



J R C T E C H N I C A L R E P O R T S

# Development of European Ecolabel and Green Public Procurement Criteria for Televisions

TECHNICAL REPORT, TASK 2

## **Market Analysis**

(Draft) Working Document

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DRAFT - WORK IN PROGRESS

## INTRODUCTION

This draft Task report is intended to provide the background information for the revision of the EU Ecolabel criteria for televisions. The study has been carried out by the Joint Research Centre's Institute for Prospective Technological Studies (JRC-IPTS) with technical support from the Öko-Institut e.V. (OEKO). The work is being developed for the European Commission's Directorate General for the Environment. The EU Ecolabel criteria form key voluntary policy instruments within the European Commission's Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan and the Roadmap for a Resource-Efficient Europe. The Roadmap seeks to move the economy of Europe onto a more resource efficient path by 2020 in order to become more competitive and to create growth and employment. The EU Ecolabel promotes the production and consumption of products with a reduced environmental impact along the life cycle and is awarded only to the best (environmental) performing products in the market.

An important part of the process for developing or revising Ecolabel criteria is the involvement of stakeholders through publication of and consultation on draft technical reports and criteria proposals and through stakeholder involvement in working group meetings. This document sets the scene for the discussions planned to take place at the two working group meetings planned in 2013/2014.

This draft preliminary Task 2 report addresses the requirements of the Ecolabel Regulation No 66/2010 for technical evidence to inform criteria revision. It consists of background information regarding a market analysis. Together with the description of the scope, definitions and legal framework (Task 1) and the technical analysis (Task 3) as well as input from stakeholders, the information will be used to determine the focus for the revision process (Task 4) and present an initial set of criteria proposals (Task 5).

## 2. MARKET ANALYSIS

*Aim of the Task 2 report is to update and/or collect key figures which will enable quantitative assessment of the economic relevance of the product group at micro and macro level, and to provide information on the functioning of the market for the product group both from the producer and consumer perspective in order to identify relevant trends, drivers, innovations, market segmentations and initiatives.*

The following sections provide short summaries of the main characteristics of the television market based on an analysis of European statistical data (production, sales, imports and exports intra and extra EU, apparent consumption and annual growth rates) as well as a collection and overview of existing data of the main products, technologies and their market shares. The key manufacturers are presented, supplemented by an analysis of the market penetration of televisions with energy and/or ecolabels. Finally, consumer aspects and future trends are compiled which might have an influence on the current and future potential for the market penetration of products bearing the EU Ecolabel.

### 2.1 Market data

#### 2.1.1 Generic economic data based on Eurostat

This section presents an economic and market analysis based on official European statistics<sup>1</sup> provided by Eurostat concerning production and trade data (sections 2.1.1.2 to 2.1.1.4). Based on these data, the apparent EU-27 consumption of televisions is calculated in section 2.1.1.5.

It has to be noted that the statistical data have to be interpreted with care as there are some data gaps, especially for the domestic production; also the sub-categories for television products do not match exactly comparing Prodcom and Trade statistics (see section 2.1.1.1). Finally, some of the product groups have been divided into sub-categories during the accounting period leading to distortions in the presentation of the results. However, the statistical analysis can very well complement the general market analysis which is presented in section 2.1.2.

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<sup>1</sup> <http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes>



### 2.1.1.1 Classification of television equipment in Eurostat

In the following table, the product categories of the Prodcom database corresponding to television equipment are presented<sup>2</sup>. The last column shows the corresponding so called CN8-codes that are used by the European trade statistics (see also Table 2).

**Table 1: PRODCOM categories corresponding to television equipment**

PRODCOM code	Description	Corresponding EU-27 trade code CN8
26.40	Manufacture of consumer electronics	
26.40.20	Television receivers, whether or not combined with radio-broadcast receivers or sound or video recording or reproduction apparatus	
26.40.20.20	Tuner blocks for CTV/VCR and cable TV receiver units (colour video tuners) (excluding those which isolate high-frequency television signals)	8528 71 11 8528 71 15 8528 71 19
26.40.20.40	Colour television projection equipment	8528 72 10
26.40.20.90	Other television receivers, whether or not combined with radio-broadcast receivers or sound or video recording or reproduction apparatus n.e.c.	8528 71 91 8528 71 99 8528 72 20 8528 72 30 8528 72 40 8528 72 60 8528 72 80 8528 73

Table 2 presents the classification codes used in the Eurostat EU Trade statistics which cover television equipment<sup>3</sup>. In the EU-27 trade statistics, the so called Combined Nomenclature codes (CN8) are used. For the purpose of this study for the revision of the EU Ecolabel criteria for televisions, only the cells marked green will be taken into account of the further market analysis. They mostly overlap with the Prodcom category 26.40.20.90.

**Table 2: EU-27 Trade categories covering television equipment**

EU-27 Trade code CN8	Description
8528	Reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus

<sup>2</sup> Source: Eurostat, Prodcom;  
[http://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP\\_PUB\\_WELC](http://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC)

<sup>3</sup> Source: Eurostat, Prodcom;  
[http://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP\\_PUB\\_WELC](http://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC)

EU-27 Trade code CN8	Description
8528 71	-- Not designed to incorporate a video display or screen
	--- Video tuners
8528 71 11	---- Electronic assemblies for incorporation into automatic data-processing machines
8528 71 15	---- Apparatus with a microprocessor-based device incorporating a modem for gaining access to the Internet, and having a function of interactive information exchange, capable of receiving television signals (so-called 'set-top boxes which have a communication function', including those incorporating a device performing a recording or reproducing function, provided that they retain the essential character of a set top box which has a communication function)
8528 71 19	---- Other
	--- Other
8528 71 91	---- Apparatus with a microprocessor-based device incorporating a modem for gaining access to the Internet, and having a function of interactive information exchange, capable of receiving television signals (so-called 'set-top boxes which have a communication function', including those incorporating a device performing a recording or reproducing function, provided that they retain the essential character of a set top box which has a communication function)
8528 71 99	---- Other
8528 72	-- Other, colour
8528 72 10	--- Television projection equipment
<b>8528 72 20</b>	--- Apparatus <b>incorporating a video recorder or reproducer</b>
	--- Other
<b>8528 72 30</b> 8528 72 31 8528 72 33 8528 72 35 8528 72 39 8528 72 51 8528 72 59 8528 72 75	---- With <b>integral tube</b> <i>(sub-categories due to differences in screen width/height ratio, diagonal measurement of the screen and scanning parameters, reported by end of 2011)</i>
<b>8528 72 40</b>	---- With a screen of the <b>liquid crystal display (LCD)</b> technology
<b>8528 72 60</b>	---- With a screen of the <b>plasma display panel (PDP)</b> technology
<b>8528 72 80</b> 8528 72 91 8528 72 99	---- <b>Other</b> <i>(sub-categories due to differences in screen width/height ratio, reported by end of 2011)</i>
<b>8528 73</b>	-- Other, <b>monochrome</b> (Reception apparatus for television, black and white or other monochrome, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus, designed to incorporate a video display or screen)

### 2.1.1.2 Production of televisions in the EU-27

In the following table, the production data of televisions in the EU-27 for the years 2006 to 2011 is presented<sup>4</sup>. The production is expressed in quantity (units produced) and in values (in 1,000 euros).

The statistic shows that the EU-27 production of televisions has been rising between 2006 and 2010, with a slight decline in 2011. The corresponding production value has been volatile during the past years.

An indicative average price of the televisions produced in EU-27 has been calculated by dividing the production value in euros by the respective production quantity. The results show that the average unit price of produced televisions in the EU-27 has declined over the past years and is, in general, considerably low.

**Table 3: Production of televisions in the EU-27 in the years 2006-2011 according to PRODCOM statistics**

	2006	2007	2008	2009	2010	2011
<b>Quantity (in units)</b>	30,463,859 <sup>(1)</sup>	39,982,698 <sup>(2)</sup>	40,638,605 <sup>(1)</sup>	50,963,015 <sup>(1)</sup>	59,423,806 <sup>(1)</sup>	57,804,587 <sup>(1)</sup>
<b>Value (in million EUR)</b>	11,812,893	15,332,303 <sup>(1)</sup>	12,429,030	11,296,110	13,218,006 <sup>(1)</sup>	10,638,988 <sup>(1)</sup>
<b>Indicative average price per produced TV (EUR)</b>	388	383	306	222	222	184

PRODCOM code 26.40.20.90: "Other television receivers, whether or not combined with radio-broadcast receivers or sound or video recording or reproduction apparatus n.e.c."

(1) At least one of the national figures in this EU aggregate is estimated

(2) This total has been rounded to the base given in the BASE indicator

According to Prodcom statistics, significant volumes of televisions are only produced in Poland (near 20 million units per year), Hungary (around 3 to 5 million units per year) and Spain (around 2 to 3 million units per year), see Table 4. The Czech Republic reported a volume of 2.3 million produced units in 2011.

<sup>4</sup> Source: <http://epp.eurostat.ec.europa.eu/newxtweb/setupdimselection.do#>

Further minor production capabilities are in Bulgaria, Germany, Italy, Lithuania, and Portugal. However, it has to be noted that there are significant data gaps (empty cells), which might hamper the assessment of the data (apparent as the total sum of production data of the individual Member States presented in the last row of Table 4 does not correspond to the overall EU-27 production data presented in Table 3).

**Table 4: Production of televisions in EU-27 Member States from 2006 to 2011 [number of units]**

	2006	2007	2008	2009	2010	2011
Austria	0	0	0	0	0	
Belgium	0	0				
Bulgaria	176,804	9,215	78,004	11,851		
Cyprus	0	0	0	0	0	0
Czech Republic	0	0		313,486		2,335,848
Denmark	25,762	1,313				
Estonia	0	0	0	0	0	0
Finland	0	0	0	0	0	0
France	831,693	727				0
Germany	260,996	366,294	480,127	401,526	415,947	361,918
Greece	0	0	0	0	0	0
Hungary	2,467,451	0	3,859,406	4,807,982	4,613,535	2,807,393
Ireland	0	0				
Italy	247,045	741,677	1,603,910	685,785	344,819	352,608
Latvia	0	0	0	0	0	
Lithuania	769,060	527,480	393,409	424,416	409,117	374,079
Luxemburg	0	0	0	0	0	0
Malta	0	0	0	0	0	0
Netherlands	0	0				0
Poland	8,045,162	13,134,713	15,618,898	18,726,176	23,550,947	19,215,158
Portugal	0	0	564	564		845
Romania	0	0				
Slovakia	0	6,706,980				
Slovenia	0	0	0	0	0	0
Spain	2,478,273	2,992,118	3,570,250	2,031,915	2,235,457	
Sweden	0	0	0	0		
United Kingdom	1,277,778	890,105				
<b>SUM (quantity/units)</b>	<b>16,580,024</b>	<b>25,370,622</b>	<b>25,604,568</b>	<b>27,403,701</b>	<b>31,569,822</b>	<b>25,447,849</b>

Note: 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 26.40.20.90)

While the indicative average unit value of televisions produced in EU-27 (calculated by dividing the production value in euros by the respective production quantity) has

been considerably low with 184 Euro in 2011 (cf. Table 4), Table 5 shows that the unit value of the individual producing Member States varies significantly from 64 Euro (Italy) to 957 Euro (Germany) in 2011 according to the data presented in the Prodcum statistics.

**Table 5: Average unit value of produced televisions in certain EU-27 Member States 2011**

	Quantity [units]	Value [million EUR]	Average unit value [EUR]
Czech Republic	2,335,848	495,313	212
Germany	361,918	346,488	957
Hungary	2,807,393	1,153,820	411
Italy	352,608	22,734	64
Lithuania	374,079	50,350	135
Poland	19,215,158	4,013,657	209
Portugal	845	338	400

### 2.1.1.3 External EU-27 trade of televisions

The following analyses are based on the EU-27 trade statistic databases which differentiate between internal trade between the Member States (Intra-trade) or between the Member States and third countries (Extra-trade).

Table 6 presents the import and export quantity data of televisions between the EU-27 and third countries since 2007. The total EU-27 external traded quantity of televisions was calculated by summing up the different product categories.

**Table 6: External EU-27 trade quantity of televisions in the years 2007-2012 by Eurostat EU-27 trade data [number of units]**

PRODUCT		2007	2008	2009	2010	2011	2012
85287220 (inc. Video)	Import	2,993,734	2,569,637	3,052,955	3,413,346	3,393,790	3,384,460
	Export	140,079	257,654	56,570	171,107	492,801	844,992
	(Import-Export)	2,853,655	2,311,983	2,996,385	3,242,239	2,900,989	2,539,468
85287230 (Tube)	Import	6,906,894	3,733,348	1,879,258	1,288,011	328,618	181,310
	Export	770,788	763,750	829,967	812,915	396,186	357,045
	(Import-Export)	6,136,106	2,969,598	1,049,291	475,096	-67,568	-175,735
85287240 (LCD)	Import					7,550,511	8,047,681
	Export					3,723,163	4,323,567
	(Import-Export)					3,827,348	3,724,114

PRODUCT		2007	2008	2009	2010	2011	2012
85287260 (PDP)	Import					36,375	28,216
	Export					521,057	318,303
	(Import-Export)					-484,682	-290,087
85287280 (Other)	Import	7,175,559	6,962,265	9,601,413	9,741,932	2,597,349	3,903,475
	Export	3,157,357	5,045,364	4,423,327	4,779,784	369,304	242,350
	(Import-Export)	4,018,202	1,916,901	5,178,086	4,962,148	2,228,045	3,661,125
85287300 (monochr.)	Import	393,086	99,974	43,064	245,394	105,698	971,641
	Export	68,401	286,863	152,755	105,500	41,433	44,191
	(Import-Export)	324,685	-186,889	-109,691	139,894	64,265	927,450
Overall sum Televisions	Import	17,469,273	13,365,224	14,576,690	14,688,683	14,012,341	16,516,783
	Export	4,136,625	6,353,631	5,462,619	5,869,306	5,543,944	6,130,448
	(Import-Export)	13,332,648	7,011,593	9,114,071	8,819,377	8,468,397	10,386,335

Note: 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 table shows that in general, the imports from third countries to EU-27 are much higher than the exports of televisions. Exceptions to this are monochrome televisions in the years 2008 and 2009, as well as tube and PDP televisions in the years 2011 and 2012. However, the overall quantity of these three product groups is remarkably lower compared to the other product categories.

