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# **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**

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**DG JRC (IPTS) 2011**

## Executive Summary

The purpose of this project is to develop a joint evidence base from which EU policymaking in the area of imaging equipment (office devices with one or more of the following functions: printing, copying, faxing, scanning) can be developed. In this report, EU Ecolabel and Green Public Procurement (GPP) criteria will be devised for imaging equipment in line with Ecolabel Regulation 66/2010 and Communication COM (2008) 400 'Public Procurement for a better Environment'.

In particular, this report focuses on the imaging equipment market. The undertaken generic economic analysis is based on Eurostat data. Its data quality level allows the analysis to serve mainly for general indications instead of precise parameter calculations. The imaging equipment sector is dominated by non-European companies manufacturing mainly outside the EU-27. The production of imaging equipment in the EU-27 is low and in the recent years it decreased having an overall annual production of approximately 5 million devices. Among the different imaging equipment, printers, copiers and multifunctional devices (MFDs) are the most important in terms of production and sales volume. Fax machines come next, whereas digital duplicators have very low production and trade volumes. The trade balance of imports and exports for the EU-27 is negative. The imports are in general much higher than the exports. The calculated apparent consumption in the EU-27 shows that printers and MFDs are the most important products as their values are almost 3 times more than the value of copiers which come next. Moreover, the apparent consumption associated with fax machines is approximately 13 times less than printers. The apparent consumption with digital duplicators is very low.

Regarding market distribution data, the overall stock of imaging equipment in Europe is estimated at approximately 146 million. MFDs have the highest stock shares among the several imaging devices with 54 %, followed by printers with 39 %, while copiers are estimated at 4 % and fax machines at 3 %. The overall annual sales of printers (including MFD printers) range from 25 to 29 million.

Images (e.g. prints, copies and digital images) can be separated between the ones made in a working environment and the ones made at home for private use. The ratio between images produced at work and at home is approximately 20:3. At work mainly EP printers are used which account for 75 % of the total images produced, whereas copiers are responsible for 20 %. At home the picture is different as inkjet printers are used, accounting for 86 % of the total produced images. In this context we should highlight the importance of developing Green Public Procurement (GPP) criteria as these are applicable in the working environment.

Moreover, one of the important market trends is the increased use of multifunctional devices which tend to substitute single functioning devices (SFDs). Furthermore, an increase in small colour photo inkjet printers for private use is expected. Regarding the technological trends the most important are miniaturisation and digitalisation.

The market analysis shows that despite the numerous imaging equipment manufacturers the market is dominated by up to 70 % by 5 producers namely Hewlett-Packard, Canon, Epson, Lexmark and Brother. All of these key market actors also have products bearing the Ecolabel of Blue Angel or Nordic Swan.

Furthermore, the large number of Ecolabel applications on a Member State level indicates a sufficient market penetration potential of an EU Ecolabel on imaging equipment. There are up to 19 different imaging equipment manufacturers with products Ecolabelled by Member States' awarding schemes. The overall amount of applications is over 600. Among them the majority are for multifunctional devices and printers followed by copiers. An important finding is that for Member States Ecolabels there is no application for single functioning fax machines, scanners or digital duplicators. In addition, mailing machines are not included within the scope of the Member States' Ecolabel criteria.

Based on the economic and market analysis outcomes regarding the project product scope, it is proposed to exclude single functioning fax machines, scanners, digital duplicators and mailing machines.

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<b>Abbreviations</b>	
CN8	EUROSTAT Combined Nomenclature Codes (CN8) statistics database
DFE	Digital front end
EP	Electro photography
EU	European Union
GPP	Green public procurement
IJ	Inkjet
ipm	Images per minute
IT	Information technology
LCA	Life cycle assessment
LCD	Liquid crystals diode
LED	Light emitted diode
MFD	Multifunctional device
NACE	NACE is a statistical classification of economic activities in the European Community used by EUROSTAT (Nomenclature statistique des activités économiques dans la Communauté européenne).
OM	Operational mode
PRODCOM	EUROSTAT production and manufacture statistics database
SFD	Single functioning device
TEC	Typical electricity consumption



## 1. Objective

The objective of this report is to give an economic and market analysis of the imaging equipment product group. This analysis shall provide all the necessary information which is relevant for the development of EU Ecolabel and Green Public Procurement criteria with respect to Ecolabel Regulation 66/2010 and Communication COM (2008).

## 2. Intra-community market data on imaging equipment

### 2.1. Generic economic data analysis based on Eurostat

The economic and market analysis is based on data derived by the official EU statistics given in Eurostat [1]. The European market on imaging equipment will be analysed with respect to EU production as well as external and internal EU trade. Afterwards, the apparent consumption is calculated using the values of production and trade.

It should be highlighted that Eurostat datasets are not always complete and a significant uncertainty could generally be expected. In addition, the categories in which the products are classified in Eurostat in some cases apparently do not correspond to the product classification of copiers, printers, MFDs, fax machines and digital duplicators which is undertaken here (i.e. in the PRODCOM code 30021640, there are documented printers and MFDs). Given these limitations, the reliability of the undertaken calculations is reduced. The use of aggregated data per investigated product, i.e. copier, printer, MFDs and fax machine partially compensates for these drawbacks. Moreover, this analysis should serve mainly for obtaining an overview and identifying the significant economic and market parameters of the product group investigated.

#### 2.1.1. Classification of imaging equipment in Eurostat

The generic economic data on imaging equipment was derived from the following databases:

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[<sup>1</sup>] The Official European Statistics Office (Eurostat).  
<http://epp.eurostat.ec.europa.eu/portal/page/portal/prodcom/data/database>

- PRODCOM database on Manufactured Products
- EU-27 Trade since 1995.

PRODCOM is the system used in Eurostat for the collection and dissemination of statistics on the production of manufactured goods. It is based on a product classification scheme which consists of about 4500 headings relating to manufactured products [1]. The classification of the products in PRODCOM follows the statistical classification of economic activities in the European Community known as NACE (Nomenclature des activités économiques dans la Communauté Européenne). Products are detailed on an eight digit level in which the first four digits refer to the NACE classification.

In the period prior to 2007, NACE version 1.1 was in use whereas after 2007 the classification has been according to NACE version 2. In Table 1 the categories of the database PRODCOM corresponding to imaging equipment products are presented. A short description of the products classified in each code is also given.

Table 1: PRODCOM categories corresponding to imaging equipment

<b>Product</b>	<b>PRODCOM code</b>	<b>Description</b>
Copiers	28232100 (NACE 2.0)	Photo-copying apparatus incorporating an optical system or of the contact type and thermo-copying apparatus
	30012150 (NACE 1.1)	Blueprint and diazocopiers (excl. ordinary photographic printing frames)
	30012170 (NACE 1.1)	Electrostatic photocopiers
	30012183 (NACE 1.1)	Blueprinters, diazocopiers and other photocopying apparatus of the contact type
	30012185 (NACE 1.1)	Photocopiers incorporating an optical system, thermocopiers (excluding electrostatic photocopiers and thermo-printers)
	30012190 (NACE 1.1)	Photocopiers incorporating an optical system, thermocopiers and contact type photocopiers (excl. electrostatic photocopiers, blueprinters and diazocopiers)
Printers	26201640 (NACE 2.0)	Printers, copying machines and facsimile machines, capable of connecting to an automatic data processing machine or to a network (excluding printing machinery used for printing by means of plates, cylinders and other components,

	<p>30021630 (NACE 1.1)</p> <p>30021640 (NACE 1.1)</p> <p>30021402 (NACE 1.1)</p> <p>30021430 (NACE 1.1)</p>	<p>and machines performing two or more of the functions of printing, copying or facsimile transmission)</p> <p>Printers</p> <p>Printers, copying machines and facsimile machines, capable of connecting to an automatic data processing machine or to a network (excluding printing machinery used for printing by means of plates, cylinders and other components)</p> <p>Printers and plotters</p> <p>Printers and plotters</p>
Multifunctional devises	<p>26201800 (NACE 2.0)</p> <p>29561499 (NACE 1.1)</p> <p>32202080(NACE 1.1)</p>	<p>Machines which perform two or more of the functions of printing, copying or facsimile transmission, capable of connecting to an automatic data processing machine or to a network</p> <p>Other printing apparatus, copying machines and facsimile machines (excluding printing machinery used for printing by means of plates, cylinders and other components, machines capable of connecting to an automatic data processing machine)</p> <p>Machines which perform two or more of the functions of printing, copying or facsimile transmission, capable of connecting to an automatic data processing machine or to a network</p>
Fax machines	32202075 (NACE 1.1)	Facsimile machines
Digital duplicators	30012330 (NACE 1.1)	Hectograph or stencil duplicating machines
Scanners	Correlation was not appropriate. Scanners are subsumed in large aggregated categories (30021405, 30021450, 30021679, 33403235) for which only scarce data is available	
<p>Source: EUROSTAT, PRODCOM.  <a href="http://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC">http://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC</a></p>		

It is important to emphasise here that many of the NACE categories refer to more than one piece of imaging equipment. The correspondence between the content of the PRODCOM categories to the investigated imaging equipments, i.e. printers, copiers, multifunctional devices, fax machines and digital duplicators is not always

straightforward. One example is PRODCOM category 30.02.16.40 which refers to copiers, printers and fax machines.

In such cases, the reasoning of the category allocation to a single product was based on the following points: initially, how well the products were covered in the remaining categories was considered (e.g. copiers are covered in NACE 1.1 in five other categories whereas printers are covered in three other categories). Thus, it was assumed that the better a product was covered, the less represented it was in a mixed product category. Afterwards, the category was allocated to the product which was considered to have the greatest share. However, the allocation is rather ambiguous. Hence, we should point out that precise calculations and conclusions concerning one product category versus another could be risky.

In addition, in PRODCOM categories, scanners are subsumed in a larger product group together with keyboards and other input and output devices (PRODCOM codes: 30.02.14.05, 30.02.14.50, 30.02.16.79 and 33.40.32.35). Moreover, the availability of data for these categories was very low. Therefore further investigation on scanners was not possible.

Another point which needs to be emphasised is the ambiguous way in which data is correlated to multifunctional devices. Multifunctional devices in general could have been documented in different categories especially in the older NACE 1.1 classification and in the case of products in which one of their functions dominates. In such cases, the product is likely to be categorised as the product category corresponding to its main function (e.g. if the main function is printing it is categorised as a printer). Thus, an underestimation of statistical data corresponding to MFDs could be expected.

Similarly to Table 1, Table 2 presents the classification codes used in Eurostat EU Trade statistics which refer to imaging equipment. In the EU-27 trade statistics, the Combined Nomenclature codes are used, CN8.

Trade statistics are also available via the PRODCOM database. However, the reference of EU-27 trade is more appropriate in this investigation as here the imports and exports are differentiated between those which take place within the EU-27 and those which take place between EU-27 countries and third countries.

Table 2: EU-27 Trade categories covering imaging equipment

<b>Product</b>	<b>EU-27 Trade code CN8</b>	<b>Description</b>
Copiers	90.09.11.00	Electrostatic photocopying apparatus, operating by reproducing the original image directly onto the copy [direct process]
	90.09.12.00	Electrostatic photocopying apparatus, operating by reproducing the original image via an intermediate onto the copy [indirect process]
	90.09.21.00	Photocopying apparatus, incorporating an optical system (excl. Electrostatic)
	90.09.22.10	Photocopying apparatus of the contact type
	90.09.22.00	Blueprinters and diazo-copiers
	90.09.22.90	Photocopying apparatus, of the contact type (excl. blueprinters and diazo-copiers)
	90.09.30.00	Thermo-copying apparatus (excl. thermo-printers)
Printers	84.43.32.10	Printers capable of connecting to an automatic data processing machine or to a network
	84.43.39.90	Printers and facsimile machines (excl. those capable of connecting to an automatic data processing machine or to a network)
	84.71.60.20	Printers for digital automatic data-processing machines, whether or not containing storage units in the same housing
	84.71.92.20	Printers, for digital automatic data processing machines (excl. such machines for use in civilian aircraft of subheading 8471.92-10)
	84.71.60.40	Printers, for digital automatic data processing machines, whether or not containing storage units in the same housing (excl. for use in civil aircraft of subheading 8471.60.10)
Multifunctional devises	84.43.31.91	Machines which perform at least one of the functions of printing or facsimile transmission in addition to the function of copying by scanning the original and printing the copies by means of an electrostatic print engine, capable of connecting to an automatic data processing machine or to a network (excl. those performing the functions of copying and facsimile transmission with a copying speed $\leq$ 12 monochrome pages/minute)

	84.43.31.10	Machines performing the functions of copying and facsimile transmission, whether or not with a printing function, with a copying speed $\leq$ 12 monochrome pages/minute, capable of connecting to an automatic data processing machine or to a network
	84.43.31.99	Machines which perform two or more of the functions of printing, copying or facsimile transmission, capable of connecting to an automatic data processing machine or to a network (excl. Those performing the functions of copying and facsimile transmission with a copying speed $\leq$ 12 monochrome pages/minute and those performing the function of copying by scanning the original and printing the copies by means of an electrostatic print engine)
Fax machines	84.43.32.30	Facsimile machines capable of connecting to an automatic data processing machine or to a network
	85.17.82.10	Facsimile machines for line telegraphy
	85.17.21.00	FAX machines for line telephony
Digital duplicators	84.72.10.00	Duplicating machines "hectograph or stencil" (excl. printing machines and photocopying or thermo-copying machines)
Scanners	Correlation was not appropriate. Scanners are subsumed in large aggregated categories for which scarce data is available	
<p>Source: Eurostat, PRODCOM.  <a href="http://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC">http://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC</a></p>		

### 2.1.2. Production of imaging equipment in the EU-27

In Table 3 the production of imaging equipment in the EU-27 for the years 2000 to 2009 is presented. The data is derived from the PRODCOM statistics. In Table 3 the values are aggregated, each one referring to an investigated product, e.g. copier, printer, MFD. The total production of imaging equipment was also calculated. The calculation was undertaken adding the values reported by Eurostat EU-27 of the respective product codes. In a few cases in which the EU-27 values were not available, EU-15 references had to be used. The production is expressed in quantity (units produced) and in values (million euros). The correlation between PRODCOM codes and products is given in Table 1.

