1.Signage displays

1.1.Product group description

Signage displays are a type of displays that is used in public areas, e.g. for advertising (indoor or outdoor), for information systems in train stations, airports, hotels, or conference centres, or for professional presentations in conference rooms and classrooms (see Figure 2 to Figure 3).

Display technology is normally LCD /TFT with LED backlight. If a product is called an LED display, this means LED backlight in this context. There are also some LCD products with traditional Cold Cathode Fluorescent Lamp (CCFL) backlight, and some Plasma displays.

Furthermore, there is the more traditional technology of combining individual LEDs to form a picture. Because the resolution is rather low, this technology is generally used to create very rough, basic signs (Figure 4), or else for big outdoor installations, e.g. in stadiums or on building fronts, that are meant to be watched from a distance (Figure 5). The big installations are rather rare, generally custom made and sales data are difficult to obtain. Furthermore the LED technology is already very efficient. Therefore this type of display will be considered out of scope in the following analysis.

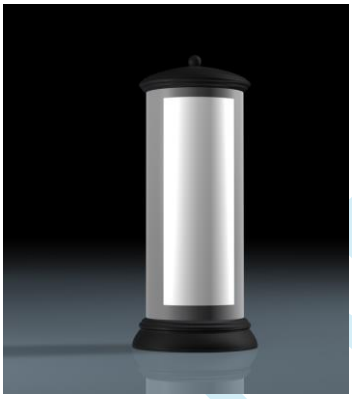

Figure 2: Advertising pillar.
Source: Fotolia

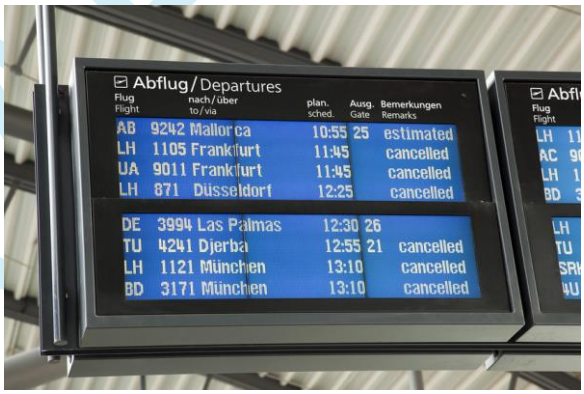

Figure 1: Flight information system.
Source: Fotolia

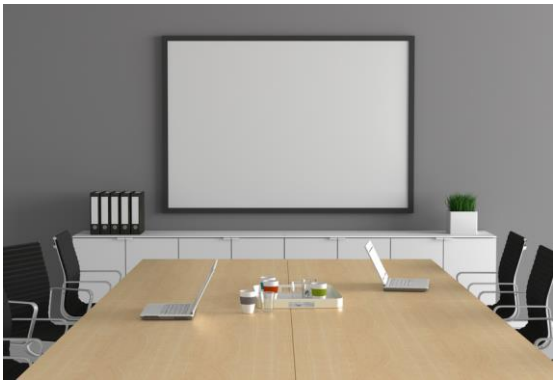

Figure 3: Conference presentation screen.
Source: Fotolia

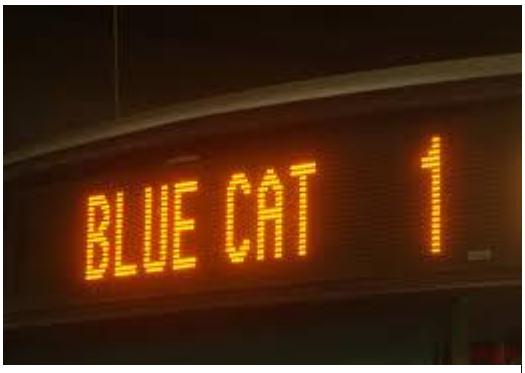

Figure 4: Simple traditional LED sign. Source: Wikimedia Commons

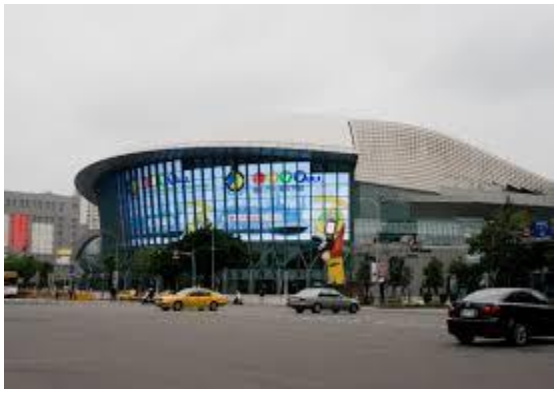

Figure 5: Building integrated LED installation. Source: Wikipedia

1.1.1. Definitions and scope

It is not easy to define a proper scope for signage displays. There is a great variety, both in terms of size and functionality. Size can vary from small 12'' digital doorsigns to screens of 100'' and more. Some types of signage displays are connected to an external computer, server or media player to provide content. More advanced products have in-built data processing and storage facilities, media players, TV receivers and/or internet connectivity. In "System on a Chip" (SoC) solutions, all functionalities are integrated on a single chip. Some signage displays also offer the possibility for interaction via a touchscreen. Specialized products are constructed for around-the-clock use or for outdoor use with weatherproofing and protection against vandalism. Other possible features are remote control possibilities for up to 25 units linked serially and long battery back-up.

It is also not always easy to distinguish them from typical consumer displays such as TVs or computer monitors. Applications such as hotel TV are close in functionality to consumer TVs. Small applications such as shelf signs or individual TV in airplane passenger seats may use the same technology as consumer tablets.