The quantity of traded televisions incorporating a video recorder or reproducer (CN8-code 85287220) has remained at a rather stable level whereas the number of traded tube televisions has declined significantly between the years 2007 and 2012. The category "Other" (85287280) shows a significant decline after 2010, resulting from the introduction of two separate sub-categories for LCD and PDP televisions which have been subsumed in the category "Other" in the years before.

The number of traded LCD televisions has slightly increased in 2012 whereas the number of PDP televisions has declined compared to 2011.

The overall trade balance of televisions ranges between 13 and 17 million units for imports, and between 4 and 6 million units for exports to third countries. Compared to 2011, there was a slight increase of imports and exports in 2012.

**Table 7: External EU-27 trade value of televisions in the years 2007-2012 by Eurostat EU-27 trade data [in 1,000 Euro]**

PRODUCT		2007	2008	2009	2010	2011	2012
85287220 (inc. Video)	Import	320,663	333,074	313,736	349,335	353,454	445,644
	Export	34,292	16,095	12,240	79,587	168,257	335,849
	(Import-export)	286,371	316,979	301,496	269,749	185,198	109,795
85287230 (Tube)	Import	573,130	332,541	174,115	109,798	16,517	4,418
	Export	220,411	204,343	217,107	175,848	7,338	5,054
	(Import-export)	352,719	128,198	-42,991	-66,049	9,179	-636
85287240 (LCD)	Import					1,019,452	1,200,227
	Export					1,308,772	1,435,796
	(Import-export)					-289,320	-235,570
85287260 (PDP)	Import					11,036	5,436
	Export					206,898	139,023
	(Import-export)					-195,863	-133,587
85287280 (Other)	Import	1,400,918	1,418,003	1,422,907	1,472,528	308,773	351,806
	Export	1,797,772	2,231,249	1,583,287	1,749,407	103,427	57,330
	(Import-export)	-396,854	-813,246	-160,380	-276,879	205,346	294,475
85287300 (monochr.)	Import	10,215	4,093	3,330	1,783	2,481	11,117
	Export	6,107	7,363	4,627	3,806	4,470	3,446
	(Import-export)	4,108	-3,270	-1,297	-2,023	-1,988	7,671
Overall sum Televisions	Import	2,304,926	2,087,711	1,914,088	1,933,445	1,711,714	2,018,648
	Export	2,058,581	2,459,051	1,817,261	2,008,647	1,799,160	1,976,500
	(Import-export)	246,345	-371,339	96,827	-75,202	-87,447	42,148

Note: 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 7 presents the external EU-27 trade of televisions expressed in 1,000 Euro. The analysis shows that LCD televisions are the TV products with the highest trade value followed by televisions with incorporated video. Interesting is the fact that the export trade value is similar to the import trade value, although the export volume is significantly lower. This indicates that the average price of the televisions exported by EU-27 to third countries is higher compared to the prices of imported televisions (see also Table 8).

**Table 8: Average price of televisions based on external EU-27 trade from 2007-2012 [EUR]**

PRODUCT		2007	2008	2009	2010	2011	2012
<b>85287220 (inc. Video)</b>	Import	107	130	103	102	104	132
	Export	245	62	216	465	341	397
<b>85287230 (Tube)</b>	Import	83	89	93	85	50	24
	Export	286	268	262	216	19	14
<b>85287240 (LCD)</b>	Import					135	149
	Export					352	332
<b>85287260 (PDP)</b>	Import					303	193
	Export					397	437
<b>85287280 (Other)</b>	Import	195	204	148	151	119	90
	Export	569	442	358	366	280	237
<b>85287300 (monochr.)</b>	Import	26	41	77	7	23	11
	Export	89	26	30	36	108	78

Note: 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 analysis of average prices of traded televisions in Table 8 confirms that the export values are higher than the average prices of imported televisions. For tubes, the average prices declined significantly and are on a similar level as monochrome TVs, indicating running out technologies.

#### 2.1.1.4 Internal EU-27 trade of televisions

The following Table 9 presents the import and export quantity data of televisions between EU-27 Member States since 2007. The total EU-27 internal traded quantity of televisions was calculated by summing up the different product categories.

**Table 9: Internal EU-27 trade quantity of televisions in the years 2007-2012 by Eurostat EU-27 trade data [number of units]**

PRODUCT		2007	2008	2009	2010	2011	2012
<b>85287220 (inc. Video)</b>	Import	759,628	1,073,931	1,106,191	1,964,675	3,187,163	4,826,625
	Export	757,305	1,303,184	1,513,029	2,279,881	2,516,807	3,019,045
	(Import-Export)	2,323	-229,253	-406,838	-315,206	670,356	1,807,580
<b>85287230 (Tube)</b>	Import	8,556,231	3,348,062	2,315,561	1,955,962	473,869	184,088
	Export	6,992,944	4,818,334	4,325,833	3,431,003	296,678	223,149
	(Import-Export)	1,563,287	-1,470,272	-2,010,272	-1,475,041	177,191	-39,061
<b>85287240 (LCD)</b>	Import					42,124,178	35,674,748
	Export					47,382,835	42,314,018
	(Import-Export)					-5,258,657	-6,639,270



PRODUCT		2007	2008	2009	2010	2011	2012
85287260 (PDP)	Import					3,553,283	2,406,544
	Export					4,969,573	2,718,052
	(Import-Export)					-1,416,290	-311,508
85287280 (Other)	Import	62,532,662	42,337,703	47,923,041	56,568,855	1,825,218	1,707,920
	Export	32,435,091	40,545,872	50,960,527	56,366,393	1,342,446	1,113,178
	(Import-Export)	30,097,571	1,791,831	-3,037,486	202,462	482,772	594,742
85287300 (monochr.)	Import	195,388	160,423	176,628	87,539	99,528	114,852
	Export	202,991	161,519	27,744	54,395	31,769	12,889
	(Import-Export)	-7,603	-1,096	148,884	33,144	67,759	101,963
Overall sum Televisions	Import	72,043,909	46,920,119	51,521,421	60,577,031	51,263,239	44,914,777
	Export	40,388,331	46,828,909	56,827,133	62,131,672	56,540,108	49,400,331
	(Import-Export)	31,655,578	91,210	-5,305,712	-1,554,641	-5,276,869	-4,485,554

Note: 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 analysis shows that the internal EU-27 trade is significantly higher compared to the external trade with third countries (cf. Table 6). After a peak in 2010, however, the internal trade has declined in the following years.

The most dominating television products for the EU-27 internal trade are LCD TVs. The quantity of internally traded televisions incorporating a video recorder or reproducer (CN8-code 85287220) has been continuously increasing since 2007 whereas all other categories have declined during these years. The category “Other” (85287280) shows a significant decline after 2010, resulting from the introduction of two separate sub-categories for LCD and PDP televisions which have been subsumed in the category “Other” in the years before.

Table 10 presents the internal EU-27 trade of televisions expressed in 1,000 Euro. The analysis shows that LCD televisions are the TV products with the highest trade value followed by PDP televisions.

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**Table 10: Internal EU-27 trade value of televisions in the years 2007-2012 by Eurostat EU-27 trade data [in 1,000 Euro]**

PRODUCT		2007	2008	2009	2010	2011	2012
85287220 (inc. Video)	Import	135,061	166,628	224,142	350,638	663,171	1,210,672
	Export	133,561	158,757	165,182	457,450	484,507	947,583
	(Import-export)	1500	7,871	58,960	-106,812	178,664	263,090
85287230 (Tube)	Import	1,170,011	648,538	453,453	425,971	87,523	30,144
	Export	1,865,596	1,573,048	1,292,452	1,243,213	53,417	26,593
	(Import-export)	-695,584	-924,510	-838,999	-817,242	34,106	3,551
85287240 (LCD)	Import					12,389,805	10,790,757
	Export					13,637,632	12,236,194
	(Import-export)					-1,247,826	-1,445,437
85287260 (PDP)	Import					1,483,783	940,917
	Export					1,935,159	1,064,933
	(Import-export)					-451,375	-124,016
85287280 (Other)	Import	14,861,160	16,734,076	15,532,078	18,080,444	536,076	421,272
	Export	14,080,706	16,150,345	16,270,199	17,659,579	359,155	257,765
	(Import-export)	780,454	583,731	-738,121	420,865	176,920	163,507
85287300 (monochr.)	Import	17,104	27,057	9,979	10,979	12,218	6,571
	Export	5,362	14,818	1,594	5,014	5,270	1,665
	(Import-export)	11,742	12,240	8,386	5,965	6,948	4,906
Overall sum Televisions	Import	16,183,336	17,576,299	16,219,652	18,868,033	15,172,577	13,400,335
	Export	16,085,224	17,896,967	17,729,427	19,365,256	16,475,139	14,534,734
	(Import-Export)	98,112	-320,668	-1,509,774	-497,223	-1,302,562	-1,134,399

Note: 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 analysis of average prices of EU-27 internally traded televisions in Table 11 shows that the export values are higher than the average prices of imported TVs. PDP televisions have the highest average price followed by LCD televisions. In general, there is no clear trend to be seen; the prices seem to be rather volatile.

**Table 11: Average price of televisions based on internal EU-27 trade from 2007-2012 [EUR]**

PRODUCT		2007	2008	2009	2010	2011	2012
<b>85287220 (inc. Video)</b>	Import	178	155	203	178	208	251
	Export	176	122	109	201	193	314
<b>85287230 (Tube)</b>	Import	137	194	196	218	185	164
	Export	267	326	299	362	180	119
<b>85287240 (LCD)</b>	Import					294	302
	Export					288	289
<b>85287260 (PDP)</b>	Import					418	391
	Export					389	392
<b>85287280 (Other)</b>	Import	238	395	324	320	294	247
	Export	434	398	319	313	268	232
<b>85287300 (monochr.)</b>	Import	88	169	56	125	123	57
	Export	26	92	57	92	166	129

Note: 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.

#### 2.1.1.5 Apparent consumption in the EU-27

Using the generic economic data of EU-27 television production, import and export (external trade) as presented in the sections 2.1.1.2 and 2.1.1.3, the apparent consumption for the EU-27 can be calculated as follows:

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

The Prodcom database (code 26.40.20.90, see Table 1) does not differ between the various sub-categories of the EU trade statistics (codes 852872-20/-30/-40/-60/-80 and 852873). Thus, the analysis of the apparent consumption is based on one collective category for television receivers. Further, it has to be mentioned again, that the statistical data of Eurostat is not complete and contains several gaps due to different reasons, so that the results have to be handled with care.

**Table 12: Calculated apparent consumption of televisions in the EU-27 in the years 2007 - 2011**  
[number of units]

		2007	2008	2009	2010	2011
<b>Television receivers</b>	<b>Production</b>	39,982,698	40,638,605	50,963,015	59,423,806	57,804,587
	<b>Import</b>	17,469,273	13,365,224	14,576,690	14,688,683	14,012,341
	<b>Export</b>	4,136,625	6,353,631	5,462,619	5,869,306	5,543,944
	<b>Apparent consumption</b>	<b>53,315,346</b>	<b>47,650,198</b>	<b>60,077,086</b>	<b>68,243,183</b>	<b>66,272,984</b>

The calculated apparent consumption of televisions in the EU-27 ranges between 47 and 69 million units. There has been a decline in 2008, followed by two years of rising consumption data in 2009 and 2010, whereas the consumption of televisions in 2011 declined again by 3% compared to 2010.

## 2.1.2 Forecast to next years

For the purpose of this study, the revision of the European Ecolabel criteria for televisions, not only the past and current market situation as presented in section 2.1.1 is of relevance, but rather the trends and forecasts to next years. Public available market data are rather provided for worldwide forecasts and trends and not for EU-27. Nevertheless, the major global trends are expected to be valid also for Europe so that general conclusions for this study can be drawn.

### 2.1.2.1 *Worldwide and European TV shipments*

In 2011, the worldwide total TV shipments fell for the first time since 2004 according to DisplaySearch<sup>5,6</sup>. This trend also continued in 2012: in the third quarter of 2012 worldwide shipments decreased by 7% compared to Q3'2011, as demand in Japan and Western Europe fell sharply. Western Europe shipments even decreased more than 15% compared to the year before.

According to DisplaySearch the global TV demand is expected to be flat in 2013 due to external factors, such as slowing economic growth, high unemployment rates, and the rising household penetration of flat panel TVs. Further, internal factors, such as slower cost reductions and a greater focus on profits at the expense of volume, are leading to a lower level of retail price decline, which impacts consumers' demand.

