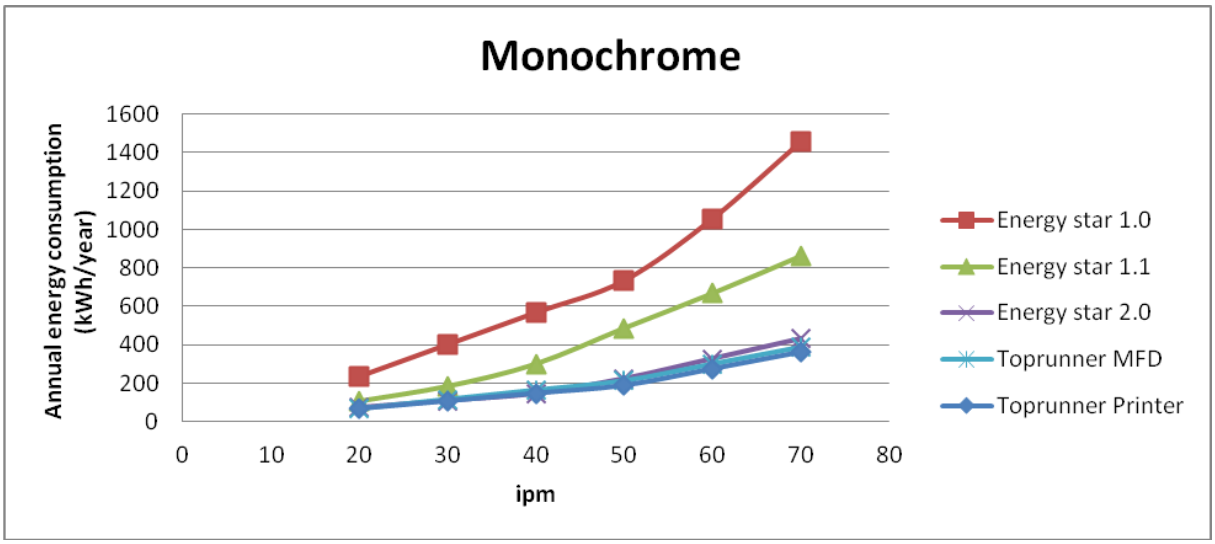

Figure 8: Target standard lines for monochrome imaging equipment (ENERGY STAR vs. Top Runner. source VHK[70])

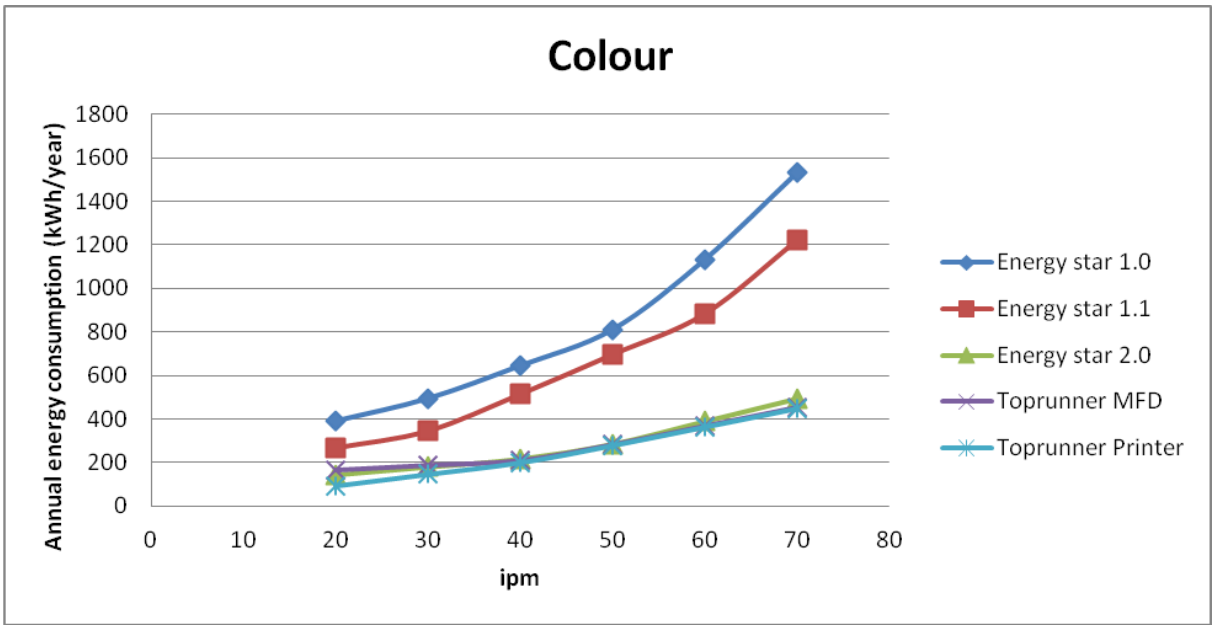

Figure 9: Target standard lines for colour imaging equipment (ENERGY STAR vs. Top Runner. Source VHK)

[70] Source: Data analysis VHK, technical IA assistance to the Commission, 2012.

US ENERGY STAR programme

The U.S. Environmental Protection Agency (EPA) introduced the ENERGY STAR label in 1992 to recognize energy-efficient computers. Since then, the label has grown to identify efficient products across more than 40 product categories and in more than 35 countries[71]. For office equipment (category 'Computers') a distinction is made between computers, displays and imaging equipment.

The ENERGY STAR programme is a voluntary partnership between government, businesses, and purchasers designed to encourage the manufacture, purchase, and use of energy efficient products. The primary objective of the ENERGY STAR programme is to make it easy for buyers to identify the most energy-efficient products in the marketplace by differentiating them with the ENERGY STAR mark. When the EPA and U.S. Department of Energy (DOE) set specifications for the specific products, they strive to recognize the top energy performers in the market [72] (Annex 4 gives more detailed information about when the specifications are set or changed).

The main driver for industry participation in ENERGY STAR in the US is that meeting the ENERGY STAR requirements is a mandatory condition for procurement by the US government and governmental institutions.

2.2.4. National voluntary initiatives in the EU Member States and third countries

The most important national and regional voluntary initiatives regarding the labelling and subsequent procurement incentives for imaging equipment are:

Australian Voluntary Environmental Labelling Standard GECA: The primary purpose of this standard is to define environmental performance criteria for the most harmful environmental and human hazards of printers and fax machines placed on the Australian market and to use these criteria as indicators of general environmental performance of this product group. [73]

Nordic Swan: The Scandinavian Nordic Swan Ecolabel product definition and criteria refer to the current ENERGY STAR criteria for energy consumption. Other criteria relate to the design for reuse/disassembly/recycling and presence of hazardous/toxic substances.[74]

Blue Angel: The German Blue Angel ecolabel employs, just like the ENERGY STAR programme, limit values for power consumption and default times for transition between various power modes, but uses a more elaborate approach.[75]

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[71] EU-27, Iceland, Norway, Liechtenstein, USA, Canada, Japan, Taiwan, Australia and New Zealand

[72]http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/EPA_Oven_Announcement_Memo.pdf?cd2b-9cc9

[73] Good Environmental Choice Australia (GECA) May 2006: Australian Voluntary Environmental Labelling Standard for Printers, Faxes, and Multifunction Devices.

[74] For more information please see: Nordic Ecolabelling of Imaging equipment Version 5.3 14 June 2007 – 30 June 2013 http://www.nordic-ecolabel.org/criteria/product-groups/

[75] For more information please see: Office Equipment with Printing Function (Printers, Copiers, Multifunction Devices), RAL-UZ 122 http://www.blauer-engel.de/en/products_brands/search_products/produkttyp.php?id=333

Umweltzeichen of Austria: The Austrian Umweltzeichen, 'UZ 16' Office appliances with print function, sets out criteria for energy consumption, emissions, paper and toner use. [76]

A more complete overview of national and regional voluntary initiatives in the EU and third countries is given in Annex 5.

2.3. Market and regulatory failures

As mentioned in Chapter 2, if it is accepted that a limited level of market imperfection is unavoidable there are no major ecodesign problems for the imaging equipment sector in comparison to other product groups subject to ecodesign Regulations.

In as much as market and/or regulatory failures for imaging equipment exist, according to the preparatory study they pertain mainly to the low-volume equipment in the consumer market and less to the professional office market,. They can be caused by the fact that current electricity prices do not reflect environmental costs for society and thus play an insufficient role in the purchase decision (negative externality). Furthermore, most consumers base their choice of equipment on purchase price and other factors like availability, service and 'trusted' brand names rather than energy costs because of lack of adequate information (asymmetric information). In this context it is relevant that the Energy Star logo is well known in the office sector but much less with private consumers. Finally, cases of market failure occur where investment costs and running costs are borne by different parties, e.g. a company purchasing department may have a different financial perspective than the business unit actually using the equipment and paying for its running costs (split incentives).

2.4. Subsidiarity

The principle of subsidiarity as defined in Article 5 of the Treaty on European Union ensures that decisions are taken as closely as possible to European citizens. Consequently, EU Institutions should take action only in areas which fall within its exclusive competence and which lead to a more effective action if the latter was taken at national, regional or local level. The production of imaging equipment is a global business with no EU players and Member States are fully aware that requirements regarding the placing on the market can only effectively be realised at EU, if not at a global level.

2.5. Legal basis for EU action

The Directive 2009/125/EC (hereinafter 'Ecodesign Directive')[77] establishes a legal framework for laying down ecodesign requirements for selected priority product groups.

According to Article 15 of the Ecodesign Directive, a priority product group must be covered by either a mandatory implementing measure (i.e. the Commission Regulation) or a self-regulation (e.g. a voluntary agreement concluded by the industry), if it meets three conditions: (i) represents significant sales volumes, (ii) has a significant environmental impact and (iii) has a significant improvement potential.

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[76] For more information please see: http://www.umweltzeichen.at/

[77] Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products OJ L 285/10, 31.10.2009

In accordance with Art. 15(6) and Annex II of the Ecodesign Directive a technical-economic analysis shall be performed, amongst others proposing target levels based on the available data at the time.

Article 16 of the Ecodesign Directive provides the legal basis for the Commission to adopt an ecodesign Regulation for a chosen product group, while Article 19 provides for a regulatory procedure with scrutiny for the adoption of such a measure.

Recitals 18, 19 and Art. 15(3) of the Ecodesign Directive encourage the Commission to give priority to a self-regulation over a mandatory measure, if the former is likely to deliver the policy objectives faster or in a less costly manner then the latter.

According to Article 17 of the Ecodesign Directive, a valid voluntary agreement proposed by the industry must comply with the criteria laid down in Annex VIII to the Ecodesign Directive.

An ecodesign self-regulation meeting the conditions stipulated in Annex VIII to the Ecodesign Directive can be considered a valid alternative to an ecodesign mandatory implementing measure. Consequently, as long as the voluntary agreement meets its objectives, the Commission may refrain from adopting an ecodesign implementing measure.

If the monitoring and reporting performed under the voluntary agreement, or Member States or stakeholders indicate distortions in the functioning of the voluntary agreement, the Commission should consider proposing ecodesign mandatory Regulation. The Commission may recognise valid VA in the form of a Commission Report to the European Parliament and the Council. (i.e. non-legislative act).

3. DEFINING OBJECTIVES

The strategic policy context has been addressed in par. 1.1. Operational objectives that are relevant for measures on imaging equipment in the context of ecodesign are:

- a 20% energy saving in 2020 versus 1990,
- a 20% carbon emission abatement in 2020 versus 1990,
- promotion of non-energy materials resources efficiency through amongst others materials reduction (e.g. paper), recycling (e.g. of larger plastics parts, electronics, metals) and re-use (of toner cartridges).

The preparatory study stated that with respect of the 2005 level a 30% electric efficiency improvement in 2020 was cost-effective, to be reached through mandatory measures. This conclusion is in line with what usually can be expected from mandatory ecodesign measures also for other product groups. It would mean that in a 'best case scenario' and a continued increase in market penetration of the equipment, the absolute EU energy consumption in 2020 would remain at the 2005 level. The preparatory study did not provide energy efficiency data for 1995.

The additional 2012 research by the Commission based on new data that came available after the conclusion of the preparatory study filled in the 1995 data and showed that the ambition level can be significantly higher. More specifically, new information indicated that if the positive trend –based on voluntary measures– continues, a 60% energy saving over the 2012-

2020 period is realistic. This means a 2020 target value of 1.5-2 TWh electricity consumption, i.e. an electricity saving of 90-95% over the policy reference period 1990-2020 is realistic.

For automatic duplexing and N-printing a realistic target is that in a few years **over 90%** of typical office printers (speed >19 ipm for colour; >25 ipm for monochrome) will have both features. A further penetration of duplexing in the consumer market (below the given speeds) may be expected, but –given the low printing volume—add relatively little in terms of savings for 2020.

4. IDENTIFYING POLICY OPTIONS

This Chapter describes five policy options that will be considered in this impact assessment.

Option 1: No EU action

Option 2: Self-regulation

Option 3: Mandatory energy labelling Regulation

Option 4: Mandatory ecodesign Regulation

Option 5: Combined ecodesign Regulation and energy labelling Regulation

4.1. Option 1: No EU action

This option means that the EU will not engage in any new measures.

Furthermore, 'No EU action' also means that the Commission does not accept the VA concluded by the imaging equipment industry and thus still considers the option of mandatory action beyond (ambitious) criteria proposed in the VA. As has been argued in the introduction of the 'baseline scenario' (par. 2.1) this creates a high level of uncertainty and a considerable risk that the on-going positive trend of energy efficiency improvements will slow down, stop or may well be reversed. Specifically, there is a possibility that R&D spending on energy efficiency, as part of the total R&D budget, can be reduced, e.g. in favour of aesthetics, gadgets or minor performance features. Manufacturers, which are all extra-EU multinationals, can decide not to introduce on the EU market their most energy efficient models[78]. Furthermore, in a worst-case scenario, the EU-US co-operation could fall apart with negative repercussions on the current global harmonisation in test procedures and requirements.

To calculate the effect of this scenario the baseline scenario from the preparatory study has been assumed.

4.2. Option 2: Self-regulation

This option means that the Commission will continue relying on the self-regulation and will accept the VA as a guarantee for continuation of the current trend and will refrain from

[78] This has happened before and often for reasons that seem far less important. For instance, the COM (2011)337 mentioned that as much as 60% of manufacturers are expected to drop out of the EU ENERGY STAR programme if third-party certification would become mandatory.

mandatory actions under Directives 2009/125/EC and 2010/31/EU as long as the policy targets are met. The terms of the final VA are given in Annex 9.

In short: the energy efficiency and duplexing requirements relate to the current ENERGY STAR requirements version 1.1 and commitments that by 1 January 2012, 90% of models of Signatories will meet those requirements. Signatories cover over 90% of the EU market.

Design for recycling and re-use of cartridges are new items in the VA, i.e. they are not part of ENERGY STAR v. 1.1 but anticipate requirements of the new v. 2.0.

Section 11 of the VA states that a revision of the VA will take place 3 months after the publication of a new version of the ENERGY STAR programme requirements. The Commission, assisted by a Regulatory Committee will decide whether the ambition level and others terms and conditions of the revised VA are acceptable, following consultations with all stakeholders (including NGOs and industry) in the Consultation Forum framework[79].

It was understood between parties that a revised VA would adhere to the continuation of the progress in recent years. Chapter 3 explains the target values that pertain to this policy option.

These ambitious targets that go far beyond what was considered possible in the preparatory study, can be found in achievements seen in previous years:

- Over the 1995-2005 period, industry reached an electricity saving of at least 60-65%, i.e. for the EU the electricity consumption for imaging equipment was reduced from 27 TWh/a in 2005 to around 9-10 TWh/a in 2020 (see also par. 2.2.3.Top Runner).

- Over the 2005-2012 period, strictly following voluntary measures, a further reduction of electricity consumption was reached of 60-65% with a drop to 3.5 TWh in 2012. This was achieved not only through 90% of models complying with ENERGY STAR version 1.1 (as assessed in the context of the VA) but also by the fact, as shown by the 2012 additional analysis, that the average compliant model outperformed the minimum ENERGY STAR energy efficiency requirements by 43%. (see Annex 7) Over the 2005-2012 period, the share of typical office models with automatic duplexing rate increased from an estimated 65% in 2005 to 80-90% in 2020. Duplexing rates for 1990-1995 are not available (see Annex 7).

- Overall, over the period 1995-2012 an energy saving of 87% was reached, which results in an average efficiency improvement of over 6% annually.

Hereafter the second and third points are illustrated with some main outcomes of the analysis of the ENERGY STAR database in February 2012. A full explanation is given in Annex 7.

Typical Energy Consumption (TEC)

The ENERGY STAR methodology for the efficiency of mainly EP imaging equipment distinguishes four TEC classes: TEC 3 and 4 cover monochrome and colour MFDs respectively; TEC 1 and 2 cover other imaging equipment (copiers, printers, fax machines

[79] Article 18 of the Ecodesign Directive.

etc.) with monochrome and colour output respectively. All TEC classes use a standard size paper format and the energy performance is determined through a duty cycle.

Figure 10 shows how the registered EP models in the EU ENERGY STAR database (n=2612) score against the minimum requirements of ENERGY STAR version 1.1 for the various TEC classes. The minimum requirement is set at 100% and efficiency classes with a bandwidth of 10% were distinguished. For example an efficiency class '10-20%' means that these models consume 80 to 90% less energy than the ENERGY STAR limit. The models in the class '>100%' were not in the database; they constitute 10% of the total (ca. n=290).

Under the terms of the VA, over 90% of products comply with the ENERGY STAR version 1.1 means that still, 10% of products is not included in the database and thus an additional column was added to the graph below representing the percentage of products that are outside the VA and assumed to be above the maximum TEC value. With a sample size of 2 612 products representing 90% of the market, the 10% outside the scope represent around 290 products.

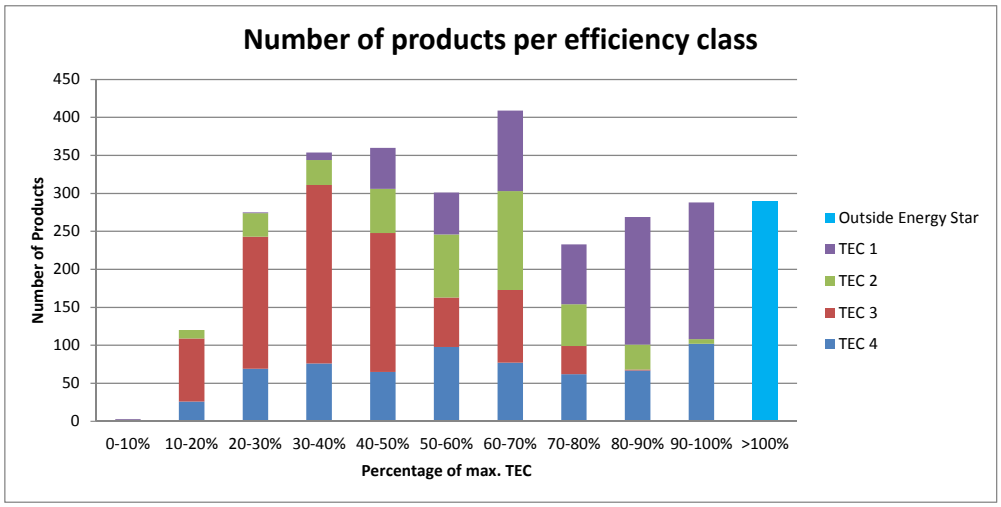
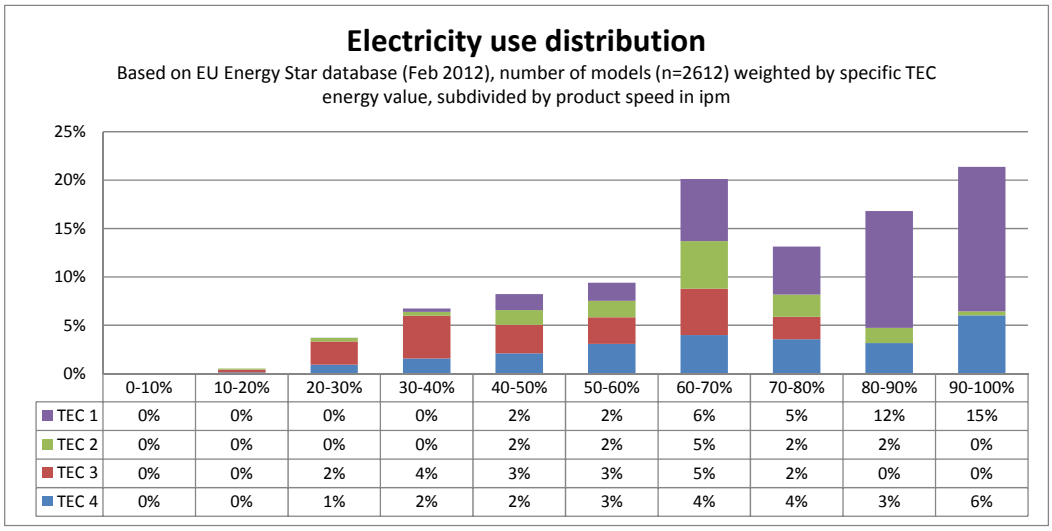


Figure 10: Number of product per energy efficiency class

The results in figure 10 are not weighted for the specific energy consumption. For example it might well be that the best models pertain to low-volume/low speed imaging equipment, whereas most high volume equipment that has the highest environmental impact is very close to the limit. To take that into account, an analysis was made of the print-speeds (which determine the print volume in the ENERGY STAR metric) within each TEC class. The results are shown in figure 11 below.



	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%
TEC 1	0%	0%	0%	0%	2%	2%	6%	5%	12%	15%
TEC 2	0%	0%	0%	0%	2%	2%	5%	2%	2%	0%
TEC 3	0%	0%	2%	4%	3%	3%	5%	2%	0%	0%
TEC 4	0%	0%	1%	2%	2%	3%	4%	4%	3%	6%

Figure 11: Overall electricity use distribution

The results from figure 11 are slightly less favourable than those in figure 10, However, as mentioned above, this indicates that the average energy efficiency of the models is over 40% better than the ENERGY STAR limit. This is not exactly a sales weighted outcome but it is as close as data allows and given the large number of models it is estimated to be accurate.

Duplexing and OM (operational mode)

Similar to the TEC improvement, the OM and duplexing rate also show potential for significant savings. More detailed information on the ENERGY STAR requirements is given in Annex 6.

For OM products the ENERGY STAR v.1.1 requirements sets maximum power values for standby-mode (1 Watt), sleep-mode (between 1.4 - 30 W depending on OM class) and 'functional adders'[80] like interface (e.g. wired, wireless, infrared) and storage (e.g. CCFL lamps, memory, cordless handset). On average the EU-registered products are also 35% below the levels. The best products perform 85% better than the maximum requirement.

4.2.1. Main elements of the VA proposed by the industry

At the Consultation Forum meeting (of 12 October 2009), the imaging equipment industry has presented a proposal for a VA (self-regulation) aiming at limiting the power consumption of imaging equipment placed on the EU market. The proposal for the agreement has been amended on the basis of comments received from the Commission and stakeholders.[81] The VA version 3.5, of 15 February 2011 has already been signed and has entered into force and thus it already generates savings.

[80] A functional adder is a standard product feature that adds functionality to the base marking engine of an imaging equipment product. The Operational Mode portion of this specification contains additional power allowances for certain functional adders. Examples of functional adders include wireless interfaces and scanning capability.

[81] The most recent version of the voluntary agreement is v3.5 from 15 February 2011

Scope

The VA applies to imaging equipment defined as in ENERGY STAR v.1.1. ENERGY STAR distinguishes the Typical Electricity Consumption (TEC) products and Operational Mode (OM) products. TEC products are standard-size copiers, Multifunction Devices (MFDs), and printers that use Electrophotography (EP), Solid Ink (SI), and High Performance Ink Jet (IJ) marking technologies, OM products cover the remainder of mainly non high-performance inkjet products (see par. 2.1 for exemptions).

Signatories

Currently there are seventeen Signatories[82] to the VA, including: Brother International Europe, Canon, Dell, Epson, HP, Kodak Limited (UK), Konica Minolta Business Solutions Europe, KYOCERA Document Solutions Europe B.V., Lexmark International, Murata Machinery Europe, OKI (UK) Ltd., Panasonic Europe Ltd., Ricoh Europe PLC, Samsung Electronics Europe, Sharp Electronics (Europe) GmbH, Toshiba TEC Germany Imaging Systems and Xerox. The current Signatories to the VA account for more than 90% of the total EU market for imaging equipment, which exceeds the agreed limit[83].

As required by Annex VIII to the Ecodesign Directive, the voluntary agreement remains open to the participation of other companies.

Requirements

The requirements laid down in the VA are based on the ENERGY STAR programme requirements (v.1.1). The VA will be revised in 2013 to be brought in line with the new ENERGY STAR programme requirements (v.2) to enter into force in 2013.