Before presenting and interpreting the data of the EU-27 production of imaging equipment, it is important to emphasise that the PRODCOM data is not complete. Therefore, the analysis can serve only for general indications. In particular, the empty cells in Table 1 mean that either no data was documented or the used PRODCOM code was not valid for that particular year.

In Table 3, there is no data input for copiers after 2007 whereas for the MFDs the same is true prior to 2007. This is because during this time period, MFDs were documented in the PRODCOM code 30.02.16.40 which refers to printers. Similar to this is the case of fax machines. Fax machines are classified in both NACE 1.1 and NACE 2 but no data were reported after 2006.

Figure 1 presents the overall EU-27 production of imaging equipment between 2000 and 2009, whereas Figure 2 gives the production per product. In both cases the production value is expressed in euros.

Table 3. Production of imaging equipment in the EU-27 in the years 2000-2009 according to PRODCOM statistics

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Copiers</b>	Quantity	684707	281096	592668	511869	483812	394703	312000		1200	400
	Value in million euros	1648.586	1513.486	1498.747	1041.4	1077.952	1016.203	750		3	3
<b>Printers</b>	Quantity	13600000	11961282	5463432	9000000	6000085	5429939	4375355	3600000	1790295	1151821
	Value in million euros	2273.838	1773.457	671.2625	954.7814	944.6157	863.4102	788.9935	1345.973	1163.587	901.559
<b>MFD</b>	Quantity								1761528	1282393	1899347
	Value in million euros								4.85E+08	5.08E+08	8E+08
<b>Digital Duplicator</b>	Quantity	2100	400	320	0	0	0	0	0		
	Value in million euros	15	8	2.8	0	0	0	0	0		
<b>FAX</b>	Quantity	3471854	2115640	2635183	3695803	3673470	921112	211209			
	Value in million euros	488.8732	308.8615	319.1099	331.1113	320.9283	111.9118	45.20226			
<b>Total</b>	Quantity	17758661	14358418	8691603	13207672	10157367	6745754	4898564	5361528	3073888	3051568
	Value in million euros	4426.297	3603.805	2491.92	2327.293	2343.496	1991.525	1584.196	1831.121	1675.081	1704.559

NB: An empty cell means that either no data were reported or the codes were not valid in these years. Zero value means that zero production was reported.



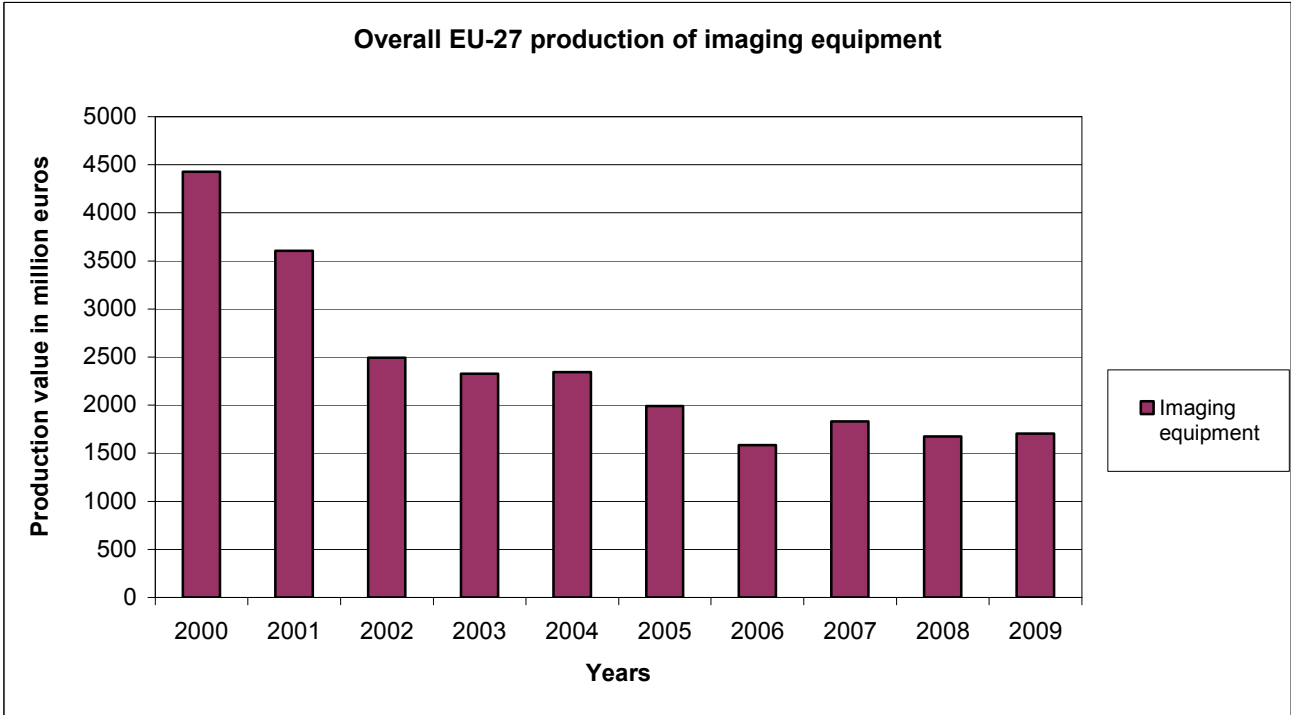


Figure 1. Overall EU-27 production of imaging equipment expressed in million Euros (Source: calculations on Eurostat data)

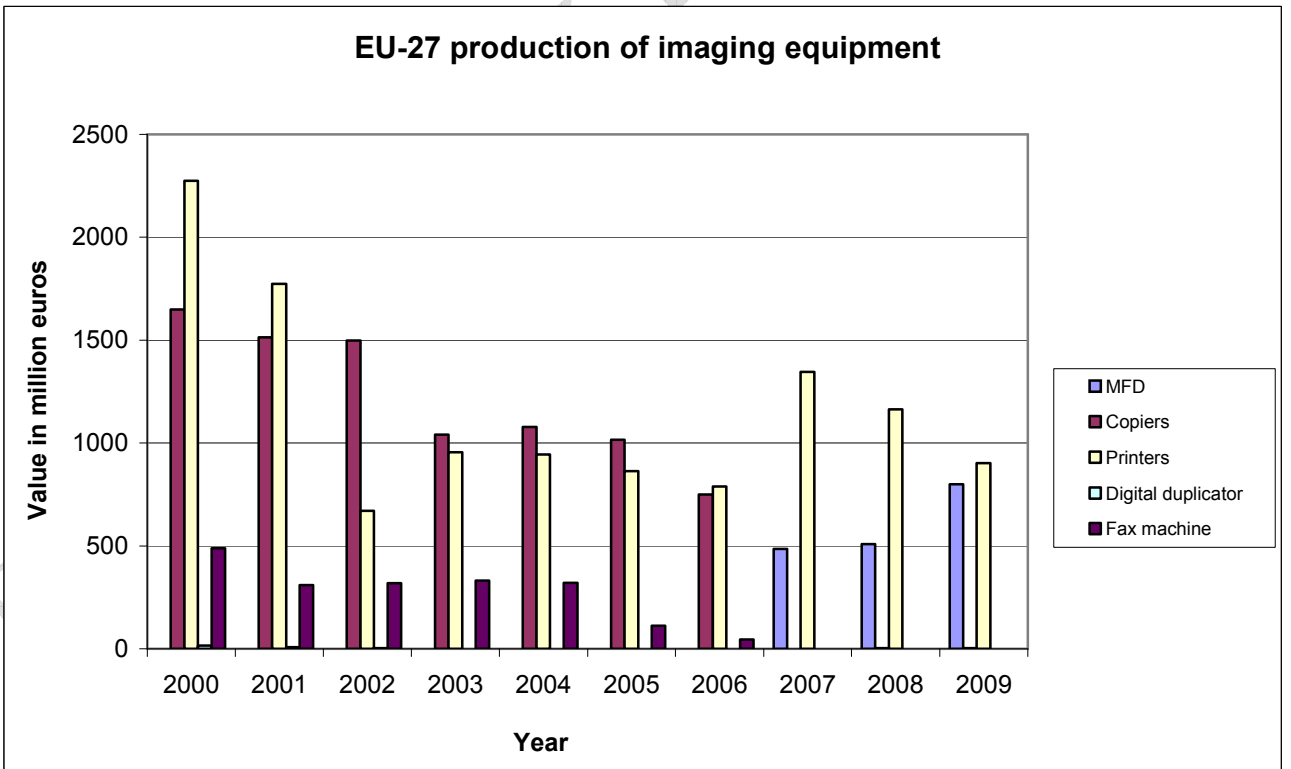


Figure 2. EU-27 production of imaging equipment expressed in million euros (Source: calculations on Eurostat data)

Based on Figure 1 we could detect that the value of the overall EU-27 production of imaging equipment ranges from almost EUR 4500 to 1500 million declining from 2000 to 2009. Moreover, based on Figure 2 it can be identified that among imaging equipment, printers together with copiers are the product groups which show the highest production value in EUR in recent years.

The production value of fax machines is more than a factor of 3 lower than the one of the dominating product groups whereas the value production of digital duplicators is extremely low. However, the production value of MFDs which are documented after 2007 is rather significant and shows a constant increase. In 2009 MFDs reached almost the value of the production of printers.

In Figure 3 the EU-27 production given in units is expressed. Again printers are the dominating product group followed by copiers. Similar to the value of production, a decline in the quantity produced can be identified during the period 2000 to 2007. The overall production of imaging equipment ranges from 17 758 000 in 2007 to 3 052 000 in 2009. However, due to data gaps it could be expected that a value of approximately 5 million could be more representative. In general, the overall current production in Europe seems to be rather low with a declining trend.

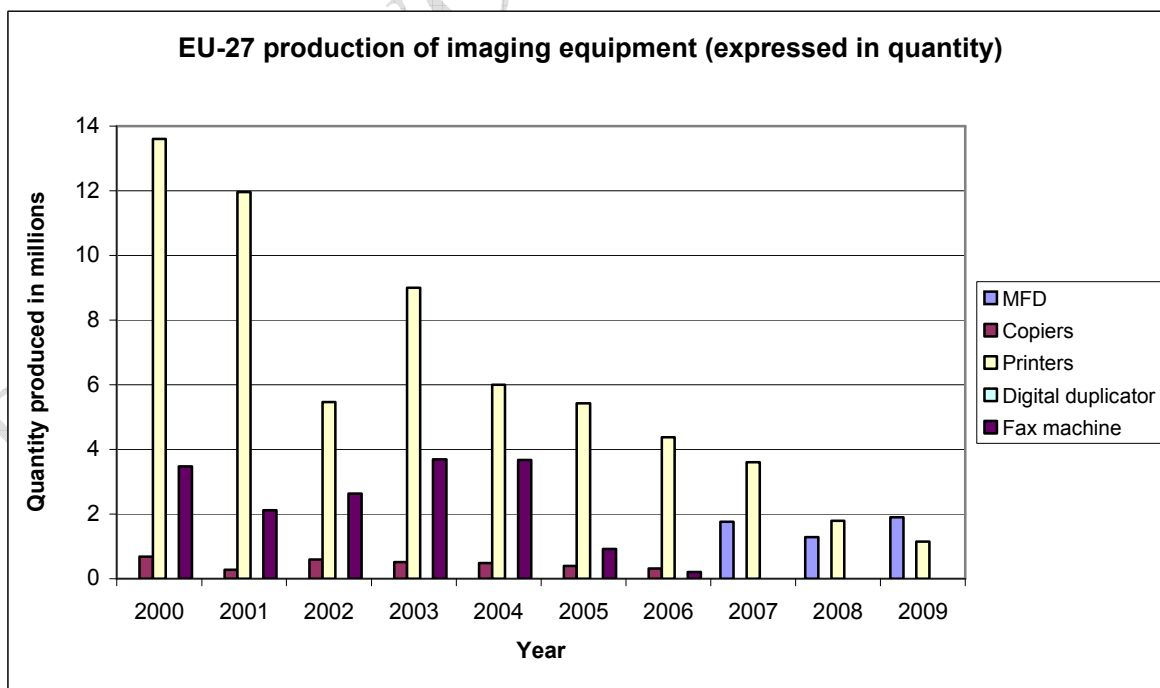


Figure 3. EU-27 production of imaging equipment expressed in million units (Source: Calculations on EUROSTAT data)

It would be worth investigating which Member States are manufacturing imaging equipment and what their manufacturing capacity is. According to the PRODCOM statistics, significant volumes of produced imaging equipment were reported for France, Germany, Italy, the United Kingdom, Austria, Denmark, Sweden, Poland, and Spain. The kind of manufactured product, its applied technology, as well as its produced volume varies significantly among the different countries. In general larger volumes are reported from France, Germany, Italy, United Kingdom and also Poland which shows a rather significant contribution in the case of printers.

In the remaining Member States Bulgaria, Romania, Hungary, the Czech Republic and Slovakia for a short time period low volumes of production were reported whereas for the rest of the EU-27, country-specific data was neither reported nor available.

The best data availability for imaging equipment is found in the category of printers (PRODCOM codes 30.02.16.30 and 26.20.16.40). For printers, the countries with the highest production volume are Italy, the United Kingdom, Germany and France. Table 4 presents the production of printers expressed in units produced after the year 2000 as reported in the PRODCOM codes 30.02.16.30 and 26.20.16.40. Table 4 shows the visible data gaps which would hamper a more detailed analysis.