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<sup>5</sup> Source:  
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120314\\_2011\\_tv\\_shipments\\_fall\\_after\\_six\\_consecutive\\_years\\_of\\_growth.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120314_2011_tv_shipments_fall_after_six_consecutive_years_of_growth.asp)

<sup>6</sup> Source:  
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121120\\_north\\_america\\_and\\_china\\_tv\\_shipments\\_rise\\_ahead\\_of\\_holidays.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121120_north_america_and_china_tv_shipments_rise_ahead_of_holidays.asp)

In Europe, total **TV shipments** fell 1% in 2011 to just under 68 million units and were **forecasted to fall** a further 3% in 2012. In many Western European markets shipments reached a peak due to the completion of the Analogue switch-off process, and then declined by 6% in 2011. A further fall of 6% was expected for 2012. On the other hand, the Eastern European market was growing at around 5% in 2012 following a 12% increase in 2011 due to still rapidly increasing flat panel penetration. However, the growth in the Eastern European markets cannot compensate the declines in Western Europe in total. The varying growth rates across European countries depend on the level of flat panel penetration and economic conditions within individual markets. For Germany for example, a slight growth was expected in 2012 while for France and Spain double digit declines were forecasted.<sup>7</sup> According to topten.eu 2013<sup>8</sup>, for EU-24<sup>9</sup> the number of annually sold TVs increased from 2007 to 2010 by 50% - from 37 million to 56 million units per year. After 2010 the sales decreased at a similar pace – back to 47 million units in 2012.

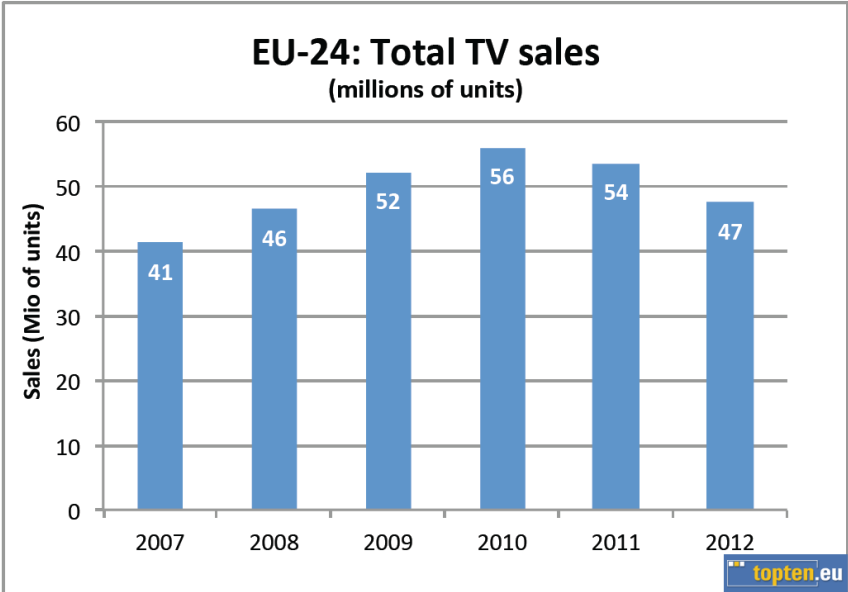


Figure 1: Total annual TV sales in the EU 24; data source: GfK

<sup>7</sup> Source: <http://www.dvd-and-beyond.com/display-article.php?article=1856>

<sup>8</sup> Source: [http://www.topten.eu/uploads/File/TV\\_market\\_2007-2012\\_Topten.pdf](http://www.topten.eu/uploads/File/TV_market_2007-2012_Topten.pdf)

<sup>9</sup> EU-24 including Germany, Denmark, UK, Italy, Poland, Spain, Austria, Belgium, Bulgaria, Estonia, Finland, France, Greece, Hungary, Ireland, Latvia, Lithuania, Netherlands, Portugal, Czech Republic, Romania, Slovakia, Slovenia and Sweden.

### 2.1.2.2 Display technologies

Table 13<sup>10</sup> shows that **LCD** remains the **dominant flat panel TV technology** with 88% of the unit share, although the overall LCD TV unit sales fell in Q3'2012 down 1% compared to the year before. Plasma shipments continue to decline despite their superior picture quality. The unit share of Rear Projection (RP) televisions declined towards 0%. The global unit share of **CRT TVs as well as PDP TVs** is lower than 10% and **further declining**. For PDP TVs, the reason for this is that their pricing becomes uncompetitive at key sizes. Plasma technology has historically dominated the large screen TV market but due to price declines of large screen LCD LED sets, the price advantage of large screen PDPs is now limited to the niche extra-large screen market (Source: DVD and beyond).

Within LCD TV shipments, the LED technology continues to climb, exceeding 70% of units and 80% of revenues for total global TV shipments, compared to just 45% in 2011<sup>6</sup>. OLED TVs were expected likely to launch late in 2012.

**Table 13: Q3'12 Worldwide TV Shipments by Technology (000s); (Source: DisplaySearch)**

	Q3'12 Units	Q3'12 Unit Share	Y/Y Growth
LCD TV	51,088	88.0%	-1%
PDP TV	3,332	5.7%	-20%
OLED TV	0	0.0%	-85%
CRT TV	3,647	6.3%	-43%
RP TV	9	0.0%	-59%
<b>Total</b>	<b>58,076</b>	<b>100%</b>	<b>-7%</b>

For Europe, topten.eu 2013 state for the year 2012 an overall sales share of 95% LCD televisions; LCD-TVs with CCFL-backlight accounted only for around one quarter of sales – now LED-LCD TVs are dominating the market with 72%. The plasma technology never reached the breakthrough and the sales share always remained below 10%.

<sup>10</sup>

Source:

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121120\\_north\\_america\\_and\\_china\\_tv\\_shipments\\_rise\\_ahead\\_of\\_holidays.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121120_north_america_and_china_tv_shipments_rise_ahead_of_holidays.asp);

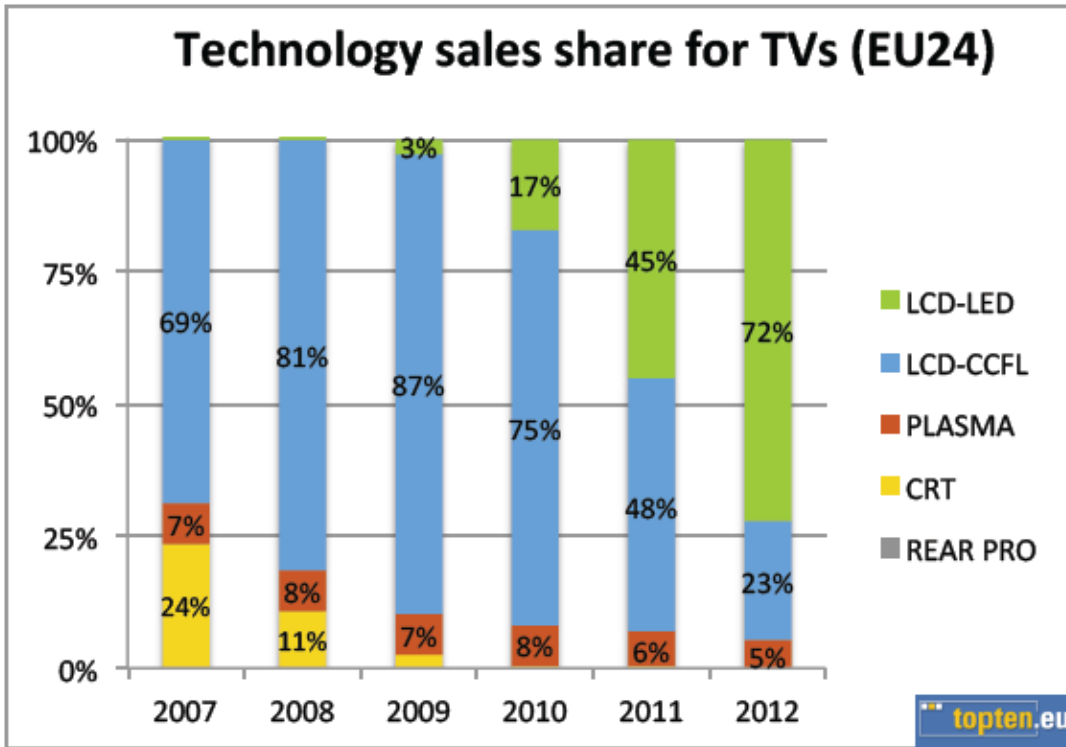


Figure 2: Sales shares of different TV technologies; data source: GfK

DisplaySearch<sup>11,12</sup> expects global **LCD TV shipments to continue growing** throughout the forecast. This technology is projected to peak around **97% of the overall unit demand in 2015**. On the other side, the demand for CRT and plasma TVs is expected to decline towards zero within the next few years as the LCD TV market captures market share from declining CRT and plasma technology (see Figure 3)<sup>13</sup>. In the long term, as the TV replacement cycle shifts from the flat panel replacement of CRTs to flat panel upgrades, there is a potential for renewed growth, especially as new features become more affordable.

<sup>11</sup> Source:  
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121023\\_global\\_tv\\_demand\\_expected\\_to\\_be\\_flat\\_in\\_2013.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121023_global_tv_demand_expected_to_be_flat_in_2013.asp)

<sup>12</sup> Source:  
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120509\\_lcd\\_tv\\_shipments\\_to\\_grow\\_in\\_2012\\_to\\_220M\\_units\\_despite\\_zero\\_growth\\_in\\_overall\\_tv\\_shipments.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120509_lcd_tv_shipments_to_grow_in_2012_to_220M_units_despite_zero_growth_in_overall_tv_shipments.asp)

<sup>13</sup> Source:  
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120710\\_lcd\\_tv\\_forecast\\_lowered\\_to\\_216\\_units\\_solid\\_growth\\_still\\_expected.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120710_lcd_tv_forecast_lowered_to_216_units_solid_growth_still_expected.asp)



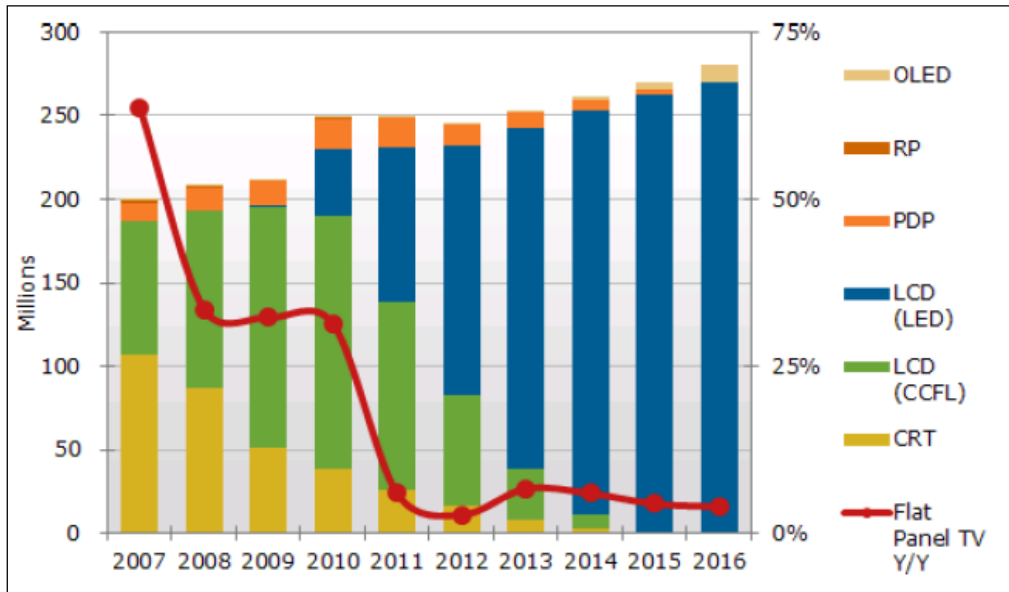
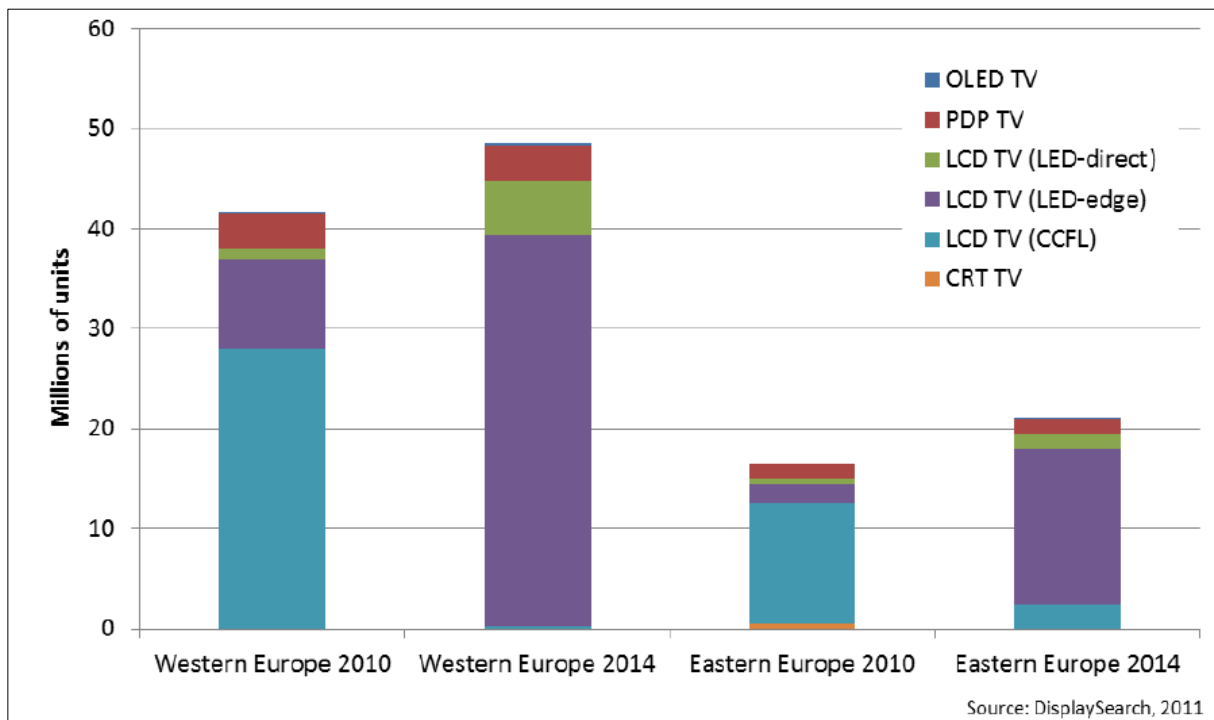


Figure 3: Worldwide TV forecast by technology (Source: DisplaySearch)

For the European market, forecasts are most similar (see Figure 4)<sup>14</sup>. The majority of televisions sold in 2010 both in Western and Eastern Europe were LCD televisions with **CCFL backlight**. However, this technology is **predicted to be nearly eliminated from the Western European market** and to account for only 10% of shipments in Eastern Europe in 2014, disappearing towards more energy efficient edge-lit LED TVs.