Each signatory to the agreement committed itself that at least 90% of its products placed on the EU market (regardless of their origin) will comply with the minimum efficiency requirements formulated in TEC and OM[84]. Furthermore, all products should comply with to the requirements on duplexing rates, recycling and use of cartridges.

Administrative bodies

The VA establishes two administrative bodies:

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[82] www.eurovaprint.eu

[83] The Directive requires that signatories to the agreement must 'represent a large majority of the relevant economic sector'. In its explanatory document on voluntary agreements concluded under the Ecodesign Directive (EDWB 2010 Doc03), the Commission specified that to consider an agreement as valid, the proven market share must be at least 70%.

[84] Signatories shall submit to an Independent Inspector reports based on compliance with the Voluntary Agreement (the 'Reports') according to the guidelines in Section 6 of the VA (see also Annex 9). Individual companies will work towards the fulfilment of the compliance rate set out in section 4.1 of the VA. In case a Signatory fails to meet the compliance rate, actions will be taken, depending on the level of non-compliance: underachieving<=5% Signatory has 6 months to achieve the targets and status will be set to Defaulting Signatory, underachieving >5% discussion Signatory and the steering committee to develop a suitable way forward and status will be set to Defaulting Signatory. If the Signatory does not comply within the set deadline as agreed with the Steering Committee, the Signatory shall be deemed not to take part any more in the Voluntary Agreement and shall be deleted from the list of Signatories.

- The Steering Committee consists of the representatives of the Signatories to the agreement and the European Commission. The representatives of the EU Member States, EFTA/EEA countries and NGOs have a status of observers. The Committee manages the agreement. The Committee is to meet at least twice per year and its meetings are open to any person who represents a legitimate stakeholder. The Committee is to seek to achieve agreement by consensus at all times.
- The Independent Inspector_plays a crucial role in the process of monitoring the application of the agreement. 'ERA Technology Ltd' has been chosen to act as the Inspector[85].

4.2.2. Assessment of the VA proposed by the industry against the criteria of Annex VIII to the Directive

According to Article 17 of the Ecodesign Directive, voluntary agreements and other self-regulation presented as alternatives to ecodesign mandatory Regulations shall be assessed on the basis of nine criteria laid down in Annex VIII to the Directive:

1. openness of participation,
2. added value,
3. representativeness (market coverage),
4. quantified and staged objectives,
5. involvement of civil society (transparency and dissemination of information),
6. monitoring and reporting, cost-effectiveness (no disproportionate administrative burden),
7. sustainability (meet policy objectives in this respect),
8. incentive compatibility (consistency with other policy measures).

Therefore, before proceeding to the comparison of the expected impacts of this option with the impacts of other viable options, an analysis of these criteria has been performed. This is reported in Annex 11. The VA fulfils the criteria for a valid voluntary agreement laid down in Annex VIII.

4.3. Option 3: Mandatory energy labelling Regulation

This option would include the mandatory energy efficiency labelling of imaging equipment consisting of seven efficiency classes established under the Energy Labelling Directive[86].

This option would imply the following benefits of the labelling:

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[85] The independent third party designated by the Steering Committee (on behalf of all Signatories) and who is tasked with, and responsible for, the collection and processing of information supplied by Signatories pursuant to Section 6 and Annex B, and determining a Signatory's compliance with the Agreement in accordance the Commitments. The Steering Committee shall engage the services of the Independent Inspector upon terms and conditions that shall require undertakings of confidentiality from the Independent Inspector, and which shall also set out any requirements or applicable mechanisms for a process of appeal, in case this is ever be necessary

[86] Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products OJ L 153/1 18.6.2010

- it could allow comparison on gradual scale and would help consumers to make cost effective purchasing decision by addressing running costs,

- it could increase the compliance rate. However, given that the latest tests of office equipment showed a 95% compliance rate with self-certification, the additional gains are expected to be minimal[87].

Drawbacks for energy labelling:

- A difference between the seven energy scales would be very close, what – coupled with the measurement tolerances — might have a negative effect on the credibility of such a scheme.

- Mandatory Regulations might affect agreements between the US Environmental Protection Agency and the European Commission about the use of ENERGY STAR programme, because it is necessary that the ENERGY STAR programme and the ecodesign scheme are consistent and coordinated.

- New testing requirements in the energy labelling Regulation would add at least one month to the process of product registration.

- The cost of product registration would increase, in a way that would unevenly impact different market operators.[88]

It is therefore concluded that a policy option that relies only on energy labelling will not be optimal. This is in line with conclusion of COM (2011)337. Energy labelling besides the agreement will be time consuming and will increase the administrative burden for the manufactures. Therefore, this option is discarded from further analysis.

4.4. Option 4: Mandatory ecodesign Regulation

This option aims at improving the environmental performance of imaging equipment by laying down mandatory minimum efficiency requirements for their power consumption.

Article 15(5) of the Ecodesign Directive requires that an ecodesign Regulation must meet the following criteria:

a) there shall be no significant negative impacts on the functionality of the product, from the perspective of the user,

b) health, safety and the environment shall not be adversely affected,

c) there shall be no significant negative impact on consumers in particular as regards affordability and life cycle cost of the product,

d) there shall be no significant negative impacts on industry's competitiveness,

e) in principle, the setting of an ecodesign requirement shall not have the consequence of imposing proprietary technology on manufacturers,

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[87] COM(2011) 337 final Communication from the Commission on the implementation of the ENERGY STAR programme in the European Union in the period 2006 – 2010

[88] For this market segment, feedback received from two major manufacturers indicates a 30% increase in the cost of product registration. COM(2011)337 final

f) no excessive administrative burden shall be imposed on manufacturers.

In general an ecodesign Regulation could be an effective measure because it is largely independent on consumers and market behaviour and takes the worst performing products from the market.

The biggest disadvantage of a mandatory Regulation vis-à-vis an effective voluntary agreement is that its ambition level is typically very much lower. By definition, a Regulation requires not 90% compliance, like a VA, but 100% compliance. This may seem more ambitious, but in practice this is highly questionable. The 'missing' 10% difference between a VA and a Regulation usually concerns the special products with specific functionality that will have trouble in meeting stringent requirements and/or it concerns products marketed by a few financially weak companies for which even modest investments might be problematic. In other words, in order not to come into conflict with Article 15(5) regarding the requirement of 'no negative effect' on e.g. functionality or industry competitiveness, this 10% will drag down the ambition level for the whole product group considerable, i.e. by much more than 10%.

It is concluded that this policy option is valid and thus it will be further analysed and compared with other valid options in Chapter 5.

The scenario analysis of this option takes the above into account: The first tier was set for 2014, assuming an efficiency target level of 40% under the BAU level and the second tier was set for 2016 assuming a target level 60% below BAU. For duplexing it was assumed – optimistically—that it would be possible, after the formulation of a list of exemptions, to set requirements with the same effect as the Voluntary option, i.e. that for typical office printers a 75% (2014) and 85% (2016) duplexing rate would apply.

4.5. Option 5: Combined mandatory ecodesign and energy labelling Regulations

This option foresees the adoption of the ecodesign and energy labelling Regulations.

As stated above, an ecodesign Regulation could be an effective measure, because it is largely independent on consumers and market behaviour and could take the worst performing products off the market.

However, as concluded above, the energy labelling will be time consuming and will increase the administrative burden for manufacturers.

It is therefore concluded that this option is discarded from further analysis.

4.6. Policy options proposed

Given the previous paragraphs the options considered in the impact analysis are as follows:

- 'Baseline' (Business As Usual, hereinafter 'BAU') that follows the preparatory study;
- 'Voluntary', assuming that the combination of the current measures (ENERGY STAR, GPP, etc.) and mainly the voluntary agreement proposed by the industry will allow for maintaining the pace of improvements at a level above ENERGY STAR requirements[89];

[89] For details see Annex 6

- 'Mandatory' (ecodesign) assuming the adoption of a mandatory ecodesign Regulation.

The technical and market data on the ENERGY STAR programme and the voluntary agreement that supports the analysis of the proposed options is provided in Annex 6.

5. ANALYSIS OF IMPACTS

The aim is to describe for each option the associated environmental, economic and social impacts related to achieving compliance with the applicable requirements, while avoiding negative impacts on industry's competitiveness and product functionality. This assessment includes impacts on manufacturers, including SMEs.

This chapter compares impacts of the options per aspect, including:

- energy saving and security of supply,
- paper consumption (duplexing),
- greenhouse gas emission reduction,
- customer economics and affordability,
- business economics and competitiveness,
- employment,
- health, safety and other environmental aspects,
- technology, functionality and innovation, and
- administrative burden (including monitoring and reporting).

Starting point of the analysis was the preparatory study, which was the basis for the 'BAU' scenario. Sales data of the preparatory study is used in the stock model to calculate the stock, electricity consumption and paper consumption for all the options.

Additional analysis was performed on the models registered in the EU ENERGY STAR database at www.eu-energystar.org. It showed electricity consumption and duplexing characteristics of all imaging equipment models placed on the EU market that were registered in the EU ENERGY STAR database in 2012 but also in preceding reference years back to 2009 (see Annex 6). This assessment showed not only the number of models compliant with ENERGY STAR requirements version 1.0, 1.1 (on which the current VA is based) and the draft version 2.0 (to enter in force in 2013 and on which the next version of the VA will be based), but it revealed also how much better these models scored with respect of the ENERGY STAR minimum requirements.

The results of this assessment are shown in the Voluntary scenario. It is assumed under this scenario that a voluntary agreement will allow for maintaining the pace of improvements at the levels above the ENERGY STAR requirements (as in previous years). More details of this option are provided in par. 4.2 and in Annex 10.

The third option is 'Ecodesign' that lays down minimum mandatory efficiency requirement for imaging equipment placed on the market. More details of this option are given par. 4.5 and in Annex 10.

5.1. Energy saving and security of supply

The table and figure below shows the direct electricity consumption of the imaging equipment, the indirect energy consumption (calculated as electricity equivalent) to produce paper and total energy consumption (direct + indirect) of the BAU and two other options.

Table 4: Energy consumption of IE for BAU, Voluntary and Ecodesign scenario in TWh (electricity equivalent) for EU-27

	1995	2000	2005	2010	2015	2020	2025	2030
BAU (preparatory study)								
Direct (TWh)	27.01	22.33	11.97	8.67	8.69	9.13	9.74	10.40
Indirect (TWh)	23.42	27.74	33.14	38.77	40.89	42.75	44.43	46.99
Total (TWh)	50.43	50.07	45.11	47.44	49.58	51.88	54.18	57.39
Voluntary								
Direct (TWh)	27.01	22.33	9.04	3.54	1.56	1.22	1.27	1.33
Indirect (TWh)	23.42	27.74	33.14	36.67	34.67	35.62	37.03	39.16
Total TWh)	50.43	50.07	42.18	40.21	36.23	36.84	38.29	40.49
Ecodesign	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Direct (TWh)	27.01	22.33	11.97	8.67	6.98	3.57	3.83	4.08
Indirect (TWh)	23.42	27.74	33.14	38.77	39.69	36.21	37.03	39.16
Total (TWh)	50.43	50.07	45.11	47.44	46.68	39.78	40.85	43.24

Direct energy consumption

Option Ecodesign saves approximately 5.6 TWh in 2020 and 6.3 TWh/a in 2030 compared to BAU (61% savings). Option Voluntary saves some 7.9 TWh/a in 2020 compared to BAU and 9.0 TWh/a in 2030 compared to BAU (87% savings).

The most remarkable outcome of research 2012 is that the electricity consumption of imaging equipment covered by the voluntary agreement is around 40% better than the minimum requirement according to ENERGY STAR v. 1.1.

Indirect energy consumption

This product group consumes also a lot of indirect energy as can be seen in the paper consumption.

The table above shows the paper consumption of imaging equipment products per unit per year, according to the different duplexing rates and the electricity equivalent of the energy that is required to produce that paper for all imaging equipment in the EU. The number of prints is assumed the same for each year and the only change is in the duplexing rate, following ENERGY STAR requirements[90].

[90] ENERGY STAR v.1.0 in 2005 (baseline see also Chapter 2.1.4), ENERGY STAR 1.1. in 2009 and ENERGY STAR 2.0 in 2013

For the BAU a duplexing rate of 65% is used as already explained in Chapter 2 and an N-printing possibilities of 15% is used for all the options. The Voluntary scenario is linked with the ENERGY STAR requirements concerning duplexing. The analysis of the research 2012 (Annex 6) has been used to calculate the duplex rates. This resulted in 78% duplexing in 2009 and 85% in 2013. The Ecodesign scenario follows the BAU till 2014 where besides energy efficiency requirements also requirements for duplexing are set. In 2014, 75% of imaging equipment products has to have duplexing capabilities and in 2016 this has to be 85%.

The table above shows paper savings in 2020 of 17% in the case of the Voluntary scenario compared to the baseline what results in an energy saving for paper production equivalent to around 7.1 TWh/year in electricity.[91]The above estimate should be treated with caution. The calculation is based, as was the baseline calculation, on the paper output for an average product. Differentiation and weighting by print speed (images per minute ipm) and the related non-linear increase of paper output would result in a higher share of duplexing. On the other hand, an unknown share of images printed by a duplex printer may still be single-sided and this would have a more unfavourable effect on the duplexing figures presented above.

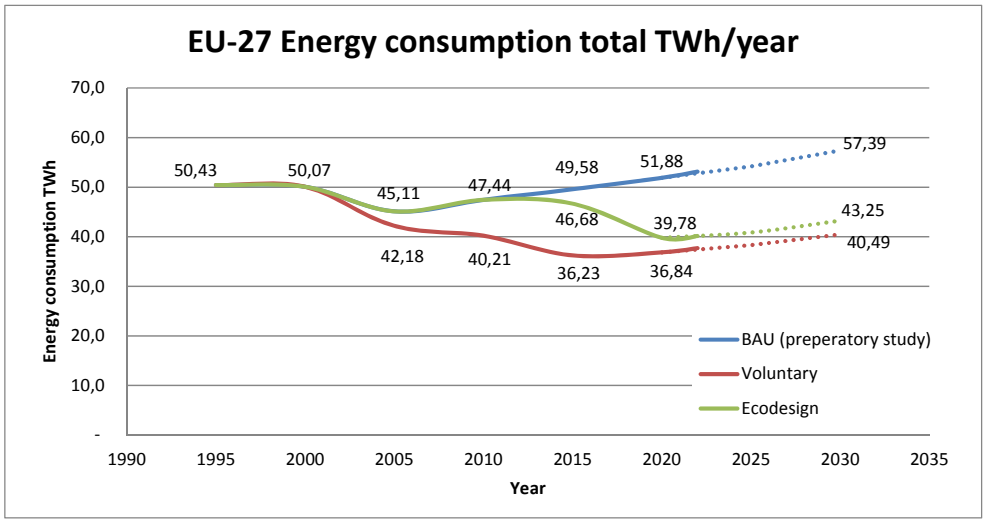

Figure 12: Total energy consumption IE per scenario for EU-27 in TWh per year

5.2. Greenhouse gas emission reduction

Table 5: CO_2 emissions of imaging equipment per scenarios in Mt (eq.) for EU-27

	1995	2000	2005	2010	2015	2020	2025	2030
BAU (preparatory study)								
Direct (Mt)	12.56	9.60	5.03	3.56	3.43	3.47	3.51	3.54
Indirect (Mt)	3.51	4.16	4.97	5.82	6.13	6.41	6.66	7.05
Total (Mt)	16.07	13.76	10.00	9.37	9.57	9.88	10.17	10.58

[91] Note that the actual production energy for paper is made up for the most part by fuels (fossil and biomass), but the electricity equivalent is used to make the indirect energy savings from paper savings comparable to the direct electricity savings from the unit

Voluntary								
Direct (Mt)	12.56	9.60	3.80	1.45	0.62	0.46	0.46	0.45
Indirect (Mt)	3.51	4.16	4.97	5.50	5.20	5.34	5.55	5.87
Total (Mt)	16.07	13.76	8.77	6.95	5.82	5.81	6.01	6.33
Ecodesign								
Direct (Mt)	12.56	9.60	5.03	3.56	2.76	1.36	1.38	1.39
Indirect (Mt)	3.51	4.16	4.97	5.82	5.95	5.43	5.55	5.87
Total (Mt)	16.07	13.76	10.00	9.37	8.71	6.79	6.93	7.26

The picture for greenhouse gas emissions is similar to that of the electricity consumption. The estimated CO_2 emissions savings in 2020 for the Voluntary scenario is 4.07 Mt CO_2 equivalent compared to the BAU and are higher than savings to be achieved under the ecodesign option.

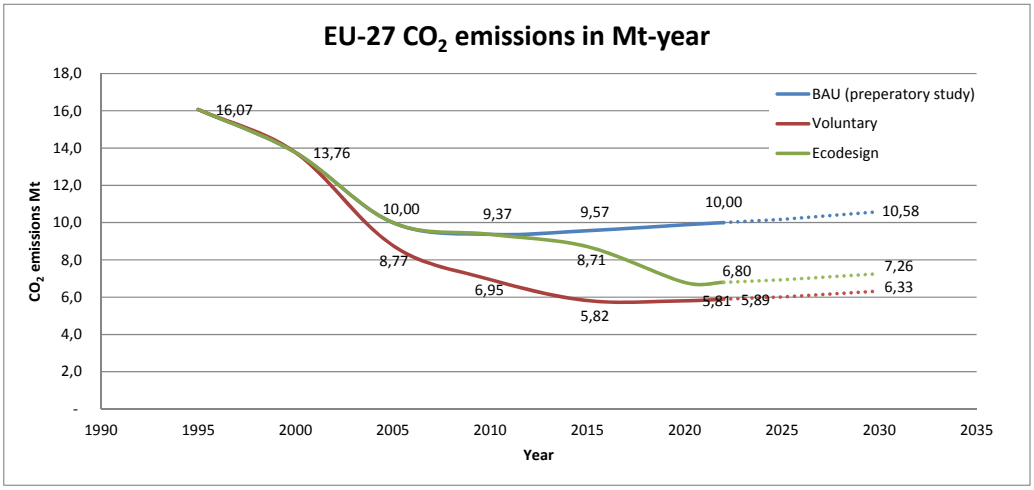

Figure 13: Total CO_2 emissions of imaging equipment per scenarios in Mt (eq.) for EU-27

5.3. Customer economics and affordability

The VA is an extra guarantee for a continuation of the on-going trend; hence no impacts of measures on the consumer prices are expected as a consequence of the VA in the 'Voluntary' scenario. In the Ecodesign scenario, the progress in energy efficiency and other features is less significant than in the 'Voluntary' scenario and thus no higher production-costs, and also no higher purchase prices, could be expected from the measures.

5.4. Business economics and competitiveness proofing

The impact of the two options on the turnover and investment costs of stakeholders is small. There are no significant investments needed and the price level can be maintained.

The main difference between the baseline scenario and policy scenarios such as the voluntary agreement is not in an absolute investment level, but in the way the customary R&D investments – typically 3.6 to 8.7%[92] of turnover in this sector — are spent. The agreement indirectly ensures that the industry remains committed to R&D-spending on energy saving

[92] Annual report Xerox in 2010, R&D investment 3.6% of turnover, Annual report 2011 Canon R&D investment 8.7%, Annual report Ricoh 2011 R&D investment 5.7%

and environmentally friendly features. Without the agreement the industry might decide to invest more in aesthetics or other commercial gadgets appealing to customers. Likewise, companies invest continuously in lowering production costs through improving rationalisation, automation and/or employing low-cost labour. The agreement indirectly ensures that the gain from this activity – for example 2% per year is spent in paying for the extra energy features while keeping consumer prices more or less constant.

5.5. Competitiveness proofing (CP)

CP is a possible element of the Impact Assessment. Commission Staff Working document SEC (2012) 0091[93] describes 'Competitiveness proofing' *as* 'a complementary instrument to reinforce the overall assessment of economic impacts of a new proposal with a better account of impacts on enterprise competitiveness at sector and aggregate level by identifying, and – where proportionate – by quantifying the likely impacts of the new proposal in three dimensions of enterprise competitiveness, i.e. costs, capacity to innovate and international competitiveness [of the European industries].'

However, the same source also states that 'In the case of policy interventions of a self-regulatory nature (such as codes of conduct, or voluntary standards), the case for an in-depth analysis of impacts on sectorial competitiveness is likely to be limited since the sector itself plays a key role in determining the content of the initiative'.

For the products in the scope of the agreement or other considered options, the need for an in-depth competiveness proofing is further weakened by the fact that there are neither EU owned manufacturers nor any mainstream product manufacturing activities on EU27-soil by non-EU companies. The EU27 hosts the administrative headquarters, physical distribution facilities, sales offices and other commercial activities of non-EU companies as well as some of their research and development (R&D) activities, technical support, manufacturing of spare parts and auxiliaries.

It is concluded that a more in-depth competitiveness proofing in this case is not necessary.

5.6. Territorial impact

Territorial impact assessment (TIA) is one of the possible elements of the impact assessments. As stated in a recent presentation of the Commission services[94], TIA is only required when the policy explicitly targets a (type) of a region and/or the policy targets some regions or areas more than others. In the case of the ecodesign policy for imaging equipment, these conditions do not apply and thus the TIA is not appropriate.

5.7. Employment

Actual manufacturing of mainstream imaging equipment, part production and assembly of imaging equipment could not be identified according to the preparatory study and the research 2012. Therefore any negative impact of product-oriented measures can be excluded.

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[93] http://ec.europa.eu/governance/impact/key_docs/docs/sec_2012_0091_en.pdf

[94] Dijkstra, Lewis (European Commission, DG Regio), "Assessing territorial impacts as part of the general impact assessment guidelines, presentation ESPON Workshop, 6 June 2012. http://www.espon.eu/export/sites/default/Documents/Events/Workshops/TerritorialImpactAssessment062012/Lewis_Dijkstra_DG_REGIO_Presentation.pdf

Geographically the industrial employment is concentrated in the Netherlands (many European HQs, Océ R&D, total ca. 6 000 jobs) and other EU Member States like Germany, UK, France and Italy with each 1 000-3 000 jobs partitioned to imaging equipment. In the remaining Member States the employment rate is at the level of 100-500 jobs, mainly depending on the size of the national markets and - to a lesser degree - the geographical focus of individual manufacturers.[95]

5.8. Technology, functionality and innovation

The implementation of the Ecodesign and particularly Voluntary scenario would not have a negative impact on the functionality of the equipment. Linking the agreement with the ENERGY STAR programme reduces the electricity consumption of imaging equipment without a need for additional changes to the technology or functionality.

5.9. Health and safety

The preparatory study addresses the health issues briefly. Studies published by BGfA[96] and BfR[97] prove that emission levels are below the maximum amounts of indoor emission levels[98]. Modern printer designs, especially the smaller devices produce little or no ozone.[99] No impacts of the considered options on health or safety have been identified during the impact assessment.

5.10. Administrative burden

Voluntary scenario

In the case of the Voluntary scenario, the monitoring will be performed by the Commission assisted by the Committee referred to in Article 19 of the Ecodesign Directive and stakeholders. This monitoring will be performed on the basis of the reports submitted by the Independent Inspector who will be assessing the compliance of the Signatories with the agreement. For that reason, the Inspector will collect and aggregate the data from the individual Signatories in accordance with Annex G to the agreement. Member States authorities will not be obliged to perform market surveillance actions. Furthermore, Member State market surveillance authorities will have access upon request to the background data in order to verify the compliance. Per Member State, the cost of extra hours of workload for the Ecodesign Regulatory Committee (and possibly the EU ENERGY STAR Board) in

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[95] In this context it should be considered that all manufacturers are non-EU companies and basically all go where the market is. There may be some peak local interests because of local companies that have been taken over in the more recent past, but on the long run these historical local interests tend to disappear

[96] German Research Institute for Occupational Medicine of the Institutions for Statutory Accident Insurance and Preven

[97] German Federal Institute for Risk Assessment

[98] All studies show that copiers and printers mainly emit VOCs to the ambient air during operation. However, the measured indoor air concentrations are below the currently valid occupational limit values for the respective single substances approximately by the factor 100 to 1,000. Thus, almost all of the measured concentrations lie within the background exposure of the average population.

[99] Criteria and emission levels are discussed more extensively in the Green Public Procurement (GPP) and Ecolabel studies by DG JRC and IPTS. Development of European Ecolabel and Green Public Procurement Criteria for Imaging Equipment; Jiannis Kougoulis, Renata Kaps, Oliver Wolf

evaluating the annual monitoring reports and propositions for new VA target levels may be in the same order of magnitude, including market surveillance.

The administrative burden per individual manufacturer to participate in the VA is estimated in the order of € 5000- 10 000 as a contribution in the costs for e.g. the Independent Inspector and attending meetings of the Steering Committee.

As a conclusion, the Voluntary scenario will not significantly increase the administrative burden of the actors involved. For more information on monitoring and reporting under the agreement, see Chapters 4.2.3 and 7.