Table 4. Production of printers in EU-27 Member States from 2000 to 2009

Country	Product: <b>printers</b> PRODCOM 30.02.16.30 (NACE 1.1.)						Product: <b>printers</b> PRODCOM 26.20.16.40 (NACE2.)			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Austria	0	0			0	0	0	0	0	
Belgium										
Bulgaria		0	0	0	85				2005	
Croatia		0	0	0	0	0	0	0	0	0
Cyprus				0	0	0	0	0	0	0
Czech Rep.		0								
Denmark	544	445	370	294	372	395	330	4316	1112	857
Estonia	0	0	0	0	0	0	0	0	0	0
Finland	0			0	0	0	0		0	0
France			355 014	107 326	76 483	98 663	101 570	375 134	270 234	228 168
Germany	98 719	104 057	104 017	104 018	99 955	81 901	15 032			32 794
Greece		0		0	0	0	0	0	0	0
Hungary			4 198 000							
Iceland	0	0	0	0	0	0	0	0	0	0
Ireland										
Italy	1 009 287	829 580	661 065	574 395	489 364	353 548	235 952	162 617	137 899	81 846
Latvia		0	0	0	0	0	0	0	0	0
Lithuania	0	0				82	0	0	0	0
Luxemburg	0	0	0	0	0	0	0	0	0	0
Malta				0	0	0	0	0	0	0
Netherlands					0	0	0			
Norway					0	0	0	0	0	0
Poland			20 288	0	22 019	25 382	24 107		0	38 080
Portugal	0	0	0	0	0	0	0			
Romania	0				0		0		0	0
Slovakia			0	0				0	0	0
Slovenia										0
Spain	8 981 972	8 808 834	12 692	8907						0
Sweden	2752									
United Kingdom	1 652 916	1 413 297	111 986		603 658	489 227	491 080	104 997	79 712	134 739

NB: An empty cell means that either no data were reported or the codes were not valid in these years. Zero value means that zero production was reported.

(Source: EUROSTAT PRODCOM code 30.02.16.30 and 26.20.16.40).

### 2.1.3. External EU-27 trade of imaging equipment

The trade of imaging equipment is documented in the European database of PRODCOM and of EU-27 trade. The trade figures in PRODCOM do not differentiate if they are between Member States or between Member States and third countries. On the contrary, in the EU-27 trade statistics, the imports and exports between the community and third countries are differentiated. Therefore, the EU-27 trade database was selected.

In Table 5 the import and export data of imaging equipment between the EU-27 and third countries for the years 2000 to 2009 are presented. The values in Table 5 are aggregated ones and refer to the traded quantity. The calculation was made by adding per product the values reported in Eurostat of the respective EU-27 trade codes which are given in Table 2. The total traded quantity of imaging equipment was calculated afterwards by summing up the values of the different products.

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Table 5. Import and export quantity of imaging equipment in the EU-27 in the years 2000-2009 by Eurostat EU-27 trade data

Product		Time period									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Copiers	Import	1 148 665	1 187 721	3 379 432	2 207 172	2 830 681	4 341 535	8 550 255			
	Export	2 353 65	247 208	458 457	739 300	766 980	898 103	1 140 952			
	(Import-export)	913 300	940 513	2 920 975	1 467 872	2 063 701	3 443 432	7 409 303			
Printers	Import	19 195 686	23 472 712	27 671 096	29 319 409	33 531 962	31 269 907	30 395 522	24 275 133	20 079 050	13 694 691
	Export	4 609 417	4 958 162	5 702 258	7 614 984	7 973 410	8 753 755	7 111 727	5 460 821	4 874 226	3 667 544
	(Import-export)	14 586 269	18 514 550	21 968 838	21 704 425	25 558 552	22 516 152	23 283 795	18 814 312	15 204 824	10 027 147
MFDs	Import								20 325 952	23 249 932	19 905 307
	Export								2 137 181	3 810 982	2 712 353
	(Import-export)								18 188 771	19 438 950	17 192 954
Fax machines	Import	3 438 171	2 555 894	2 516 905	2 413 752	3 347 943	3 804 372	4 716 851	2 005 249	1 367 056	946 917
	Export	227 235	224 299	213 306	227 579	381 675	554 404	705 142	101 294	61 069	63 020
	(Import-export)	3 210 936	2 331 595	2 303 599	2 186 173	2 966 268	3 249 968	4 011 709	20 224 658	1 305 987	883 897
Digital duplicators	Import	28 665	13 308	30 717	16 842	35 799	20 116	15 357	30 781	308 021	181 445
	Export	30 854	20 201	9001	37 924	32 825	15 271	22 500	1 023 482	14 368	12 473
	(Import-export)	-2189	-6893	21 716	-21 082	2 974	4845	-7143	-992 701	293 653	168 972
Imaging equipment	Import	20 373 016	24 673 741	31 081 245	31 543 423	36 398 442	35 631 558	38 961 134	64 957 818	45 004 059	34 728 360
	Export	4 875 636	5 225 571	6 169 716	8 392 208	8 773 215	9 667 129	8 275 179	8 722 778	8 760 645	6 455 390
	(Import-export)	15 497 380	19 448 170	24 911 529	23 151 215	27 625 227	25 964 429	30 685 955	56 235 040	36 243 414	28 272 970

NB: An empty cell means that either no data were reported or the codes were not valid for that year.

Source: calculations on Eurostat EU-27 trade data.

Based on the data in Table 5, Figures 4 and 5 have been drawn. As can be seen in Figure 4, imported printers is the product group which shows the highest traded units during the investigated period of time. MFDs which are reported after 2006 also have a high number of traded items. During the period of 2000-2006 MFDs were possibly subsumed under the label codes of printers. The highest traded quantity of copiers is reported in 2006 with 8 555 000 items imported while for the period 2006-2009 no data were available. The copiers product category shows a positive trend during the investigated time frame while for the other products either a trend is negative (i.e. printers and fax machines) or the trade units have remained rather stable.

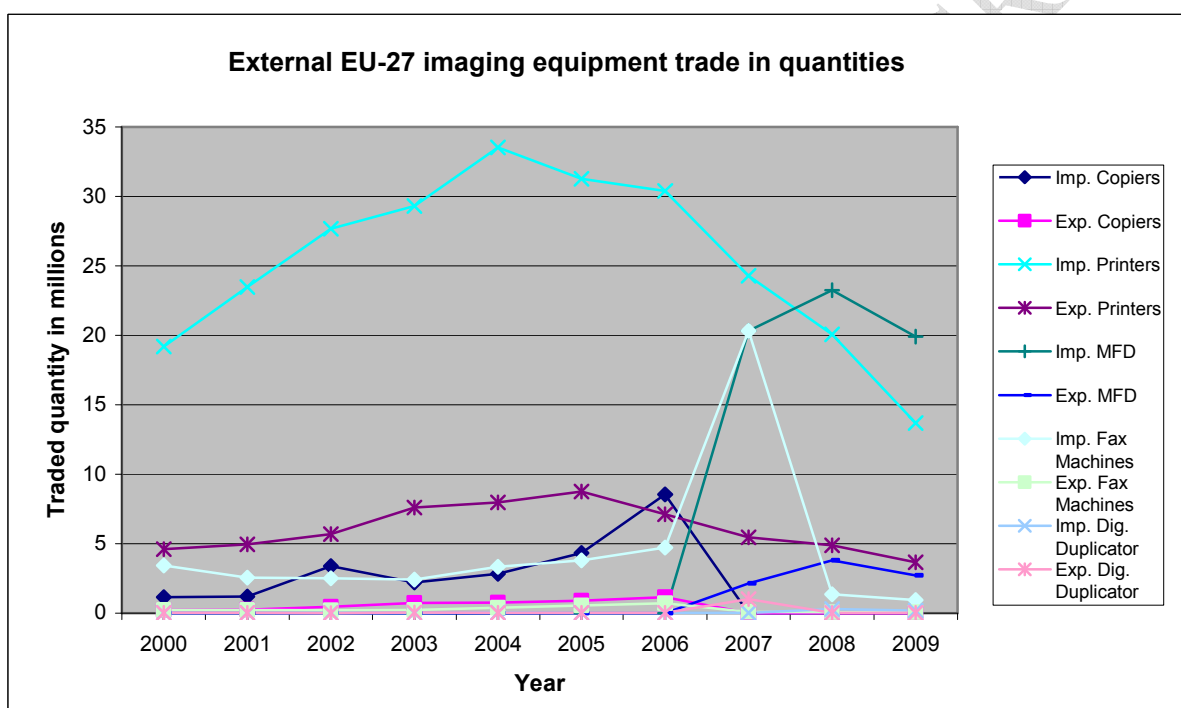


Figure 4 External trade of imaging equipment in the EU-27 during the period 2000-2009 expressed in million traded units (*Source*: calculations on Eurostat EU-27 trade data).

Another important aspect to investigate in the external EU-27 trade data is the balance between imports and exports. The traded quantities as calculated in Table 5 show that the balance for the imaging equipment is negative for Europe meaning that the imports are much higher than the exports. The only exception to this is the case of digital duplicators for which the exports are higher than the imports. Nevertheless, the traded quantity of digital duplicators compared with other imaging equipment is very low. The trade balance for copiers is always under 7.5 million whereas in the case of MFDs and of printers, the trade balance reaches values in the range of 10 million to 20 million units.

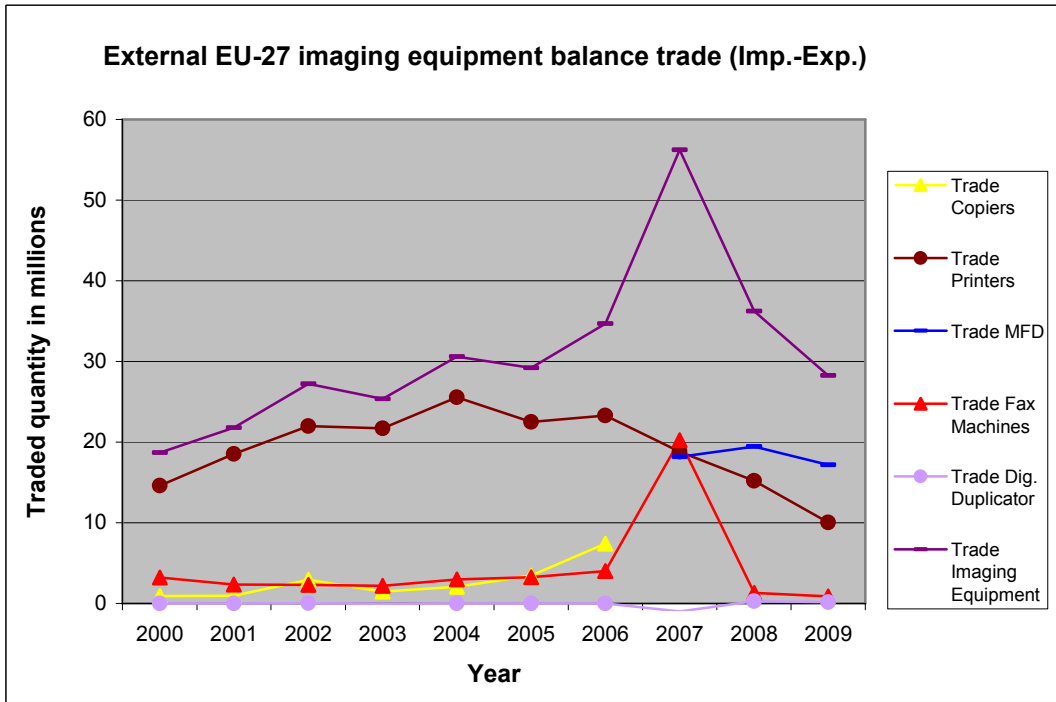


Figure 5. Import/export balance of imaging equipment in the EU-27 during the period 2000-2009 expressed in million traded units.  
 Source: calculations on EUROSTAT EU-27 trade data.

Table 6 presents the external EU-27 trade of imaging equipment expressed in euros. Based on this information, printers are the category with the highest trade expressed in euros followed by MFDs.



Table 6. Imaging equipment export and import outside the EU common market in Euros in the EU-27 for the years 2000-2009

Product		Year									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Copiers	Import	1439286689	1420601286	1502740625	1270820527	1476717591	1578276424	2130311264			
	Export	354447164	291857988	307287557	397161094	395800290	330204121	355063094			
	(Import-Export)	1084839525	1128743298	1195453068	873659433	1080917301	1248072303	1775248170			
Printers	Import	3016882207	3527791391	3703795942	3960068254	3969910754	3667024710	3694312996	3026970370	2636081518	1721878259
	Export	1461136097	1487747737	1285033018	1320468307	1336588088	1488356055	1503573823	1177129722	998435072	876252841
	(Import-Export)	1555746110	2040043654	2418762924	2639599947	2633322666	2178668655	2190739173	1849840648	1637646446	845625418
MFDs	Import								2312687720	2537029485	2150097589
	Export								388981424	372764238	414633921
	(Import-Export)	0	0	0	0	0	0	0	1923706296	2164265247	1735463668
Fax machines	Import	839273226	639753559	516488623	390826483	436195139	419375794	426813707	146394720	88486948	49012854
	Export	43176441	48345550	52722788	46142759	71215136	109467202	138196344	9806657	6411627	6272012
	(Import-Export)	796096785	591408009	463765835	344683724	364980003	309908592	288617363	136588063	82075321	42740842
Digital duplicators	Import	35734497	28211412	28232349	23941396	14845472	20757752	27195791	17514674	13360319	9460856
	Export	7138063	8949918	4830189	8501914	9017898	8458514	9542599	10234778	5424112	3048641
	(Import-Export)	28596434	19261494	23402160	15439482	5827574	12299238	17653192	7279896	7936207	6412215
Imaging equipment	Import	5331176619	5616357648	5751257539	5645656660	5897668956	5685434680	6278633758	5503567484	5274958270	3930449558
	Export	1865897765	1836901193	1649873552	1772274074	1812621412	1936485892	2006375860	1586152581	1383035049	1300207415
	(Import-Export)	3465278854	3779456455	4101383987	3873382586	4085047544	3748948788	4272257898	3917414903	3891923221	2630242143

NB: An empty cell means that either no data were reported or the codes were not valid for that year. Imaging equipment external export and import means export and import outside the EU common market.

Source: calculations on Eurostat EU-27 trade data.

Table 7. Average price (in EUR) of imaging equipment based on export and import data outside the EU common market from 2000-2009

Product		Time Period									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Copiers	Import	1253	1196	445	576	522	364	249			
	Export	1506	1181	670	537	516	368	311			
Printers	Import	157	150	134	135	118	117	122	125	131	126
	Export	317	300	225	173	168	170	211	216	205	239
MFDs	Import								114	109	108
	Export								182	98	153
Fax	Import	244	250	205	162	130	110	90	7	65	52
	Export	190	216	247	203	187	197	196	97	105	100
Digital duplicators	Import	1247	2120	919	1422	415	1032	1771	569	43	52
	Export	231	443	537	224	275	554	424	10	378	244
Imaging equipment	Import	224	206	171	166	148	144	144	85	117	113
	Export	366	337	258	206	198	189	223	182	158	201

NB: An empty cell means that either no data were reported or the codes were not in valid in that year.