<sup>14</sup> Source: DisplaySearch 2011. "Quarterly Advanced Global TV Shipment and Forecast Report, Fourth Quarter, 2010", January 2011. Taken from the "Discussion paper on the review of the Ecodesign and Energy Labelling Regulations for televisions and on the draft Regulation on electronic displays, including computer monitors", August 2012.



**Figure 4: Projected market transition of television shipments in Europe, 2010 and 2014**  
(Source: DisplaySearch)

#### Trend to LED technology

In Europe, LED based LCD TVs were expected to become the dominant technology in 2012 accounting for 65% of the total TV demand according to “DVD and beyond”<sup>15</sup>. It is predicted that LED's share will rise to 93% of the total market by 2016, thus completely replacing the CCFL LCD technology by that time.

According to DisplaySearch<sup>12,16</sup> the primary reason for the increasing share of LED backlight LCD TVs is the introduction of low-cost direct-LED backlight models, which have smaller premiums over CCFL backlight models and thus can attract price-sensitive consumers.

Low-cost LED backlight models are feasible by reducing the number of LEDs per TV set roughly to half, as well as replacing other materials with lower cost structures.

These direct-lit LED models are bulkier compared to the slim design of edge-lit

<sup>15</sup> Source: <http://www.dvd-and-beyond.com/display-article.php?article=1856>

<sup>16</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120118\\_low\\_cost\\_direct\\_led\\_backlights\\_to\\_reduce\\_premium\\_for\\_led\\_backlit\\_lcd\\_tvs.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120118_low_cost_direct_led_backlights_to_reduce_premium_for_led_backlit_lcd_tvs.asp)

models, and they move away from higher picture quality that has been a characteristic of LED-backlit LCD TVs. On the other side, the reduced **brightness of direct-LED backlight models corresponds to lower power consumption.**

Life-cycle costs of LED technology

The material costs for direct LED backlights come closer to that of CCFL backlights thus increasing their competitiveness with CCFL-backlit LCD TV and even CRT TV. DisplaySearch estimates that for 32” LCD TVs, direct LED backlights cost 1.3 to 1.4 times compared to CCFL backlights, as opposed to edge-lit LED backlights, which are estimated to cost more than twice as much as CCFL backlights. For 40” LCD TVs, the savings could be even greater.

Further, DisplaySearch<sup>17</sup> analysed the life cycle costs and corresponding payback times of LED- compared to CCFL-backlight TVs. They investigated whether the cost savings based on lower energy consumption during the use phase outweigh the increased purchase price of LED-backlit TVs. In comparing CCFL and LED-backlit 40” LCD TVs, basic configuration and Energy Star certified, **LED-backlit sets were found to have lower life-cycle costs, under reasonable lifetime assumptions.**

The payback time for an entry-level LED-backlit TV is under two years in Europe (see table below), considering electricity and TV prices together with power consumption data.

**Table 14: Payback time for entry-level LED-backlit TV in comparison to CCFL-backlit TVs (Source: DisplaySearch)**

Region	Payback Time (Years)
US (California)	3.8
US (Average)	5.1
China	12.2
Western Europe	1.9

<sup>17</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110718\\_energy\\_and\\_cost\\_savings\\_from\\_led\\_backlit\\_lcd\\_tvs\\_not\\_communicated\\_to\\_consumers.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110718_energy_and_cost_savings_from_led_backlit_lcd_tvs_not_communicated_to_consumers.asp)

### Market introduction of OLED technology

OLED is a mass-market technology in small or medium displays, particular in smart phone applications. OLED displays can provide high contrast ratio, fast response time, wide colour gamut, and wide viewing angle, while operating in a broad temperature range at low power consumption. In addition, OLED technology enables thin devices that can be both flexible and transparent. OLED displays operate through direct emission, as opposed to transmissive LCD or reflective displays, which enables area lighting.

For the European market OLED was expected to begin displacing LED in 2012 assuming that OLED TV shipments will represent 4% of the total European TV market in 2016<sup>18</sup>.

However, according to DisplaySearch<sup>19</sup>, the global mass production for televisions based on OLED technology was delayed until at least 2013, with a reduced shipment forecast of 50,000 units. At the end of 2012, OLED TVs were still not commercially available due to mass production challenges and expected high retail prices. They compete with LCD TVs that are shifting to larger screen sizes and higher resolutions. Still, the OLED penetration of the TV market is forecasted to exceed 3% or 9 million by 2016.<sup>11,20</sup>

#### 2.1.2.3 Screen sizes

According to topten.eu 2013, the sales data between 2007 and 2012 for EU-24 show a constant decrease of the sales proportion of very small TVs (screen diagonal < 20 inches) and a constant increase for the two largest size categories (screen diagonal between 40 and 50 inches and 50 to 60 inches). Especially TVs between 40 and 50 inches became increasingly popular: the sales proportion doubled from 15% to 31%.

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<sup>18</sup> Source: <http://www.dvd-and-beyond.com/display-article.php?article=1856>

<sup>19</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120106\\_oled\\_display\\_technology\\_moving\\_to\\_compete\\_in\\_the\\_tv\\_market.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120106_oled_display_technology_moving_to_compete_in_the_tv_market.asp)

<sup>20</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121105\\_oled\\_tvs\\_to\\_start\\_shipping\\_by\\_the\\_end\\_of\\_2012.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121105_oled_tvs_to_start_shipping_by_the_end_of_2012.asp)

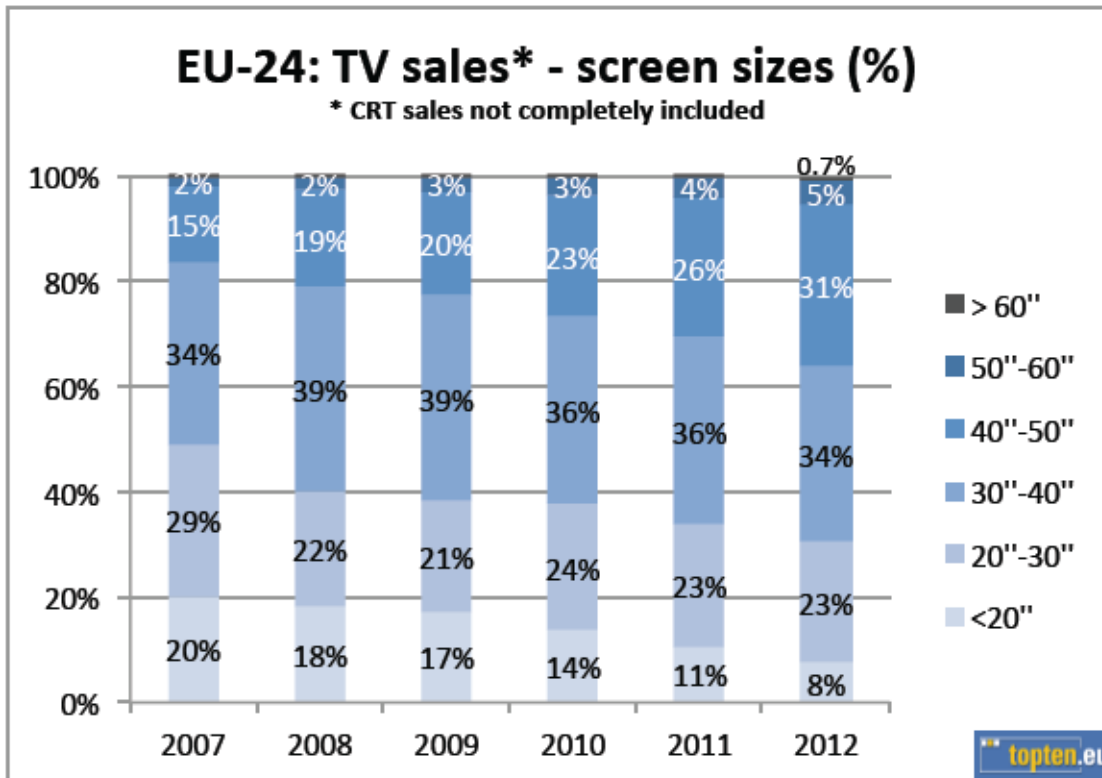


Figure 5: TV sales in the EU-24: percentage of different screen size categories; data source: GfK<sup>21</sup>

The average diagonal sizes of TVs have increased over the past years. The average shipped size of LCD TVs increased more than 6% to 35.9" in 2012 from less than 30" just four years ago (see Table 15). Further, new LCD TV panel sizes are replacing smaller sizes: 28"/29" are replacing 26", 39" replacing 37", 50" replacing 46"/47", and 60" replacing 55".

Table 15: Average diagonal display size of televisions

	2010	2011	2012	2013
LCD TV	33.2"	34.5"	35.9"	36.1"
OLED TV	15.0"	-	55"	55"
Plasma TV	46.3"	47"	48,1"	50"

Source: DisplaySearch, 16 October 2012

<sup>21</sup> Because of rounding the total sales can sum up to 101%.

Also for the coming years, **large screen sizes are expected to continue to have strong growth** as affordability improves due to rapidly falling prices of LCD TVs. This encourages early adopting flat panel TV consumers to re-enter the market for an upgrade, e.g. from 32" LCD TVs to 40" and larger sizes, thus driving a new replacement wave, and it also lowers barriers to first-time adoption in emerging markets when converting from CRT TVs. Further, consumers tend not to revert to smaller displays once they adopted larger sizes.

In 2015, 40"+ sizes are expected to account for 38% of total LCD TV panel demand. Shipments of 50" and larger screen sizes are expected to rise 13% in 2013, compared with just 1% growth of 40-49" and a 2% decline in shipments of 40" and smaller sizes. Panel makers are also developing even larger TV panels, including 70", 75", and 80". Features like smart interactive TV, 3D viewing, direct-type LED backlights or high-end features and specifications such as 21:9 cinema form factor or 4Kx2K resolution shall encourage end-users to choose larger sizes.

On the other side, the demand for smaller sizes is expected to decrease as they start to compete with TV viewing on the larger and higher resolution displays of mobile devices such as tablet PCs and smartphones. (Sources: DisplaySearch<sup>22</sup>)

For the European market, data and the reasons for these trends are similar<sup>23</sup>:

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<sup>22</sup>

Sources:

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120123\\_new\\_sizes\\_increase\\_lcd\\_tv\\_area\\_demand\\_outlook.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120123_new_sizes_increase_lcd_tv_area_demand_outlook.asp);

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121023\\_global\\_tv\\_demand\\_expected\\_to\\_be\\_flat\\_in\\_2013.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121023_global_tv_demand_expected_to_be_flat_in_2013.asp);

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120710\\_lcd\\_tv\\_forecast\\_lowered\\_to\\_216\\_units\\_solid\\_growth\\_still\\_expected.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120710_lcd_tv_forecast_lowered_to_216_units_solid_growth_still_expected.asp);

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121120\\_north\\_america\\_and\\_china\\_tv\\_shipments\\_rise\\_ahead\\_of\\_holidays.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121120_north_america_and_china_tv_shipments_rise_ahead_of_holidays.asp);

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120509\\_lcd\\_tv\\_shipments\\_to\\_grow\\_in\\_2012\\_to\\_220M\\_units\\_despite\\_zero\\_growth\\_in\\_overall\\_tv\\_shipments.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120509_lcd_tv_shipments_to_grow_in_2012_to_220M_units_despite_zero_growth_in_overall_tv_shipments.asp);

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121016\\_flat\\_panel\\_display\\_industry\\_poised\\_for\\_recovery\\_and\\_long\\_term\\_growth.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121016_flat_panel_display_industry_poised_for_recovery_and_long_term_growth.asp)

<sup>23</sup>

Source: <http://www.dvd-and-beyond.com/display-article.php?article=1856>

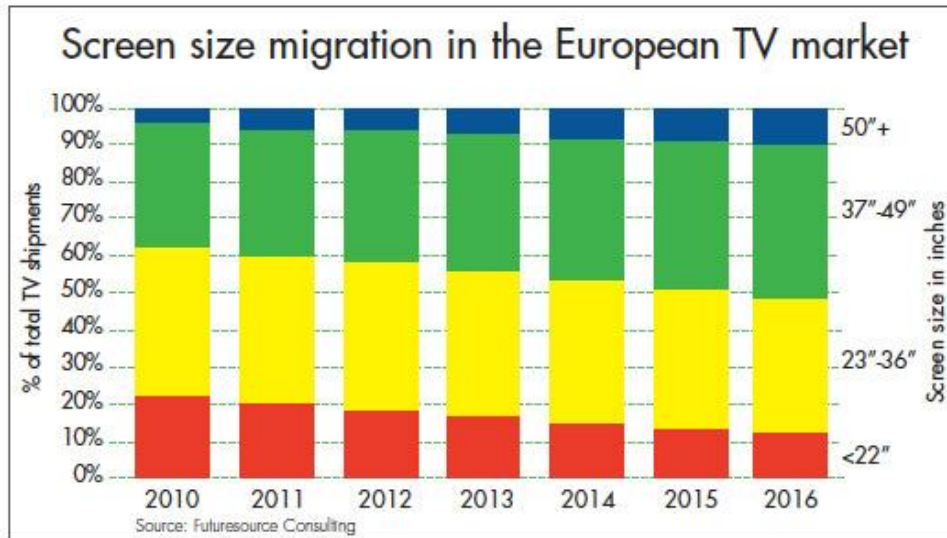


Figure 6: Screen size migration in the European TV market (Source: DVD and beyond)

#### 2.1.2.4 Special features

##### 3D

According to DisplaySearch<sup>24</sup>, 3D is proving a popular feature, helping to drive shipments of more than 24 million units in 2011 and an anticipated 90% increase in 2012 to 46 million units. Shipment penetration is expected to exceed 25% in Western Europe and 20% in Eastern Europe (see Figure 7)<sup>25</sup>.