Ecodesign scenario

In the case of the Ecodesign option, the administrative burden will be higher than in the case of the Voluntary scenario as the verification of the compliance of imaging equipment with the applicable requirements will wholly relay on the national authorities. The administrative burden of Member States for mandatory measures would probably be similar to that of other ecodesign measures, i.e. in the order of € 0.5 million initial costs for setting up the legal framework plus –per Member State– the costs of continuous market surveillance, including spot checks. The costs of the latter will depend on the overall budget that each individual Member State is willing to spend on surveillance. Assuming e.g. testing of 50-100 models/year in total by the Member States, the testing and reporting costs will be in the area of € 0.25 – 0.5 million annually.

The costs of mandatory measures for industry will depend on the exact modality of the requirements. If it involves mandatory third-party certification, it can be expected that manufacturers will diminish their EU catalogue to save costs[100]. At the moment (Sept. 2012) there are 5111 different imaging equipment models registered in the EU ENERGY STAR database. These represent more than 90% of the market and thus 10% should be added. On the other hand, probably also 10% of the registered models are out of scope. So this means that around 5000 models should undergo third-party testing.

As a rough estimate, assuming that for bulk-testing it will be possible to find test-houses that will charge € 2000,-/model an initial market transformation would require € 10 million. Subsequently, assuming that a model stays in the catalogue for 4-5 years, the costs would be € 2 to € 2.5 million/year. Compared to the estimated turnover of the industry (say 50% of the market size of € 5 billion, see p. 7) this is 0.1%.

Note that the € 2000,- is estimated on the basis of the costs for other products that undergo simple duty cycle testing (e.g. 'white goods').

5.11. Impact on trade

The requirements proposed in this report are based on a technical, environmental and economic analysis. The process for establishing requirements for imaging equipment has been transparent. Competitive disadvantages for EU manufacturers exporting imaging equipment to third countries are not expected. The ENERGY STAR programme on which the agreement

[100] As an illustration: COM (2011)337 predicts that 60% of manufacturers will drop out of the EU ENERGY STAR program if third-party testing becomes mandatory.

is based, is also applicable in many non-EU economies[101] and thus in all these countries the same criteria apply (see Annex 8).

5.12. Summary

The following table summarizes the findings of the savings in 2020 and 2030 and the accumulative savings 2011-2020 and 2011-2030. The projections between 2020 and 2030 have some degree of uncertainty, as already mentioned in the sales and stock paragraph in Chapter 2, and for this a simple extrapolation of the sales, electricity consumption, CO_2 emissions and electricity costs savings have been used.

Table 6: Summary of the savings generated by imaging equipment under different options compared to the baseline BAU for 2020 and 2030. (The monetary savings are expressed in constant 2010 Euro.)

Total savings (Direct and Indirect paper energy excl. toner) 2020				
Versus Baseline	**Voluntary**		**Ecodesign**	
	2020	**2011-2020**	**2020**	**2011-2020**
Energy consumption (TWh)				
Direct	7.9	71.2	5.6	26.0
Indirect	7.1	59.2	6.5	24.9
Total	15.0	130.4	12.1	50.9
CO_2 emissions (Mt)				
Direct	3.0	27.0	2.1	7.9
Indirect	1.1	8.9	1.0	3.7
Total	4.1	35.9	3.1	11.6
Costs saving excl. toner (in bln. Euro) [102]				
Direct	2.11	16.2	1.5	6.4
Indirect	7.12	59.2	6.5	24.9
Total	9.24	75.4	8.0	31.3

Total savings (Direct and Indirect paper energy excl. toner) 2030				
Versus Baseline	**Voluntary**		**Ecodesign**	
	2030	**2011-2030**	**2030**	**2011-2030**
Energy consumption (TWh)				
Direct	9.1	156.7	6.3	85.66
Indirect	7.8	134.0	7.8	99.70
Total	16.9	290.7	14.1	185.36
CO_2 emissions (Mt)				
Direct	3.1	57.5	2.1	29.2
Indirect	1.2	20.1	1.2	15.0
Total	4.3	77.6	3.3	44.2
Costs saving excl. toner (in bln. Euro) [75]				
Direct	3.6	44.7	2.5	26.3

[101] Norway, Iceland, Liechtenstein, US, Japan, Canada, Taiwan, Australia and New Zealand

[102] Paper cost savings are calculated by multiplying the number of pages saved times 0.02 euro (price for 1 page, also in chapter 2 calculated). Electricity rates per kWh primary energy. For electricity, the assumption is to use residential electricity rates excluding taxes in 2010, i.e. € 0.18/kWh; Annual (long-term 2011-2030 average) electricity price rate increase of 4%.

Indirect	7.8	134.0	7.8	99.7
Total	11.4	178.7	10.3	126.0

Note that in the table above, the baseline is a reference point to compare the two policy options, but may have some limitations as mentioned in paragraph 2.1. For the assessment of the contribution of options to the policy objectives, notably the '20-20-20' target in 2020 with respect to 1990, the options have to be compared not to a baseline, but to the status quo in the reference years 1990-1995. Also the restrictions in data reliability should be taken into account.

Still, the conclusions on electric efficiency improvements are robust: The voluntary scenario can be expected to make a contribution of at least 25 TWh direct electricity saving (0.9 % of EU27 end-use electricity consumption in 2007) and thus 9.5 Mt CO2 of greenhouse gas emissions (0.2% of EU27 total in 2007). The Ecodesign scenario, i.e. mandatory measures, will deliver an estimated 2.5 TWh less, i.e. around 22.5 TWh and 8.6 Mt CO2.

For the savings on paper consumption, it has to be taken into account that the scenario calculations –both in the preparatory study and in the baseline presented in Chapter 2—are based on the ENERGY STAR duty cycle, which is typical of the US practice. In the EU, however, the average paper use per capita is significantly (30-40%) lower than in the US. It is not known with certainty that this also applies to the office paper market and thus ENERGY STAR duty cycle was chosen as at least a robust reference point. But anecdotal evidence based on CEPI industry statistics also seem to suggest that consumption of office paper (mostly UWF cut-size grade) in the EU is some 40% lower than in the US. As a result, also the absolute savings will probably be 40% lower.

As a result, it is cautiously estimated that duplexing and N-printing will contribute to savings of around 1 million tonnes (1 Mt) of office paper. This is an estimated 15-17% of the (lowered) estimated total EU office paper consumption and 1,25% of the total EU paper and cardboard consumption. The mandatory Ecodesign scenario is expected to score worse than the Voluntary scenario in this respect, but the inaccuracy of available data does not allow a quantitative differentiation. A saving of 1 Mt paper causes an indirect primary energy saving equivalent to 4 TWh electricity and 0.6 Mt CO2.

6. COMPARING THE OPTIONS

Following the principle of proportionality in the analysis effort, the policy options: 'No new EU action', 'Mandatory energy labelling Regulation' and 'Combination of mandatory ecodesign Regulation and energy label Regulation' were discarded at an earlier phase of the analysis.

The analysis of option 'Voluntary' shows that this option optimally fulfils the objectives laid down in Chapter 3. As described in Chapter 4.2.3 it also meets the criteria of Annex VIII to the Ecodesign Directive. Recital 18, 19 and Article 15(3) of the Ecodesign Directive state that the priority shall be given to a self-regulation over a mandatory Regulation, if the former is likely to deliver the policy objectives faster or in a less costly manner then the latter. The analysis shows that this is the case in the imaging equipment sector.

The main reasons for which the Ecodesign option is *not* preferable over the Voluntary option are:

- It generates lower savings than the Voluntary option (see Chapter 5);
- It does not provide flexibility in introducing new, more stringent requirements. In particular, a review and revision of the Ecodesign Regulation every three years, like in the case of the ENERGY STAR criteria (see Annex 6) is highly unlikely.
- Costs of monitoring the compliance of imaging equipment with the applicable requirements (mainly costs of the market surveillance performed by national authorities) will be significantly higher than under the Voluntary option.
- Mandatory Regulation might affect agreements between the US Environmental Protection Agency and the European Commission about the use of ENERGY STAR programme (see Chapter 4.3).
- As is also explained in COM (2011)337, the dynamics of this product sector is much larger than the dynamics that can reasonably be expected for mandatory measures and the flaws in the preparatory study, which was certainly not worse than many other studies of its kind, are an ulterior proof.

Furthermore, the Voluntary option implies:

- a contribution to the '20-20-20' target over the 1990-2020 period of 25 TWh/a direct electricity saving through efficiency improvement and the equivalent of approximately 4 TWh/a electricity saving through indirect paper resources saving, making a total of 29 TWh/a (compare: 1,1 % of the EU's total electricity consumption in 2007);
- a contribution to the '20-20-20' target over the 1990-2020 period of 9.6 Mt CO2 eq./a direct (electricity) and 0.6 Mt CO2 eq./a (paper) abatement of greenhouse gases, making a total of 10.2 Mt CO2/a (0.2% of EU greenhouse gas emissions).
- a contribution to non-energy resources efficiency policy of over 1 million tonnes (1 Mt) reduced office paper consumption over the 1990-2020 period and a contribution to recycling and re-use.
- that the requirements of the Ecodesign Directive 2009/125/EC, and in particular Recital 18 and Annex VIII are met,
- that there is compatibility and complementarity with the existing policy instruments,
- that there is no significant administrative burden for stakeholders,
- insignificant, if any, increase of the purchasing cost, which would be largely overcompensated by savings during the use-phase of the product,
- no significant impacts on the competitiveness of the industry and employment, and in particular in the SMEs sector due to the small absolute costs related to product re-design and re-assessment.

7. MONITORING AND EVALUATION

The procedure for monitoring and reporting under the voluntary agreement is as follows:

- The Steering Committee will continuously follow progress and results of the VA and agree on practicalities, such as the collecting of the data from the individual Signatories

by ERA. The Steering Committee will include the Signatories of the VA and will be opened to outside stakeholders (as observers).

- Signatories will annually submit to the Commission a report through the independent third-party. For quantified objectives the report will include detailed figures based on agreed measurement methods. The first reporting period started in January 2011 and ends in June 2011. In line with the provisions of the draft VA, by the latest 30 June 2011 each signatory shall provide the applicable information to the independent third-party. The independent third-party will then have 3 months to aggregate the results and present them to the Commission and stakeholders.
- The members of the Consultation Forum will be consulted to take stock and monitor the results of the VA. Member States wishing to verify the reported information will be granted access on demand to the background data and on that basis will be able perform products checks/tests.
- The Commission, assisted by the Ecodesign Regulatory Committee (in its advisory capacity), will, in the light of the received reports and input from the Consultation Forum, consider whether the objectives of the VA are met. The Commission will give special attention to the reporting and monitoring obligations laid down in the Ecodesign Directive, existing Commission guidelines and in the agreement itself. In particular, the Commission will regularly assess whether the provisions of the agreement and their application by the Signatories allow the Commission and stakeholders (including the national authorities) to effectively monitor the effectiveness of the agreement and meeting by the latter its objectives.
- If the Commission considers that the VA failed to achieve its objectives it will consider proposing a mandatory Regulation instead.[103].
- No significant impacts on the competitiveness of industry, and in particular SMEs.
- No market surveillance is needed due to the annual reports produced by Independent Inspector and the possibility to do annual analysis of the EU-ENERGY STAR database.

[103] The environmental 'cost' of regulating later, at a failure of the VA, instead of now are believed to be limited. The underlying impact assessment shows that current voluntary progress in the field of energy saving is significant, promises to continue and exceeds what is expected to be reached through mandatory minimum requirements. Should such progress come to an un-anticipated stop, the monitoring mechanisms in place should signal this trend. Given the fact that the parameters to be regulated as well as the relevant test and calculation methods are in place, the design of a mandatory ecodesign measure should be possible within a limited timeframe of 1.5 to 2 years.

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ANNEX 1 STEERING COMMITTEE MEETINGS

1st Steering Committee Meeting

16 June 2011

Meeting Minutes

Voluntary Industry Agreement to Improve the Energy Consumption of Imaging Equipment under the EuP Directive

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Meeting Details

Agenda

1. Introduction
2. Status and next steps towards official endorsement
    a. Status of industry signatures
3. Electing of a Chair and Secretary of the Steering Committee
4. Organization of VA operations
5. Legal entity
    a. Selection of an Independent Inspector
6. Publication of an FAQ for clarifications on VA commitments and operations
7. Next Steps – Steering Committee Meeting

8. Q&A session
9. Conclusions

Date and Venue
June 16, 2011
DIGITALEUROPE
Rue Joseph II, 20
B-1000, Brussels
Belgium

Agreement of the Agenda
The agenda was agreed.

Status and next steps towards official endorsement

A background on how the VA was created and developed was given by Pierre Sicsic (HP). On the basis of the Commission's final report published in May 2009, the Consultation Forum decided in October 2009 that a VA would be the appropriate tool to address this product category already covered by ENERGY STAR. It was felt that the new VA would provide more visibility to the ENERGY STAR in Europe and reduce free riding. It was estimated that this VA would reduce the annual energy consumption of imaging equipment in the EU from ca. 11 TWh to between 5 and 6 TWh in 2020.

Following intense consultation with stakeholders, a final version of the VA was presented in February 2011 after which the Commission recommended industry to start the implementation.

Overall, the 17 companies signing up to this VA represent more than 96% of the European market.

Mr. Truszczynski reported that the European Commission is fully supportive of industry's proposed VA as it represents a valid alternative to regulation, having a quasi-legal status. To this end, a message from DG ENER Head of Unit was sent to the members of the Consultation Forum in March 2011, informing that the Commission would refrain from regulating this specific product group and inviting industry to implement the VA.

Mr. Truszczynski informed that the impact assessment is due to be finalized in the coming months and that the inter-service consultation would follow in autumn 2011. On this basis, Mr. Truszczynski further added that the Commission's formal endorsement could be expected by the end of the year. The VA Signatories expressed their hope that the VA would have the same legal ground of a regulation in the framework of the Ecodesign Directive.

Mr. Arditi from EEB expressed satisfaction with industry's proposed VA as it integrates recommendations from NGOs and Member States, and ensures good market coverage.

Formal Commitment

Participants were made aware that implementation has already started, with signatures from the different companies being collected.

An overview of industry's commitments in sales unit in the EU27 between 01/10/2011 and 31/03/2012 was provided. Regarding requirements for cartridges, a question was raised as to whether it would be possible to clarify these in a FAQ.

Legal Entity and Management

Mr. Sicsic provided an overview of the operational structure of the VA.

As regards the Steering Committee, it was clarified that each signatory to the Agreement, as well as the European Commission, shall have the right to nominate one person to represent it at the Steering Committee. Also, the Steering Committee shall elect, amongst its members, a Chair. Meetings of the Steering Committee shall be open to:

- Any person representing a Signatory or potential signatory to agreement,
- Any representatives of the European Commission or Member States, as well as member states of the EEA or EFTA, and
- Organizations that have a permanent seat on the Consultation Forum

It was pointed out that companies not able to attend the meetings could be represented with a proxy.

A legal entity (Newco) would be established as a not-for-profit association under the Belgian Law. Newco would represent the VA Signatories and have a seat at the Steering Committee. Possible names for Newco are currently being evaluated. A launch event is planned after the summer.

Invitation to Tender

Participants were informed that an invitation to tender was sent on 18 May 2011 with a request for proposals to be submitted by 10 June. It was noted that so far three proposals have been received (Fraunhofer IZM, ERA and BIO Intelligence Service). Mr. Sicsic further informed that tenders' evaluation would be finalized by end of June and followed by a recommendation to the Signatories.

Among the tasks of the Independent Inspector would be to aggregate the information from the Signatories, make it anonymous and report about companies' compliance rate to the Steering Committee. Additionally, the Independent Inspector would issue a report in October 2011 which would represent the reference baseline for the Signatories. The report will cover aggregated sales figures of the first six months of 2011.

Publication of an FAQ

A guideline document would cover the following subjects and questions:

- Legal basis of the VA
- Market context
- Product scope, definitions
- Objectives, targets, timeline

- Automatic duplex implementation
- Environmental information
- Demonstration of compliance

It was pointed out that the FAQ guideline would be a living document to be published on DIGITALEUROPE's website until the launch of a dedicated website.

Q&A session

A question as to whether a dedicated email reflector for the Lot 4 VA would be created was raised. Mr. Sicsic replied that the main documents would be uploaded to the CIRCA website.

Regarding non-compliant models, it was asked whether they would be communicated so as to orient consumers' choice. Mr. Sicsic replied that ENERGY STAR requirements already allow distinguishing among products and that EPEAT would be implemented as well.

Regarding section 9, it was asked whether the only obligations to refer to are those mentioned in section 4.1.

Clarification was provided with regard to non-compliant companies and the reasoning behind the fact that, in case of non-compliance, these companies would be given the chance to first achieve the basic requirements and then to step up. Mr. Arditi mentioned that this scenario should not become an industry strategy.

It was mentioned that new versions of the ENERGY STAR should not be disregarded. However, it was pointed out that there will be a delay between ENERGY STAR and the up-grade of the VA. The aim of ENERGY STAR is to trigger innovation to improve products. This frontrunner approach is to be respected, thus the upgraded ENERGY STAR versions cannot be applied to all products immediately.

It was further mentioned that it would be appreciated if clear requirements for dismantling the equipment would be provided.

Regarding the use of recycled parts, the wish was expressed that the next version of product declaration might contain the percentage of recycled parts in order to show the dynamic of the VA.

The chair drew the attention to the fact that there have been and there will be direct and indirect discussion with all stakeholders about their expectations. Mr. Sicsic mentioned that so far a standard for the recycled contents does not yet exist. Should there be one, industry would be ready for discussion.

The role of the Independent Inspector was questioned with regard to the data verification process. It was clarified that information is provided by default in annex C, and that for the purpose of clarification and upon request, industry is prepared to provide information as per annex B. It was requested by some stakeholders that the Independent Inspector should have the power to undertake random audits. It was clarified that the Independent Inspector only performs an audit when there is obvious non-compliance. The chair pointed out that there is a good basis for market surveillance since there are verified ENERGY STAR products being certified by third parties. There was one claim that third party certification may not always be

reliable. Signatories underlined that the US verification requirements are very strict and that laboratories are all accredited.

Next steps

It was agreed that the next Steering Committee meeting would be convened on 7 December 2011 (at 14.30 – 17.00 CET).

List of participants

Stephane Arditi / EEB
Valentina Bolognesi / DIGITALEUROPE
Wolfram Buchroth / Konica Minolta Europe
Tracey Rawling Church / Kyocera Mita
William Dazy / Canon
Marie-Hélène Dubray / Panasonic
Sylvie Feindt / DIGITALEUROPE
Maxime Furkel / Lexmark
Detlef Hagemann / German Machine Tool Builders' Association
Wolfgang Hahn / DIGITALEUROPE
Hiromitsu Hatano / Ricoh Europe PLC
Yasuhiro Jingu / Toshiba Tec
Nicole Kearney / Defra
Stephen Kimber / Brother
Karsten Lindloff / German Energy Agency
Sara Rodriguez Martinez / HP
Peter McGregor / OKI
Pascale Moreau / Epson
Tom Moriarty / Dell
Jonathan Murray / DIGITALEUROPE
Milena Presutto / ENEA
Claire Schonbach / Xerox
Pierre Sicsic / HP
Bram Soenen / Belgian Federal Government
Laura Spengler / Okopol
Jacek Truszczynski / European Commission
Dierk Ulken / Toshiba Tec
Frank Weyler / Muratec

ErP Lot 4 VA – Second Steering Committee meeting

Brussels, 7 December 2011, 10h00

Meeting minutes

Participants

Name Company
Stephane Arditi EEB
Boncho Bonchev Republic of Bulgaria
Wolfram Buchroth Konica Minolta
William Dazy Canon
Marie-Helene Dubray Panasonic
Maxime Furkel Lexmark
Emilien Gasc ANEC/BEUC
Hiro Hatano Ricoh Europe
Sharon Heyman Sharp
Yasuhiro Jingu Toshiba TEC
Remy H. Kadirbaks Kyocera Mita
Nicole Kearny UK Department for Environment, Food and Rural Affairs
Declan Keegan Epson
Stephen Kimber Brother
Christoph Mordziol Rationelle Energienutzung bei Elektrogeräten und Beleuchtung
Karsten Lindloff German Energy Agency
Boris Manev Epson
Peter McGregor Oki
Christoph Mordziol German Federal Environment Agency
Chris Robertson ERA
Sara Rodriguez Martinez HP
Adam Romanowski EC
Feriel Saouli EuroVAprint ASBL
Claire Schonbach Xerox
Pierre Sicsic HP
Andy Skarstein ERA
Bron Soenen Belgium Federal Government
Frank Weyler Murata Machinery Europe

Apologies
Greg Batts Kodak
Milena Presutto Enea
Bill Skeates Samsung
Mark Sweeney Environment and Green Technologies Dept. Enterprise Ireland

1. Update from EuroVAprint (Sara Rodriguez Martinez)

• Explain the process to date.

An association (EuroVAprint ASBL) has been created in October 2011 to serve as a legal and administrative framework for the Signatories to abide by the requirements of the VA.

The founding members are Canon, Epson, Hewlett Packard, Lexmark, OKI and Xerox.

The Board members are: Canon, Epson, Hewlett Packard, Lexmark and Xerox (the association is not allowed to have the same number of Directors and members).

The President is Sara Rodriguez-Martinez (Hewlett Packard)

The Secretary is William Dazy (Canon)

The Treasurer is Maxime Furkel (Lexmark)

All 17 Signatories are in the process of acquiring membership in EuroVAprint. Their market coverage is around 96%.

The Board launched a call for tender to select an association management company.

Cambre Associates SPRL (www.cambre -associates.com) was awarded the contract in November 2011.

• Choice of ERA as Independent Inspector

A call for tender was issued in May and three proposals were received. ERA Technology Ltd (www.era.co.uk) was awarded the contract in November 2011.

2. Update from the European Commission (Adam Romanowski)

• After the October 2009 Consultation Forum (CF), industry took on board a lot of stakeholders' comments. The VA was deemed to be acceptable under the requirements of the Ecodesign Directive. The VA also had relevance in terms of market coverage – one of the requirements of the Directive (art. 8).

• The impact assessment will start in January 2012 by external consultants – The process to assess the technical, economic and social impact of the VA) should take about 2-3 months. If the outcome is positive, the College of Commissioners will formally approve it in the form of a Commission Recommendation (mid 2012 draft, possibly adopted, published in Series C of OJEU in summer).

• The VA will therefore be considered as a viable alternative to implementing measures under the Ecodesign Directive. In other words the European Commission will not regulate this particular product group.

• A Regulatory Committee will assist the European Commission in monitoring the implementation of the VA – if the VA fails to meet its set objectives, then an implementing measure (IM) will have to be adopted.

• This VA (and the cSTB[104] VA) is not meant to cover every aspect of the industry.

Flexibility is expected from the European Commission as well as from other stakeholders. There is a need to ensure smooth implementation and transparency on both sides. Industry has to prove that it can self -regulate responsibly.

• A revision of the imaging equipment VA may be initiated sometime mid-2012 at the earliest.

Q&A

• Flemish environmental agency: is there a Regulatory Committee set up under the Ecodesign Directive for this VA? The European Commission: the EC will be assisted by the Regulatory Committee will decide whether the VA meets its objectives. Once the

Commission has data from the Independent Inspector, Member States will be invited to decide, together with the Commission, whether implementation is on track or not. A meeting (possibly joint with the cSTB VA) will look at the first reporting period (timing: April/May 2012).

• The Impact assessment and the Commission Recommendation will be published on the same day in the OJEU.

• UK (DEFRA) asked about the timing of version 2.0 ENERGY STAR specifications?

• BEUC/ANEC requested an email distribution list be set up for non -industry stakeholders, as is the case with the cSTB VA. EuroVAprint indicated its intention to create a website (see actions below).

• EEB asked how Commission and Member States' recommendations could be integrated in further discussions.

Actions

• EuroVAprint President to send copies of the signatures (Annex G of the VA) to European Commission.

• EuroVAprint Secretary General to set -up e-mail reflector for the SC members and a

section on the website where people can ask to be contacted to receive more information.

3. Update from ERA (Chris Robertson and Andy Skarstein)

• Please refer to attached presentation.

• The role of ERA is to provide impartial technical advice.

• Examples of recent ERA work – some RoHS compliance for the UK government (guidance & enforcement), European Commission (RoHS 2 medical devices in categories 8-9).

[104] Impact assessment already drafted – bottleneck: signatures. More advanced than the imaging equipment VA.

• Also help industry with compliance issues.

Baseline report process

• The terms & conditions were signed and came into force on 22 November 2011.

• 13 NDAs have been returned to ERA, 4 to go. Delays were due to compressed timescale.

• ERA suggested each company makes sure the signatory of the compliance report has the authority to sign/commit on behalf of the company (compliance manager/director at least?).

Data collection (Andy Skarstein)

• Annex C– the form was sent to all 17 Signatories. Some companies have not been able to return data so quickly.

• Confidentiality: only Chris Robertson and Andy Skarstein will have access to the data. Andy Skarstein will generate the report, which he will send to EuroVAprint in an anonymized and aggregated report.

• Within 3 months, VA Signatories to submit data.

• Within 4 months, annual progress report to be issued by ERA.

• ERA will use a random numbering system (Company A, etc.) that will change over time to make it impossible to identify companies.