Source: calculations on Eurostat EU-27 trade data.

Moreover, using data from Tables 5 and 6 we can calculate an indicative average price of the external EU-27 traded imaging equipment by dividing the trade values in euros by the respective traded quantity. This information is presented in Table 7. The average price of imaging equipment shows a clear decline over the years and for the reported data of 2009, the average price of any traded imaging product is lower than EUR 250. Among the different products, the average price of digital duplicators is the highest followed close by the average price of copiers. Although in the past the average price varied strongly among the different products, in recent years this does not seem to be the case. The average price difference in 2009 is very low (see Figure 6).

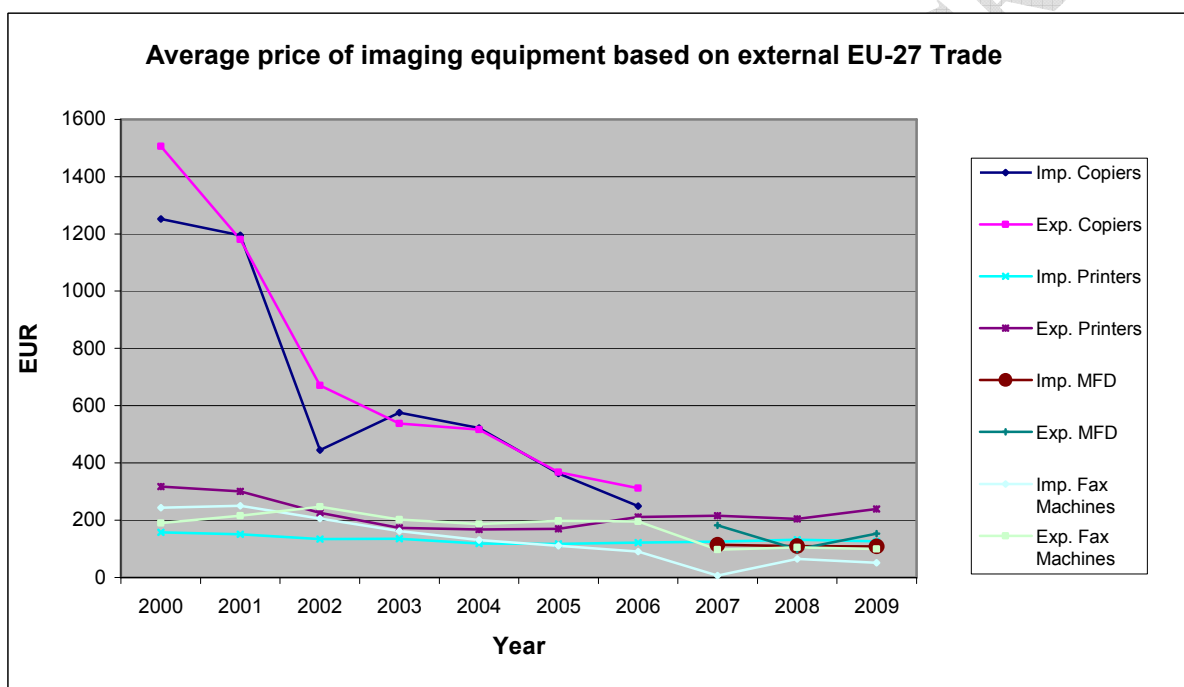


Figure 6 Indicative average price of imaging equipment in the EU-27 in the period 2000-2009 expressed in euros.

Source: calculations on Eurostat EU-27 trade data.

#### 2.1.4. Internal EU-27 trade of imaging equipment

The internal EU-27 trade data refer to the "imports and exports from one Member State to another". In Table 8 the export and import of imaging equipment within the European Union for the years 2000 to 2009 is presented. Similar to the analysis of external EU-27 trade, the presented values are aggregated per investigated product. The aggregation is based on the EU-27 trade codes presented in Table 2. The total internal traded quantity of imaging equipment was afterwards calculated by summing up the values of the different products.

Table 8. Quantity of imaging equipment export and import inside the EU common market for the years 2000-2009 by Eurostat EU-27 trade

Product		Year									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Copiers	Import	1791274	5764433	2826365	4027474	5557526	6853314	7811934			
	Export	1309225	1397135	2951527	4104818	4926309	5498524	7248274			
	(Import-Export)	482049	4367298	-125162	-77344	631217	1354790	563660			
Printers	Import	34397849	30759597	24713204	26693227	30580178	38092004	27022119	24376315	17698272	13411281
	Export	34571774	31300945	25902920	34928397	28295407	29060798	29050201	23860383	19538590	12556594
	(Import-Export)	-173925	-541348	-1189716	-8235170	2284771	9031206	-2028082	515932	-1840318	854687
MFD	Import								16675914	18747132	17436967
	Export								17860531	19685993	18519407
	(Import-Export)								-1184617	-938861	-1082440
Fax machines	Import	5436844	4654656	3698265	3963696	3973933	4227075	88598134	1250720	790461	702374
	Export	4843079	4250979	3381790	3071843	3190878	3659651	3227966	927648	997848	859603
	(Import-Export)	593765	403677	316475	891853	783055	567424	85370168	323072	-207387	-157229
Digital Duplicators	Import	62130	39747	43610	149099	173642	78084	52828	157628	134275	190523
	Export	33709	13387	12176	16667	36183	11625	10640	14350	10246	19663
	(Import-Export)	28421	26360	31434	132432	137459	66459	42188	143278	124029	170860
Imaging equipment	Import	41688097	41218433	31281444	34833496	40285279	49250477	123485015	42460577	37370140	31741145
	Export	40757787	36962446	32248413	42121725	36448777	38230598	39537081	42662912	40232677	31955267
	(Import-Export)	930310	4255987	-966969	-7288229	3836502	11019879	83947934	-202335	-2862537	-214122

NB: An empty cell means that either no data were reported or the codes were not valid for that year.

Source: calculations on eurostat EU-27 trade data.

The data in Table 8 was the basis for Figure 7 in which the internal trade of imaging equipment expressed in number of traded units is shown. In general the internally traded quantity in the EU-27 remains for recent years below 20 million. In the period prior to 2007, the traded quantity of printers ranges between 20 million – 40 million, whereas for other imaging products the traded quantities are lower than 7 800 000. Similar to the external EU-27 traded data, the highest number of traded quantity is found for printers followed by MFDs. In addition, based on data in Table 8 a peak value in imports of fax machines can be identified in 2006. This extreme value is difficult to explain and raises questions regarding its reliability.

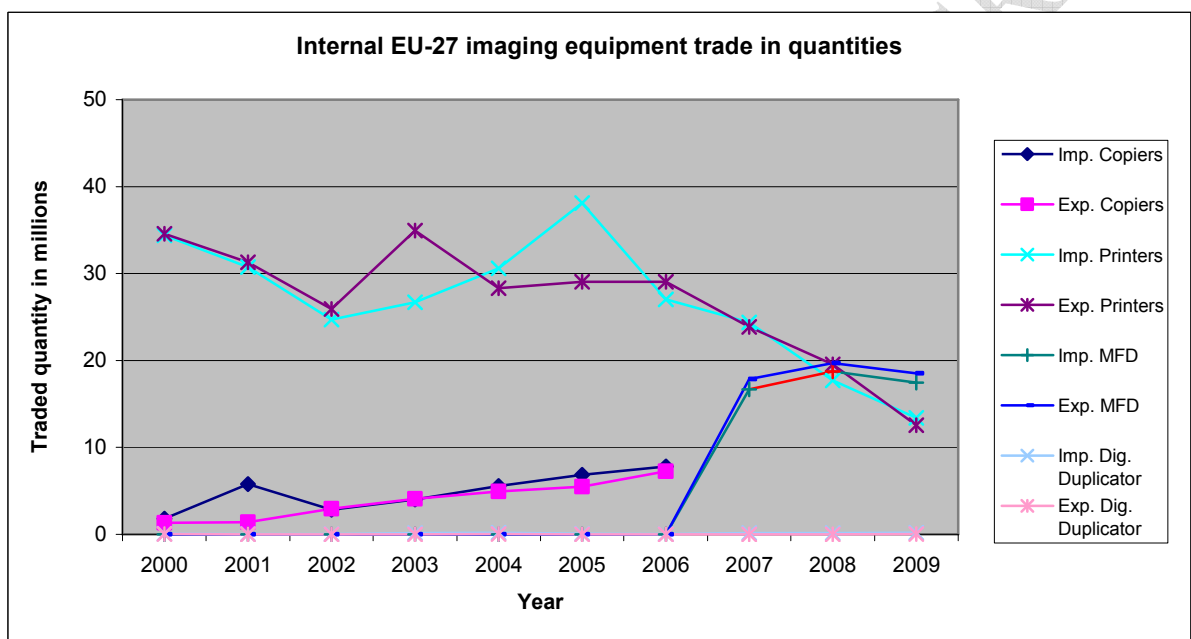


Figure 7 Internal trade of imaging equipment in the EU-27 during the period 2000-2009 expressed in million traded units  
 Source: calculations on Eurostat EU-27 trade data.

Table 9. Imaging equipment export and import inside the EU common market in euros in the EU-27 for the years 2000-2009

Product		Year									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Copiers	Import	1931894627	1711901341	1864223642	1804881564	1962430434	2200164678	2561377104			
	Export	2037708928	1827210880	2073653043	2043804922	2010789837	2333633479	2667536843			
	(Import-Export)	-105814301	-115309539	-209429401	-238923358	-48359403	-133468801	-106159739			
Printers	Import	6039393461	5703035025	4554316991	4103272021	4213772610	4287285847	4444212234	4177093481	3298365372	2580712038
	Export	6040205752	5743372711	4589243397	5373722692	4876696408	4535055722	5090505084	4501821358	3442742553	2592590629
	(Import-Export)	-812291	-40337686	-34926406	-1270450671	-662923798	-247769875	-646292850	-324727877	-144377181	-11878591
MFDs	Import								3164458196	3302553045	2982807406
	Export								3519580988	3988170456	3471711020
	(Import-Export)								-355122792	-685617411	-488903614
Fax machines	Import	784907471	810792987	552885191	525256365	484576339	536816841	512959748	119163617	71333544	49542556
	Export	685181243	704033045	524311581	406993557	370087550	503185530	515765968	93039958	73699892	54259237
	(Import-Export)	99726228	106759942	28573610	118262808	114488789	33631311	-2806220	26123659	-2366348	-4716681
Digital duplicators	Import	31802439	26170819	30208051	35013418	30782891	23213596	19626770	23046142	21411785	35693166
	Export	24268756	16881374	15506153	15848253	18284965	16635159	17669777	10053367	12215082	10330425
	(Import-Export)	7533683	9289445	14701898	19165165	12497926	6578437	1956993	12992775	9196703	25362741
Imaging equipment	Import	8787997998	8251900172	7001633875	6468423368	6691562274	7047480962	7538175856	7483761436	6693663746	5648755166
	Export	8787364679	8291498010	7202714174	7840369424	7275858760	7388509890	8291477672	8124495671	7516827983	6128891311
	(Import-Export)	633319	-39597838	-201080299	-1371946056	-584296486	-341028928	-753301816	-640734235	-823164237	-480136145

NB: An empty cell means that either no data were reported or the codes were not valid for that year.

Source: calculations on Eurostat EU-27 trade data.

Table 10. Average price (in EUR) of imaging equipment based on the export and import inside the EU common market data of the EU-27 from 2000-2009

Product		Year									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Copiers	Import	1079	297	660	448	353	321	328			
	Export	1556	1308	703	498	408	424	368			
Printers	Import	176	185	184	154	138	113	164	171	186	192
	Export	175	183	177	154	172	156	175	189	176	206
MFDs	Import								190	176	171
	Export								197	203	187
Fax machines	Import	144	174	149	133	122	127	6	95	90	71
	Export	141	166	155	132	116	137	160	100	74	63
Digital duplicators	Import	512	658	693	235	177	297	372	146	159	187
	Export	720	1261	1274	951	505	1431	1661	701	1192	525
Imaging equipment	Import	211	200	224	186	166	143	61	176	179	178
	Export	216	224	223	186	200	193	210	190	187	192

NB: An empty cell means that either no data were reported or the codes were not valid for that year. Internal export and import means export and import from one member state to another.

Source: calculations on Eurostat EU-27 trade data.

In Table 9 the internal EU-27 trade values expressed in euros are given, whereas based on the data in Tables 8 and 9, the indicative average price per product as shown in Table 10 are calculated, similar to table 7.

The data from Tables 9 and 10 were used afterwards to draw the diagrams given in Figures 9 and 10. Similar to the external EU-27 trade and in the case of the internal EU-27 trade, printers are the imaging equipment with the highest values followed by MFDs. However, in the internal market the overall traded values are quite a bit higher than the externally traded ones.

Based on Figure 8, a decreasing trend of the trade values of printers after 2006 can be identified, which is also the period in which MFDs are separately reported in the category of NACE 2. However, copiers show a rather stable trade value ranging from 2 billion to 2.8 billion with a positive trend for recent years. Contrary to the rather high trade values for copiers, the values of digital duplicators on the one hand and of fax machines on the other hand are very low. Fax machines show for instance after 2007 traded values of less than 93 million whereas the traded values of digital duplicators were even lower than 36 million.

Based on Figure 9, it can be identified that the average prices show a negative trend during the years 2000 – 2009. After 2004 the negative trend is not as strong and the average prices of the EU-27 internally traded copiers tend to stabilise close to the value of EUR 400. The respective average trade prices for printers, MFDs and fax machines are below EUR 200 which is lower than that of printers.

However, in the case of digital duplicators there seems to be a difference. Digital duplicators are the most expensive type of imaging equipment with an indicative average price of over EUR 400. The average price variations during the investigated years are very high. It is also remarkable that in the case of digital duplicators, the difference between the annually imported and exported average trade price is always over EUR 250.