<sup>24</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120509\\_lcd\\_tv\\_shipments\\_to\\_grow\\_in\\_2012\\_to\\_220M\\_units\\_despite\\_zero\\_growth\\_in\\_overall\\_tv\\_shipments.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120509_lcd_tv_shipments_to_grow_in_2012_to_220M_units_despite_zero_growth_in_overall_tv_shipments.asp)

<sup>25</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/111228\\_3d\\_tv\\_gaining\\_momentum\\_in\\_western\\_europe\\_and\\_china\\_declining\\_in\\_north\\_america.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/111228_3d_tv_gaining_momentum_in_western_europe_and_china_declining_in_north_america.asp)

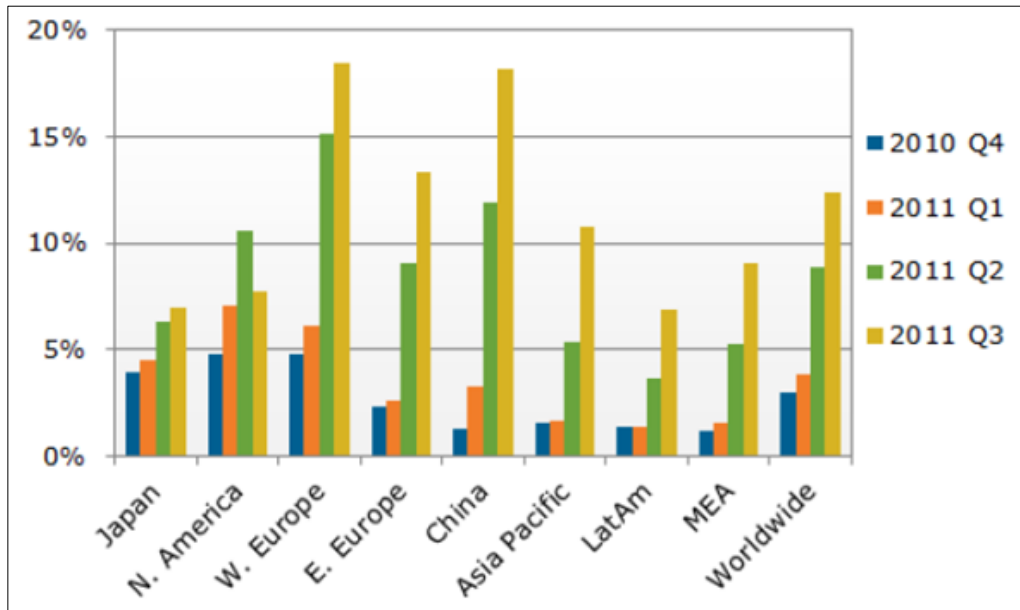


Figure 7: 3D penetration as a percentage of TVs shipped (Source: DisplaySearch)

LCD TV panel makers have pushed 3D capability via lower prices and the introduction of new, cost-effective technologies. Many TV brands have started to list 3D as a basic feature for their models above a certain screen size level<sup>26</sup>.

DisplaySearch<sup>27</sup> forecasts the household penetration rate of 3D-ready TV devices to increase from 10% to more than 50% by 2019 worldwide, but actual usage of 3D may not move as quickly. For the European market, just 9% of the TV sales in 2011 were 3D devices with a penetration rate of just 2% of the households<sup>28</sup>.

Even though consumers own these 3D-ready TV devices, there is **still a need for more 3D content before broader adoption can be expected**. Further, due to limitations and high prices of auto-stereoscopic technologies for large displays, additional glasses will be necessary for many 3D applications for a number of years.

<sup>26</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120307\\_shipments\\_of\\_3d\\_lcd\\_tv\\_panels\\_reach\\_21m\\_in\\_2011.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120307_shipments_of_3d_lcd_tv_panels_reach_21m_in_2011.asp)

<sup>27</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120926\\_tv\\_to\\_drive\\_global\\_demand\\_for\\_3d\\_ready\\_devices.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120926_tv_to_drive_global_demand_for_3d_ready_devices.asp)

<sup>28</sup> Source: <http://www.dvd-and-beyond.com/display-article.php?article=1856>



Several sources<sup>29</sup> indicate that the **energy consumption of televisions increases when being in 3D mode** compared to the standard 2D mode, caused by an increase in brightness. In October 2011 the Consumer Electronics Association (CEA) launched a 3D TV Technology and Energy Consumption Discovery Group to investigate the state of 3D television technology and its effect on energy consumption and to allow progress on the revision of energy measurement standards. Their report<sup>30</sup> to CEA's Technology and Standards Council from 23 March 2012 states that preliminary testing of 5 TV models ranges from 16% less to 86% more power consumption in 3D compared to 2D mode.

However, the current measurement standards do not include standard test videos or rigorous methodologies to facilitate comparative energy consumption measurements for 3D capable televisions.

The "Draft discussion paper on the review of the Ecodesign and Energy Labelling Regulations for televisions and on the draft regulation on electronic displays, including computer monitors" (2012) highlights 3D with its increased energy consumption generally as important aspect for the revision process, however, proposing to take it into account at the second review time in the light of the retarded market developments.

#### Internet connectivity ("Smart TVs")

"Smart TVs" are referred to televisions that provide users with integrated internet capabilities to check emails and social networking websites, browse the internet including app stores, or watch programmes via the internet.

In Europe, Smart TV usage had a slow start in terms of consumer interest. However, in 2011 already 20% of European TV shipments were Smart TVs and it is expected that by 2016 over 90% of the TV shipments will include internet functionality meaning that more than 50% of European households will own a Smart TV set.<sup>31</sup>

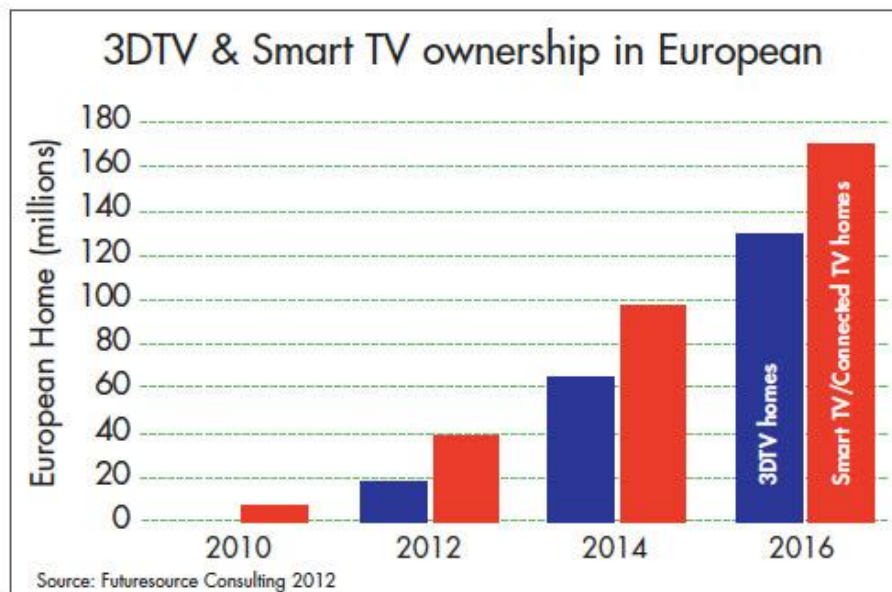
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<sup>29</sup> <http://www.pcwelt.de/ratgeber/Energieeffizienz-Trickserei-beim-Energie-Label-Fernseher-der-Klasse-B-sparsamer-als-A-6144333.html>; [http://news.cnet.com/8301-17938\\_105-20009547-1.html](http://news.cnet.com/8301-17938_105-20009547-1.html)

<sup>30</sup> Source:

[http://cea.aristotle.com/Shared%20Documents/3DTVVEC%20DG%20Report\\_15March.pdf](http://cea.aristotle.com/Shared%20Documents/3DTVVEC%20DG%20Report_15March.pdf)

<sup>31</sup> Source: <http://www.dvd-and-beyond.com/display-article.php?article=1856>



**Figure 8: 3D TV and Smart TV ownership in European homes (Source: DVD and beyond)**

Smart TVs might encourage the development of larger screen sizes and wider formats such as 20:9 ratio, as consumers want to do multiple activities on the same screen (watching the TV programme on the main screen with small embedded screens e.g. for emails overlaid on the side). This possible trend might increase the overall energy consumption of televisions.

#### Ultra high definition TVs

Ultra-high definition televisions, also known as UHD, 4K-2K, 4K, 8K or RETINA displays, are making an entrance this year in some large screen sizes (55" and larger). Mass market adoption of these sets is not expected for the next five to eight years due to high prices and a lack of 4K content and standards.<sup>32</sup>

<sup>32</sup> Sources: Draft discussion paper on the review of the Ecodesign and Energy Labelling Regulations for televisions and on the draft regulation on electronic displays, including computer monitors" (2012); and <http://www.dvd-and-beyond.com/display-article.php?article=1856>

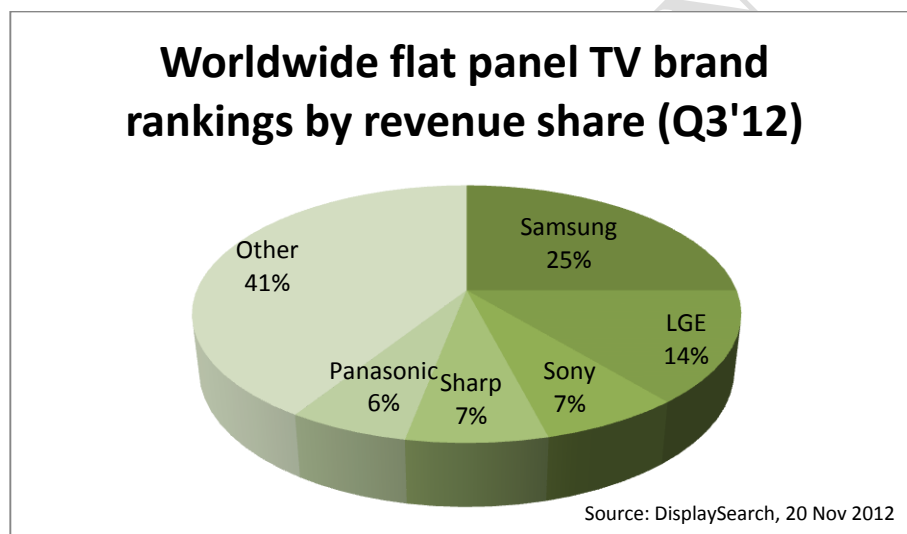
## 2.2 Market and production structures

### 2.2.1 Major players, SMEs and relative market shares

According to DisplaySearch<sup>33</sup>, the five major brands by revenue share in the flat panel TV market are Samsung (South Korea), LG Electronics (South Korea), Sony (Japan), Panasonic (Japan) and Sharp (Japan). Together, they cover around two thirds of the market. Other major TV brands are, inter alia, (alphabetical order):

- AOC (Taiwan), ChangHong (China), Funai (Japan), Grundig (Germany), Haier (China), Hisense (China), Insignia, Konka (China), Philips (Netherlands), Sanyo (Japan), Skyworth (China), TCL (China), Toshiba (Japan), Vestel (Turkey), Vizio (USA), Westinghouse Digital (USA), and Xoxeco (China).

While the worldwide market share of the Japanese brands Sony, Panasonic and Sharp declined, the share of Chinese and Korean brands grew.



**Figure 9: Worldwide flat panel TV brand rankings by revenue share, Q3 2012 (Source: DisplaySearch)**

<sup>33</sup>

Sources:

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120911\\_global\\_tv\\_shipments\\_decline\\_for\\_second\\_straight\\_quarter.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120911_global_tv_shipments_decline_for_second_straight_quarter.asp);

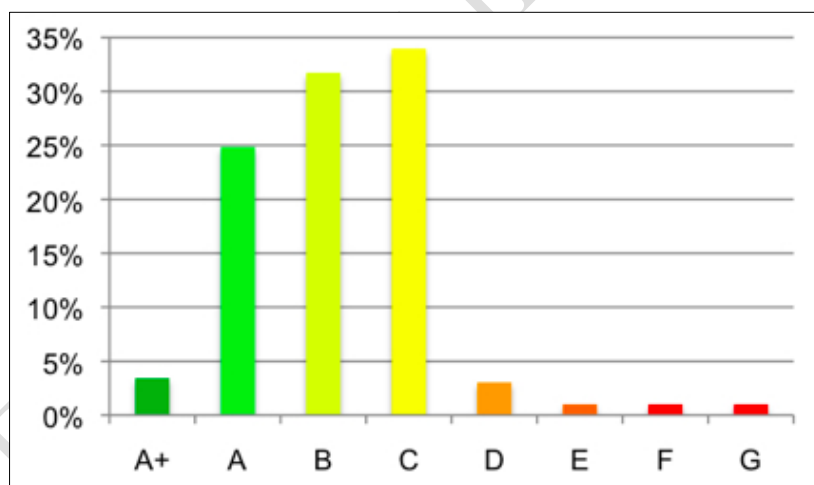
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121120\\_north\\_america\\_and\\_china\\_tv\\_shipments\\_rise\\_ahead\\_of\\_holidays.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/121120_north_america_and_china_tv_shipments_rise_ahead_of_holidays.asp)

## 2.2.2 Front-runners and market penetration

In this section, the market of environmentally front-runner models is described. For this purpose, the European energy and ecolabel were analysed to provide an impression on their market relevance and to identify top runner brands.