Q&A

• Flemish EPA: should Annex C not be adapted? No, as some answers are Y/N, not compliance rates.

• Annex C should be cleaned up to reflect that section 3 only applies to requirements after 1 January 2012 (although clarified later in section 5). Consider drafting a style change for further clarification.

• Failure to comply with Part II means failure to comply with the entire VA, which applies to all products sold from 1 January 2012.

Actions

• EuroVAprint to discuss clarification to Annex C, section 3 and report conclusions at the next Steering Committee

• Claire Schonbach to add a definition of 'new model' as a style change

Timing & next steps

• The first baseline report will be sent to the Steering Committee by 20 December 2011, pending all the data are sent by Signatories by then.

• According to the European Commission, similar discussions are taking place in the context of the cSTB VA, highlighting the need to find a balanced solution to sometimes conflicting interests of the industry, Member States, and other stakeholders, without breaching

confidentiality agreements. The report should be submitted by ERA to EuroVAprint who will then forward it to the Steering Committee within 5 working days.

• It is in the interest of all parties that a consistent approach is worked out for all Vas under the Ecodesign Directive. The suggestion was made to link this to the ENERGY STAR database. EuroVAprint indicated that no decision had been made yet. NGOs argued that some alignment was necessary between cSTB and Imaging equipment VAs.

Action:

• This will be further discussed with the European Commission.

• BEUC/ANEC suggested the setting up of a database of compliant products under this VA, which would go further than the ENERGY STAR database. EuroVAprint noted that products carrying the ENERGY STAR logo can be presumed to be compliant with the VA.

Action

• EuroVAprint to add text in the FAQ about how consumers can tell whether a product is compliant.

• The European Commission suggested that the Independent Inspector could take the initiative to prepare a table with data they need for the purposes of data verification/auditing, and how such reporting should be presented. It was established that data verification is currently out of ERA's remit.

• On which basis cans ERA objectively run audits? No answer other than random checks was proposed.

• Transparency means credibility – without full transparency, the sector will need regulating. It is in industry's best interest to minimize unclear sections/leave less room for interpretation/doubt.

• The Commission has drafted a document on how it understands the VAs (dated 12 March 2010): the paper includes informal guidance on monitoring, reporting, procedure etc.

Action

• European Commission to share this document with ERA (as it has already been shared with the CF)

• BEUC/ANEC raised the issue that the VA does not foresee automatic auditing. There ensued a discussion about how audits were run in the US for Energy Star products.

ANEC/BEUC insisted that they had requested this clause in the months before the VA was signed. In their view this calls for a change in the text of the VA.

o The European Commission acknowledged that no automatic auditing clause was to be found in VA 3.5. However, Adam Romanowski proposed that for the sake of transparency, one audit per reporting period would make sense. Companies would be chosen randomly.

o Budget should be earmarked to provide for such audits – even though not "automatic" under the VA. The SC can mandate an audit, but the Independent Inspector first needs to have funds available to run that audit upon request.

Action

• Adam Romanowski to send VA guidance note to the SC

4. Discussion on introducing a procedure to add 'style changes' into the VA

• At the suggestion of the European Commission, and after a discussion within the SC, it was agreed that EuroVAprint will collect all style changes suggested by the SC members and circulate a comprehensive version in advance of the last SC meeting of the year, where the changes will be discussed and approved.

• This will only apply to style-related changes that do not affect the content of the VA.

Q&A

• There was a discussion about the relevant market share (80% at least, otherwise VA terminates under art 12)

• The question was raised of the consequence of a VA Signatory being taken over by another VAS.

Action

• EuroVAprint Secretary General to enquire about style changes requests during week 12

December 2011.

5. Update on ENERGY STAR v.2 (Claire Schonbach)

The US EPA draft has been delayed and might not be available before January 2012. Industry will need time to adapt its products to the new specifications

6. Update on the FAQ document: When and where will these be published, how should they be interpreted?

Pierre Sicsic indicated that the Signatories had prepared an FAQ document, which was meant for publication on the forthcoming EuroVAprint website (see below). ERA volunteered to check the FAQ before their publication.

7. Website: when and where will VA information be made available, discussion about contents (Feriel Saouli)

• Online mid -January.

• Sections:

o About EuroVAprint, why it was set up etc.

o Contacts

o Useful links (Commission Recommendation when available, ENERGY STAR EU-US, Eco Declarations, etc.)

o Sign up section

o Members only – SC and all non-public documents (password protected)

• ANEC suggested that the signature page of the VA of each member be posted on the website. The purpose was unclear. The EuroVAprint Secretary highlighted that this might come in violation of data protection rules. After discussing it, the SC objected to publishing signing forms of the VAs.

8. Any Other Business

• EEB mentioned a report on reusability/recyclability of plastic parts, which it will share with the SC. The industry said it would look at this document. Possibility to set requirements on all products horizontal) under the Ecodesign Directive.

• No more AOB.

Actions

• Stéphane Arditi to share report on reusability/recyclability.

9. Date of next SC meeting

Thursday 13 September 2012, 10.00 am (to 18.00 hrs.) Brussels time.

10. Closing of meeting

Meeting closed at 13.00 hrs.

ANNEX 2 RECYCLING AND REUSE OF PAPER, INK AND CARTRIDGES

Recycling paper

The recycling content of office paper lies between 10-15%.[105] Assumption of 12.5% recycling content will result in a paper consumption of around 1 800 pages (approximately 9 kg/unit at 80g/m^2).

70% recycled mass, 10% recyclable content, recyclability 50% (closed loop 100%) reference to MEErP gives 10% van recycled mass.

Ink cartridges

Resources consumption for ink and toner cartridges varies widely between practically zero (solid ink) and ink jet cartridges that use - relative to the weight of the ink - 1.5 times more plastic and 2.5 times more cardboard. For toner cartridges the share of cardboard is smaller.

Assuming a factor 1.5 for both plastic and cardboard, an average unit would consume 1 kg of plastic (usually PET) and 1 kg cardboard annually for ink/toner cartridges. At a current cartridge-recycling rate of 25%[106] this will result in 100 million kg plastics and 100 million kg cardboard being discarded. At a recycled content of 40%[107] for the plastics and 90% for the cardboard, as well as an 80% thermal energy recovery of plastics ending up in incineration plants, the net energy required for cartridge and packaging production is similar at around 28-35 MJ/kg. This amounts to approximately 6 PJ per year (equivalent to 0.6 TWh electricity) with related emissions of 0.26 Mt CO_2 equivalent.

Reuse/ Remanufacturing/ Recycling

There are over 1 400 remanufacturers in Europe, with a job estimate of 10 - 15 000 employees according to the European Toner and Inkjet Remanufacturing Association (ETIRA). [108]

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[105] www.wrap.org.uk/downloads/Secondary_fibre_study.0401cfdb.295.pdf

[106] 20-30% of all cartridges sold worldwide are now remanufactured according to ETIRA

[107] JRC's recent study assessed the relevance of the use of recycled plastics for the manufacturing of imaging equipment and in particular, the benefits associated to a range of recycled content of plastic parts. Moreover, the JRC study demonstrated the need of standardized procedures for the measurements and verification of recycled content based on existing standards (e.g. the EN 15343. "Plastics. Recycled plastics. Plastics recycling traceability and assessment of conformity and recycled content"). For more information please see "*Application of the project's methods to three product groups. JRC Technical Report n° 2 of the project: Integration of resource efficiency and waste management criteria in European product policies - Second phase, September 2012*", http://lct.jrc.ec.europa.eu/assessment/projects#d).

[108] There are over 10 000 remanufacturers worldwide, employing over 65 000 people.

ANNEX 3 MANUFACTURERS IN ENERGY STAR DATABASE

Manufacturer	Energystar registered			
	Copier	Printer	MFD	Fax
Advent			3	
Argox Information Co., Ltd. (imaging equipment)		1		
Avery Dennison		1		
Bixolon		7		
BOCA		19		
Brother International Europe, Ltd. (imaging equipment)		27	88	
cab		12		
Canon Europa N.V. (imaging equipment)	15	125	195	2
Citizen		8		
Colortrac Ltd. (imaging equipment)				
Compuprint S.r.l. (imaging equipment)		1		
CTS electronics S.p.A. (imaging equipment)				
Datacard		2		
Dell		26	24	
Develop GmbH (imaging equipment)	5	4	45	
Epson		136	106	
EVOLIS CARD PRINTER (imaging equipment)		2		
HID		3		
HP		238	331	
Infoprint			2	
Inforprint solutions		38	48	
InoTec GmbH Organisationssysteme (imaging equipment)	10	6	50	
Intermee		6		
KIP		5	3	
Kodak		1	22	
Konica Minolta Business Solutions Europe GmbH (imaging equipment)				
Konica Minolta Business Technologies, Inc. (imaging equipment)	5	17	51	
Konica Minolta Printing Solutions Europe B.V. (imaging equipment)				
Kyocera Mita Europe B.V. (imaging equipment)	6	21	64	
Lexmark		74	139	
NANTIAN		2		
Nica S.r.l. (imaging equipment)				
Océ Technologies B.V. (imaging equipment)	3		50	
Oki Europe Ltd. (imaging equipment)		214	62	3
Olivetti S.p.A. (imaging equipment)	4	15	63	3
Panafax				1

Panasonic Europe Ltd. (imaging equipment)			19	17
Pansonic			1	
Philips			2	2
Printronix		12		
Recognition Equipment Italy S.p.A. (imaging equipment)				
Ricoh Europe PLC (imaging equipment)	120	176	302	5
RISO Kagaku Corporation (imaging equipment)		6		
Roland		1		
Roth+Weber GmbH (imaging equipment)				
Rowe		4	4	
Sagem			2	
Sagemcom Austria GmbH (imaging equipment)			4	5
Samsung		133	120	2
Savin		2		
Sharp Electronics (Europe) GmbH (displays / imaging equipment)		3	120	
Sindfonia Technology		1		
SNBC or Beiyang		26		
Star micronics		8		
SZ Catic Info. Tech. Ind. Co. Ltd.		1		
TA/Utax			7	
TA triumph adler		13	19	
Tally		27		
Tally DASCOM		7		
Tally Genicom		56		
Toshiba TEC Corporation (imaging equipment)		7	51	
UTAX GmbH (imaging equipment)	3	18	46	
Veenman B.V. (imaging equipment)				
Wincor Nixdorf International GmbH (imaging equipment)		2		
Xerox	13	57	132	2
Zebra		19		
Total registered products	184	1590	2175	42

Source: http://www.eu-energystar.org/en/index.html (accessed 12-3-2012, Database update of 9-3-2012).

The 17 Signatories of the voluntary agreement are[109]:

Brother International Europe,
Canon Europe Ltd.,
Dell,
Epson America Inc.,
Hewlett-Packard Company,

[109] Identified according to own research, not based on official signatory documents

Kodak,
Konica Minolta Business Solutions Europe GmbH,
Kyocera Mita Europe B.V.,
Lexmark International Inc.,
Océ Technologies BV,
OKI Europe Ltd.,
Panasonic Europe Ltd.,
Samsung Electronics Co. Ltd.,
Sharp Electronics (Europe) GmbH.,
Toshiba TEC,
Xerox Corporation
Ricoh Europe PLC

ANNEX 4 US EPA

How Does EPA Choose which Products Earn the Label?

Products can earn the ENERGY STAR label by meeting the energy efficiency requirements set forth in ENERGY STAR product specifications. EPA establishes these specifications based on the following set of key guiding principles:

- Product categories must contribute significant energy savings nationwide.
- Qualified products must deliver the features and performance demanded by consumers, in addition to increased energy efficiency.
- If the qualified product costs more than a conventional, less-efficient counterpart, purchasers will recover their investment in increased energy efficiency through utility bill savings, within a reasonable period of time.
- Energy efficiency can be achieved through broadly available, non-proprietary technologies offered by more than one manufacturer.
- Product energy consumption and performance can be measured and verified with testing.
- Labelling would effectively differentiate products and be visible for purchasers.

How Does EPA decide when to Revise Specifications?

Generally, a market share of ENERGY STAR qualified products in a particular category of 50 per cent or higher will prompt consideration for a specification revision. However, there are other factors that weight into the decision, such as:

- A change in the Federal minimum efficiency standards.
- Technological changes with advances in energy efficiency which allow a revised ENERGY STAR specification to capture additional savings.
- Product availability
- Significant issues with consumers realizing expected energy savings
- Performance or quality issues
- Issues with Test Procedures

Source: http://www.energystar.gov/index.cfm?c=products.pr_how_earn

ANNEX 5 ECOLABELS

Products	European ecolabels			GPP/ Ecolabel	Non-European Ecolabels								
	Blue Angel	Nordic Swan	Umwelt-zeichen		EcoLogo Canada	Env. Choice Australia	Env. Choice New Zealand	Eco Mark Japan	Eco-label Korea	China label	Green Mark Taiwan	Singapore Green label	Green label Thailand
Copiers	√	√	√	√	√	√	√	√	√				√
Printers	√	√	√	√	√	√	√	√	√	√	√	√	√
Multi Funtional Devices (MFD)	√	√	√	√	√	√	√				√	√	
Fax		√		√	√	√	√		√	√	√	√	√

Source: clasponline.org

ANNEX 6 ENERGY STAR ANALYSIS

ENERGY STAR measure

ENERGY STAR v.1.0 was introduced in 2006 and was the first version in which TEC calculation was applied**. ENERGY STAR v.1.1 followed in 2009 and v.2.0 will be implemented in 2013**.

TEC is a method of testing and comparing the energy performance of imaging equipment products, which focuses on the typical electricity consumed by a product while in normal operation during a representative period of time. The key criteria of the TEC approach for imaging equipment is a value for typical weekly electricity consumption, measured in kilowatt-hours (kWh). The maximum TEC is calculated for each individual product and takes into account the product's size format, marking technology, and monochrome product speed.

OM is a method of testing and comparing the energy performance of imaging equipment products, which focuses on product energy consumption in various low-power modes. The key criteria used by the OM approach are values for low-power modes, measured in watts (W). An overview of the formula's and criteria:

The maximum requirement for the TEC value depends on the type of product (MFD or not, colour or not) and the monochrome speed in ipm. The formula is as follows:

max. TEC = A * X + B

ENERGY STAR version 1.0

TEC 1	**A**	**B**	**TEC 3**	**A**	**B**
X (ipm)	(kWh/ipm)	(kWh)	X (ipm)	(kWh/ipm)	(kWh)
<= 12		1.5	<= 20	0.20	2
12<x<=50	0.2	-1	20<x<=69	0.44	-2.8
>50	0.80	-31	>69	0.80	-28
TEC 2	**A**	**B**	**TEC 4**	**A**	**B**
X (ipm)	(kWh/ipm)	(kWh)	X (ipm)	(kWh/ipm)	(kWh)
<= 50	0.20	2.0	<= 32	0.20	5
>50	0.80	-28	32<x<=61	0.44	-2.8
			>61	0.80	-25.0

ENERGY STAR version 1.1

TEC 1	**A**	**B**	**TEC 3**	**A**	**B**
X (ipm)	(kWh/ipm)	(kWh)	X (ipm)	(kWh/ipm)	(kWh)
<= 15		1	<= 10		1.5
15<x<=40	0.10	-0.5	10<x<=26	0.10	0.5
40<x<=82	0.35	-10.3	26<x<=68	0.35	-6.0
>82	0.70	-39.0	>68	0.70	-30.0

TEC 2	A	B	TEC 4	A	B
X (ipm)	(kWh/ipm)	(kWh)	X (ipm)	(kWh/ipm)	
<= 32	0.10	2.8	<= 26	0.10	3.5
32<x<=58	0.35	-5.2	26<x<=62	0.35	-3.0
>58	0.70	-26.0	>62	0.70	-25.0

Colour		A	B
	X (ipm)	(kWh)	(kWh)
Monochrome	<= 7		0.5
	7<x<=44	0.07	
	44<x<=74	0.20	-5.7
	>74	0.70	-42.7
Colour	<= 45	0.07	+1.4
	45<x<=70	0.20	-4.5
	>70	0.70	-39.5

OM

Similar for the three ENERGY STAR versions except for Copier there ENERGY STAR version 1.0 differs with the ipm values are s≤50 and s>50.

Maximum Default Delay times to Sleep for OM products

Product type	Media Format	Monochrome product speed, s, as calculated in the Test Method (ipm or mppm)	Default Delay time to sleep (minutes
Copier	Large	s≤30	30
		s>30	60
Fax Machine	Small or standard	All	5
MFD	Small or standard	s≤10	15
		10<s≤20	30
		s>20	60
	Large	s≤30	30
		s>30	60
Printer	Small or standard	s≤10	5
		10<s≤20	15
		20<s≤30	30
		S>30	60
	Large	s≤30	30
		s>30	60
Scanner	All	All	15
Mailing machine	All	s≤50	20
		50<s≤100	30
		100<s≤150	40
		s>150	60

Sleep Mode Power Allowance for Base Marking Engine

Product type	Media format	Marketing techonology				Pmax_base (Watts)		
		Impact	Ink jet	All other	Not apllicable	Energystar 1.0	Energystar 1.1	Energystar 2.0
Copier	Large			x		58.0	30	7.4
Fax Machine	Standard		x			3.0	1.4	0.6
Mailing Machine	N/A		x	x		3.0	7	5.6
MFD	Standard		x			3.0	1.4	0.6
	Large		x			13.0	15	4.9
				x		58.0	30	7.4
Printer	Small	x	x	x		3	9	9
	Standard	x				6.0	4.6	2.3
			x			3.0	1.4	0.6
	Large	x		x		54.0	14	2.5
			x			13.0	15	4.9
Scanner	Any				x	5.0	4.3	2.7

	Energystar 1.0 MAX sleep (W)	Energystar 1.1 MAX	Energystar 2.0 MAX
OM1	58	30	7.4
OM2	3.0	1.4	0.6
OM3	13	15	4.9
OM4	3	7	5.6
OM5	3	9	9
OM6	6	4.6	2.3
OM7	5	4.3	2.7
OM8	54	14	2.5

Duplexing

	ENERGY STAR v.1.0		ENERGY STAR v.1.1		ENERGY STAR v.2.0	
	Colour	Monochrome	Colour	Monochrome	Colour	Monochrome
Automatic duplexing requirement	ipm	ipm	ipm	ipm	ipm	ipm
N/A	<=19	<=24	<=19	<=24	<=19	<=19
Automatic duplexing must be offered as a standard feature or optional accessory at the time of purchase.	20-39	25-44	20-39	24-44		
Automatic duplexing is required as a standard feature at the time of purchase.	>=40	>=45	>=40	>=45	>19	>19

Voluntary Agreement

The VA sets design requirement concerning compliance rate, duplexing, TEC and OM values as stated in ENERGY STAR v.1.1.

From analysis (details of the analysis are given below and Annex 6) of the EU ENERGY STAR database[110] on imaging equipment (status Feb. 2012), the following preliminary conclusions were reached:

- The energy efficiency of registered products is currently around 40-50% better than what is apparent from the maximum allowed under the ENERGY STAR programme, and is significantly better than what was projected in the preparatory study. Already today, 50-60% of products meet the ENERGY STAR v. 2.0 requirements that will enter into force in March 2013

- This is also the case for duplexing capabilities, where over 80% of products feature standard duplexing where only a duplexing option was required. In this sense over 80% of products already meet the future v. 2.0 duplexing requirements.

    - From the above it can be concluded that industry efforts in contributing to environmental policy goals are significant and continuous. If continued at similar pace, there is no reason to assume that any mandatory regulatory instrument would achieve more savings than the voluntary agreement.

[110] www.eu-energystar.org . EU ENERGY STAR database = EU ENERGY STAR registered products + US ENERGY STAR registered products available on the European market

- The first review date will be in 2013 after the implementation of the new ENERGY STAR programme version 2.0.

Share VA manufacturers

The table below gives an overview of the percentage of products, in the EU ENERGY STAR database as of 1 February 2012, manufactured by the manufacturers expected to be included in the voluntary agreement as Signatories[111].

Table 7: Percentage of Energy star registered products available for EU market by VA manufacturers

Product	VA manufacturers[112]
Copier	94%
Fax	71%
MFD	91%
Printer	94%

Testing performed by the EPA in 2009, 13 on a sample of 120 products revealed that:

• 95% of tested ENERGY STAR printers met ENERGY STAR criteria;

• 40% of tested non-ENERGY STAR printers also met the ENERGY STAR criteria.

Product categories

ENERGY STAR v.1.1 requirements, in force since July 2009, distinguish the Typical Electricity Consumption (TEC) products and Operational Mode (OM) products. TEC products are Standard-size copiers, Multifunction Devices (MFDs), and printers that use Electrophotography (EP), Solid Ink (SI), and High Performance Ink Jet (IJ) marking technologies, OM products cover the remainder of mainly non high-performance inkjet products.

Duplexing requirements and compliance

TEC products must meet the following duplexing requirements, based on monochrome product speed:

- For monochrome copiers, MFDs and printers automatic duplexing must be **optional or standard** for product speeds **25-44 ipm** (images per minute); for speeds equal to or higher than **45 ipm** automatic duplexing must be a **standard** feature.

- For colour copiers, MFDs and printers automatic duplexing must be **optional or standard** for product speeds **20-39 ipm** (images per minute); for speeds equal to or higher than **40 ipm** automatic duplexing must be a **standard** feature.

[111] Brother International Europe, Canon Europe Ltd., Dell, Epson America Inc., Hewlett-Packard Company, Kodak, Konica Minolta Business Solutions Europe GmbH, Kyocera Mita Europe B.V., Lexmark International Inc. Océ Technologies BV, OKI Europe Ltd., Panasonic Europe Ltd., Samsung Electronics Co. Ltd., Sharp Electronics (Europe) GmbH., Toshiba TEC, Xerox Corporation and Ricoh Europe PLC

[112] http://www.ebpg.bam.de/de/ebpg_medien/tren4/004_workd_09-11_printing_v3-5.pdf

The table below shows that, per 1 Feb 2012, **92%** of EU-registered monochrome products in Energy star with speed ≥ 25 ipm feature automatic duplexing as **standard.**

For colour products registered in Energy star with speed >19 ipm, **80%** of the products feature automatic duplexing as **standard**.

Table 8: Duplex capability TEC products Energy star (available on EU market)

Automatic Duplex Output Capable?	Monochrome			Colour		
	≤ 24 ipm n=839	25-44 ipm n=1112	≥ 45 ipm n=748	≤ 19 ipm n=140	20-39 ipm n=1134	≥ 40 ipm n=297
Yes	41%	92%	100%	20%	80%	100%
No	52%	1%	0%	76%	19%	0%
Option	6%	7%	0%	4%	1%	0%

There is no duplexing requirement for OM products (non-high-performance Ink Jet) or products that do not use standard-size paper.

With monochrome OM products, where duplexing is not required, still 14% of products with speed ≤ 24 ipm and 20% of products with speed 25-44 ipm featured automatic duplexing.

For colour OM products, where duplexing is not required, still 36% of products with speed ≤ 19 ipm and 41% of products with speed 20-39 ipm featured automatic duplexing.

Table 9: Duplex capability OM products Energy star (available on EU market)

Automatic Duplex Output Capable?	Monochrome			Colour		
	≤ 24 ipm n=284	25-44 ipm n=169	≥ 45 ipm n=33	≤ 19 ipm n=122	20-39 ipm n=225	≥ 40 ipm n=13
Yes	14%	20%	0%	36%	41%	0%
No	86%	80%	100%	64%	59%	100%
Option	0%	0%	0%	0%	0%	0%

In the ENERGY STAR version 2.0, Draft 1 requirements, to be published in July 2012 and entering into force March 2013, the automatic duplexing feature must be **standard** for all TEC products, colour and monochrome, with a monochrome speed of **19 ipm or higher**.

The table below shows that, per 1 Feb. 2012, 84% of mono chrome and 83% of colour EU-registered products with speed >= 19 ipm are already compliant with the duplexing requirements under version 2.0, Draft 1.