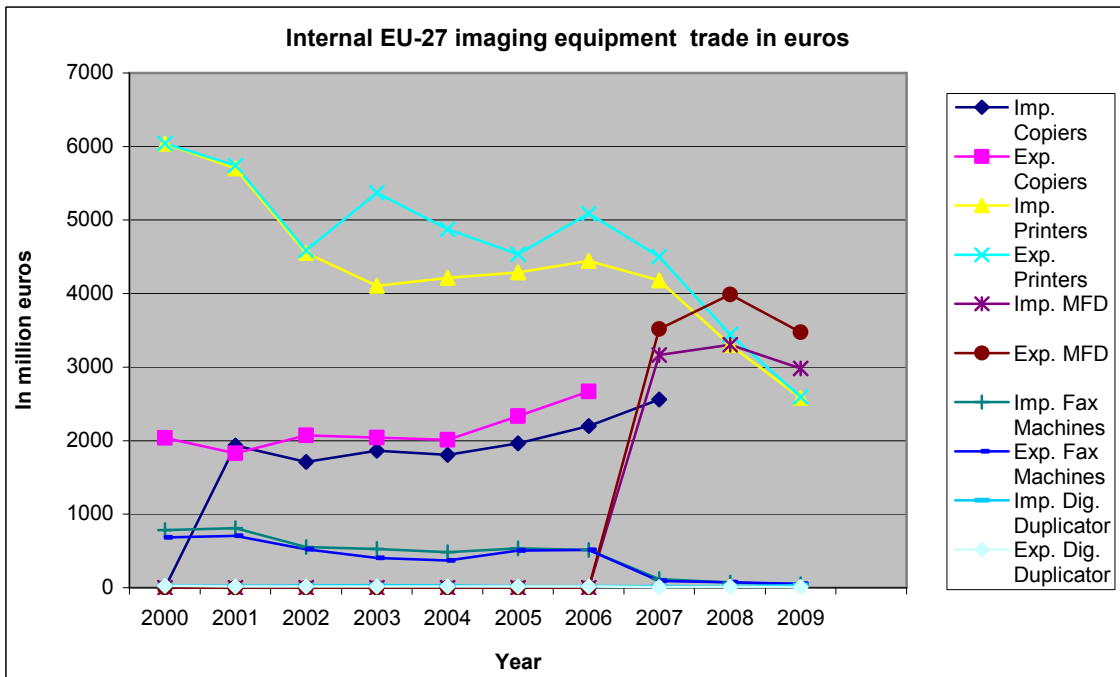


Figure 8. Internal trade of imaging equipment in the EU-27 for the period 2000 –2009 expressed in million euros.  
 Source: calculations on Eurostat EU-27 trade data.

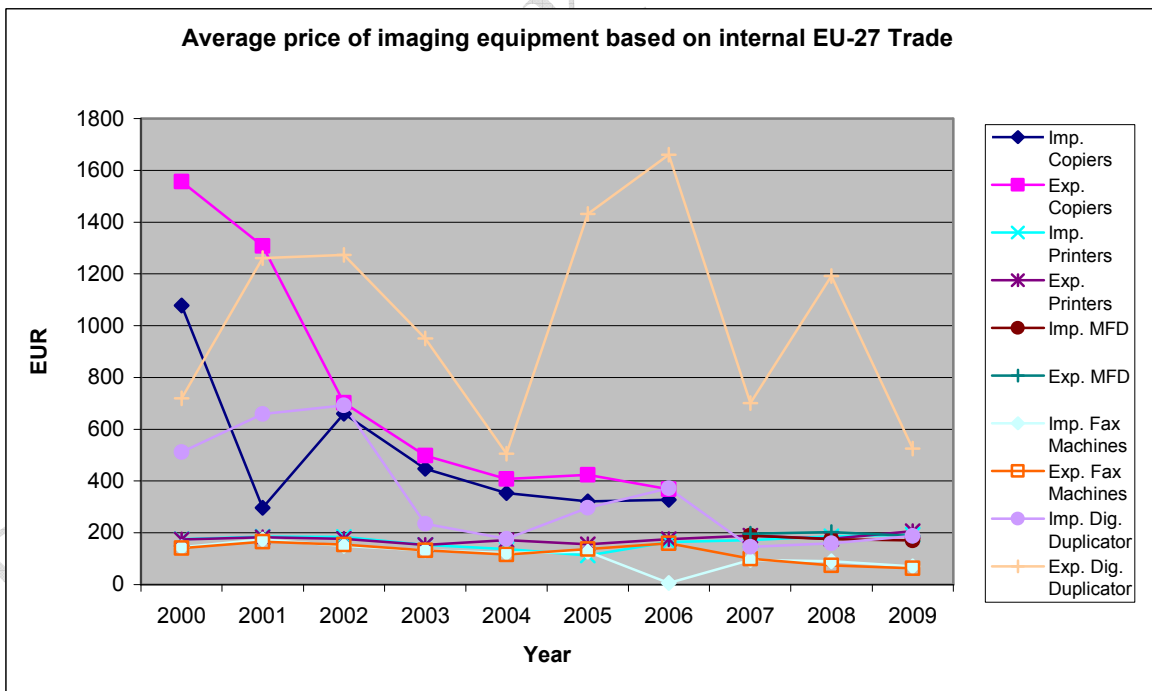


Figure 9. Indicative average price of imaging equipment in the EU-27 for the period 2000 – 2009 expressed in euros.  
 Source: calculations on Eurostat EU-27 internal trade data.

### 2.1.5. Apparent consumption in the EU-27

Using the generic economic data of EU-27 imaging equipment production, import and export as presented in Section 2.1.2 and 2.1.3, we can determine the apparent consumption for the EU-27. The calculation of the apparent consumption is:

$$\text{Apparent consumption} = \text{production} + \text{imports} - \text{exports}$$

In Table 11 the calculated apparent consumption is presented. As mentioned before, the generic statistical economic data of Eurostat is not complete and several gaps could distort the final outcomes of this analysis. On some occasions due to data gaps, the apparent consumption computation was not possible. In these cases the cells of Table 11 are marked in grey.

It should also be emphasised that the database for the particular calculation is not from one source. The production data is based on the PRODCOM database whereas the imports and exports is based on the EU-27 Trade database. The usage of different databases can possibly bias the results due to different database structures. In any case, the initial data of Eurostat was aggregated per type of imaging equipment according to the PRODCOM codes and the EU-27 trade codes presented in Tables 1 and 2.

Based on Table 11, the diagram of Figure 10 has been drawn up. There we can identify that printers and after 2007 also MFDs are the types of imaging equipment which show high consumption rates. On the contrary, copiers and fax machines show lower consumption rates.

Table 11. Imaging equipment apparent consumption calculation in the EU-27 for the years 2000 – 2009

Product		Year									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Production	Copiers	684707	281096	592668	511869	483812	394703	312000		1200	400
	Printers	13600000	11961282	5463432	9000000	6000085	5429939	4375355	3600000	1790295	1151821
	MFDs								1761528	1282393	1899347
	Fax machines	3471854	2115640	2635183	3695803	3673470	921112	211209			
	Dig.dupl.	2100	400	320	0	0	0	0	0		
Import	Copiers	1148665	1187721	3379432	2207172	2830681	4341535	8550255			
	Printers	19195686	23472712	27671096	29319409	33531962	31269907	30395522	24275133	20079050	13694691
	MFDs								20325952	23249932	19905307
	Fax machines	3438171	2555894	2516905	2413752	3347943	3804372	4716851	2005249	1367056	946917
	Dig.dupl.	28665	13308	30717	16842	35799	20116	15357	30781	308021	181445
Export	Copiers	235365	247208	458457	739300	766980	898103	1140952			
	Printers	4609417	4958162	5702258	7614984	7973410	8753755	7111727	5460821	4874226	3667544
	MFDs								2137181	3810982	2712353
	Fax machines	227235	224299	213306	227579	381675	554404	705142	101294	61069	63020
	Dig.dupl.	30854	20201	9001	37924	32825	15271	22500	1023482	14368	12473
Apparent Consumption	Copiers	1598007	1221609	3513643	1979741	2547513	3838135	7721303	0	1200	400
	Printers	28186269	30475832	27432270	30704425	31558637	27946091	27659150	22414312	16995119	11178968
	MFDs								19950299	20721343	19092301
	Fax machines	6682790	4447235	4938782	5881976	6639738	4171080	4222918	1903955	1305987	883897
	Dig.dupl.	-89	-6493	22036	-21082	2974	4845	-7143	-992701	293653	168972

NB: An empty cells mean that either no data were reported or the codes were not valid for that year. Cells marked in grey mean that the data gaps do not allow for accurate computations.

Source: calculations on Eurostat PRODCOM and EU-27 Trade.

Digital duplicators show negative values of apparent consumption for some years. In some cases this is explained by the temporal delays between the computed operations (production and trade) and storage. However, other reasons could also affect the apparent consumption as described by the authors of the Ecodesign Preparatory Study on Imaging Equipment [2] where a similar computation was applied.

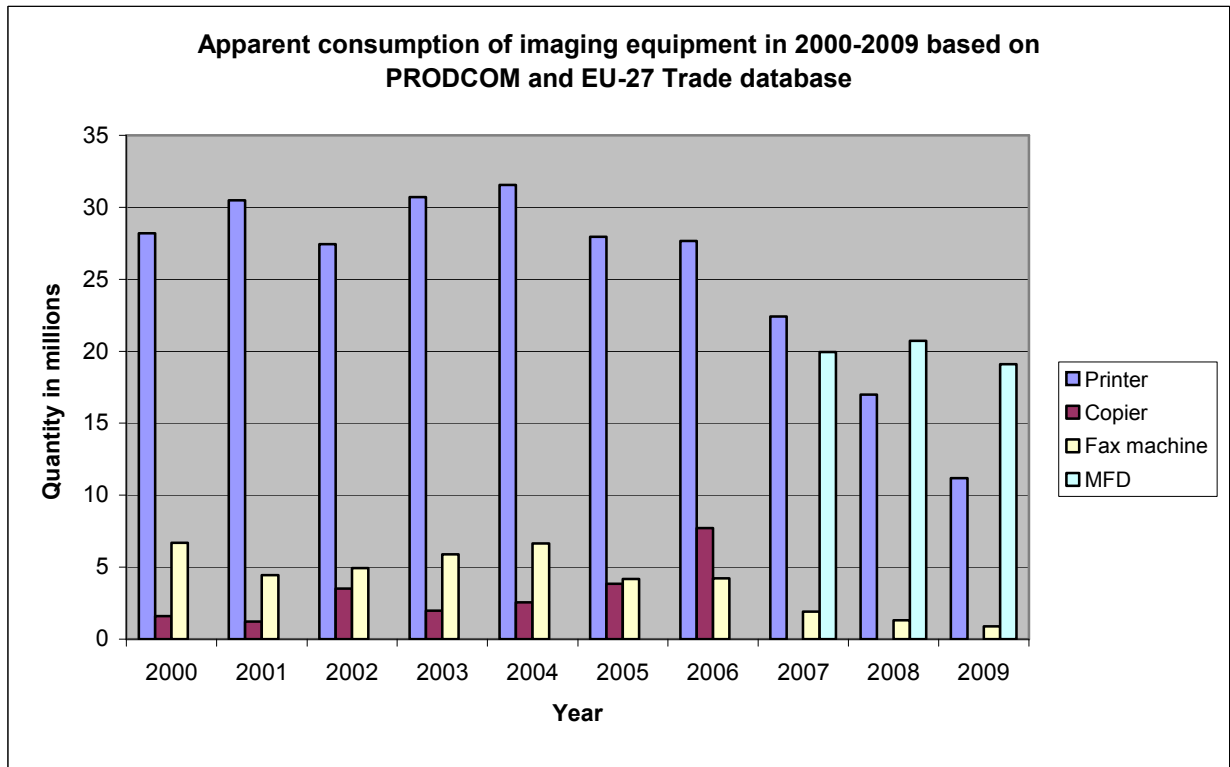


Figure 10. Apparent consumption of imaging equipment in the EU-27 for the period 2000 – 2009 based on the PRODCOM and EU-27 trade databases.

At this point we shall repeat that the generic economic analysis based on the Eurostat data should, in general, serve for gaining an overall picture of the economic activity in the EU-27 regarding imaging equipment rather than providing for precise indicator measurements. A more precise picture of the consumption and the stock of imaging equipment in the EU-27 could be gained based on market distribution data as described in Section 2.2.

## 2.2. Stock volumes and sales of imaging equipment

### 2.2.1. Imaging equipment stock volumes

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[2] DG TREN Preparatory Studies for Eco-Design Requirements of EuPs. LOT 4. "Imaging Equipment". Final Report on Task 1 "Definition". [http://www.ecoimaging.org/doc/Lot4\\_T1\\_Final\\_Report\\_2007-11-12.pdf](http://www.ecoimaging.org/doc/Lot4_T1_Final_Report_2007-11-12.pdf) accessed on 17 March 2010

The market analysis on sales and stock rates of imaging equipment in the EU-27 as provided by market research institutes should complement the findings of the generic economic analysis.

The stock of imaging equipment for two reference years, 2005 and 2009, are provided in Table 12. These data were also published in the Ecodesign Preparatory Study of Imaging Equipment conducted for DG ENER [2] The initial source of the data is the market research institute InfoTrends [3].

In these calculations the stock is determined using the annual sales data and assuming [3] an average product life of 6 years. The assumption of 6 years may not be precise for all products, i.e. in the Ecodesign Preparatory Study, the product lifetime of fax machines was assumed to be 8 years and for inkjet printers 4 years. However, for the purpose of consistency, a recalculation was avoided at this point. The final stock volumes should in any case serve as an indicative rate.

Initially these data were conducted referring to 'western Europe' meaning the EU-15 without including Luxembourg but with the inclusion of Norway, Switzerland and Turkey. As also analysed in the Imaging Equipment Ecodesign Preparatory Study, the use of this data is considered to be a good indication and/or approximation for the EU-27 [2]. Because the stock data for 2009 was not available in this case this was recalculated based on the provided data of 2008 and the growth rates given in this analysis.