### 2.2.2.1 EU Energy Efficiency Label

Since November 2011, energy efficiency labels for televisions have been mandatory for models entering the market. The first stage is open for energy efficiency classes A to G; from 2014, 2017 and 2020, respectively, the range of energy efficiency classes will be moved upwards, introducing A+ / A++ / and A+++ energy classes. A+ and better energy classes can already be used by manufacturers on a voluntary basis<sup>34</sup>. A television database by Friends of the Earth Germany (BUND) based on a research of 495 models in 2011 revealed that the energy efficiency classes D to G were only minor represented whereas already 25% achieved the A class and even some A+ class model were available (see Figure 10)<sup>35</sup>.



**Figure 10: Distribution of 495 televisions of the BUND TV-database to the energy efficiency classes, 2011 (Source: BUND)**

According to Initiative Energieeffizienz<sup>36</sup>, manufacturers providing models with **A+** are **Loewe, Panasonic, Philips, Samsung, Sharp, and Sony**.

<sup>34</sup> Source: [www.come-on-labels.eu/download/energy-label-vs-ecodesign.pdf](http://www.come-on-labels.eu/download/energy-label-vs-ecodesign.pdf)

<sup>35</sup> Source: [http://www.bund.net/index.php?id=2560\\_self](http://www.bund.net/index.php?id=2560_self)

<sup>36</sup> Source: [www.stromeffizienz.de/private-verbraucher/stromsparchecks/topgeraete-datenbank/unterhaltung.html](http://www.stromeffizienz.de/private-verbraucher/stromsparchecks/topgeraete-datenbank/unterhaltung.html)

In November 2011, **Philips** introduced an **A++** LED TV model. The low energy consumption is realised by using a high efficient LED-LC display with edge-lit backlight, increased transparency of the glass and dynamic dim algorithms that optimise the backlight. In case no backlight is necessary, no light is produced. Further, a Zero Power Switch reduces the energy consumption to 0 W when turning the television off. The television contains recycled materials and the use of hazardous substances has been further reduced (no PVC and brominated flame retardants).<sup>37</sup>

According to topten.eu (2013), only looking at the models that were put on the market in 2012 the market share of A+ models already reached 13% for EU-24. Figure 11 shows that across the EU 53% of the new models sold in 2012 were classes A or better. Class D is no longer visible on the market (EU: 1%).

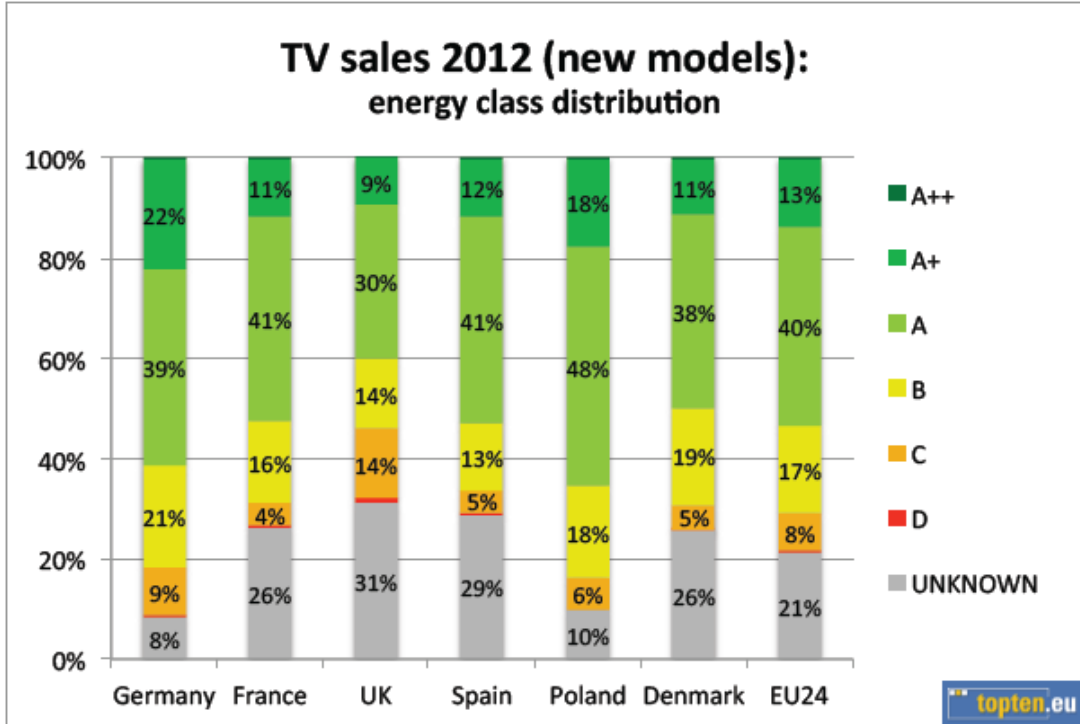


Figure 11: Distribution of Energy Classes of TV sales in 2012 for new models put on the market in 2012; data source: GfK

<sup>37</sup> Source: [http://www.newscenter.philips.com/de\\_de/standard/news/consumerlifestyle/20111129\\_philips\\_hat\\_wegweisenden\\_aplusplus\\_smart\\_led-tv\\_im%20angebot.wpd](http://www.newscenter.philips.com/de_de/standard/news/consumerlifestyle/20111129_philips_hat_wegweisenden_aplusplus_smart_led-tv_im%20angebot.wpd)

#### 2.2.2.2 *EU Ecolabel*

According to the European Commission<sup>38</sup>, in January 2012 there were in total 676 EU ecolabelled products in the product group category televisions.

For the current EU Ecolabelling criteria, valid from March 2009 to October 2013, the following manufacturers hold licences for their televisions<sup>39</sup>: **LG Electronics, Philips, Samsung, Sharp, Sony, and Toshiba.**

#### 2.2.2.3 *Nordic Ecolabelling*

For the current Nordic Ecolabelling criteria, valid from December 2009 to October 2014, **Samsung** is the only licence holder with 85 models awarded<sup>40</sup>. The current criteria are under revision (see also Task 1).

#### 2.2.2.4 *Blue Angel*

Currently, there are no licence holders of the Blue Angel's latest award criteria RAL-UZ 145 valid since July 2012. In September 2011 two television models from **Philips** have been awarded according to the former Blue Angel criteria set, valid from January 2011 to July 2012.

#### 2.2.2.5 *TCO*

The TCO Certified Displays 6.0 criteria are applicable to all flat panel displays, televisions shall be tested according to the criteria in the document. However, the TCO Development's product database only contains computer displays up to 30 inch, and **no televisions.**

#### 2.2.2.6 *EPEAT*

According to Environmental Leader<sup>41</sup>, in April 2013 for the first time televisions have been included to the EPEAT database, the Electronic Product Environmental Tool (EPEAT) global registry for greener electronics.

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<sup>38</sup> Source: <http://ec.europa.eu/environment/ecolabel/facts-and-figures.html>; note: the numbers provided by the EU COM are indicative. The exact numbers are under validation and will be updated as soon as possible.

<sup>39</sup> Source: <http://ec.europa.eu/ecat/>

<sup>40</sup> Source: [www.svanen.se/en/Buy-Svanenmarkt/Ecolabelled-products/?categoryID=159&p=4](http://www.svanen.se/en/Buy-Svanenmarkt/Ecolabelled-products/?categoryID=159&p=4)

<sup>41</sup> Source: <http://www.environmentalleader.com/2013/04/03/samsung-lg-tvs-make-epeat-debut/>

In total, 123 television products from two manufacturers (more than 50 television models from **LG Electronics** and 71 **Samsung** TVs) fulfilled the environmental criteria. So far, the models are only available at the United States market.

To be added to the EPEAT registry, a television must meet at least 24 required environmental performance criteria (bronze). Products may achieve higher ratings (silver or gold) by meeting up to 29 additional optional criteria (see also Task 1).

From the EPEAT registered products<sup>42</sup>, 84 models meet the silver standard and 39 models the gold standard. The following table shows an analysis, which of the additional optional criteria have been fulfilled or not by the gold rated products. This analysis might facilitate the revision of EU ecolabel criteria for televisions.

**Table 16: EPEAT gold rated televisions – overview of optional criteria fulfilment**

<b>Optional criteria to achieve silver or gold standard</b>	<b>Fulfilled</b>
<b>Reduction of use of hazardous substances</b>	
4.1.2.1 Further reduction of the use of RoHS Directive hazardous substances (cadmium)	Yes
4.1.3.2 Use of non-mercury containing light sources	Yes
4.1.4.1 Further reduction of the use of RoHS Directive hazardous substances (lead)	Yes
4.1.5.1 Reduction of substances on the European Union REACH Candidate List of SVHCs	Yes
4.1.7.1 Reducing BFR/CFR/PVC content of external plastic casings	Yes
4.1.7.2 Eliminating or reducing BFR/CFR content of printed circuit board laminates	No
4.1.7.3 Eliminating or reducing BFR/CFR/PVC content of product	No
4.1.8.1 Reduce fluorinated gas emissions resulting from flat panel display manufacturing	No
4.1.9.1 Inventory of intentionally added chemicals residing in the product	Yes
<b>Materials selection</b>	
4.2.1.2 Minimum 5% to 10% content of postconsumer recycled plastic	No
4.2.1.3 Minimum 25% content of postconsumer recycled plastic	No
4.2.2.2 Minimum content of biobased plastic material	No
<b>Design for end of life</b>	
4.3.2.1 One recyclable plastic type per rigid plastic part >25 g	Yes
4.3.2.3 Manual separation of plastics for recycling	Yes
4.3.2.4 Molded/glued-in metal eliminated or removable	Yes
4.3.3.2 Marking provided on the product identifying items containing materials with special handling needs	Yes
4.3.4.2 Minimum 90% reusable/recyclable	Yes

42

<http://ww2.epeat.net/publicSearchResults.aspx?return=search&&status=1&ProductType=16&stdid=3&epeatcountryid=1>

<b>Optional criteria to achieve silver or gold standard</b>	<b>Fulfilled</b>
4.3.4.3 Preparation of end-of-life characterization report	Yes
<b>Energy conservation</b>	
4.5.1.2 On Mode power performance exceeding ENERGY STAR	Yes
4.5.2.1 Additional On Mode performance exceeding ENERGY STAR	Yes
4.5.2.2 Low standby power	Yes
4.5.2.3 Automatic switch to sleep mode	Yes
<b>End of life management</b>	
4.6.1.2 Provision of take-back service for broader scope of products	Yes
4.6.2.2 Certification of programs exempt from end of life processing	No
<b>Corporate performance</b>	
4.7.1.2 Third-party certified environmental management system for design and manufacturing organizations	Yes
4.7.2.2 Public disclosure of supply chain toxics	Yes
4.7.3.1 Product life cycle assessment and public disclosure of analyses	Yes
<b>Packaging</b>	
4.8.2.2 Packaging 90% compostable/recyclable	Yes
4.8.4.1 Provision of take-back service for packaging	Yes

### 2.2.2.7 *Energy Star*

ENERGY STAR® Program Requirements Product Specification for Televisions Eligibility Criteria Version 5.3 from September 30, 2011. The Version 6.0 ENERGY STAR specification for televisions has been finalized and will take effect on June 1, 2013. Manufacturers may already certify their eligible products to the Version 6.0 requirements.

The list of qualified televisions<sup>43</sup> contains 1,476 television models being available on the US and Canadian market, either qualified according to version 5.3 or to version 6.0. Amongst the Energy Star qualified TVs, there are three OLED TVs, 6 “other” screen types, 56 PDP models, and 1,411 LCD televisions. Within LCD technology, a minority of 155 models have a CCFL backlight, the rest accounts for LED technology (156 models marked as direct-lit LED and 218 models as edge-lit LED). The display sizes range from 13.3 inches to 80 inches and one model with 275 inches.

<sup>43</sup> Source: [http://downloads.energystar.gov/bi/qplist/tv\\_prod\\_list.xls](http://downloads.energystar.gov/bi/qplist/tv_prod_list.xls), sighted at 6 May 2013



## 2.3 Consumer aspects

### 2.3.1 TV replacement cycle

According to DisplaySearch<sup>44</sup>, the **TV replacement cycle decreased** on a global scale **from 8.4 to 6.9 years** (compared to the previous 10-15 year average for CRT-to-CRT replacement). As reasons for this trend declining prices, a wider variety of sizes, and the desire for the latest technologies are given. The majority of households, on a global basis, are still replacing CRT TVs with flat panel TVs. Mature markets, as for example UK, on the other side, are replacing their first-generation flat panel TVs.