Table 10: Duplexing rates TEC products compliant with Energy star version 2.0 (draft 1 requirement)

Automatic Duplex Output Capable?	Monochrome		Colour	
	≤ 19 ipm n=401	>19ipm n=2298	≤ 19 ipm n=140	>19ipm n=1431
Yes	42%	84%	20%	83%
No	52%	12%	76%	16%
Option	5%	4%	4%	1%

Electricity consumption standards and compliance

TEC products are subject to maximum energy requirements of a calculated weekly duty cycle. The duty cycle calculation follows these equations:

The following two equations are used for all product types:

Average Job Energy = (Job2 + Job3 + Job4) / 3

Daily Job Energy = (Job1 × 2) + [(Jobs per Day – 2) × Average Job Energy)]

The calculation method for printers, digital duplicators and MF Ds with print-capability, and fax machines also uses the following three equations:

Daily Sleep Energy = [24 hours – ((Jobs per day / 4) + (Final Time × 2))] × Sleep Power

Daily Energy = Daily Job Energy + (2 × Final Energy) + Daily Sleep Energy

TEC = (Daily Energy × 5) + (Sleep Power × 48)

The calculation method for copiers, digital duplicators, and MFDs without print-capability also use the following three equations:

Daily Auto-off Energy = [24 hours – ((Jobs per day / 4) + (Final Time × 2))] × Auto-off Power

Daily Energy = Daily Job Energy + (2 × Final Energy) + Daily Auto-off Energy

TEC = (Daily Energy × 5) + (Auto-off Power × 48)

The maximum requirement for the TEC value depends on the type of product (MFD or not, colour or not) and the monochrome speed in ipm. The formula is as follows:

max. TEC = A * X + B

Table 11: Maximum TEC (kWh/week) calculation values

TEC 1	**A**	**B**	**TEC 3**	**A**	**B**
X (ipm)	(kWh/ipm)	(kWh)	X (ipm)	(kWh/ipm)	(kWh)
<= 15		1	<= 10		1,5
15<x<=40	0,10	-0,5	10<x<=26	0,10	0,5
40<x<=82	0,35	-10,3	26<x<=68	0,35	-6,0
>82	0,70	-39,0	>68	0,70	-30,0
TEC 2	**A**	**B**	**TEC 4**	**A**	**B**
X (ipm)	(kWh/ipm)	(kWh)	X (ipm)	(kWh/ipm)	(kWh)
<= 32	0,10	2,8	<= 26	0,10	3,5
32<x<=58	0,35	-5,2	26<x<=62	0,35	-3,0
>58	0,70	-26,0	>62	0,70	-25,0

Registered products that are in the scope of the voluntary agreement (VA) achieve on average a TEC value that is 43% below the maximum requirement for ENERGY STAR v. 1.1. The best products perform 90% better than the maximum requirement.

For OM products the ENERGY STAR v.1.1 requirements sets maximum power values for Standby-mode (1 Watts), Sleep-mode (between 1,4 - 30 W depending on OM class) and functional adders like interface (e.g. wired, wireless, infrared) and storage (e.g. CCFL lamps, memory, cordless handset). On average the registered products showed values that were also 35% below maximum levels. The best products perform 85% better than the maximum requirement.

In the ENERGY STAR version 2.0, Draft 1 requirements, to be published in July 2012 and entering into force March 2013, the maximum requirements for both the TEC and the OM products are set around 40-50 % more ambitious.

50% of the registered TEC products that are in the scope of the voluntary agreement comply with the draft 1 version 2.0 requirements. Around 50% of the currently registered OM products meet the draft v 2.0 requirements.

In a 'business-as-usual' scenario it may be expected that per 1 March 2015 around 90% of EU-registered products meet the draft v. 2.0 requirements.

Tables below first give the sales and stock data (from BAU-scenario, see Annex 10) and then the electricity consumption values.

Sales and Stock

	SALES (in mln. units/year)																
Category	**1995**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
EP-Copier mono	2.00	1.02	0.97	0.92	0.88	0.83	0.78	0.71	0.63	0.55	0.48	0.40	0.37	0.34	0.31	0.28	0.25
EP-Copier colour	-	0.14	0.15	0.17	0.18	0.20	0.22	0.23	0.25	0.27	0.28	0.30	0.33	0.36	0.39	0.42	0.45
EP-printer mono	3.58	3.68	3.64	3.59	3.55	3.50	3.46	3.31	3.16	3.00	2.85	2.70	2.58	2.46	2.34	2.22	2.10
EP-printer colour	-	0.83	0.89	0.95	1.01	1.07	1.13	1.27	1.40	1.53	1.67	1.80	2.00	2.20	2.40	2.60	2.80
IJ SFD printer	7.80	12.33	10.72	9.11	7.51	5.90	4.29	3.93	3.58	3.22	2.86	2.50	2.30	2.10	1.90	1.70	1.50

IJ MFD printer	6.45	10.11	12.32	14.54	16.76	18.98	21.19	21.96	22.72	23.48	24.24	25.00	25.20	25.40	25.60	25.80	26.00
Total	19.83	28.11	28.70	29.30	29.89	30.48	31.08	31.40	31.73	32.05	32.38	32.70	32.78	32.86	32.94	33.02	33.10

	Stock (in mln. units/year)																
Category	**1995**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
EP-Copier mono	5.00	5.97	5.60	5.23	4.86	4.49	4.12	3.81	3.50	3.19	2.87	2.56	2.25	1.94	1.62	1.31	1.00
EP-Copier colour	-	0.38	0.44	0.51	0.57	0.63	0.69	1.12	1.55	1.98	2.41	2.85	3.28	3.71	4.14	4.57	5.00
EP-printer mono	11.90	14.74	14.65	14.56	14.48	14.39	14.31	13.88	13.44	13.01	12.58	12.15	11.72	11.29	10.86	10.43	10.00
EP-printer colour	-	1.92	2.37	2.83	3.29	3.74	4.20	4.78	5.36	5.94	6.52	7.10	7.68	8.26	8.84	9.42	10.00
IJ SFD printer	29.48	68.41	60.99	53.58	46.16	38.74	31.32	30.06	28.79	27.53	26.26	25.00	24.00	23.00	22.00	21.00	20.00
IJ MFD printer	24.17	21.76	32.96	44.17	55.37	66.57	77.78	80.22	82.67	85.11	87.56	90.00	92.00	94.00	96.00	98.00	100.0
Total	70.55	113.1	117.0	120.8	124.7	128.5	132.4	133.8	135.3	136.7	138.2	139.6	140.9	142.2	143.4	144.7	146.0

Electricity consumption Scenario's

TEC electricity consumption TWh	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
Energystar	9,48	9,61	9,73	9,86	4,33	4,43	4,64	4,84	2,40	2,42	2,45	2,48	2,51	
VA	4,74	4,80	4,87	4,93	3,25	3,06	2,92	2,76	1,80	1,70	1,59	1,49	1,50	
BAU	6,28	6,31	6,34	6,38	6,41	6,45	6,46	6,46	6,45	6,44	6,41	6,57	6,72	

OM electricity consumption TWh	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2
Energystar	1,15	1,20	1,25	1,30	0,73	0,76	0,76	0,77	0,41	0,42	0,42	0,42	0,43	
VA	0,81	0,76	0,75	0,65	0,55	0,54	0,52	0,50	0,31	0,29	0,27	0,25	0,26	
BAU	1,48	1,61	1,75	1,89	2,02	2,16	2,11	2,05	1,99	1,93	1,87	1,89	1,92	

Total Electricity consumption TWh	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energystar	10,63	10,81	10,98	11,16	5,06	5,19	5,40	5,62	2,81	2,84	2,87	2,90	2,93	2,97	3,00	3,03
VA	5,55	5,56	5,62	5,58	3,80	3,60	3,44	3,26	2,11	1,99	1,87	1,74	1,76	1,78	1,80	1,82
BAU	7,75	7,92	8,09	8,26	8,44	8,61	8,56	8,51	8,45	8,37	8,28	8,46	8,64	8,82	9,00	9,17

Paper energy consumption

ENERGY STAR programme v.1.1

In the 2012 research, a duplexing rate of 84% was calculated according to ENERGY STAR version 1.1 requirements (see Annex 5) and assuming 15% N-printing[113]. This results in a paper consumption of around 12 500 pages, i.e. approximately 62 kg/unit at 80g/m^2. Thus, it is estimated that imaging equipment in the EU27 consumes almost 8 200 million kg (8.2 Mt) of paper annually, of which 820 million kg (0.82 Mt) in IJ equipment and 7 380 million kg

[113] 90% of images are produced by EP equipment, of which 90% has duplex capabilities (according to EU ENERGY STAR database) that are used in 90% of all prints. 10% of images are produced by IJ equipment, of which 26% has duplex capabilities (according to EU ENERGY STAR database) that are used in 90% of all prints. N-printing (2 images per page) is assumed relevant for medium volume equipment (20-40 ppm, workgroup printing) and for legal documents or similar (large font, large line space, few graphs).

(7.38 Mt) in EP equipment. Energy consumption to produce this paper is 328 PJ in primary energy (equivalent to around 32.8 TWh electricity) and the related greenhouse gas emissions amount to 5.0 Mt CO_2 equivalent per year.

ENERGY STAR programme v.2.0

In the 2012 research, a duplexing rate of 88% was calculated according to ENERGY STAR version 2.0 requirements (see Annex 5) and assuming 15% N-printing[114]. This results in a paper consumption of around 12 000 pages (approximately 60 kg/unit at 80g/m^2). Thus, it is estimated that imaging equipment in the EU27 consumes almost 7 900 million kg (7.9 Mt) of paper annually, of which 790 million kg (0.79 Mt) in IJ equipment and 7 110 million kg (7.11 Mt) in EP equipment. Energy consumption to produce this paper is 315 PJ in primary energy (equivalent to around 31.5 TWh electricity) and the related greenhouse gas emissions amount to 4.7 Mt CO_2 equivalent per year.

[114] 90% of images are produced by EP equipment, of which 98% has duplex capabilities (according to EU ENERGY STAR database) that are used in 90% of all prints. 10% of images are produced by IJ equipment, of which 26% has duplex capabilities (according to EU ENERGY STAR database) that are used in 90% of all prints. N-printing (2 images per page) is assumed relevant for medium volume equipment (20-40 ppm, workgroup printing) and for legal documents or similar (large font, large line space, few graphs).

ANNEX 7 RESEARCH 2012

Analysis of EU ENERGY STAR database imaging equipment (status Feb. 2012)

The EU ENERGY STAR database is accessible at www.eu-energystar.org. At the time of the analysis this database contained 2 612 registered models of imaging equipment on the EU market that have to comply with a maximum TEC value (Typical Electricity Consumption) in accordance with ENERGY STAR requirements version 1.1.

There are four TEC categories:

- TEC 1 - Copiers, printers, digital duplicators and fax machines with monochrome marking technology (sample size n= 662);
- TEC 2 - Copiers, printers, digital duplicators and fax machines with colour marking technology (n=445);
- TEC 3 - MFDs with monochrome marking technology (n=868);
- TEC 4 - MFDs with colour marking technology (n=642).

Each of these TEC categories is subdivided in 3 or 4 ipm (images per minute) subcategories, indicating ranges of product speed. ENERGY STAR defines maximum TEC values through specific equations per TEC-category and per ipm class, whereby the ipm number is also part of the equation (see Annex5).

All TEC classes have standard size paper format and the marking technologies predominantly contain electro photographic ('laser') and solid ink. Other marking technologies are dye sublimation, thermal transfer, direct thermal, stencil and high performance ink jet.

The underlying detailed analysis concerns only the electro photographic and solid ink categories. Ink jet and impact technologies, which have to comply with OM values, as well as imaging equipment for non-standard paper represent a far lower energy impact (approximately 15% of total).

The data base does not contain sales values per model, but given the size of the data base it is plausible that the number of models per TEC classes can be used for weighting purposes in order to make an estimate of impacts.

The pragmatic yardstick that is chosen here for the energy efficiency is the fraction of the maximum TEC value ('x'% max TEC), divided in discrete 10% classes.

TEC 1 (Monochrome copiers, printers, etc.)

Figure 14 shows the distribution of the energy efficiency of the TEC1 category, subdivided by ipm subcategories. The distribution is a straight, not weighted count of the number of models.

Figure 14 shows that 55% of the models (370 of n=662) have an energy performance in the range of 80 to 100% of max TEC. The other 45% of the models are lower than 80% max TEC. There are only a few very energy efficient models featuring a 10% max TEC.

Overall, the average energy efficiency in TEC 1 is around 78% max TEC. Note that this is the value for registered products. As stated in the VA, it should also be taken into account that some 10% of products on the EU market are not registered.

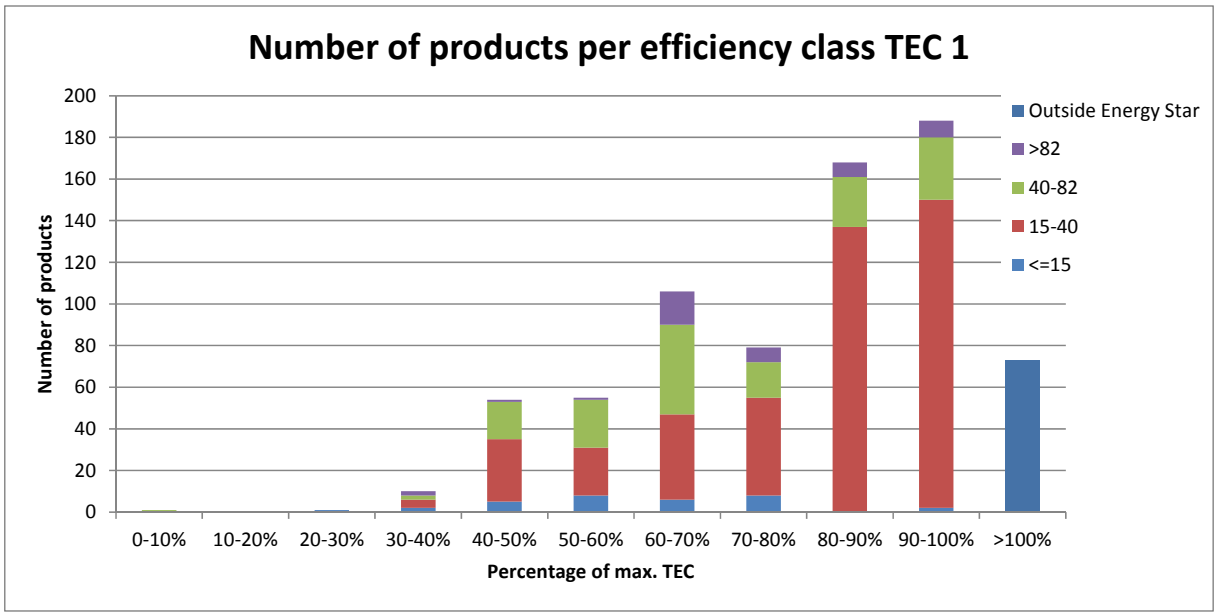


Figure 14: Distribution of the energy efficiency of the TEC 1 category

In order to investigate whether distribution of the energy efficiency also depends on product speed, the average energy consumption in kWh/year was calculated per ipm subcategory, using the max TEC equation for that product category and the average ipm value. This is shown in the table 12 below.

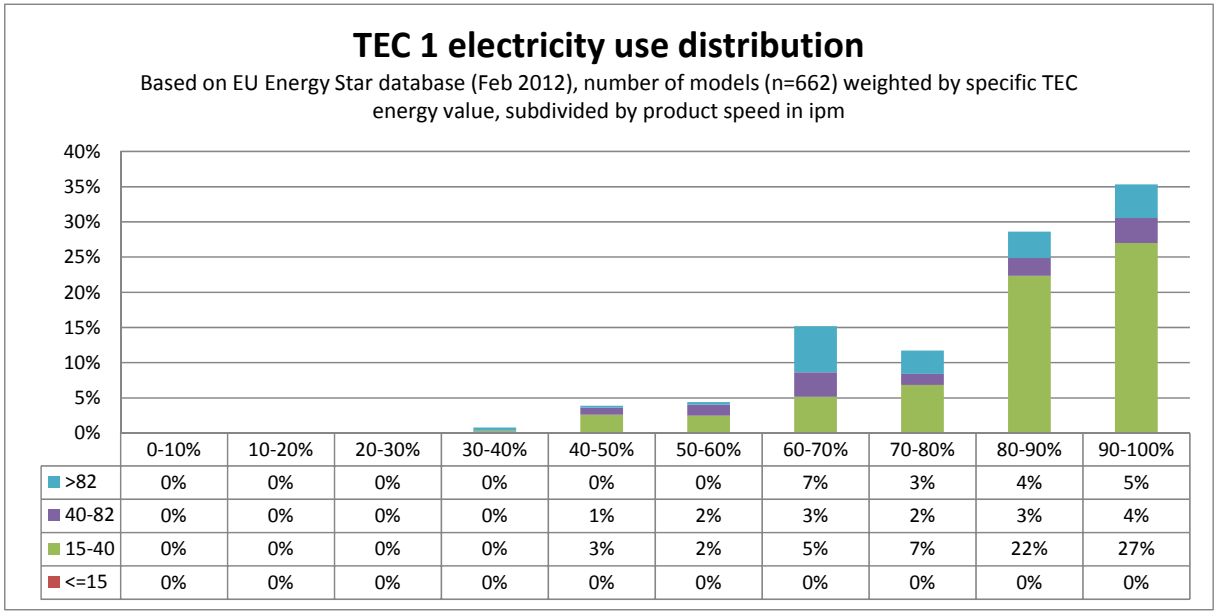
Table 12: TEC 1 calculations per subcategory

Product speed class (ipm)	<=15	15-40	40-82	>82
Average product speed (ipm)	9.3	28.2	55.3	121.9
Max. TEC kWh/week	1.0	14.1	9.1	46.3
Annual Max. TEC kWh/year	52.0	733.2	471.6	2408.6

The annual kWh/year figures were then used to give a weighting to the straight count in Figure 15.

As mentioned, this is not exactly a sales weighted outcome but it is as close as data allows. The figure below shows that the distribution is similar to the energy efficiency graph above. The average saving is more or less the same.

Note that for products in the scope of the VA the max speed for monochrome products is <66 ipm.



	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%
>82	0%	0%	0%	0%	0%	0%	7%	3%	4%	5%
40-82	0%	0%	0%	0%	1%	2%	3%	2%	3%	4%
15-40	0%	0%	0%	0%	3%	2%	5%	7%	22%	27%
<=15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Figure 15: TEC 1 Electricity use distribution

TEC 2 (Colour copiers, printers, etc.)

Figure 16 shows the distribution of the energy efficiency of the TEC2 category, subdivided by ipm subcategories. The distribution is a straight, not weighted count of the number of models.

Figure 16shows that 51% of the models (227 of n=445) have an energy performance in the range of 60 to 100% of max TEC. The other 49% of the models are lower than 60% max TEC. There are only a few very energy efficient models featuring a 10% max TEC.

Overall, the average energy efficiency in TEC 2 is around 58% max TEC. Note that this is the value for registered products. As stated in the VA, it should also be taken into account that some 10% of products on the EU market are not registered.

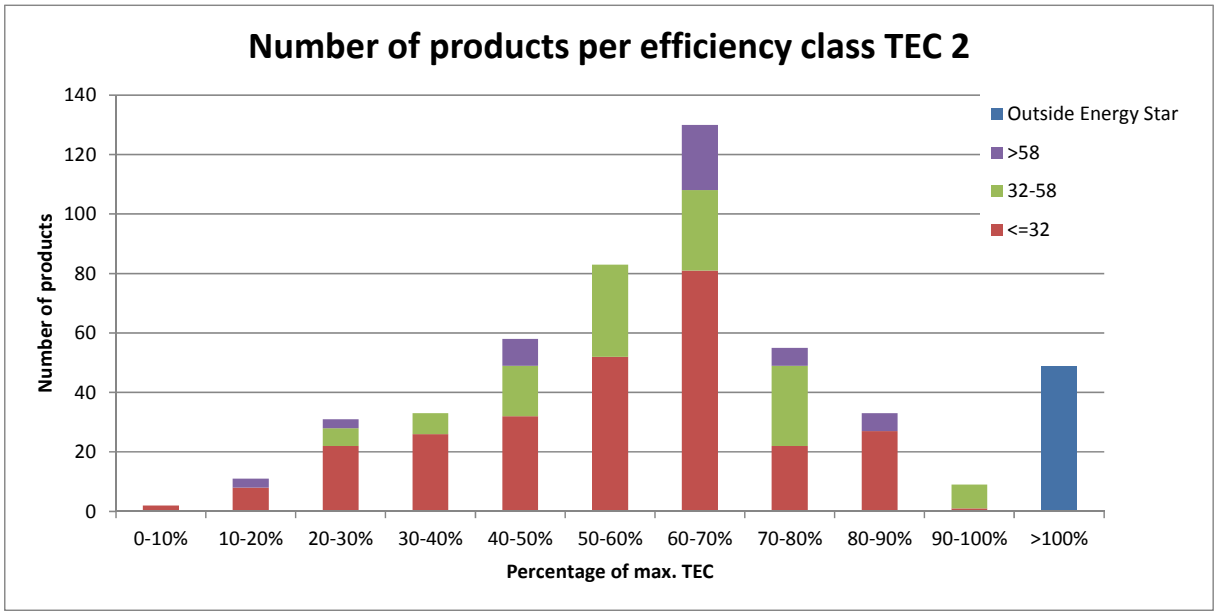


Figure 16: Distribution of the energy efficiency of the TEC 2 category

In order to investigate whether distribution of the energy efficiency also depends on product speed, the average energy consumption in kWh/year was calculated per ipm subcategory, using the max TEC equation for that product category and the average ipm value. This is shown in the table 13 below.

Table 13: TEC 2 calculations per subcategory

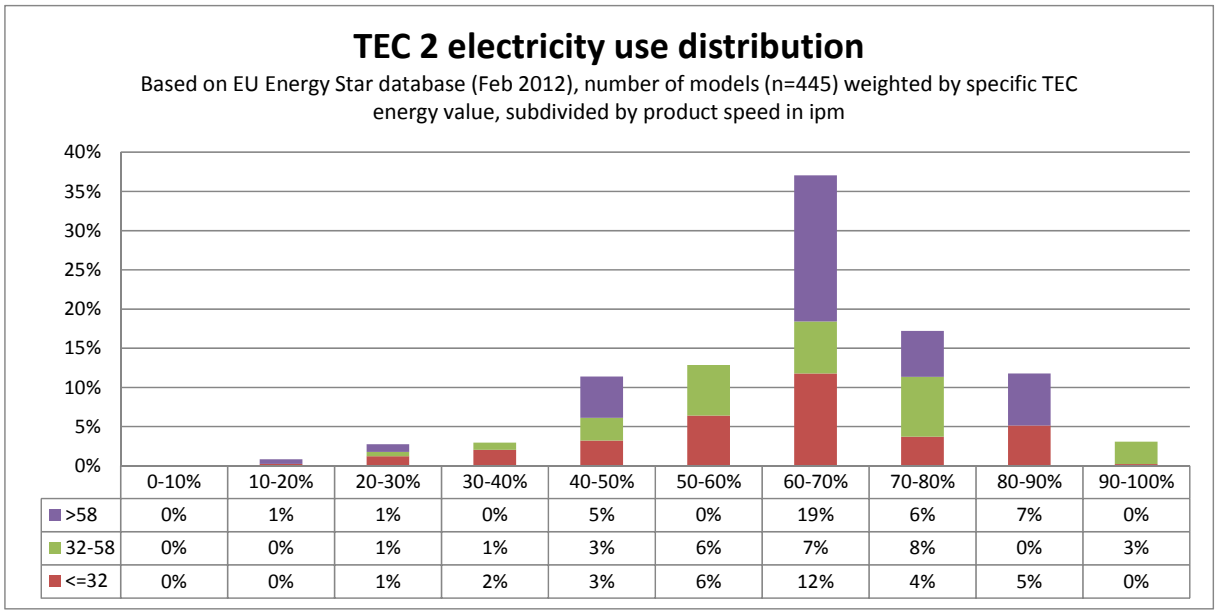
Product speed class (ipm)	**<=32**	**32-58**	**>58**
Average product speed (ipm)	23.8	39.9	80.1
Max. TEC kWh/week	5.2	8.8	30.1
Annual Max. TEC kWh/year	269.4	455.8	1565.2

The annual kWh/year figures were then used to give a weighting to the straight count in Figure 17.

As mentioned, this is not exactly a sales weighted outcome but it is as close as data allows.

The figure below shows that the distribution is similar to the energy efficiency graph above. The average saving is more or less the same.

Note that for products in the scope of the VA the max speed for monochrome products is <51 ipm.



	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%
>58	0%	1%	1%	0%	5%	0%	19%	6%	7%	0%
32-58	0%	0%	1%	1%	3%	6%	7%	8%	0%	3%
<=32	0%	0%	1%	2%	3%	6%	12%	4%	5%	0%

Figure 17: TEC 2 Electricity use distribution

TEC 3 (Monochrome MFDs)

Figure 18 shows the distribution of the energy efficiency of the TEC3 category, subdivided by ipm subcategories. The distribution is a straight, not weighted count of the number of models.

Figure 18 shows that 70% of the models (611of n=868) have an energy performance in the range of 30 to 100% of max TEC. The other 30% of the models are lower than 30% max TEC. There are no models featuring a 10% max TEC.

Overall, the average energy efficiency in TEC 3 is around 43% max TEC. Note that this is the value for registered products. As stated in the VA, it should also be taken into account that some 10% of products on the EU market are not registered.