Moreover, the data is divided into the overall product groups of copiers, printers and fax machines. Data for MFDs is not presented separately. MFDs data are included in the aforementioned product groups. However, some particular fractions of printers and fax machines which refer to MFDs are given. Data for scanners are not available.

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<sup>3</sup> InfoTrends,  
<http://www.capv.com/public/home.html>

Table 12. Imaging equipment stock in 2005 and 2009

Product type and characteristics			Reference year	
			2005	2009
Copiers	EP	Black/white	5 969 951	4 297 716
		Colour	380 948	674 595
		<b>Total</b>	<b>6 350 899</b>	<b>4 966 945.3</b>
Printers	EP	Black/white	14 735 315	14 809 890.3
		Colour	1 919 397	3 982 690.7
		Subtotal	16 654 712	18 792 581
	Inkjet	Single function	68 412 276	38 384 900.7
		<b>MFD</b>	21 759 956	69 442 821.4
		Subtotal	90 172 232	107 827 722
	Overall Total		<b>106 826 944</b>	<b>126 620 303</b>
	Fax machines	Single function		13 241 539
<b>MFD</b>		6 890 175	8 699 679.41	
<b>Total</b>		<b>20 131 715</b>	<b>14 030 482.3</b>	

NB: EP = electro-photographic technology.

Source: [2].

The stock values of imaging equipment in Figure 11 are based on Table 12. In Figure 12 the respective imaging product stock shares for 2009 are presented. It is important to emphasise here that the data on MFDs were only partly disaggregated from values given in Table 12 of printers and fax machines. This disaggregation is not complete; therefore some MFDs are considered to still be subsumed under the category of electro-photographic printers and copiers.

Based on Figure 11 we can identify that the market stock of printers show a decrease from 2005 to 2009 from 85 million to less than 60 million. The printer product group is the one with the highest stock rates in 2005 followed by MFDs which had at that time just 33 % of the rate of printers. However, in 2009 there was a change with MFDs leading with 78 million while printers followed with 57 million. The case of copiers is different as the copiers stock did not have such a vast change between 2005 and 2009. In 2005 copiers showed 6.3 million stock whereas in 2009 the stock fell to approximately 4.9 million. The stock of fax machines decreased between 2005 and 2009 from 13.3 million to 5.2 million. It is remarkable that the stock of copiers and fax machines are less than 10 % of the respective stock of MFDs in 2009.

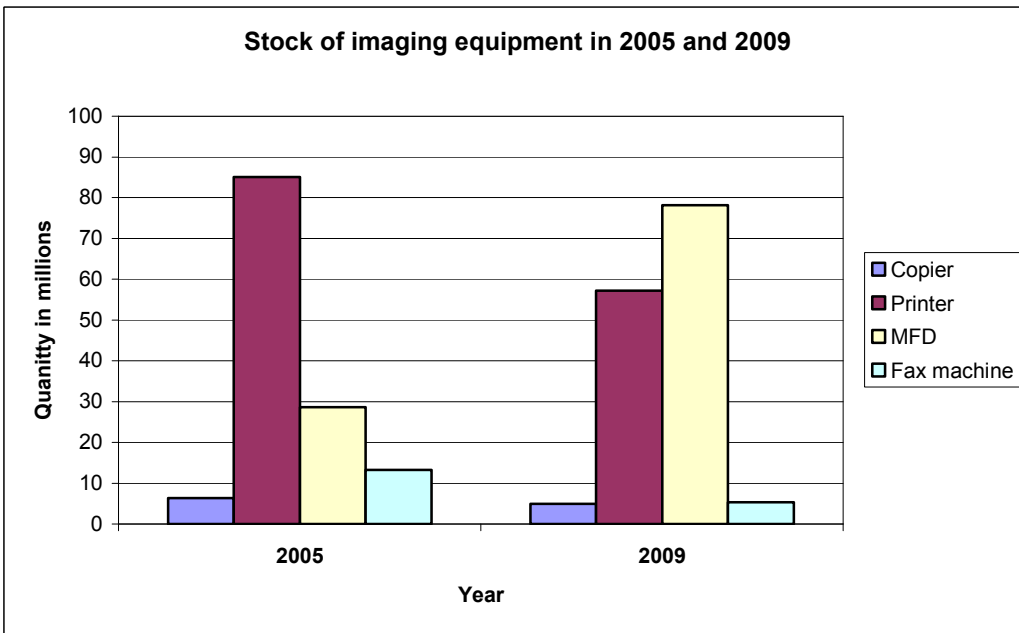


Figure 11. Stock of imaging equipment in 2005 and 2009 based on market research data. *Source:* [2].

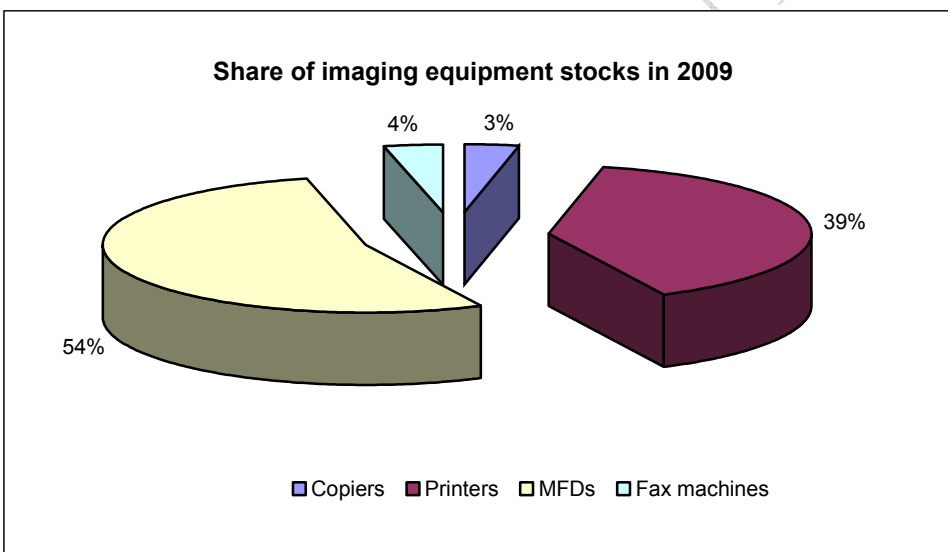


Figure 12. Share of imaging equipment stock in 2009 based on calculations on market research data *Source:* [2].

### 2.2.2. Imaging equipment sales

Sales data on imaging equipment are presented in the Tables 13 – 15. Similar to the previously presented stock data, the market data are also derived from the Ecodesign Preparatory Study [2].

In Table 13 the sales of printers are presented for the years 2003 – 2009. In Table 14, sales of MFDs which have printing as their main function are presented for the same time period. Sales data on MFDs with copying as their main function are given in Table 15. Based on these data the diagram in Figure 13 has been drawn which clearly shows a decline in the sales of printers and an increase in the sales of MFDs.

Table 13. Market data on the sales of printers from 2003 – 2009

Printers in 1000 units		Year						
		2003	2004	2005	2006	2007	2008	2009
EP	Black/white	3 821	3 372	3 275	3 266	3 196	3 110	2 883
	Colour	464	592	713	720	753	751	765
	Subtotal	4 285	3 964	3 988	3 986	3 949	3 861	3 648
Inkjet		16 016	13 947	12 330	10 039	8 249	6 445	5 260
Total (EP+Inkjet)		<b>20 301</b>	<b>17 911</b>	<b>16 318</b>	<b>14 025</b>	<b>12 198</b>	<b>10 306</b>	<b>8 908</b>

Note: EP = electro-photographic technology.

Source: [2]

Table 14. Market data on the sales of MFDs (main function printing) from 2003 – 2009

MFDs (main function printing) in 1000 units		Year						
		2003	2004	2005	2006	2007	2008	2009
EP	Black/white	266	382	407	448	500	599	699
	Colour	5	77	121	153	224	267	308
	Subtotal	271	459	528	601	723	866	1 007
Inkjet		5 040	7 855	10 107	12 675	14 838	16 911	18 932
Total (EP+Inkjet)		<b>5 311</b>	<b>8 314</b>	<b>10 635</b>	<b>13 276</b>	<b>15 561</b>	<b>17 777</b>	<b>19 939</b>

NB: EP = electro-photographic technology.

Source [2]

In Table 15 the sales volume for colour copiers in the period 2000-2004 is presented. It can be identified there that colour copiers show a sufficient increase of sales from 2000 – 2004. The overall sales volume of colour copiers is three times more than the one from 2000.



Table 15. Market data on sales of colour copiers from 2000 – 2004

Copier colour in 1000 units	Year				
	2000	2001	2002	2003	2004
Colour single function	17.03	1.15	2.65	8.14	5.8
MFD colour	25.37	43.82	37.15	66.4	131.3
<b>Total</b>	<b>42.39</b>	<b>44.97</b>	<b>39.79</b>	<b>74.54</b>	<b>137.1</b>

NB: EP = electro-photographic technology.  
 Source: [2].

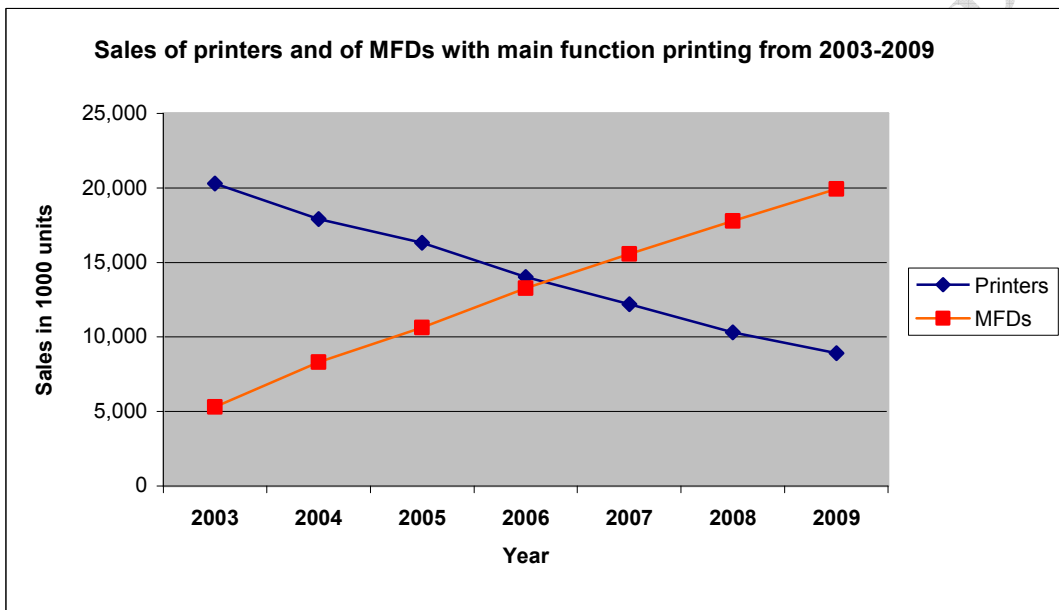


Figure 13. Sales of printers and MFDs with printing as the main function from 2003 – 2009 based on data on the Ecodesign Study [2].

### 2.2.3. Sales market shares in imaging equipment

There are numerous producers of imaging equipment. A list of important manufacturers and the country of origin is given in Table 16; the list is indicative and not exhaustive.

Table 16. Manufacturers of imaging equipment (not an exhaustive list)

Manufacturers of imaging equipment			
Brother JPN	Fuji Xerox USA/JPN	NEC JPN	Samsung Korea
cab GmbH Germany	Fujifilm JPN	Nikon JPN	Sanyo JPN
Canon JPN	Fujitsu JPN	NRG (Ricoh) UK (JPN)	Sharp JPN
Copystar USA	Hewlett-Packard USA	Océ NL	Tally Genicom USA
CPG International Italy	Hitachi JPN	Oki JPN	TA Triumph-Adler DE
Datamax USA	IBM USA	Olivetti Italy	Toshiba JPN
Dell USA	Konica Minolta JPN	Panasonic JPN	Toshiba TEC JPN
AMT Datasouth USA	Kyocera Mita JPN	Philips NL	Utax Germany
Eastman Kodak USA	Lanier Ricoh USA/JPN	Pitney Bowers USA	Xerox USA
Epson JPN	Lexmark USA	Printronix USA	
Olympus	Polaroid	Ricoh JPN	

Source: Ecodesign Preparatory Study on Imaging Equipment [2] and own research

European companies include Olivetti, OGP International, CAB, Triumph-Adler and Utax, Philips, Océ. However, the market is dominated by companies from the US as well from the far east, mainly Japan.

Of particular interest is that despite the numerous companies operating, the market of printers is dominated by just 3 companies which together cover up to 70 % of the total market sales. In particular, as reported by Gartner [4] and published in the journal *PC Welt* [5] in 2006, the printer market sales share for the geographic region of Europe, the Middle East and Africa (EMEA) measured in sold units is dominated by Hewlett-Packard covering 41 %. In second place comes Canon with 16.6 % followed by Epson with 12.7 % whose shares had a dramatic decrease of almost 50 % in one year. In the fourth and fifth place are Lexmark and Brother with 10.3 and 5 % of the market sales share respectively. The overall printer sales shares for 2006 are shown in Figure 14.