### 2.3.2 Drivers for TV replacement

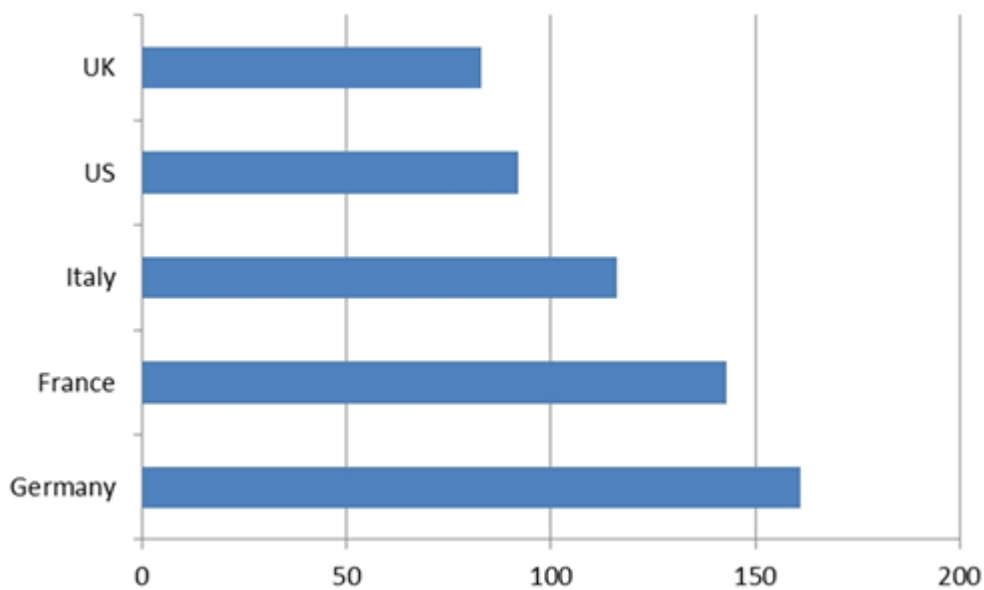
The most critical driver of TV replacement in nearly all countries is a **desire to trade up in size**, followed by **wanting to own a flat panel TV with improved picture quality**. Price related factors were also important in TV replacement decisions. The existing TV being outdated or broken was a strong driver for TV replacement, but not one of the top reasons. New advanced features such as LED backlights, 3D and internet connectivity, seem however only to a minor extent be important to buy a new TV just because these features become available. In the majority of countries being analysed by DisplaySearch<sup>45</sup>, LED was a below average driver of new TV replacements, but ranked stronger than internet connectivity and 3D in most cases. Regarding internet connectivity, most consumers view it as a nice feature to have, but not as a principle reason to upgrade a TV. For 3D, the lack of broadly available content is making this feature not a main reason to upgrade the TV in the first place.

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<sup>44</sup> Source:  
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120529\\_global\\_tv\\_replacement\\_cycle\\_falls\\_below\\_7\\_years\\_as\\_households\\_continue\\_to\\_replace.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120529_global_tv_replacement_cycle_falls_below_7_years_as_households_continue_to_replace.asp);

<sup>45</sup> Sources:  
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110608\\_new\\_tv\\_features\\_not\\_strong\\_drivers\\_of\\_new\\_tv\\_purchases.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110608_new_tv_features_not_strong_drivers_of_new_tv_purchases.asp);  
[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110421\\_displaysearch\\_study\\_reveals\\_consumers\\_are\\_replacing\\_tvs\\_faster\\_than\\_ever.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110421_displaysearch_study_reveals_consumers_are_replacing_tvs_faster_than_ever.asp)

Interesting is that especially German consumers consider **energy consumption** more than other consumers when upgrading their TV sets<sup>46</sup>. Energy usage is the fifth most important factor for German consumers whereas buyers from the UK and the US don't seem to consider energy consumption as much when purchasing a new TV. The result is explained with the priority of energy efficiency especially in Germany, and mirrors the image of German consumers to be well-informed and technically savvy, seeking out features they really value (e.g. LED backlights due to their lower energy consumption).



**Figure 12: Normalized importance of energy efficiency in selecting a replacement TV (100 = average importance for that country) (Source: DisplaySearch)**

On the other hand, it seems that **TV brands are missing the opportunity to market LED-backlit LCD TVs based on their energy and cost savings**. According to DisplaySearch<sup>47</sup>, in most countries, lower power emerged as a stronger purchase motivator than LED backlights, but the connection between the two is not being

<sup>46</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110831\\_germans\\_go\\_green\\_when\\_upgrading\\_their\\_tv\\_sets.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110831_germans_go_green_when_upgrading_their_tv_sets.asp)

<sup>47</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110718\\_energy\\_and\\_cost\\_savings\\_from\\_led\\_backlit\\_lcd\\_tvs\\_not\\_communicated\\_to\\_consumers.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110718_energy_and_cost_savings_from_led_backlit_lcd_tvs_not_communicated_to_consumers.asp)

made. Set makers seem to be failing to establish the connection or make the case for power, and thus cost savings, in their LED-backlit products.

A survey amongst UK consumers who bought a TV within the last 12 months or intended to buy a TV within the next 12 months, revealed similar results regarding the significance of different decision criteria for the purchase of a new television (see Figure 13)<sup>48</sup>:

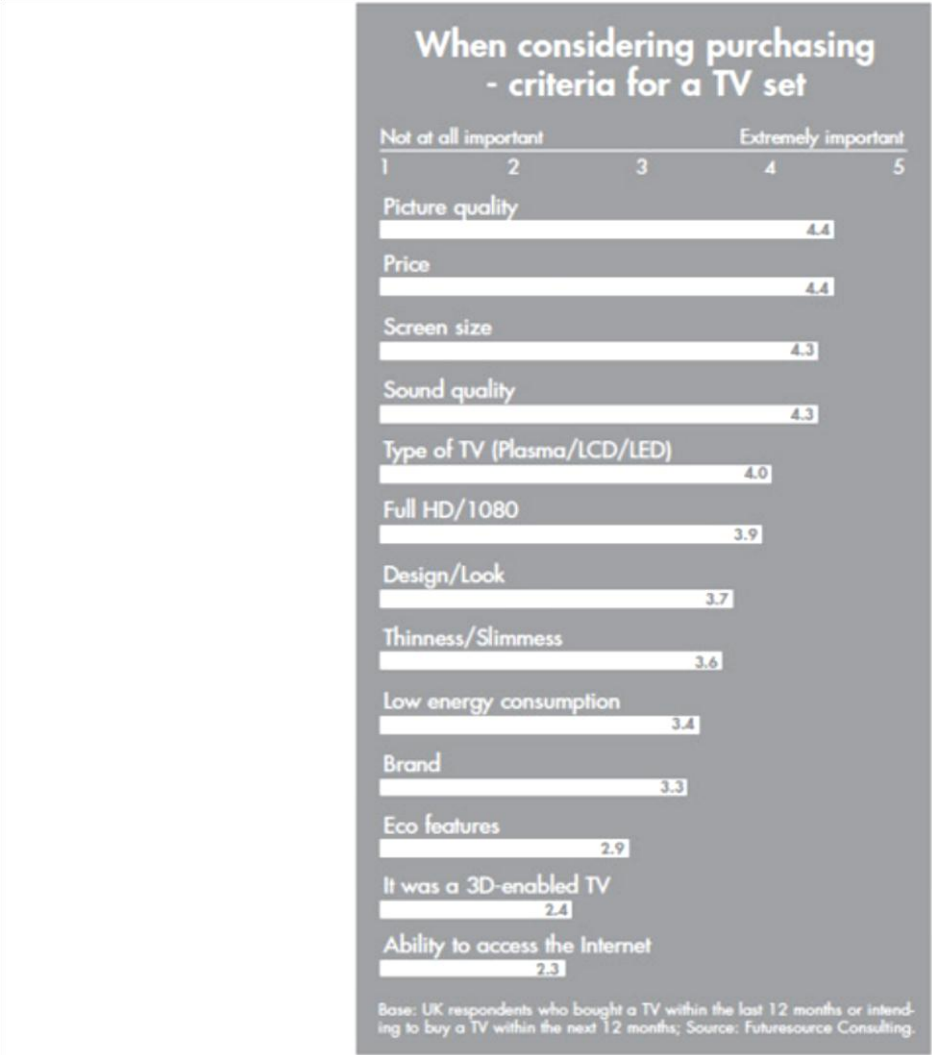


Figure 13: Importance of different decision criteria regarding the television purchase (Source: DVD and beyond)

<sup>48</sup> Source: <http://www.dvd-and-beyond.com/display-article.php?article=1856>

### 2.3.3 Average number of TVs per household

According to DisplaySearch<sup>49</sup>, **households in mature markets own an average of 2.4 TVs each, and in emerging markets, the average is 1.8 TVs per household.** More than two-thirds of households in mature markets have more than one TV set, but nearly half of the households in emerging markets have only one TV.

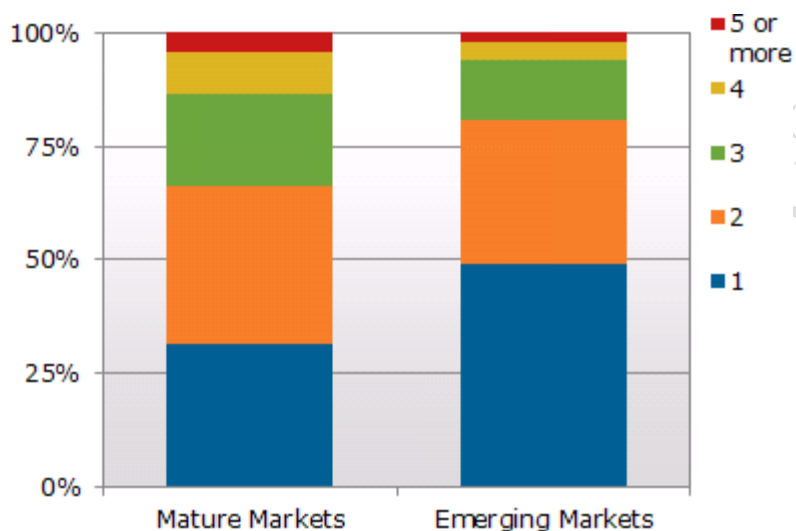


Figure 14: Average TVs per household in 2012 (Source: DisplaySearch)

### 2.3.4 Average TV viewing time

The following figure provides data on the average amount of time people in different countries spend watching TV<sup>50</sup>. Across European countries, the average TV viewing time ranges significantly, e.g. from 2.7 hours in Sweden to 4.2 hours per day in Italy.

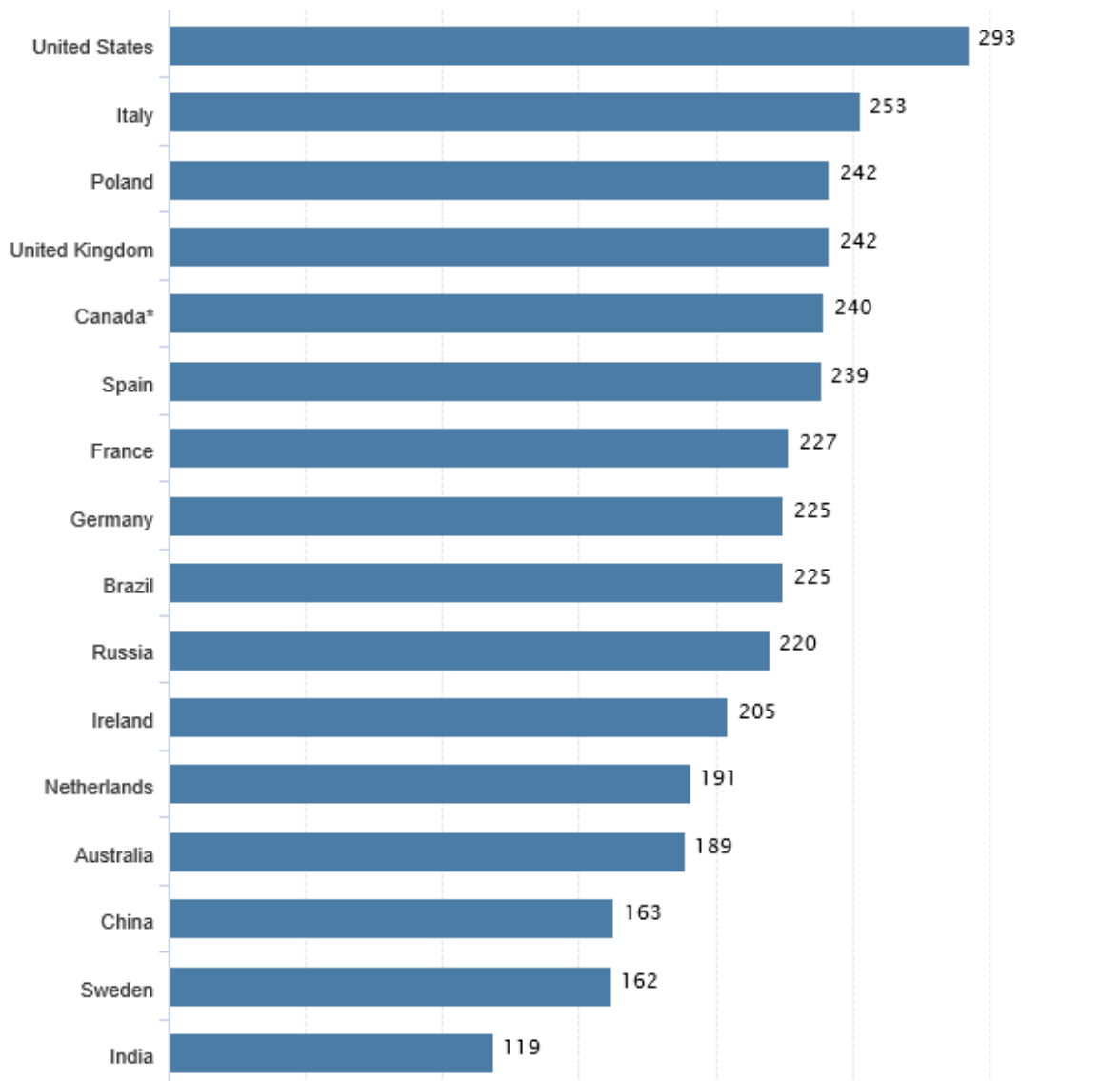
<sup>49</sup>

Source:

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120723\\_consumers\\_in\\_emerging\\_markets\\_such\\_as\\_china\\_Brazil\\_will\\_drive\\_tv\\_demand.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120723_consumers_in_emerging_markets_such_as_china_Brazil_will_drive_tv_demand.asp)

<sup>50</sup>

Source: <http://www.statista.com/statistics/214353/average-daily-tv-viewing-time-per-person-in-selected-countries/>



**Figure 15: Average daily TV viewing time per person in selected countries in 2011 (in minutes)**  
 (Source: Statista.com)

According to DigitalTVEurope<sup>51</sup>, the **average TV viewing times increased** across all of the big five European territories in 2011, with the exception of the UK where the number remained the same.