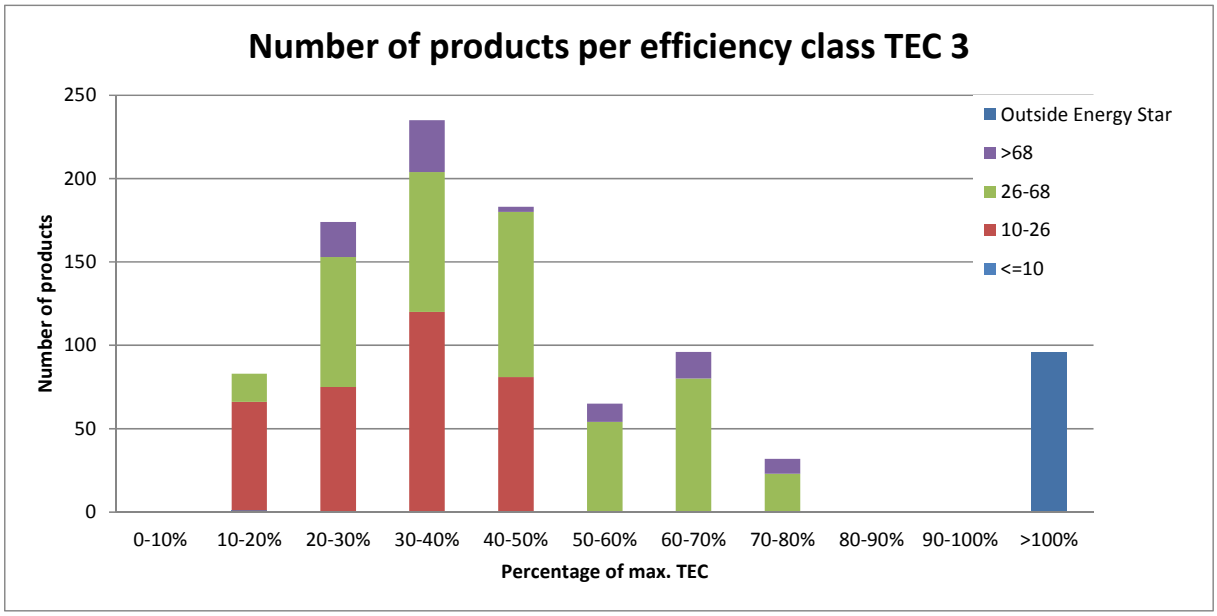


Figure 18: Distribution of the energy efficiency of the TEC 3 category

In order to investigate whether distribution of the energy efficiency also depends on product speed, the average energy consumption in kWh/year was calculated per ipm subcategory, using the max TEC equation for that product category and the average ipm value. This is shown in the table 14 below.

Table 14: TEC 3 calculations per subcategory

Product speed class (ipm)	<=10	10-26	26-68	>68
Average product speed (ipm)	10.0	20.5	40.9	98.1
Max. TEC kWh/week	1.5	2.5	8.3	38.7
Annual Max. TEC kWh/year	78.0	132.5	431.6	2010.3

The annual kWh/year figures were then used to give a weighting to the straight count in Figure 19.

As mentioned, this is not exactly a sales weighted outcome but it is as close as data allows.

The figure below shows that the distribution is similar to the energy efficiency graph above.

The average saving is more or less the same.

Note that for products in the scope of the VA the max speed for monochrome products is <66 ipm.

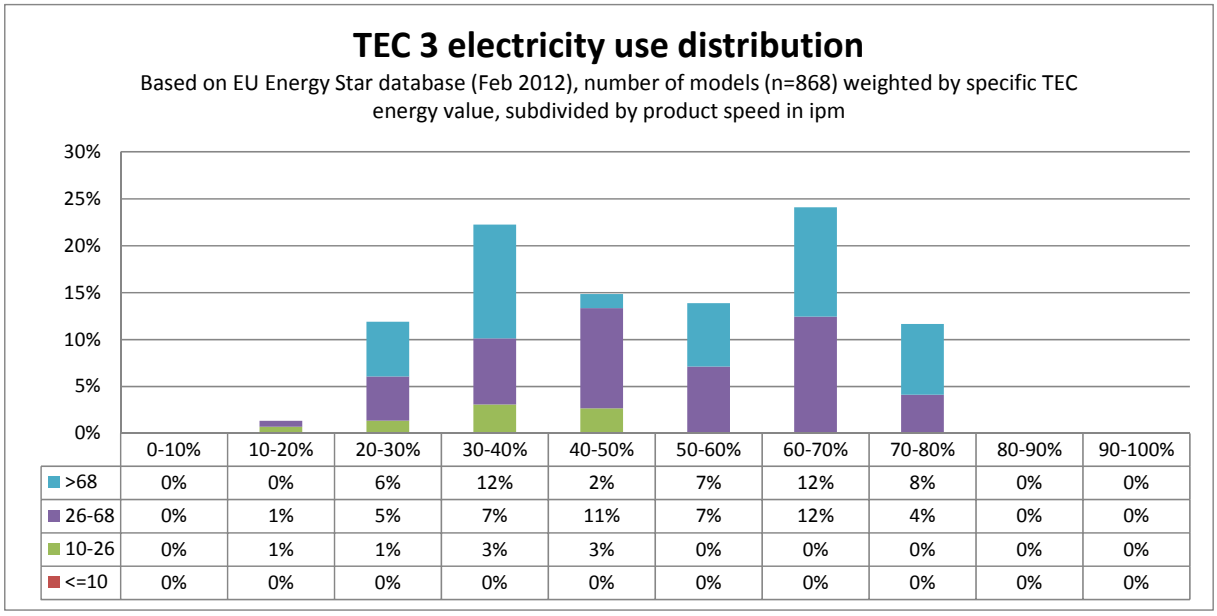


Figure 19: TEC 3 Electricity use distribution

TEC 4 (Colour MFDs)

Figure 20 shows the distribution of the energy efficiency of the TEC4 category, subdivided by ipm subcategories. The distribution is a straight, not weighted count of the number of models.

Figure 20 shows that 64% of the models (408 of n=642) have an energy performance in the range of 50 to 100% of max TEC. The other 36% of the models are lower than 50% max TEC. There are no models featuring a 10% max TEC.

Overall, the average energy efficiency in TEC 4 is around 61% max TEC. Note that this is the value for registered products. As stated in the VA, it should also be taken into account that some 10% of products on the EU market are not registered.

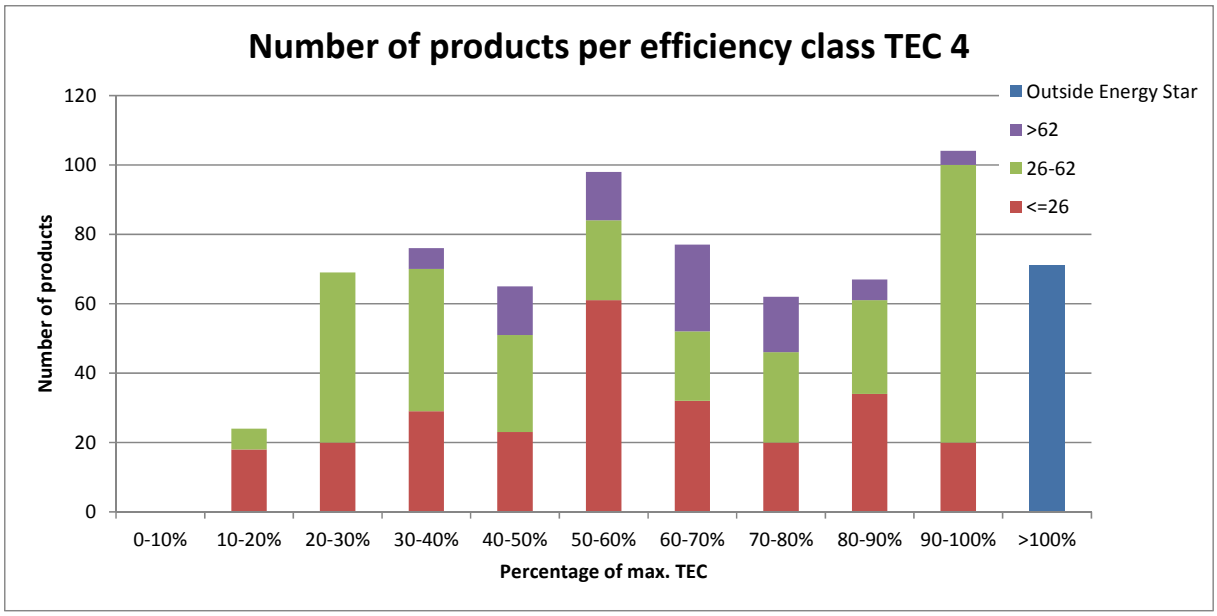


Figure 20: Distribution of the energy efficiency of the TEC 4 category

In order to investigate whether distribution of the energy efficiency also depends on product speed, the average energy consumption in kWh/year was calculated per ipm subcategory, using the max TEC equation for that product category and the average ipm value. This is shown in the table 15 below.

Table 15: TEC 4 calculations per subcategory

Product speed class (ipm)	**<=26**	**26-62**	**>62**
Average product speed (ipm)	21.0	40.2	73.7
Max. TEC kWh/week	5.6	11.1	26.6
Annual Max. TEC kWh/year	291.1	575.7	1382.1

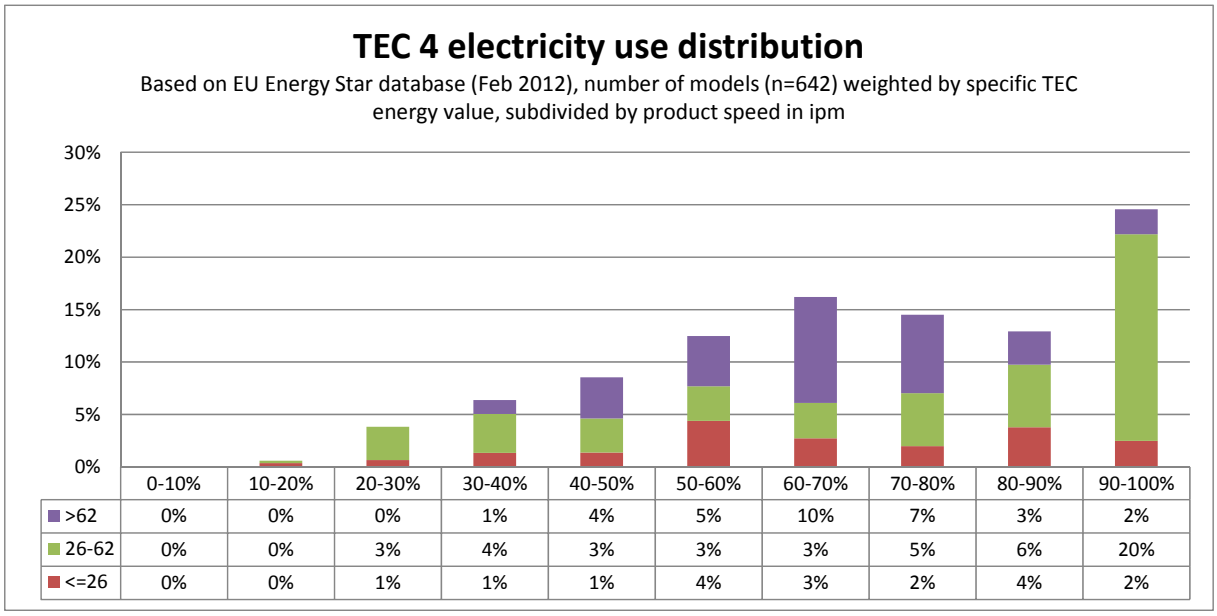
The annual kWh/year figures were then used to give a weighting to the straight count in Figure 21.

As mentioned, this is not exactly a sales weighted outcome but it is as close as data allows.

The figure below shows that the distribution is similar to the energy efficiency graph above.

The average saving is more or less the same.

Note that for products in the scope of the VA the max speed for colour products is <51 ipm.



	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%
>62	0%	0%	0%	1%	4%	5%	10%	7%	3%	2%
26-62	0%	0%	3%	4%	3%	3%	3%	5%	6%	20%
<=26	0%	0%	1%	1%	1%	4%	3%	2%	4%	2%

Figure 21: TEC 4 Electricity use distribution

ANNEX 8 ENERGY STAR COUNTRIES

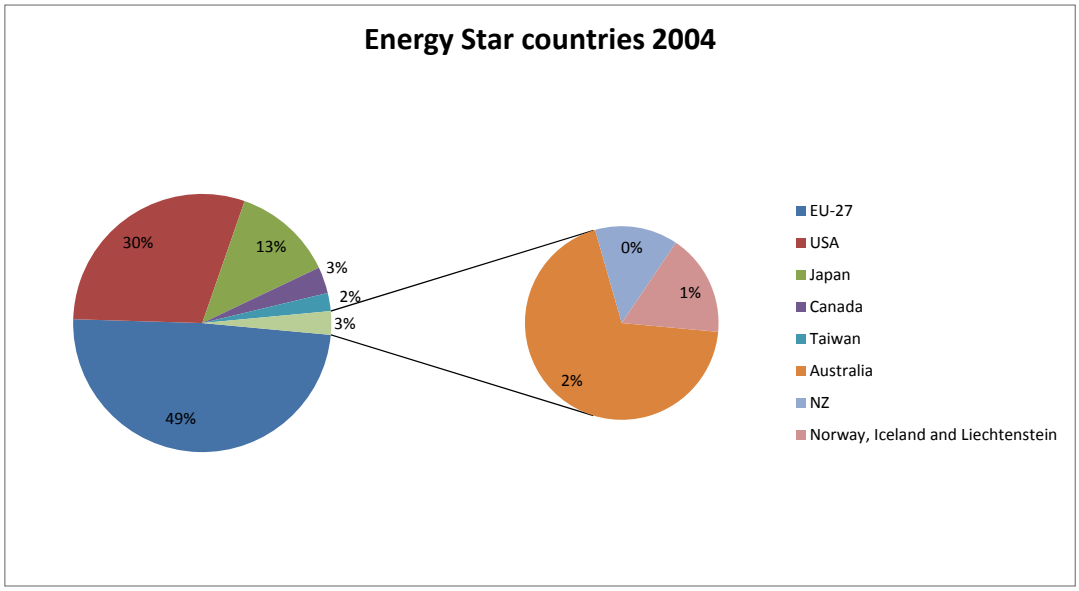


Figure 22: Countries where ENERGY STAR applied as percentage of inhabitants per country in 2004 Source: http://www.eu-energystar.org/en/en_042.shtml

ENERGY STAR is an international voluntary labelling scheme for energy-efficiency started by the US Environment Protection Agency (EPA) in 1992. Through an Agreement with the US government, the European Union participates in the **ENERGY STAR** scheme as far as it is related to **office equipment**.

In 2007 the European Union (EU-27) represents a market of over 494 million consumers, or 49% of the total of all ENERGY STAR countries (EC, US, Canada, Japan, Taiwan and Australia). In 2006 this EU market absorbed 79 million PCs including approx. 48 million laptops (Gartner, IDC), and over 12 million PC printers and 2 million copiers. In terms of market value, the EC represents roughly 170 billion EUR/year (EICTO), or roughly one third of the total ICT hardware market in the present ENERGY STAR countries. This shows that there is considerable potential for growth.

Table 16: Population and number of households in millions, 2006 sources: http://www.eu-energystar.org/en/en_042.shtml

Country	Population	Households
AT	8.3	3.5
BE	10.51	4.5
CY	0.78	0.2
CZ	10.29	4.1
DE	82.35	38.3
DK	5.45	2.5
EE	1.34	0.6
EL	11.17	3.9
ES	44.47	15.7
FI	5.28	2.4
FR	63.39	28.2

HU	10.06	4.4
IE	4.21	1.4
IT	58.75	26.2
LT	3.38	1.4
LU	0.46	0.2
LV	2.28	0.9
MT	0.41	0.2
NL	16.36	7.3
PL	38.13	14.4
PT	10.6	3.8
SE	9.11	4.3
SI	2.01	0.7
SK	5.39	2.7
UK	60.39	27
BU	7.68	2.9
RO	21.57	8.2
EU-27	494	210
NO	4.68	2
IS	0.31	0.1
LI	0.04	0
EEA	5.03	2.1
ENERGY STAR 2007	499	212

Other ENERGY STAR countries:

USA	301.1
Canada	33.4
Japan	127.4
Taiwan	22.9
Australia	20.4
NZ	4.1
Total	509

Sources:

Eurostat, CIA, US Census Bureau, Statistics Canada, US Department of State, Boverket, PRIMES, Australian Bureau of Statistics, NSI Bulgaria, INS Romania

ANNEX 9 VOLUNTARY AGREEMENT

---------- DRAFT ----------

INDUSTRY VOLUNTARY AGREEMENT TO IMPROVE THE ENVIRONMENTAL PERFORMANCE

OF

IMAGING EQUIPMENT PLACED ON THE EUROPEAN MARKET

Version 3.5

15 February 2011

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1 INTRODUCTION

The Imaging Industry is an innovative industry with a long track record on environmental improvements. The Imaging Industry wishes to formalize their commitment to continuous improvement via this voluntary agreement (VA) which we believe will help to contribute to the achievement of the EU Action Plan on Energy Efficiency. It is expected that the proposed Commitments as defined herein will enable energy savings of around 1 to 1,5 TWh per year in EU27 excluding the additional savings that will be made through increased resource efficiency. This Voluntary Agreement should enable customers to make more sustainable purchasing decisions by providing them more accurate information on the environmental performance of our products.

The Imaging Industry has been working on this Voluntary Agreement since spring 2009 and has been open for participation from all producers. The current market coverage of the companies involved in the drafting process is **over 90%** based on units sold in the EU. The goal is to continue to expand the coverage of the voluntary agreement and to include as many companies as possible.

The scope of the voluntary agreement is based on the EuP Preparatory Study and linked with ENERGY STAR. It aims to target the highest sales volume products and technologies on the household and office market. Technologies of declining markets such as small photo and scanner devices have been excluded from the scope of the agreement to ensure that companies can focus resources on improving the performance of our products in the high volume, high growth markets/sectors..

It became clear from the EuP Preparatory Studies on "Imaging Equipment" (Lot 4), that the product category Imaging Equipment contains a wide variety of product types, designed and marketed for a wide variety of markets and applications. Products range from a very affordable personal printer that is used occasionally by a private household user, through multifunctional devices used in offices to accommodate the daily needs for copying, printing, scanning and faxing of documents for groups of office workers, up to highly productive printing systems that are designed to run continuously in print rooms. For such widely different applications, widely different imaging technologies have been developed since instant printing emerged in the market in the 1920's: inkjet printing and electrophotographic printing are the most well-known of the core technologies used in the printers to transfer information onto paper. In addition to the core technologies, a wide range of additional convenient functionalities have been added to imaging equipment: ranging from modules for automated duplex printing, into modules for stapling, punching and even digital document storage inside the printer's memory. Each technology and each additional function has its own environmental impact. It should be noted that the implementations of the core technologies and additional functions is very different between the different producers in the imaging industry.

When setting out to develop the underlying Voluntary Agreement, the imaging Industry was faced with the challenge to formulate requirements that are not only relevant and significant for achieving environmental efficiency, but also applicable to the wide range of different imaging products present in the market. Despite the fact that the imaging industry focussed on the products that are sold in the highest numbers, by limiting the product scope to household

and office equipment, still the problem of diversity remained, which is mainly driven by the wide variety of customer requirements in the imaging market.

For the reasons outlined above, the Imaging Industry will commit to the requirements in this Voluntary Agreement for the vast majority of its products. Nevertheless the allowance of exemptions could not be avoided.

In line with the European Commission 'Communication on Environmental Agreements at Community level within the Framework of the Action Plan on the Simplification and Improvement of the Regulatory Environment'[115], this Agreement should be acknowledged by the European Commission through an exchange of letters with the Signatories.

2 OBJECTIVES

2.1 Continuously improve the environmental performance of the types of imaging equipment in scope of this agreement.

2.2 Contribute to the objectives of Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products, in line with Recitals 18-20 and Annex VIII on self-regulation.

2.3 Ensure the involvement of all stakeholders represented in the Consultation Forum in monitoring of the results and updating the requirements of the Voluntary Agreement.

3 SCOPE

3.1 General: All terms used in this section are defined in Annex C, Part VII to the Agreement between the Government of the United States and the European Community on the coordination of energy-efficiency labelling programmes for office equipment, as set out in the Annex of Commission Decision 2009/347/EC (ENERGY STAR).

3.2 For the purposes of this Agreement, "products" are understood as imaging equipment meeting the conditions in section 3.3. The terms "imaging equipment" and "product" do not include cartridges or other consumables

3.3 Scope:

3.3.1 Product categories: The Voluntary Agreement covers imaging equipment belonging to one of the following product categories that have been reviewed in the EuP Lot 4 preparatory study:

- Copiers
- Multifunction Devices (MFDs)
- Printers

[115] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52002DC0412:EN:NOT

- Fax machines

3.3.2 Cartridges: cartridges produced by or recommended by the OEM for use in the products set out in 3.3.1

3.3.3 Marking technologies: This Agreement is limited to the following marking technologies:

- Electrophotography (EP)
- Inkjet (IJ), including high performance IJ
- Solid Ink (SI)

3.3.4 Household and office equipment: This Agreement is limited to household and office equipment, meaning:

- Standard BW format products with maximum speed < 66 A4 images per minute
- Standard Colour format products with maximum speed <51 A4 images per minute

(Speed to be rounded to the nearest integer as prescribed in the ENERGY STAR agreement).

Other format products can be included in their reporting by individual Signatories on a voluntary basis but will not count but do not count for the target specified in 4.1 a)..

4 COMMITMENTS PART I – DESIGN REQUIREMENTS

Signatories commit to:

4.1 Compliance on primary requirements:

a) Products as defined in section 3 and placed by Signatories on the EU market will meet the specifications of ENERGY STAR v1.1 and to duplex settings in accordance with the following target:

By 1 January 2012: 90% or more of the products placed by a Signatory on the market.

b) The specifications in ENERGY STAR v1.1 and duplex settings concern:

1. energy consumption requirements (TEC and OM products);
2. default delay times (OM products); and
3. duplex availability (TEC products).

4. duplex-printing is set as default when printing from the computer, meaning that the relevant software (driver or firmware) will be configured so that the first print-job will be in duplex unless the print settings have been modified at the stage when the product is first installed to function as intended.

Summary of Duplex requirements for TEC approach products

Monochrome Print Speed		Duplex Requirements as per Energy Star V 1.1	Default Duplex set at shipment or at installation
Colour products	Monochrome products		
<=19ppm	<=24ppm	No requirement	Not applicable
20-39ppm	25-44ppm	Automatic duplexing must be offered as a standard feature or optional accessory at the time of purchase.	At discretion of either the user or manufacturer
>=40ppm	>=45ppm	Automatic duplexing is required as a standard feature at the time of purchase.	Required

c) For the purposes of compliance with section (a) above, the rate of compliance shall be calculated following the methodology described in Annex B.

d) A preliminary baseline will be established and published by 1 October 2011 on the basis of products placed by Signatories on the market during the first half of calendar year 2011 and their compliance to the above criteria.

4.2 Availability of N-up printing.

All printing products placed on the market after 1 January 2012 offer as a standard feature the capability to print several pages of a document on one sheet of paper, when the product is managed by an original software provided by the manufacturer (printer driver).

4.3 Design for recycling[116]

For all new product models introduced after 1 January 2012

4.3.1 Plastic parts >100 g shall be manually separable into recyclable plastic streams with commonly available tools.

4.3.2 Product shall utilize commonly used fasteners for joining components, subassemblies, chassis and enclosures.

4.3.3 Non-separable connections (e.g. glued, welded) between different materials shall be avoided unless they are technically or legally required.

4.3.4 Product plastics shall be marked by material type (ISO 11469 referring ISO 1043, resin identification code, SPI, DIN, or country specific). Marking requirement does not apply to plastic parts weighing less than 25g or with surface area less than 50 cm2; tape; plastic protective and stretch wraps and labels; or plastic pieces when due to shape marking is not possible. Exempted are plastic parts contained in reused complex modules

4.4 Cartridges[117]

[116] Following commitments are drawn from section 4.3.1 Disassemble-ability of the IEEE 1680.2 Draft Standard for Environmental Assessment of Imaging Equipment (EPEAT criteria)

For all products placed on the market after 1 January 2012

4.4.1 any cartridge produced by or recommended by the OEM for use in the product is not designed to prevent its reuse and recycling.

4.4.2 the machine is not designed to prevent the use of a Non-OEM Cartridge.

The requirements of paragraph 4.4 shall not be interpreted in such a way that would prevent or limit innovation, development or improvements in design or functionality of the products, cartridges, etc.

An exception from the criteria in section 4.2 and 4.3 will be acceptable for models that are sold in small numbers (less than 5000 per year), on the ground that the cost of implementing the criteria is disproportionate to the sales of the product. Exceptions should be reported to the Independent Inspector (see Annex C, section 4 for reporting template).