[4] Gartner Inc., <http://www.gartner.com/technology/about.jsp>

[5] [http://www.pewelt.de/it-profi/business-ticker/234746/gartner\\_drucker\\_markt\\_waechst\\_um\\_5\\_prozent/](http://www.pewelt.de/it-profi/business-ticker/234746/gartner_drucker_markt_waechst_um_5_prozent/)

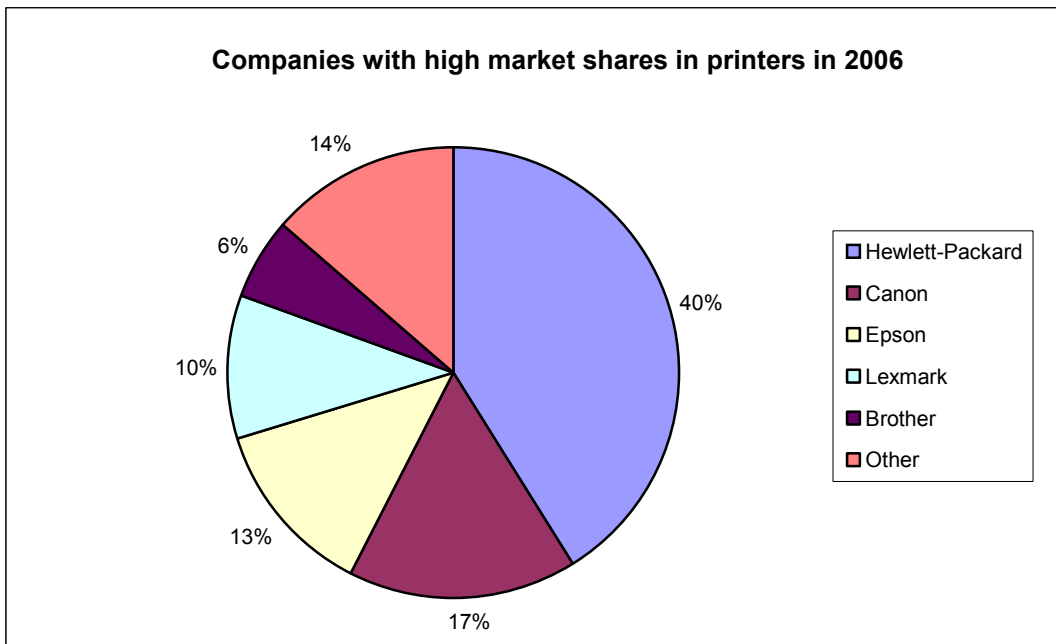


Figure 14. Companies with high market shares in printers in 2006  
 Source: Gartner Market Research 2006

### 2.3. Image creation volumes

The term 'image creation' refers respectively to copies for the copiers and to prints made for printers. However, in the case of scanners, image creation refers to the produced digital image while in the case of fax machines the term refers to the fax prints when a fax is received or to the digital image created when a fax is sent. The definition of this term for MFDs concerns the operating function.

#### 2.3.1. Image creation volume shares of imaging equipment for domestic use

In Table 17 data on images creation for personal use for the two reference years 2010 and 2005 are presented. This data is similar to the previously presented market data in Section 2.2 used in the Ecodesign Preparatory Study on Imaging Equipment [2]. The area of 'western Europe' which was represented in this data is considered relevant to the EU-27. The stock data for 2010 is calculated via extrapolation of market data for the previous year. Based respectively on Tables 17 and 18, Figures 15 and 16 present the shares of each product for each reference year.

Table 17. Market data on image creation in 2010 and 2005 for private use

Product	Reference year 2010		Reference year 2005	
	Images for private use (in million units)	EU-25 stock in 2010	Images for private use (in million units)	EU-25 stock in 2005
Copier	5	4 813 000	13	6 351 000
EP-Printer	1	18 504 000	18	16 654 000
IJ-Printer	82	109 098 000	71	90 172 000
Fax machine	8	13 256 000	17	20 131 000
Total	96	145 671 000	119	133 308 000

NB: EP = electro-photographic technology; IJ=Inkjet.  
 Source: [2]

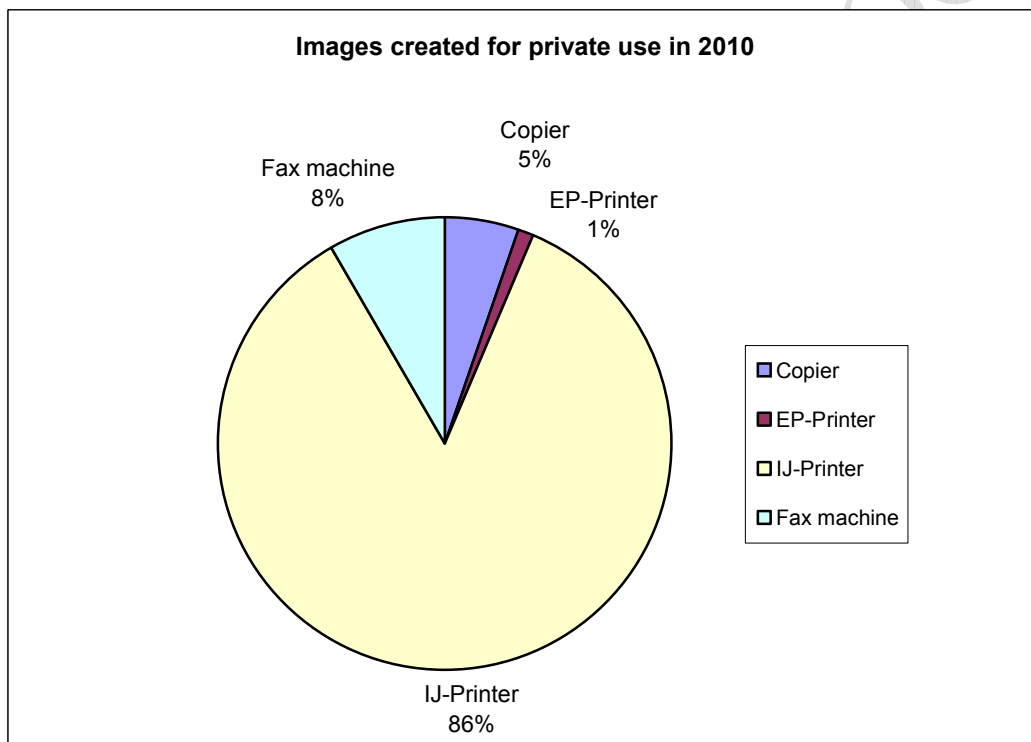


Figure 15. Images created for private use in 2010  
 NB: EP = electro-photographic technology; IJ = Inkjet.  
 Source: [2]

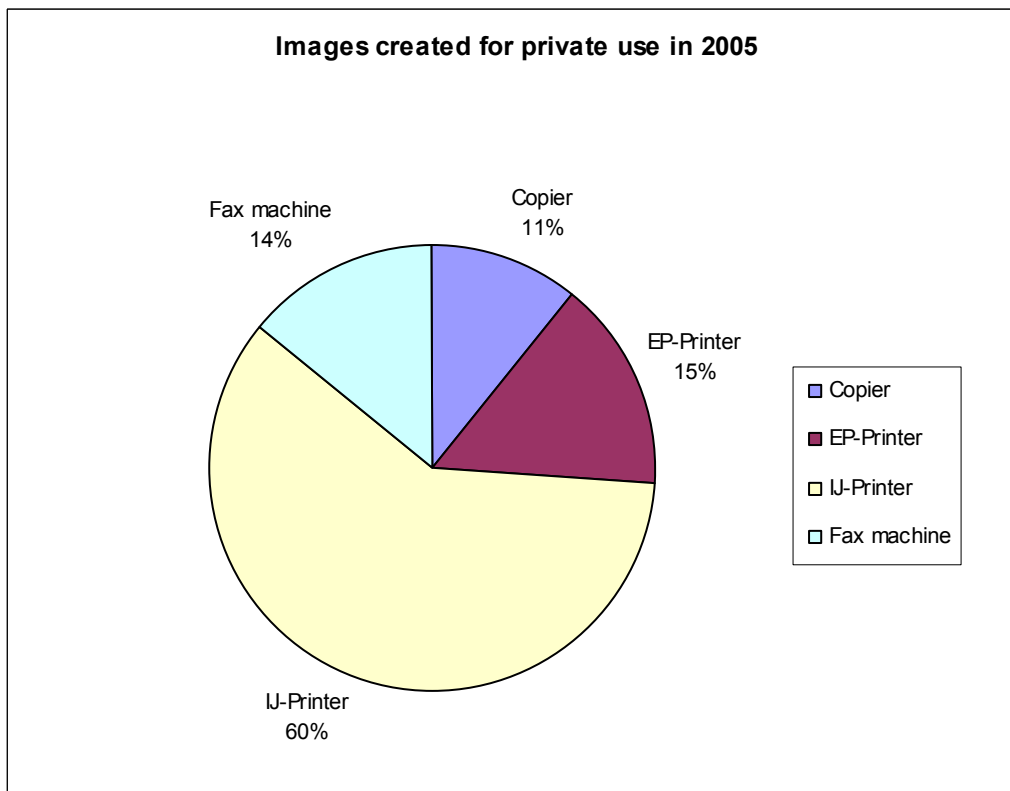


Figure 16. Images created for private use in 2005  
 NB: EP = electro-photographic technology; IJ = inkjet.  
 Source: [2].

It can be identified from Figures 15 and 16 that most of the images are created from inkjet printers in private use. The share of created images for private use by inkjet printers is also rising from 60 % in 2005 to 86 % in 2010. Similarly, the share of images that were created by copiers and fax machines were reduced from 2005 to 2010 by almost 50 %. Electro-photographic printers in 2010 seem to have a marginal share of created images for private use although in 2005 their share was 15 %. However, in the working environment, the shares of inkjet printers and electro-photographic copiers are much different, as presented in Section 2.3.2 below.

### 2.3.2. Image creation volume shares of imaging equipment for professional use

Analogous to the data for private use, the image volumes created for professional use are presented in Table 18. The data are from the same source as the data in the previous Section 2.3.1 and are considered to be relevant to the EU-27. Again the reference years of the data are 2010 and 2005. The stock data for 2010 is calculated via extrapolation of the market data for the previous year.

Table 18. Market data on image creation in 2010 and 2005 for professional use

Product	Reference year 2010		Reference year 2005	
	Images for professional use (in million units)	EU-25 stock in 2010	Images for professional use (in million units)	EU-25 stock in 2005
Copier	125	4 813 000	116	6 351 000
EP-printer	500	18 504 000	421	16 654 000
IJ-printer	5	109 098 000	8	90 172 000
Fax	7	13 256 000	11	20 131 000
Total	637	145 671 000	556	133 308 000

NB: EP = electro-photographic technology; IJ = inkjet  
 Source: [2]

The data in Table 18 was the basis for Figures 17 and 18 where the shares of each product of the total image creation for professional use volume in 2010 and 2005 are given.

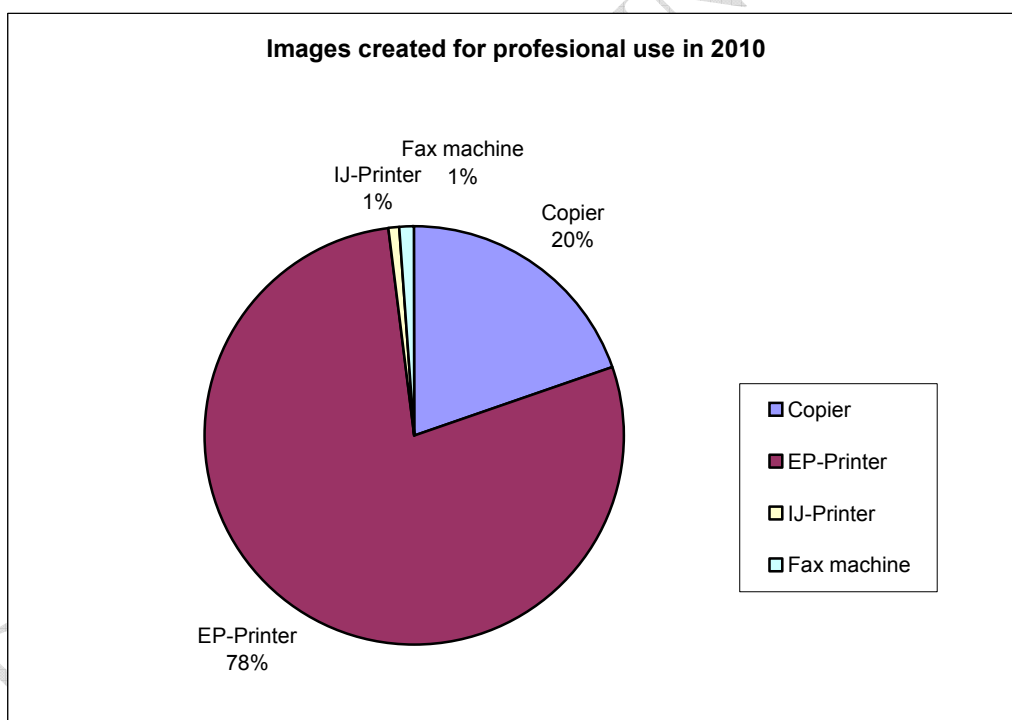


Figure 17. Images created for professional use in 2010  
 NB: EP = electro-photographic technology. IJ = inkjet.  
 Source: InfoTrends Data [3].

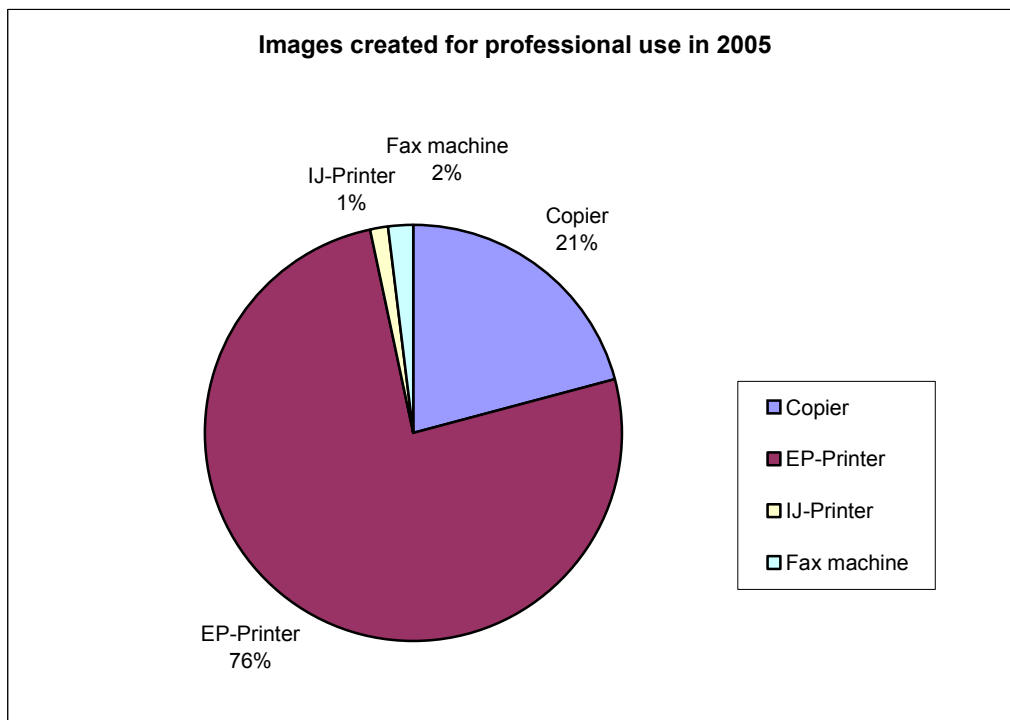


Figure 18. Images created for professional use in 2005  
 NB: EP = electro-photographic technology; IJ = inkjet.  
 Source: InfoTrends Data [3].