<sup>51</sup> Source: <http://www.digitaltveurope.net/26880/daily-viewing-times-increase-across-europe/>, using its own data and that from Ofcom and EAO, Informa Telecoms & Media collated the average number of minutes individuals spent watching TV per day.

According to the DEFRA study “Powering the nation” from 2012, the daily average TV watching time was even found to be six hours for UK.<sup>52</sup> However, the detailed viewing time in households might also differ between TVs used in the living room and in the sleeping room.

The general trend to spend more time in front of TV is explained with more channels and more choice being available, combined with households being better equipped with TV sets and other devices<sup>53</sup>. On the other side, there’s an indication that with the rise of social media, mobile device usage, and other such digital trends, the **TV consumption of especially younger consumers might decline in future.**<sup>54</sup>

### 2.3.5 Growing trend to alternate means for watching TV

DisplaySearch<sup>55</sup> surveyed households about the additional devices used to view TV/video content, finding that more households in emerging markets use devices other than a TV, including mobile devices such as tablets, smart phones, and MP3 players. The reason is that households in emerging markets have only one TV but multiple generations living under one roof, and the mobile device penetration of these markets is high which enables consumers to access content in other ways.

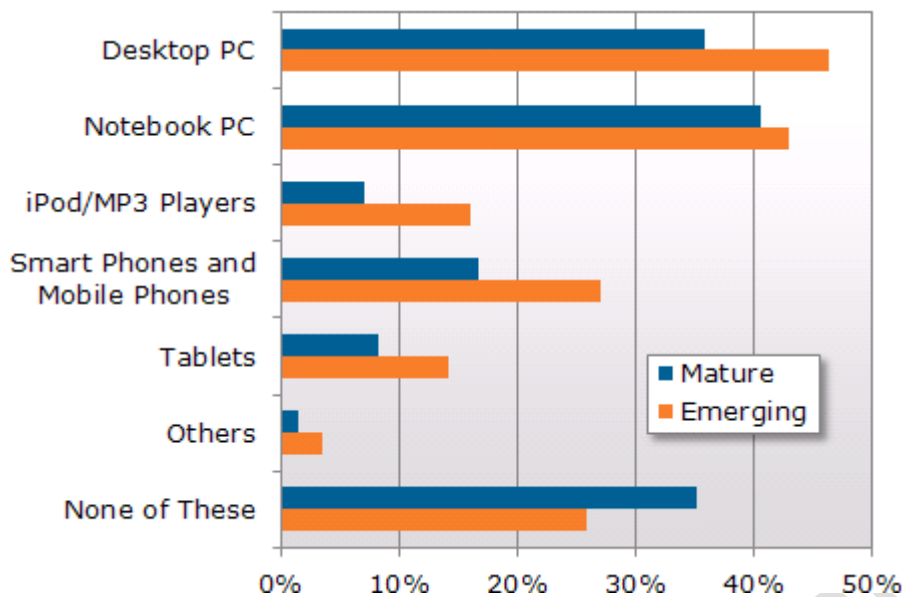
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<sup>52</sup> Source: <http://www.energysavingtrust.org.uk/Publications2/Corporate/Research-and-insights/Powering-the-nation-household-electricity-using-habits-revealed>

<sup>53</sup> Source: [http://www.ejc.net/media\\_news/worldwide\\_tv\\_daily\\_viewing\\_rises\\_20\\_minutes\\_in\\_ten\\_years/](http://www.ejc.net/media_news/worldwide_tv_daily_viewing_rises_20_minutes_in_ten_years/)

<sup>54</sup> Source: <http://www.marketingcharts.com/wp/television/are-young-people-watching-less-tv-24817/>

<sup>55</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120723\\_consumers\\_in\\_emerging\\_markets\\_such\\_as\\_china\\_Brazil\\_will\\_drive\\_tv\\_demand.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120723_consumers_in_emerging_markets_such_as_china_Brazil_will_drive_tv_demand.asp)



**Figure 16: Usage of additional devices for viewing TV/Video content in 2012 (Source: DisplaySearch)**

Many consumers are starting to use non-traditional mediums for viewing TV or video programming, mostly via the Internet. PCs, both desktops and notebooks, were the primary devices used for watching video content aside from the TV. This was the case for at least 40% of the consumers in every country. There were also a small but notable number of consumers using mobile devices to view content. In some emerging regions, this may be based on a better developed mobile infrastructure and a relatively high penetration of wireless networks compared to the traditional TV broadcasting system<sup>56</sup>.

The share of consumer spend on consumer electronics seems shifting away from traditional audio-visual (AV) products to new portable “infotainment” devices such as smartphones and tablets. The capability of these devices to act as companion devices to Smart TVs is being increasingly showcased to consumers, which is expected to stimulate further interest and demand for Smart TVs moving forwards.<sup>57</sup>

<sup>56</sup> Source: [http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110524\\_displaysearch\\_tv\\_replacement\\_study\\_highlights\\_consumer\\_tv\\_usage\\_and\\_alternate\\_means\\_for\\_watching\\_tv.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/110524_displaysearch_tv_replacement_study_highlights_consumer_tv_usage_and_alternate_means_for_watching_tv.asp)

<sup>57</sup> Source: <http://www.dvd-and-beyond.com/display-article.php?article=1856>

Despite this increase, however, TVs still remain the primary device of choice for viewing TV content, with 30% of consumers reporting that they view TV/video content on TVs alone.<sup>58</sup>

### 2.3.6 Viewing online content via TV

Online content is still mostly viewed on computers or mobile devices such as tablets and smart phones, but TVs are increasingly becoming devices of choice for consumers, particularly since an increasing number of sets have either built-in connectivity (Smart TV) or can be connected to the internet via a peripheral device such as a connected Blu-ray player or set top box.

A survey by DisplaySearch<sup>59</sup> revealed that 25% of the surveyed consumers said they view online content on their TV several times a week, 18% are accessing online content daily on their TV sets. Movies being available via online sites have become the most preferred internet content.

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<sup>58</sup>

Source:

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120627\\_global\\_tablet\\_usage\\_for\\_vie\\_wing\\_tv\\_video\\_content\\_doubles.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120627_global_tablet_usage_for_vie_wing_tv_video_content_doubles.asp)

<sup>59</sup>

Source:

[http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120823\\_consumers\\_viewing\\_more\\_o\\_nline\\_video\\_content\\_on\\_tvs.asp](http://www.displaysearch.com/cps/rde/xchg/displaysearch/hs.xsl/120823_consumers_viewing_more_o_nline_video_content_on_tvs.asp)



## 2.4 Summary of key market aspects relevant for the criteria revision

The key aspects of the market analysis being relevant for the revision of EU ecolabelling criteria for televisions can be summarised as follows:

- EU productions have been rising by 2010, with a slight decline since 2011. European production plants for televisions are in Poland, Spain, the Czech Republic, Bulgaria, Germany, Italy, Lithuania, and Portugal.
- The overall TV demand has decreased in 2011 and 2012 and is expected to remain flat in 2013 due to external factors, such as slowing economic growth, high unemployment rates, the completion of the Analogue switch-off process in many Western European markets, and generally the rising household penetration of flat panel TVs. Additional internal factors impacting consumers' demand are slower cost reductions of the manufacturing and a greater focus on profits at the expense of volume, leading to a lower level of retail price decline.
- LCD remains the dominant flat panel TV technology. The unit share of Rear Projection (RP) televisions declined towards 0%. The unit share of CRT TVs and PDP TVs is already low and expected to be further declining towards zero within the next few years.
- The majority of televisions sold in 2012 in Europe were LCD televisions with LED backlight (72%). The CCFL backlight technology of LCD TVs is predicted to be nearly eliminated from the Western European market and to account for only 10% of shipments in Eastern Europe in 2014, disappearing towards the more energy efficient edge-lit LED TVs. It is predicted that LED's share will rise to 93% of the total market by 2016 in Europe.
- Low-cost LED backlight models are feasible by reducing the number of LEDs per TV set roughly to half, as well as replacing other materials with lower cost structures. These so called direct-lit LED models are bulkier compared to the slim design of edge-lit models, and they move away from higher picture quality that has been a characteristic of LED-backlit LCD TVs. On the other side, the reduced brightness of direct-LED backlight models corresponds to lower power consumption.

- The material costs for direct LED backlights come closer to that of CCFL backlights thus increasing their competitiveness with CCFL-backlit LCD TV and even CRT TV. DisplaySearch estimates that for 32" LCD TVs, direct LED backlights cost 1.3 to 1.4 times compared to CCFL backlights, as opposed to edge-lit LED backlights, which are estimated to cost more than twice as much as CCFL backlights. For 40" LCD TVs, the savings could be even greater.
- Comparing CCFL and LED-backlit 40" LCD TVs, LED-backlit sets were found to have lower life-cycle costs, under reasonable lifetime assumptions. The payback time for an entry-level LED-backlit TV is less than two years in Europe considering electricity and TV prices together with power consumption data.
- On the other hand, it seems that TV brands are missing the opportunity to market LED-backlit LCD TVs based on their energy and cost savings.
- The global mass production for televisions based on OLED technology was delayed until at least 2013. The OLED penetration of the TV market is forecasted to exceed 3% by 2016.
- The average diagonal sizes of TVs have increased over the past years. The average shipped size of LCD TVs increased more than 6% to 35.9" in 2012. Also for the coming years, large screen sizes are expected to continue to have strong growth as affordability improves due to rapidly falling prices of LCD TVs. This encourages early adopting flat panel TV consumers to re-enter the market for an upgrade, e.g. from 32" LCD TVs to 40" and larger sizes, thus driving a new replacement wave, and it also lowers barriers to first-time adoption in emerging markets when converting from CRT TVs.
- Features like smart interactive TV, 3D viewing, direct-type LED backlights or high-end features and specifications such as 21:9 cinema form factor or 4Kx2K resolution shall encourage end-users to choose larger sizes.
- On the other side, the demand for smaller sizes is expected to decrease as they start to compete with TV viewing on the larger and higher resolution displays of mobile devices such as tablet PCs and smartphones.

- 3D televisions accounted for just 9% of the European TV sales in 2011 with a penetration rate of just 2% of the households. Even though consumers own these 3D-ready TV devices, there is still a need for more 3D content before broader adoption can be expected. Further, due to limitations and high prices of auto-stereoscopic technologies for large displays, additional glasses will be necessary for many 3D applications for a number of years.
- The energy consumption of televisions increases when being in 3D mode compared to the standard 2D mode, caused by an increase in brightness. However, current measurement standards do not include standard test videos or rigorous methodologies to facilitate comparative energy consumption measurements for 3D capable televisions.
- Smart TV usage had a slow start in terms of consumer interest in Europe. However, in 2011 already 20% of European TV shipments were Smart TVs; it is expected that by 2016 over 90% of the TV shipments will include internet functionality meaning more than 50% of EU households owning a Smart TV set.
- Smart TVs might encourage the development of larger screen sizes and wider formats such as a 20:9 ratio, as consumers want to do multiple activities on the same screen.
- Ultra-high definition televisions, also known as UHD, 4K-2K, 4K, 8K or RETINA displays, are making an entrance this year in some large screen sizes (55" and larger). Mass market adoption of these sets, however, is not expected for the next five to eight years due to high prices and a lack of content and standards.
- The market penetration of energy and ecolabels for televisions is quite different (EnergyStar: about 1,400 TVs, EU ecolabel around 650 licences, EPEAT 123 televisions from two manufacturers, Nordic Ecolabelling 85 models from one manufacturer, Blue Angel two models from one manufacturer, TCO no models).
- Front runners in terms of ecolabelling are LG Electronics, Philips, Samsung, Sharp, Sony, and Toshiba, in terms of the EU Energy label Loewe, Panasonic, Philips, Samsung, Sharp, and Sony. In November 2011, Philips introduced an A++ LED TV model.

- Households in mature markets own an average of 2.4 TVs each, and in emerging markets, the average is 1.8 TVs per household.
- The TV replacement cycle decreased on a global scale from 8.4 to 6.9 years (compared to the previous 10-15 year average for CRT- to-CRT replacement). The majority of households, on a global basis, are still replacing CRT TVs with flat panel TVs. Mature markets, on the other side, are replacing their first-generation flat panel TVs.
- Strong drivers for TV replacement are increasing the size, wanting to own a flat panel TV and improving the picture quality. New advanced features such as LED backlights, 3D and internet connectivity, seem however only to a minor extent be important to buy a new TV just because these features become available.
- Across European countries, the average TV viewing time ranges significantly, e.g. from 2.7 hours in Sweden to 4.2 hours per day in Italy. In general, the average TV viewing times increased due to more channels and more choice being available combined with households being better equipped with TV sets and other devices. On the other side, there's an indication that with the rise of social media, mobile device usage, and other such digital trends, the TV consumption of especially younger consumers might decline in future.
- The merge of computers and television applications continues: Many consumers are starting to use non-traditional mediums for viewing TV or video programming, mostly via the Internet. PCs, both desktops and notebooks, were the primary devices used for watching video content aside from the TV, followed by a small but notable number of consumers using mobile devices such as smartphones and tablets to view TV content. Despite this increase, however, TVs still remain the primary device of choice for viewing TV content. On the other hand, online content is still mostly viewed on computers or mobile devices such as tablets and smart phones, but Smart TVs are increasingly becoming devices of choice for consumers.