5 COMMITMENTS PART II – INFORMATION REQUIREMENTS

Signatories commit to:

5.1 Environmental information for end-users in relation to use and end-of-life

5.1.1 Resource- and energy-efficiency

For new models introduced after 1 January 2012 Signatories commit to providing end-users with information regarding resource efficiency when using imaging equipment. The intent is to ensure the end-user is made aware of good efficiency practices when they first begin to use a new product. Signatories shall achieve this through one of the following methods:

- A pop-up screen on the end-users' computer during the initial installation of software (preferred)[118]
- An insertion sheet provided in/on the box of the product as defined in Section 3 above
- An information sheet to be provided at the time of sale of the product as defined in Section 3 above

The following information shall be provided as a minimum[119] where applicable:

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[117] Following commitments are drawn from section 4.9.4. "Not inhibiting reuse of cartridges" and 4.9.2 4. "Allow use of Non-OEM Cartridges" of the IEEE 1680.2 Draft Standard for Environmental Assessment of Imaging Equipment (EPEAT criteria)

[118] This can only be implemented when imaging equipments are managed through computers under mainstream Operating Systems (Microsoft Windows or Mac/OS)

5.1.1.1 Information that recycled as well as virgin paper certified under environmental stewardship initiatives, or carrying recognised ecolabels, may be suitable providing that it meets appropriate quality standards as defined, for example, in EN 12281 on "Printing and business paper for dry toner imaging processes" for papers in the range 75-250 g/m2. For specific applications, the lower boundary may be chosen at 64 g/m2.

5.1.1.2 For Electro Photography printers: indication that these can print on 64 gr/m2 paper and that this paper contains less raw material per print, thus saving significant resources.

5.1.1.3 Energy can be saved by purchasing ENERGY STAR compliant products

5.1.1.4 Description of the benefits of printing in duplex mode (for TEC products having a duplex function)

5.1.1.4 The environmental benefits of power management

The information as described in sections 0 through 0 will be provided in the form of compact statements.

This paragraph 0 applies to: all new product models introduced after January 1, 2012. Paper weight mentioned in the pop-up window (or alternatives as described above) will be consistent with the paper weight specifications of the product.

5.1.2 Cartridge disposal and treatment

For products placed on the market after 1 January 2012, Signatories will provide end-users with information on suitable end-of-life management options for used cartridges. This information may be communicated via a company website.

5.2 Information on product environmental characteristics to be provided by Signatories

The following applies to products placed on the market after 1 January 2012.

5.2.1 Signatories will make information on the environmental performance of their products available to customers. This information may take the form of for example ECMA 370 The Eco Declaration[120,] EPEAT verification documentation[121], or similar company formats.

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[119] Not all 5 statements mentioned in section 5.1.1 may be applicable to the product that is equipped with this information. Manufacturers are free to choose if they add a statement to this effect to the information, or leave out statements that are not applicable, such as the statement regarding electrophotography and duplex printing.

[120] The eco declaration (ECMA 370) is a communication tool for customers. ECMA 370 declaration was developed to answer questions from customers to choose the best supplier. The standard addresses individual company programs and product related attributes.

5.2.2 Signatories will make information on inkjet and toner cartridge yield available to customers based on the measurement standards specified, for example, in ISO/IEC 24711:2006 (for ink), ISO/IEC 19752:2004 (for monochrome toner) , or ISO/IEC 19798:2006 (for colour toner). or through other company methods.

An exception from the criteria in section 5.1 and 5.2 will be acceptable for models that are sold in small numbers (less than 5000 per year), on the ground that the cost of implementing the criteria is disproportionate to the sales of the product. Exceptions should be reported to the Independent Inspector (see Annex C, section 4 for reporting template).

6 REPORTING AND MONITORING

6.1 Signatories shall submit to an Independent Inspector reports based on compliance with the Voluntary Agreement (the "Reports") according to the guidelines in this Section

6.2 The reports shall include:

- Company name
- Compliance status (compliant/non-compliant) + sales data per model (to allow for verification)
- Rate of compliance with the commitments listed in section 4.1.
- Compliance confirmation for all other commitments

Annex C shows the template according to which the Reports shall be prepared by the Signatories.

Compliance to all Commitments has to be reported according to the following schedule:

- ,A first Report by October 1st 2011 shall cover products placed on the market and Signatory commitments between January 1st, 2011 and June 30th , 2011. This Report will establish the initial baseline for the Voluntary Agreement.
- A second Report by July 1st 2012 shall cover products placed on the market between October 1st 2011 and March 31st 2012 and demonstrate compliance with targets set for January 1, 2012.
- Unless differently stated in next revisions of the current Voluntary Agreement, following reports will be established by March 31st every year covering products

[121] EPEAT, the Electronic Product Environmental Assessment Tool, is a set of environmental criteria to support green public procurement and environmentally conscious purchasing decisions. For Imaging Equipment, an EPEAT standard is being developed (IEEE1680.2) that will include a specification of the verification documentation that the manufacturer has to make available in order to have a product registered with EPEAT. This documentation will provide disclosure of environmental performance.

placed on the market during the previous full calendar year , e.g. by March 31st,2013 for products placed on the market between January 1st, 2012 and December 31st, 2012

Within two weeks following the end of a reporting period, the Independent Inspector shall send a request to the Signatories to file their Reports. These shall be submitted no later than three months after the end of the reporting period to the Independent Inspector.

The Reports shall be compiled by the Independent Inspector into an annual progress report (the "Annual Progress Report") that will be submitted to the Steering Committee within 4 months following the end of a period. This Annual Progress Report will be prepared by the Independent Inspector and will only show anonymous results. Signatories will not be named although individual achievements shall be disclosed (company A, company B, etc).

The Independent Inspector shall be responsible for ensuring that confidentiality of the Signatory's identity and any data or information provided to it under or in relation to this agreement is maintained this shall include entering into a non-disclosure agreement with each Signatory if requested by the Signatory..

6.3 The Steering Committee will meet at least once a year to discuss the Annual Progress Report and shall decide if an independent audit is required to verify the accuracy of "Annual Progress Report" or of an individual signatory. The results of the independent audit will be submitted to the Steering Committee. Any independent auditor will be required to treat the identity and data of the Signatories as confidential and shall if requested by any Signatory enter into a non-disclosure agreement with each Signatory before having access to the data.

7 NATURE AND ORGANIZATION OF THE VOLUNTARY AGREEMENT

7.1 Nature of the Voluntary Agreement

The Signatory signs and enters into this Agreement for and on behalf of itself and makes its Commitment under the Agreement to the European Commission. The consequences of non-compliance are set out in section 9.

This Agreement shall not amount to a commercial agreement and shall not give rise to any commercial expectations or liabilities between the Signatories in respect of the fulfilment of their individual Commitments as listed in this Voluntary Agreement.

All Signatories will be treated equally and there shall be no special arrangements for individual Signatories.

7.2 Organisation of the Voluntary Agreement

Each Signatory to the Agreement as well as the European Commission shall have the right to nominate one person to represent it at the Steering Committee.

The Steering Committee shall elect, from amongst its members, a Chair. The Chair shall be responsible for convening the Steering Committee at regular intervals (and at least twice within every Reporting Period) and for running such meetings of the Steering Committee. The Chair shall, however, have no executive or representative function unless this is delegated to them by the Steering Committee.

Meetings of the Steering Committee shall be open to

- any person representing a Signatory or potential signatory to agreement,
- to any representatives of the European Commission or Member States, as well as member states of the EEA or EFTA, and
- organizations that have a permanent seat on the Consultation Forum.

The Steering Committee will seek to achieve agreement by consensus at all times. If consensus cannot be achieved, the Steering Committee may reach a decision in accordance with the voting procedures described in Section 8 of this Voluntary Agreement. The Steering Committee may decide to develop and adopt further rules of procedure where it deems it necessary and may decide to delegate powers where it deems it to be necessary to specific individuals or to sub-committees.

8 VOTING RULES

All reasonable efforts shall be taken to ensure that the decisions of the Steering Committee are taken on the basis of a consensus.

However, where consensus on an issue cannot be achieved in the course of a meeting of the Steering Committee, a call for an indicative vote may be made by the Steering Committee Chair or by a Quorum.

During any voting procedure of the Steering Committee each Signatory shall be entitled to cast a single vote.

If the indicative vote indicates a favourable outcome (two-thirds majority or greater in favour) but a consensus is nonetheless not achieved, a call for a deciding vote may be made by a Quorum to be held at the following meeting of the Steering Committee. At such second meeting, the adoption of a decision shall be made in accordance with the Voting Rules. At such second meeting, the adoption of a decision shall require:

a. a Quorum

b. the agreement of a two-thirds majority of the Quorum.

9 NON COMPLIANCE

Individual companies will work towards the fulfilment of the compliance rate set out in section 4.1 of this Voluntary Agreement. In case a Signatory fails to meet the compliance rate, actions will be taken, depending on the level of non-compliance:

- Under achievement of the target by ≤ 5%: The Signatory will have a grace period of 6 months to achieve the target and present an updated semester progress report. During those 6 months, the Signatory will not be required to achieve any new target set out in a revision of the Voluntary Agreement. If the Signatory fails to achieve the target, the Steering Committee will start discussions with the Signatory in order to develop a suitable way forward. The Steering Committee may decide to change the Signatory's status from Signatory to Defaulting Signatory. Until the Defaulting Signatory fulfils the target, no new targets will apply.

- Under achievement of the target by > 5%: the Steering Committee will start discussions with the Signatory in order to develop a suitable way forward. The Steering Committee shall change the status from Signatory to Defaulting Signatory.

- If the Signatory does not comply within the set deadline as agreed with the Steering Committee, the Signatory shall be deemed not to take part any more in the Voluntary Agreement and shall be deleted from the list of Signatories.

10 VERIFICATION

10.1 Compliance to commitments Part I - Design Requirements as described in section 4 shall be verified on the basis of the signatory's report according to the template as given in Annex C.

10.2 Compliance to Commitments Part II – Information Requirements as described in section 5 can be verified by the Independent Inspector by requesting the documentation as described below. Signatories shall provide the Independent Inspector with the requested documentation within 4 weeks of a request.

a. For section 5.1.1 Resource- and energy-efficiency: Upon request, the software or information sheet, according to the delivery method for a given product will be provided to the Independent Inspector.

b. For section 5.1.2 Cartridge disposal and treatment: Upon request, the respective documents and/or the website address shall be made available to the Independent Inspector.

For section 5.2 Information on product environmental characteristics: Upon request, the respective documents (5.2.1 and 5.2.2) will be made available to the Independent Inspector

10.3 In case an organization as listed in section 7.2 wants to verify the compliance of a product that falls under the Voluntary Agreement, the request has to be addressed to the Independent Inspector and the Signatory. Only the Independent Inspector shall provide the organization with the compliance status of a model (yes/no) on a confidential basis within 2 weeks. Within 4 weeks of receiving the compliance status, the organization shall be required to inform both the Independent Inspector and the Signatory of the results of the verification.

The Independent Inspector shall only respond to requests for specific models and is not allowed to disclose lists on the compliance status of a Signatory's product portfolio.

11 REVISION OF THE COMMITMENT

A revision of the Voluntary Agreement will take place at the earliest of the following two dates:

- 3 months after the publication of a new version of the ENERGY STAR programme Requirements for Imaging Equipment
- 1 January 2013.

The Steering Committee may decide if a revision of the Voluntary Agreement is required after 2013.

12 TERMINATION OF THE VOLUNTARY AGREEMENT

Signatories can terminate their individual participation in the Voluntary Agreement by sending a letter to the chair of the Steering Committee to an address that will be communicated in due time in writing by the chair.

The Steering Committee may decide to terminate the Voluntary Agreement at any time . Reasons for termination could be, but are not limited to:

- Signatories no longer represent a significant majority of the market (i.e. over 80%);
- A majority of Signatories do not meet the Commitments of the Voluntary Agreement
- Legislation is implemented that overrules or conflicts with the Voluntary Agreement
- Signatories have a considerable disadvantage over "free riders"

ANNEX A: DEFINITIONS

All terms used in this document and not defined in this Annex A are defined in Annex C, Part VII to the Agreement between the Government of the United States and the European Community on the coordination of energy-efficiency labelling programmes for office equipment, as stated in the Annex of Commission decision 2009/347/EC (EU Energy star)

1. **Signatories**: means all member companies that have signed this Voluntary Agreement. See in section 1 the name of Signatories of this Voluntary Agreement.
2. **Potential Signatories**: means printer producers, which produce and distribute at least one device of the product categories listed in Section 3.3.
3. **Commitments:** means the Commitments described in Sections 4 and 5 to this Agreement altogether.
4. **Defaulting Signatories**: means all Signatories given the status of Defaulting Signatory by the Commission in accordance with Section 9.

5. **Copier:** A commercially-available imaging product whose sole function is the production of hard copy duplicates from graphic hard copy originals. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as copiers or upgradeable digital copiers (UDCs).

6. **Fax Machine**: commercially-available imaging product whose primary functions are scanning hard copy originals for electronic transmission to remote units and receiving similar electronic transmissions to produce hard copy output. Electronic transmission is primarily over a public telephone system, but also may be via computer network or the Internet. The product also may be capable of producing hard copy duplicates. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as fax machines.

7. **Multifunction Device (MFD):** A commercially-available imaging product, which is a physically-integrated device or a combination of functionally-integrated components, that performs two or more of the core functions of copying, printing, scanning, or faxing. The copy functionality as addressed in this definition is considered to be distinct from single sheet convenience copying offered by fax machines. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as MFDs or multifunction products (MFPs).

8. **Printer**: A commercially-available imaging product that serves as a hard copy output device, and is capable of receiving information from single-user or networked computers, or other input devices (e.g., digital cameras). The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as printers, including printers that can be upgraded into MFDs in the field.

9. **Electrophotography (EP)**: A marking technology characterized by illumination of a photoconductor in a pattern representing the desired hard copy image via a light source, development of the image with particles of toner using the latent image on the photoconductor to define the presence or absence of toner at a given location, transfer of the toner to the final hard copy medium, and fusing to cause the desired hard copy to become durable. Types of EP include Laser, LED, and LCD. Color EP is distinguished from monochrome EP in that toners of at least three different colors are available in a given product at one time. Two types of color EP technology are defined below:

    a. Parallel Color EP – A marking technology that uses multiple light sources and multiple photoconductors to increase the maximum color printing speed.

    b. Serial Color EP – A marking technology that uses a single photoconductor in a serial fashion and one or multiple light sources to achieve the multi-color hard copy output.

10. **Ink Jet (IJ)**: A marking technology where images are formed by depositing colorant in small drops directly to the print media in a matrix manner. Color IJ is distinguished from monochrome IJ in that more than one colorant is available in a product at any

one time. Typical types of IJ include Piezo-electric (PE) IJ, IJ Sublimation, and Thermal IJ.

11. **High Performance IJ**: The use of an IJ marking technology in high-performance business applications usually occupied by electrophotographic marking technology. This difference between the conventional IJ product and the High Performance IJ product is denoted by the presence of nozzle arrays that span the width of a page and/or the ability to dry the ink on the media through additional media heating mechanisms.

12. **Solid Ink (SI)**: A marking technology where the ink is solid at room temperature and liquid when heated to the jetting temperature. Transfer to the media can be direct, but is most often made to an intermediate drum or belt and then offset printed to the media.

13. **Member States**: The member states of the European Community

14. **Quorum:** Two thirds of the Signatories who requested to be on the Steering Committee being present at a meeting.

15. **Consultation Forum:** as defined by Article 18 of the 2009/125/EC Directive, and 2008/591/EC Commission Decision, the assembly ensuring a balanced participation of Member States' representatives and all interested parties concerned with the product or product group in question

16. **Steering Committee**: The co-ordinating and governing body of this Voluntary Agreement, appointed in accordance with the principles set out in Section 7

17. **Compliance period**: the period over which companies measure their performance against the Commitments of the Voluntary Agreement

18. **Placing on market**: the act of making a product available for the first time on the Community market with a view to its distribution or use within the Community whether for reward or free of charge and irrespective of the selling technique. Guidance on this definition is available in the Guide to the Implementation of Directives Based on New Approach and Global Approach.
http://ec.europa.eu/enterprise/newapproach/legislation/guide/index.htm

19. **Independent Inspector**: The independent third party designated by the Steering Committee (on behalf of all Signatories) and who is tasked with, and responsible for, the collection and processing of information supplied by Signatories pursuant to Section 6 and Annex B, and determining a Signatory's compliance with the Agreement in accordance the Commitments.. The Steering Committee shall engage the services of the Independent Inspector upon terms and conditions that shall require undertakings of confidentiality from the Independent Inspector, and which shall also set out any requirements or applicable mechanisms for a process of appeal, in case this is ever be necessary;

20. **End-user**: A person who uses the imaging equipment for one of its main functions (e.g. printing, scanning, copying). The end-user has control over the environmental impact of the product by choosing the type and weight of paper and by using duplex

and/or n-up printing. Further, the end-user can be expected to exhange consumables e.g. cartridges.

21. **Customer**: A person or legal entity who takes purchasing decisions for the products covered in this voluntary agreement.

22. **TEC:** Typical Electricity Consumption method for the Version 1.1 ENERGY STAR Imaging Equipment (IE) specification. The procedure is to be used to obtain and evaluate the TEC of Standard-size IE products such as copiers, digital duplicators, fax machines, multifunction devices (MFDs), and printers that use high-temperature technologies such as Electrophotography (EP) and Solid Ink (SI), and those that provide comparable functionality. It is not intended for low-temperature technologies such as conventional Ink Jet (IJ) or Impact, nor for Large-format or Small-format products. The key result of this test procedure is a value for typical weekly electricity consumption.

23. **OM**: Operational Mode: ENERGY STAR Imaging Equipment (IE) specification. The procedure is to be used to quantify the power consumption of imaging products that do not utilize the Typical Electricity Consumption (TEC) method. Examples of products that will be tested with this OM method include those that use marking technologies such as Ink Jet, Dot Matrix or Impact, as well as scanners and all large-format and small-format devices. The key results of this test procedure are power values for Ready, Sleep, and Off modes.

24. **Standard Size Format Product**: Products categorized as Standard include those designed for standard-sized media (e.g., Letter, Legal, Ledger, A3, A4, and B4), including those designed to accommodate continuous-form media at widths between 210 mm and 406 mm. Standard-size products may also be capable of printing on small-format media.

25. **Commonly available tools**: Widely used, commercially available tools..

26. **Non-OEM Cartridge**: A toner or ink cartridge not sold by the OEM that is remanufactured and/or refilled.

ANNEX B: CALCULATING THE COMPLIANCE RATE

The compliance rate is the percentage of compliant units in scope and placed on the market in relation to the total number of units in scope and placed on the market. A model is considered compliant when it meets all the requirements as detailed in section 4.1. This means that if a model doesn't meet a requirement it will not be counted towards the company compliance rate. The compliance rate will be calculated to 2 significant figures as a sales weighted number meaning that models with high sales will weigh heavier in calculating the compliance rate than low sales models.

$$\text{Compliance rate} = \frac{\text{Compliant units in scope and placed on the market}}{\text{Total units in scope and placed on the market}}$$

Table 17 shows a simplified example of how the compliance rate can be calculated internally by a company.

Table 17; calculating the compliance rate on sales for a given period

EU shipments from 1st October 2011 to 31st March 2012													
				Compliance to requirements									
Model name	product description	Energy Star qualifying approach (TEC or OM)	Mono print speed (ipm)	Sleep power(W)	OM Max sleep power allowance (W)	OM default delay time (Y/N)	TEC (kWh/week)	Max TEC(kWh/week)	duplex capability (Y/N)	duplex set as default (Y/N)	Product compliant (Y/N)	Total units shipped	Total compliant units
Model 1	IJ printer	OM	NA	2	1,4	Y	NA	NA	NA	NA	N	20	0
Model 2	IJ MFD	OM	NA	4,5	4,9	Y	NA	NA	NA	NA	Y	20	20
Model 3	IJ MFD	OM	NA	4	4,9	Y	NA	NA	NA	NA	Y	60	60
Model 4	IJ printer	OM	NA	2,5	2,9	Y	NA	NA	NA	NA	Y	100	100
Model 5	EP mono printer	TEC	35	NA	NA	NA	2,5	3	N	NA	N	40	0
Model 6	EP mono MFD	TEC	50	NA	NA	NA	13	11,5	Y	N	N	100	0
Model 7	EP color printer	TEC	40	NA	NA	NA	8	8,8	Y	N	N	10	0
Model 8	EP color MFD	TEC	35	NA	NA	NA	9	9,25	N	NA	N	20	0
Model 9	EP mono printer	TEC	35	NA	NA	NA	2,7	3	Y*	NA	Y	100	100
									*optional		Total	470	280
											Compliance rate		**60%**

ANNEX C: REPORTING FORM TO BE USED TO REPORT TO INDEPENDENT INSPECTOR

Section 1: general information

The organisation/company:……

Reporting Period: ……

Section 2: report on compliance to commitments in section 4.1

Table 2: reporting table

Model	Units placed on the market in EU	Product compliant?	Number of compliant units	Number of non compliant units
Total		Total		
		Compliance rate		

Section 3: manufacturers declarations

The manufacturer states that:

☐ : All printing products placed on the market after 1 January 2012 offer N-up printing as a standard feature in conformity with section 4.2.2 of the voluntary agreement

☐ : All new models introduced after 1 January 2012 are designed in view of their recycling in conformity with section 4.3 of the voluntary agreement

☐ : For all printing products placed on the market after 1 January 2012 manufacturers ensure that equipment and cartridges are not designed in a way to prevent re-use and the use of non-OEM consumables in conformity with section 4.4 of the voluntary agreement

☐ : End-user information has been implemented for all new models introduced after 1 January 2012, in conformity with section 5.1.1 of the voluntary agreement

☐ : information on the environmental performance of all the company's products sold in the EU has been made available to customers in conformity with section 5.2.1 of the voluntary agreement

☐ : information on inkjet and toner cartridge yield has been made available to customers in conformity with section 5.2.2 of the voluntary agreement (the following measurement standards were used)

☐ : information on suitable end of life management options for used cartridges has been provided to end-users

Section 4: list of products that are exempted from the statements in section 3 of this report

The following products are exempted from the statements as done in section 3 of this report:

Reports on exceptions should include:

To what requirement is the exemption reported

Which are the excepted products

What are the annual sales of these products

Section 5: Signature

The signer hereby declares that the information stated in this report is correct and represents all information available with respect to the Commitments in the INDUSTRY VOLUNTARY AGREEMENT TO IMPROVE THE ENVIRONMENTAL PERFORMANCE OF IMAGING EQUIPMENT PLACED ON THE EUROPEAN MARKET.

Name of manufacturer: -

Name of authorized person -

Function -

Date -

Signature -

8. ANNEX D: SIGNING FORM

The organisation/company/

……..

Signs this Voluntary Agreement with the objective to improve the Environmental Performance of its imaging equipment as covered by the scope of the Voluntary Agreement. More specifically the Signatory commits to:

Meet the Commitments and compliance rate as set out in section 4and 5

Provide annual reports on its performance as set out in section 6

For the Signatory

Director or person authorised to sign:

Name: ……
Function:……..
Address:……..
……
……
..……..
Date: …….
Signature…….
Contact Person for the Organisation/Company:
Name: ……
Function:……..
Email:……...
Telephone:……..

Please send a duly signed and completed Signing Form to:
European Commission
Directorate-General for Energy and Transport
Directorate D - New and renewable sources of energy, Energy efficiency & Innovation
Unit D3 - Energy efficiency of products & Intelligent Energy - Europe
Office DM24, 04/24
Rue de Mot 24-26
B-1049 Brussels

ANNEX E: EXAMPLE OF PRODUCT ENVIRONMENTAL INFORMATION

Following is an example of product environmental information provided by Signatories, based on the ECMA 370 standard. Other standard formats can be used by Signatories.

ANNEX 10 SCENARIO DATA

Stock model methodology & detailed results

The impact analysis uses the variable **inputs** as defined in the following paragraphs and used in Chapter 5.

The **calculation method** for the analysis is a so-called **Stock Model,** which means that it is derived from accumulated annual sales of imaging equipment over the period 1995-2030.

The stock-model sets the pace for the sub-options. The direction is determined by characteristics (TEC, standby, DFE etc.) and number of print pages. From these stock data the fitting sales data were calculated

Outputs for each sub-option are:

- Electricity consumption in TWh/a;
- Carbon emission in Mt CO_2 equivalent/a, using a multiplier based on electricity and gas shares (see below) and the values from the EcoReport in the preparatory study,
- Paper consumption (duplexing)

Final outcomes are presented at a high aggregation level (totals), but in the intermediate stages a distinction is made by the typology and by size.

For the economic calculations, an average energy price in €/ kWh primary energy is built from:

- Electricity rates per kWh primary energy. For electricity, the assumption is to use residential electricity rates excluding taxes in 2006, i.e. € 0.16/kWh;
- Annual (long-term 2011-2030 average) electricity price rate increase of 4%.

Data from Chapter 2 and 5 are used for the definition of the base case and calculated on the basis of the relative market shares of the lamp categories considered.

Baseline- and scenario's additional information

Sales and stock

The sales of imaging equipment have been assessed by the preparatory study on the basis of PRODCOM EU trade data and data presented by InfoTrends.

In the period 1995 – 2005 an average market growth of between 1 and 2,5% per year has been used in order to level out big fluctuations. This number has been checked according to sales

and stock data presented by Telecompaper[122] and indications mentioned in the beginning of task 2 of the preparatory study.