Comparing Figures 17 and 18, it can be identified that the electro-photographic printer has the largest share of created images for professional use, with 78 % in 2010. The difference of the shares from 2005 to 2010 seems to be marginal with just a slight increase of 2 % for EP-printers and a decrease of 1 % for copiers and fax machines.

However, comparing the two user environments, namely private and professional, we can identify key differences between them (see Figures 15 to 18). The most important one is that the overall volume of image creation for professional use is much greater than that of private use. For professional use, the created images (see data in Table 18 for the year 2010) reach 637 million, out of which only the EP-printers contribute 500 million and copiers 125 million. However, the respective total volume of created images for private users is just 96 million in which the largest contribution is the 82 million images from inkjet printers. This difference is easier to identify in of the graph in Figure 19.

The distinction between private users and professional users becomes important when the potential environmental benefits of Ecolabel criteria and of Green Public Procurement criteria are considered. GPP criteria apply to working environments. Thus, for GPP criteria special importance have among the different imaging equipment devises the product group of copiers and EP-printers as the most images are created using these

products. Moreover, due to the high image creation values, EP-printers followed by copiers and the inkjet printers are in for both policy tools of higher priority if a potential environmental benefit is associated with a technological improvement per image created.

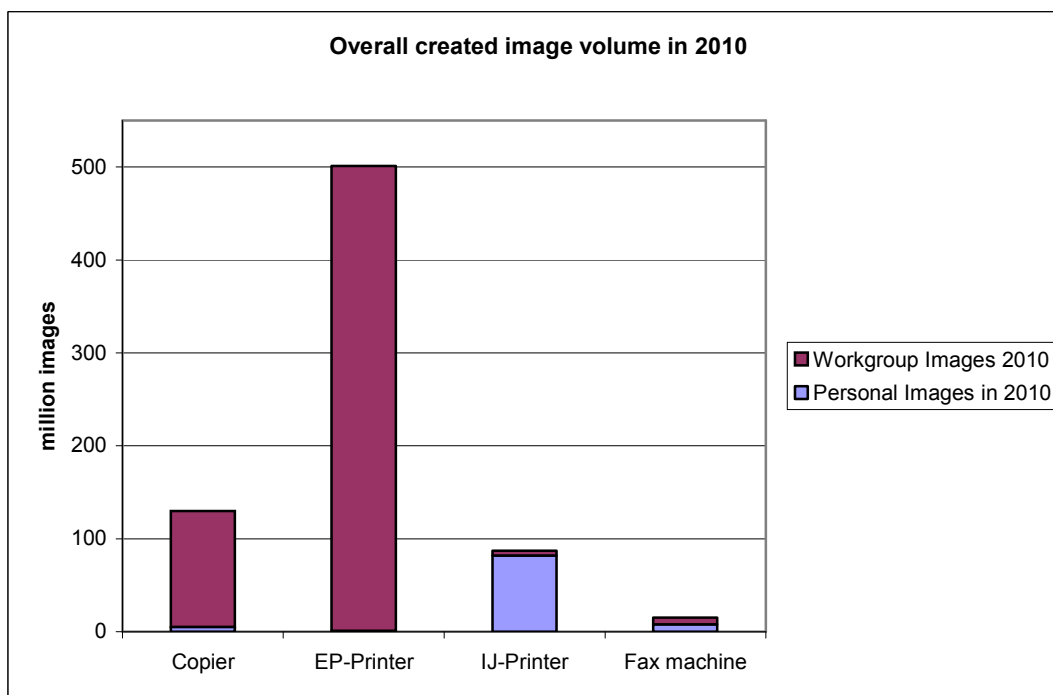


Figure 19. Overall created image volume in 2010 for private users and for professional use

NB: EP = electro-photographic technology; IJ = inkjet.

Source: InfoTrends Data [3].

### 3. Future market trends

One of the important trends in the imaging equipment market is the high increase in THE sales of MFDs. This increase affects all single function imaging equipment.

In particular, as presented in Figures 11 - 13, the rates of MFDs with printing as their main function are increasing over time whereas the rates of single function printers are decreasing. In the Ecodesign Preparatory Study on Imaging Equipment [2] the printer-MFDs are considered by now as the dominant product of the product group. This can also be confirmed based on the previous investigations in Sections 2.1 and 2.2.

Moreover, the printer market which currently has the largest share among imaging equipment is considered to be increasing even more. On the contrary, several forecasts [2] on the sales of single function fax machines and scanners expect a significant



decrease as MFDs tend to substitute these products. Furthermore, MFDs with copying as their main function are already present on a large scale in the copier market. The sales of copier-MFDs are expected to remain at the same level despite a small decrease in the copier market size as a whole.

The technological driving forces for the increase of MFDs towards single functional devices are considered to be the strong trends towards digitalisation and miniaturisation in electronics.

Another market trend is the increase of colour prints versus monochrome [2]. Colour EP-printers and MFDs are gaining larger market shares. A rapid replacement of monochrome devices can be expected. Nevertheless, the forecasts on the monochrome images volume suggest that it would not change significantly. Moreover, the market of small colour photo inkjet printers for private use is expected to rise, similar to the respective market in the US.

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#### 4. Market analysis of current and future potential market penetration of Ecolabelled products

The Ecolabels Blue Angel of Germany, Nordic Swan of the Scandinavian countries and Umweltzeichen of Austria are, as previously described, the available Ecolabels covering the product group of imaging equipment at the Member State level.

The Blue Angel label shows the highest number of applications. In particular, there are up to 630 types of imaging equipment from 18 different companies which bear the Blue Angel label. However, the application of the other two labels is not as wide as the Blue Angel label. With the Nordic Swan label, there are in total 116 labelled types of imaging equipment from 4 companies. Out of those, 90 are MFDs, 25 are printers and 1 is a copier. The Austrian label has 39 products from just 2 companies. It is important to note here that there is no application of an Ecolabel for digital duplicators or scanners. In Table 19 the information on the applications of national Member State Ecolabels for imaging equipment is summarised.

The larger numbers of Ecolabel applications as presented in Table 19 indicate a sufficient market penetration potential of EU Ecolabelled imaging equipment.

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Table 19 Ecolabelled imaging equipment products marketed in Europe.

<b>Ecolabel</b>	<b>Company</b>	<b>Products</b>	<b>Total</b>
<b>Blue Angel Germany</b>	1	Brother International GmbH	60
	2	Canon Deutschland GmbH	60
	3	DELL GmbH	41
	5	Develop GmbH	35
	6	Digital Imaging Technology/TallyGenicom	3
	7	Epson Deutschland GmbH	3
	8	Hewlett-Packard GmbH	34
	9	Konica Minolta Business Solutions Europe GmbH	43
	10	Kyocera Mita Deutschland GmbH	44
	11	Lexmark Deutschland GmbH	69
	12	Muratec Europe GmbH	3
	13	Océ-Technologies B.V.	33
	14	Oki Printing Solutions	17
	15	Ricoh Deutschland GmbH	69
	16	Samsung Electronics GmbH	48
	17	Sharp Electronics (Europe) GmbH	20
	18	Toshiba Tec Germany Imaging Syst. GmbH	18
	19	Xerox Ltd.	30
<b>Scandinavian Nordic Swan</b>	1	Brother International Sweden AB	18
	2	Kyocera Mita Svenska AB	32
	3	Sharp electronics (Nordic) AB	39
	4	Toshiba TEC Nordic AB	27
			116
<b>Austrian Umweltzeichen</b>	1	Océ-Österreich GesmbH	16
	2	Konica Minolta Business Solutions Austria GmbH	23
			39

Source: Ecolabel home pages, <http://www.blauer-engel.de/en/index.php>  
<http://www.svanen.se/en/Search-result/?productGroupID=8001&searchType=4>  
<http://www.umweltzeichen.at/cms/home233/content.html>

## 5. Conclusion on market and economical analysis

### Generic economic analysis

The generic economic analysis is based on Eurostat data. Data on imaging equipment are found in the PRODCOM and the EU-27 Trade databases. The analysis undertaken here is at product level by grouping several database codes into the category of printers, copiers, MFDs, fax machines and digital duplicators. Data on scanners were only available within large aggregated categories and hence it was not possible to use them. Eurostat data are not always complete, several data gaps and significant uncertainties are expected. Therefore this generic economic analysis should serve mainly for general indications.

The analysis findings show that the sector of imaging equipment is dominated by non-EU companies manufacturing outside Europe. The production in Europe is low and over the years has decreased reaching an overall annual average of approximately 5 million devices which corresponds to a value of a bit more than EUR 1.5 billion. Indicatively in year 2000 the overall annual production was three times more. Among the different types of imaging equipment, printers, copiers and MFDs have a higher production volume followed by fax machines. Digital duplicators have a very low production.

The Member States in which the production volumes are high are France, Germany, Italy and the United Kingdom. Poland has a significant production volume for printers. In general there are numerous Member States in which imaging equipment are produced though in low volumes and for specific years.

The imports of imaging equipment in EU-27 are generally much higher than exports. The trade balance in the case of MFDs and printers reaches values in the range of 10 million to 20 million units while for copiers it is always under 7.5 millions. Only in the case of digital duplicators is a positive trade balance found for the EU-27. However, this positive balance is only for a few years and the overall traded value compared with the respective ones of the rest of the imaging devices is very low.

For trade within the EU community market printers, copiers and MFDs are again the products with significant trade volumes. The internal trade compared to the external one is much lower both in terms of value and volume. The indicative overall average price of imaging equipment calculated by using generic economic input data shows a clear decline over the years and in 2009 was lower than EUR 250. However, in the past the average price varied among the different devices. Digital duplicators are the devices with the highest average price.

The generic economic analysis shows that printers and MFDs are, in terms of apparent consumption, the most important products in this product group. Apparent consumption in the EU for copiers is almost 3 times less than printers while fax machines (as SFDs) are approximately 13 times less. The apparent consumption of digital duplicators is extremely low and cannot be currently determined with a generic economic model approach.

#### Market data and stock of imaging equipment

Regarding market distribution data, the overall stock of imaging equipment in Europe is estimated at approximately 146 billion (in 2009), having a reduction of 25 % since 2005. However, this reduction is not considered to reflect a respective reduction in the use of imaging devices but rather it reflects the fact that generally an MFD substitutes more than one SFD. The stock of MFDs shows a continuous increase in this period. MFDs have the highest shares of the overall product group stock and they dominate the market together with printers with 54 % and 39 % respectively. The stock of copiers and fax machines together is remarkably estimated at lower than 10 % of the respective stock of MFDs.

Based on market distribution data, the overall annual sales of printers either as SFDs or as MFDs are high ranging from 25 million to 29 million and show a smooth increase during the years 2003 to 2009. Printers sales of SFDs decreases over time while at the same time a respective increase of MFD printers is detected. In 2006 the sales of SFD and MFD printers were almost equal while in 2009 MFD printers were sold twice as much SFD printers.

#### Image creation volume

In private use the larger share in image creation is found in inkjet printers with 86 % followed by fax machines at 8 %. EP printers are hardly in use at home. However, the picture is much different regarding image creation in a working environment. In this case, the prints of EP printers reach more than 75 % of the total and are followed by copiers with 20 %. However, it is remarkable that regarding the overall image creation share, EP printers are responsible for 68 % of the total (for both private and professional use) images followed by copiers with 18 % and leaving inkjet printers with only 12 % of the share. The ratio between images created at work and at home is approximately 20:3.

Therefore, the development of Green Public Procurement criteria which are applicable to the working environment is very important for the product group and for the respective overall environmental savings which can be achieved with the application of these EU product policy tools.

#### Market and technological trends

An important trend in the market of imaging equipment is the high increase in sales of multifunctional devices (MFDs) which tend to substitute single functional devices. The market availability of MFDs is larger than single functional devices.

Another market trend is the increase of colour prints. Colour EP printers, EP copiers and MFDs gain larger market shares. Devices applying the EP technology (often known as laser printers/copiers) also increase their sales due to their price reduction. Moreover, the market of small colour photo inkjet printers for private use is expected to increase. The trend over the years shows that SFD scanners and SFD fax machines will be fully substituted by MFD in the mid term.

Regarding technological trends, the most important is the miniaturisation and the digitalisation trend. These trends have a direct effect on the reduction of the electronic waste volume and in a more efficient monitoring of the device's functions. However, regarding reuse and recycling, miniaturisation could make it more complicated.

#### Sales market share

Regarding the market shares it was found that despite the numerous manufacturers of imaging equipment, the market of printers is dominated (up to 70 % of the total) by a few producers namely Hewlett-Packard, Canon, Epson, Lexmark and Brother. All of these key market actors also have products bearing the Ecolabel of Blue Angel or Nordic Swan.

#### Market penetration of Ecolabel products

The large number of Ecolabel applications on a Member state level indicates a sufficient market penetration potential of an EU Ecolabel on imaging equipment.

There are up to 19 different imaging equipment manufacturers with products Ecolabelled from Member States awarding schemes. The overall amount of applications is over 600. Among them the majority is on MFDs and printers followed by copiers. An important finding is that on Member States Ecolabels there is neither an application on single

functioning fax machines nor on scanners and digital duplicators. In addition, mailing machines are not included within the scope of the Member States Ecolabel criteria.

Therefore, it is proposed to exclude from the scope of this project the single functioning (SFD) fax machines, scanners, digital duplicators and mailing machines.

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