The preparatory study covers the sales and stock data for the period 2005-2030.

Sales

Table 18: Sales data IE in EU-27 (in millions)

	1995	2005	2010	2013	2016	2019	2022	2025	2030
EP-Copier mono	2.00	1.33	0.94	0.72	0.48	0.25	0.21	0.18	0.11
EP-Copier colour	0.00	0.14	0.19	0.61	0.93	1.19	1.31	1.40	1.53
EP-printer mono	3.58	3.68	3.35	3.15	2.82	2.50	2.31	2.05	1.83
EP-printer colour	0.00	0.76	1.29	1.63	2.07	2.50	2.76	3.10	3.60
IJ SFD printer	7.87	12.33	9.66	7.90	5.88	5.00	4.25	3.50	3.00
IJ MFD printer	6.46	10.11	16.09	19.69	23.28	25.00	26.50	28.00	30.50
Sales Total	19.91	28.34	31.52	33.68	35.46	36.44	37.34	38.23	40.56

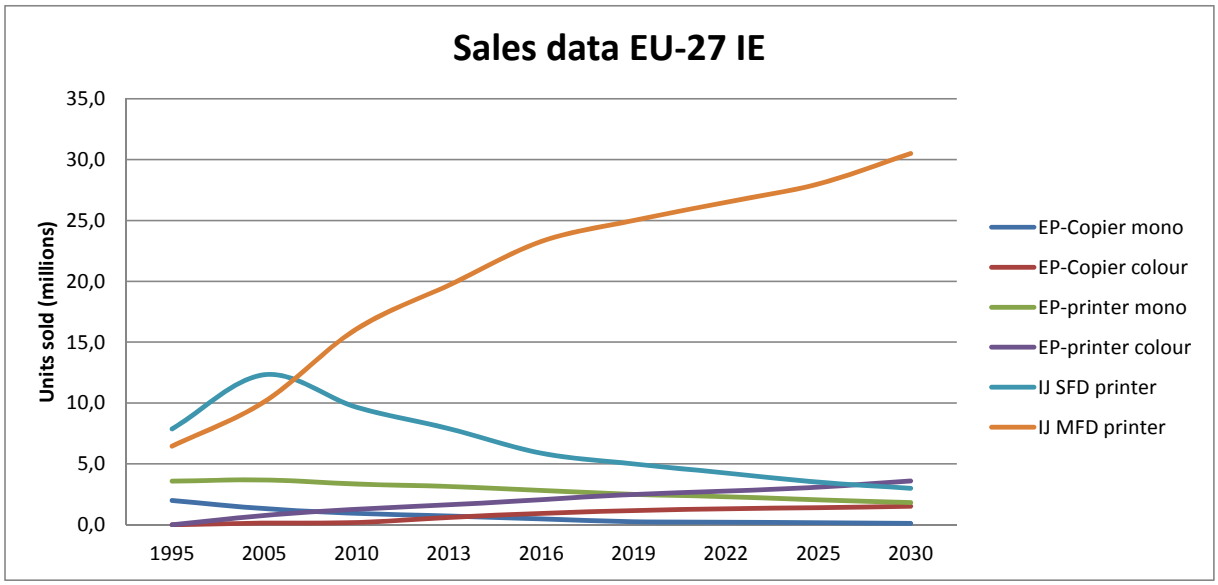

Figure 23: EU-27 IE sales data per base case (in millions)

Stock

[122] http://www.telecompaper.com/news/copier-market-is-currently-around-13-mil-unitsy

Table 19: Stock data IE in EU-27 (millions)

Millions	1995	2005	2010	2013	2016	2019	2022	2025	2030
EP-Copier mono	5.00	5.97	4.12	3.19	2.25	1.31	0.90	0.75	0.50
EP-Copier colour	0.00	0.38	0.69	1.98	3.28	4.57	5.20	5.50	6.00
EP-printer mono	11.91	14.74	14.31	13.01	11.72	10.43	9.40	8.50	7.50
EP-printer colour	0.00	1.92	4.20	5.94	7.68	9.42	10.80	12.00	14.00
IJ SFD printer	29.49	68.41	31.32	27.53	24.00	21.00	18.00	15.00	12.50
IJ MFD printer	24.17	37.85	77.78	85.11	92.00	98.00	104.00	110.00	120.00
Stock Total	70.56	129.27	132.42	136.76	140.93	144.73	148.30	151.75	160.50

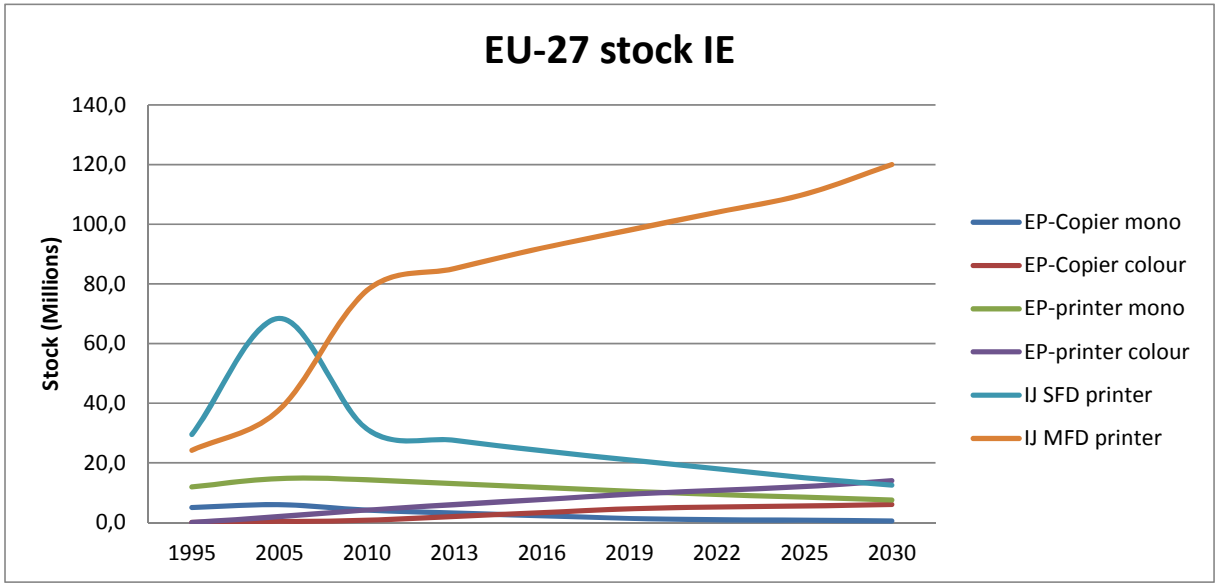

Figure 24: EU-27 stock data IE per base case (in millions)

The BAU shares its input values as regards sales and stock of IE, electricity prices, product life and many more economic variables with the sub-options considered. The impacts of the sub-options are compared with BAU, which provides the reference.

Electricity consumption

BAU

On the basis of the preparatory study data and the research 2012 data the total electricity consumption in the period 2005-2022 of the stock is calculated. For the period 1995-2005 the preparatory study supplies no data and this was derived from the Top Runner trend[123], using 2005 as a stationary point. In 2022 there has been a full stock change of products subject to

[123] In 1997 the weighted average energy consumption efficiency of copiers was 155 Wh/h and in the fiscal year 2006 this was reduced to 42,7 Wh/h. This results in an improvement of 72,5%.

The electricity used in 1997 was 3,5 times the 2006 level and towards 1995 the factor has been increased slightly.

measures proposed here. For 2022-2030 there is some degree of uncertainty of the technological trends and no new measures are envisaged.

Regarding the EP-products the preparatory study assumes that the average energy efficiency improves from factor 0.8 TEC (Energy star v.1.0. requirements) in 2005 to factor 0.7 TEC (Energy star v.1.0. requirements) in 2015.

For the IJ-products the preparatory study assumes a quite high average network standby based on the idea that network capability will increase. This will lead not only to longer periods in which a product might be kept in standby but also to higher power consumption for the maintenance of network integrity. IJ personal MFD (or single function devices) are assumed to be on (standby) 8 hours per day and the IJ workgroup MFD 12 hours per day.

Voluntary

The base cases assessed in the preparatory study were already 45% below the ENERGY STAR v.1.0. TEC requirements, but the authors used the electricity consumption discussed above in the BAU scenario. The base case electricity consumption levels are the basis for the Voluntary scenario, which further on follows the ENERGY STAR v.1.1. and draft v.2.0. criteria. From January 2012 this scenario will follow the requirements that are set out in version 3.5 of the VA. For this scenario, the additional data is available according to the analysis of the EU-ENERGY STAR database performed in 2012. This analysis gave insight in the number of imaging products registered, electricity consumption, duplexing rates (Annex 6 and 7). The 2012 research showed that in 2012 the registered products are on average 40% more energy efficient than required in ENERGY STAR v.1.1. and it is used as reference point for this scenario.

Ecodesign

The Ecodesign scenario will follow the BAU electricity consumption line till the minimum efficiency requirements are set in 2014 (40% below BAU) and 2016 (60% below BAU).

Table 20: Electricity consumption and CO2 emission IE in case of different scenarios

Electricity consumption (TWh)	**1995**	**2005**	**2010**	**2013**	**2016**	**2019**	**2022**	**2025**	**2030**
BAU	27.01	11.97	8.67	8.75	8.69	9.01	9.37	9.74	10.40
Voluntary	27.01	9.04	3.54	2.09	1.26	1.21	1.24	1.27	1.33
Ecodesign	27.01	11.97	8.67	8.75	5.67	3.53	3.68	3.83	4.08
CO2 emissions (Mt)[124]									
BAU	12.56	5.03	3.56	3.51	3.41	3.45	3.49	3.51	3.54
Voluntary	12.56	3.80	1.45	0.84	0.49	0.46	0.46	0.46	0.45
Ecodesign	12.56	5.03	3.56	3.51	2.22	1.35	1.37	1.38	1.39

In the figure below ENERGY STAR is not included as a scenario but as an index level. This is to show how the ENERGY STAR labels requirements help to lower the electricity consumption of imaging equipment and increase energy efficiency.

[124] CO_2 emissions are calculated according to the MEErP methodology 2011 part 2

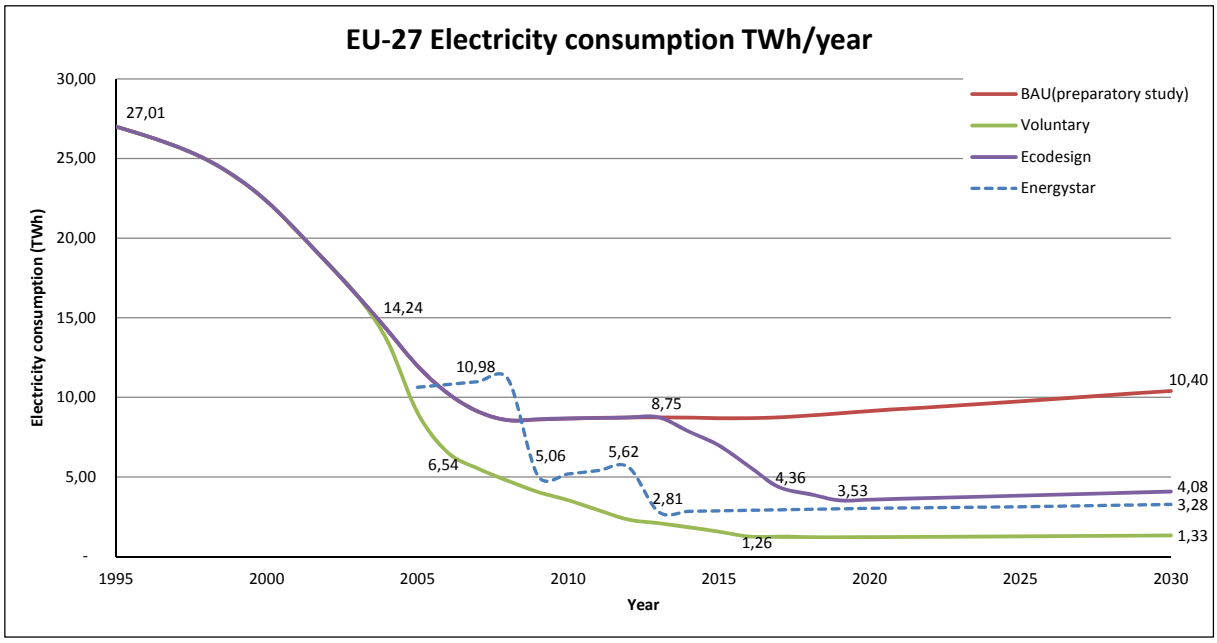

Figure 25: EU-27 total electricity consumption of IE per scenario in TWh/year

Indirect energy

BAU

Single print

According to the preparatory study the average unit is producing 24 400 images per year (122kg/ unit at 80 g/m^2) *single page print* only. On the basis of single page printing the stock would consume 16 100 million kg (16.1 Mt) of paper per year of which 1 700 million kg (1.7 Mt) in the IJ equipment and 14 400 million kg (14.4 Mt) in the EP equipment. Energy consumption to produce this paper would be 645 PJ primary energy[125] and GHG emissions 9.6 Mt CO_2 eq. per year.

Duplexing

In real life duplexing will be used. Assuming 65% duplexing rate and 15% N-printing[126] in 2005, this results in a paper consumption of around 15 000 pages (approximately 75 kg/unit at 80g/m^2). Thus, it is estimated that imaging equipment in the EU27 consumes almost 10 000 million kg (10 Mt) of paper annually, of which 1 700 million kg (1.7 Mt) in IJ equipment and 8 300 million kg (8.3 Mt) in EP equipment. Energy consumption to produce this paper is 400 PJ in primary energy (equivalent to around 40 TWh electricity) and the related greenhouse gas emissions amount to 6 Mt CO_2 equivalent per year.

Voluntary

[125] According to MEErP Office paper 40 MJ/kg

[126] 90% of images are produced by EP equipment, of which 74% has duplex capabilities (according to EU-ENERGY STAR database) that are used in 90% of all prints. 10% of images are produced by IJ equipment, of which 21% has duplex capabilities (according to Energy star database) that are used in 90% of all prints. N-printing (2 images per page) is assumed relevant for medium volume equipment (20-40 ppm, workgroup printing) and for legal documents or similar (large font, large line space, few graphs).

In research 2012, 78% of the registered products were capable of performing duplex printing.

An estimation is made for 2013 (ENERGY STAR version 2.0 will be put into force) were 85% of the registered products will be able to perform duplex printing.

Ecodesign

The ecodesign scenario follows the BAU scenario till the requirements are set in 2014 here they duplexing rate has to be at least 75% of the IE products and in 2016 it has to be 85%.

Table 21: Indirect energy consumption and CO_2 emissions IE in case of different scenarios

Energy consumption (TWh)	1995	2005	2010	2013	2016	2019	2022	2025	2030
BAU	23.42	33.14	38.77	40.04	41.26	42.38	43.42	44.43	46.99
Voluntary	23.42	33.14	36.67	35.11	34.39	35.31	36.19	37.03	39.16
Ecodesign	23.42	33.14	38.77	40.04	38.88	36.47	36.19	37.03	39.16
CO_2 emissions (Mt CO2)									
BAU	3.51	4.97	5.82	6.01	6.19	6.36	6.51	6.66	7.05
Voluntary	3.51	4.97	5.50	5.27	5.16	5.30	5.43	5.55	5.87
Ecodesign	3.51	4.97	5.82	6.01	5.83	5.47	5.43	5.55	5.87

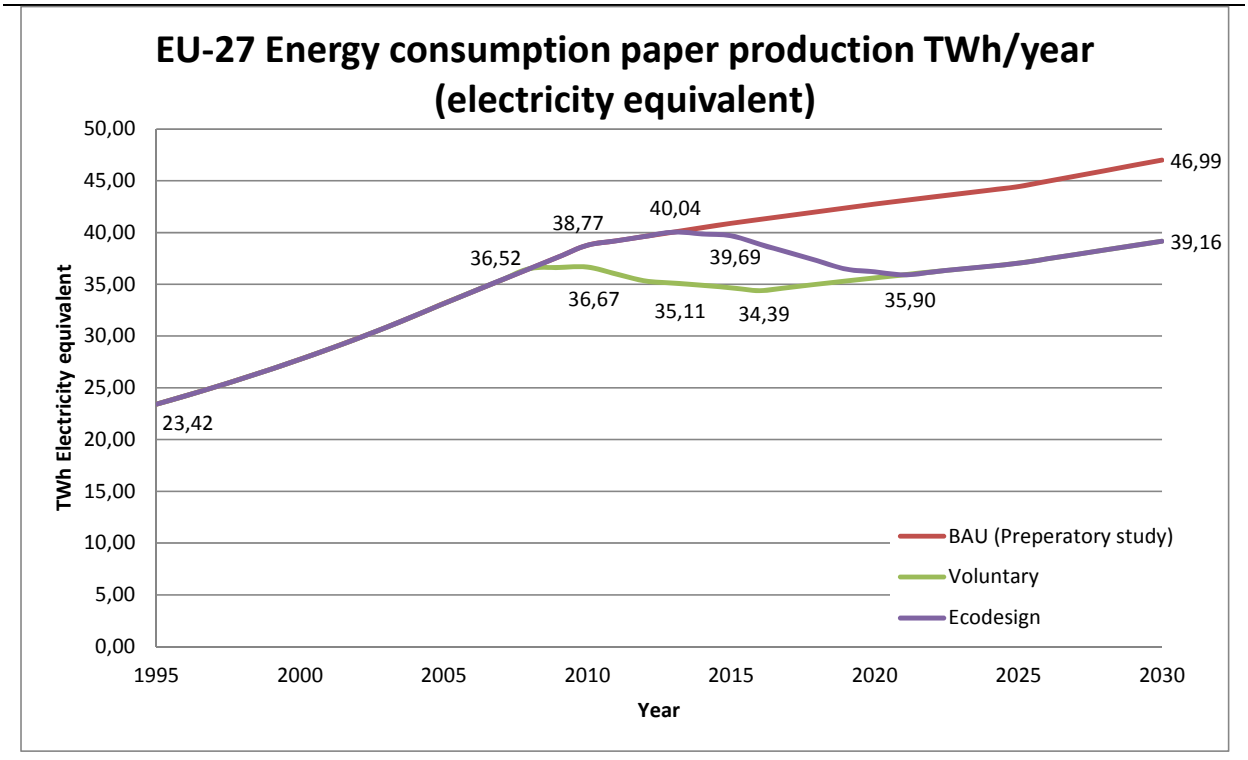

Figure 26: EU-27 indirect paper energy consumption per scenario in TWh/year (electricity equivalent)

Annex 11 COMPLIANCE WITH VA CRITERIA (ART. 17)

According to Article 17 of the Ecodesign Directive, voluntary agreements and other self-regulation presented as alternatives to ecodesign mandatory Regulations shall be assessed on the basis of nine criteria laid down in Annex VIII to the Directive:

1. **Openness of participation -** *Self-regulatory initiatives must be open to the participation of third country operators, both in the preparatory and in the implementation phases.'*

   The process of developing and implementing the agreement has been open to any third companies. The agreement including its requirements has been discussed with all interested stakeholders including at the Consultation Forum meeting. Furthermore, the Steering Committee meetings (two per year) dedicated to the application of the agreement remain open to all interested stakeholders, including companies not-being Signatories. In April 2012 a special website was published to provide all stakeholders with the complete information about the agreement[127].

2. **Added value -** *Self-regulatory initiatives must deliver added value (more than 'business as usual') in terms of the improved overall environmental performance of the product covered.'*

   The agreement aims at improving the energy efficiency of imaging equipment beyond business as usual. A detailed overview of its expected impact and comparison with the other viable option(s) is provided in Chapter 4.2.2 and Chapter 5.

3. **Representativeness -** *Industry and their associations taking part in a self-regulatory action must represent a large majority of the relevant economic sector, with as few exceptions as possible. Care must be taken to ensure respect for competition rules.'*

   The Ecodesign Directive requires that Signatories to the agreement must *'represent a large majority of the relevant economic sector*'. In its explanatory document on voluntary agreements concluded under the Ecodesign Directive[128], the Commission specified that the proven market share of a valid agreement must be at least 70%. So far, 17 manufacturers who represent together over 90% of the European market joined the VA on imaging equipment.[129]

4. **Quantified and staged objectives -** *The objectives defined by the stakeholders must be set in clear and unambiguous terms, starting from a well-defined baseline. If the self-regulatory initiative covers a long time-span, interim targets must be included. It must be possible to monitor compliance with objectives and (interim) targets in an affordable and credible way using clear and reliable indicators. Research information and*

[127] www.eurovaprint.eu

[128] EDWB 2010 Doc03

[129] Percentage is based on the units sold in the EU

scientific and technological background data must facilitate the development of these indicators.

The agreement provides for quantified objectives that can be monitored.[130] As mentioned in Chapter 4.2.2., the agreement sets out unambiguous objectives for energy consumption (TEC and OM), but also for compliance rate, duplexing, recycling and use of cartridges. The Independent Inspector[131] shall compile individual signatory reports into an annual progress report that will be submitted to the Steering Committee. An additional tool that could be used to evaluate the progress[132] could be the EU-ENERGY STAR database.

5. Involvement of civil society

With a view to ensuring transparency, self-regulatory initiatives must be publicised, including through the use of the Internet and other electronic means of disseminating information.

The same must apply to interim and final monitoring reports. Stakeholders including Member States, industry, environmental NGOs and consumers' associations must be invited to comment on a self-regulatory initiative.

The agreement stipulates that meetings of the Steering Committee that governs the application of the agreement are opened to:

- any person representing a signatory or potential signatory to agreement,
- to any representatives of the European Commission or Member States, as well as member states of the EEA or EFTA, and
- organizations that have a permanent seat on the Consultation Forum.

So far, two meetings of the Steering Committee took place with the participation of the above mentioned actors. For minutes from these meetings, please see Annexes 1 and 2. Secondly, the annual reports that will be submitted by the industry to the Commission will be presented and discussed at the Steering Committee meetings and the Consultation Forum meetings. Thirdly, as requested by the Commission and stakeholders, in April 2012 a special website dedicated to the VA was published[133].

6. Monitoring and reporting

Self-regulatory initiatives must contain a well-designed monitoring system, with clearly identified responsibilities for industry and independent inspectors. The Commission services, in partnership with the parties to the self-regulatory initiative, must be invited to monitor the achievement of the objectives.

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[130] VA version 3.5, 15 February 2011, Chapter 6 reporting and monitoring

[131] ERA Technology Ltd

[132] Energy consumption, duplexing

[133] www.eurovaprint.eu

The plan for monitoring and reporting must be detailed, transparent and objective. It must remain for the Commission services, assisted by the Committee referred to in Article 19(1), to consider whether the objectives of the voluntary agreement or other self-regulatory measures have been met.'

➢ *Monitoring*

The Commission, in cooperation with Member States and stakeholders, will monitor the application of the agreement and will consider whether it meets its objectives.

- The monitoring of the agreement will be performed by the Commission mainly on the basis of the annual reports produced by the Independent Inspector[134].

- To properly monitor the progress and results achieved under the agreement, its management has been handed over to the Steering Committee.

- As required by the Directive, the effectiveness of the agreement will be regularly assessed by the Consultation Forum established under Article 18 of the Directive.

- Finally, the effectiveness of the agreement will be assessed in the process of evaluating the Energy Labelling Directive and certain aspects of the Ecodesign Directive (intended to take place in 2014).

For more information see Chapter 4.2.2.

➢ *Reporting*

Each signatory must provide, specified in the agreement, information to the Independent Inspector who will generate reports that will be submitted, for assessment, to the Commission and the Steering Committee and the Consultation Forum. Reporting will be done by Signatories on an annual basis in the format specified in the VA. A company that has failed to comply with its commitments under the agreement will risk forfeiting its signatory status. For more information see Chapter 4.2.2.

7. Cost-effectiveness of administering a self-regulatory initiative

The cost of administering self-regulatory initiatives, in particular as regards monitoring, must not lead to a disproportionate administrative burden, as compared to their objectives and to other available policy instruments.

It is expected that the administrative burden as compared to other available policy instruments will remain limited. For more information see Chapter 5.8.

8. Sustainability

[134] 'ERA' has been chosen to act as the Inspector for the agreement on imaging equipment

Self-regulatory initiatives must respond to the policy objectives of the Ecodesign Directive, including the integrated approach, and must be consistent with the economic and social dimensions of sustainable development. The protection of the interests of consumers, health, quality of life and economic interests, must be integrated

The self-regulatory initiative is in line with the objectives of the Ecodesign Directive and in particular: free circulation, enhanced environmental performance of products in a lifecycle perspective.

9. Incentive compatibility

Self-regulatory initiatives are unlikely to deliver the expected results if other factors and incentives — market pressure, taxes, and legislation at national level — send contradictory signals to participants in the self-regulatory initiative. Policy consistency is essential in this regard and must be taken into consideration when assessing the effectiveness of the initiative.

It is considered that the VA is consistent with existing framework conditions.