Therefore one option would be to regulate all display types under one regulation. Alternatively, a separate regulation for signage displays would make sense if specific functionalities are considered that are not present in consumer products and require additional energy. These are typically present in applications that are intended to be viewed by more than one person at a time, and / or in outdoor conditions. They include a wide viewing angle in order to be viewed by several people, and / or a high luminance of 250 cdl/m² to over 3000 cdl/m² in order to be viewed in the sunlight.

Therefore, a scope definition should take into account these criteria. At the same time, the authors believe that the definition should be as broad as possible in order to prevent possible loopholes.

In the stakeholder consultation on the review of the Display (TV) regulation No. 642/2009, Digital Europe submitted a proposal for a possible definition of the product.[1] The definition is taken from the Australian MEPS document for monitors.[2] According to it, signage displays are a type of display that:

- Has a screen size of 81cm (32 inches) or above;
- Is marketed as a product that is intended to be viewed by more than one user at a time;
- Is not intended for desktop use;

---

[1] DIGITALEUROPE comments on the Display regulation revision. Scope, definition, requirements and labelling implications. Brussels, 11 August 2014

[2] Government of Australia: Greenhouse and Energy Minimum Standards (Computer Monitors). Determination 2013. Federal Register of Legislative Instruments F2013L00733. The Determination does not set requirements for signage displays but uses the definit

- Is not supplied with a means of allowing it to be freestanding; and
- Requires installation on a fixed basis.

It has to be noted that this definition is, in the Australian MEPS document, not created in order to define a product group to be regulated. Rather, it serves to exclude the product from the scope of the regulation that aims at consumer products. It does therefore not aim at being comprehensive, but rather on distinguishing them clearly from displays for consumers.
A different definition is used in the Energy Star 6.0:

"Signage Display: An electronic device typically with a diagonal screen size greater than 12 inchesand a pixel density less than or equal to 5,000 pixels/in^2. It is typically marketed as commercial signage for use in areas where it is intended to be viewed by multiple people in non-desk based environments, such as retail or department stores, restaurants, museums, hotels, outdoor venues, airports, conference rooms or classrooms."[3]

The main differences between the two definitions are:

- The inclusion of criteria regarding installation in the Australian / DE definition;
- The significantly greater screen size in the Australian / DE definition ; and
- The introduction of a criterion on pixel density in the Energy Star definition.

Screen size and pixel density are used by the Energy Star to distinguish a signage display from a computer monitor on the one hand and a digital picture frame on the other. A computer monitor is, in the Energy Star definition, a device with a pixel density greater than 5,000 pixels/in^2 (besides being intended for desktop use by an individual user). A picture frame is a device with a screen size below 12 inches.

We are going to discuss the topics one by one.

An internet research shows that some products marketed as signage displays are marketed with or can be equipped with devices that allow them to be freestanding (e.g. a pillar) or to be moved around (e.g. a wheelcart).[4] As the displays are technically the same, there is no reason why these products should be excluded from scope. Therefore, we suggest dropping the criteria that the products are not supplied with a means of allowing it to be freestanding or require installation on a fixed basis.

With respect to size, an internet search on marketed signage displays reveals that especially in advertising, display sizes of 32 inches and above are indeed common, which is in line with the Australian / DE definition. However, there are also smaller screen sizes around. For example, digital door signs or shelf displays have screen sizes from 10'' upwards, travel information systems in public transport have screen sizes between 15,6'' and 29'', and touchscreen terminals measure 22-27''. The German market analyst invidis argues that sales figures are difficult to obtain for smaller screen sizes, and often consumer products such as tablets are used in this sector.[5] However, they also predict a rising demand for smaller displays, and possibly more large-scale manufacturing in the coming years.[6] Anticipating such developments and given the array of products already in the market, it is suggested to drop the criterion on screen size altogether.

---

[3] ENERGY STAR® Program Requirements for Displays – Partner Commitments; Version 6.0

[4] See, for example, http://www.mm-display.de/shop/Kiosksysteme/MultiRack-Rollwagen-inklusive-42-Zoll-Monitor-und-Prospektboxen::761.html; http://www.mm-display.de/shop/Kiosksysteme/All-In-One-MM-1001224-Touchmonitor-24-Zoll-inkl-PC-Standfuss::621.html

[5] Personal communication.

[6] invidis digital signage yearbook 2014, invidis digital signage Jahrbuch 2014, http://invidis.de/digital-signage-book-shop/;

The pixel density criterion of the Energy Star also seems to be in line with what is marketed as a signage display. On the other hand, technology is evolving and pixel densities might change. Furthermore, a criterion on pixel density does not seem absolutely necessary to distinguish signage displays from computer monitors, because there is the decisive criterion that the display is meant to be watched by more than one person at a time.

Therefore the following definition is proposed:

A signage display is a display marketed with the intention to be viewed by more than one user at a time and is not intended for desktop use. It is typically used in public places including, but not restricted to, outdoor areas, public transport vehicles and stations, airports, malls, restaurants, hotels, waiting rooms, conference centres and classrooms. Typical (non-exhaustive) applications are digital doorsigns, conference screens, travel information, infotainment, and advertising. Content is provided via connection to an external PC, network connection, or via an internal processor and storage system, or media player. It may provide additional features such as interactivity, network connectivity, or audio features.

It is proposed to limit the scope to TFT/LCD and plasma technology.

1.2.Market and stock data

There are two Prodcom codes that seem relevant:

- 27.90.20.20: Indicator panels incorporating liquid crystal display (LCD); and
- 27.90.20.50: Indicator panels incorporating light emitting diodes (LED).

Unfortunately, Prodcom data is given in kg. Assuming an average weight of 30 kg per product (weight of a Samsung 42'' display), we could calculate the following sales for 2012.

Table 1: Prodcom data on signage displays, 2012

Prodcom code	EU-27 Sales in 1000 kg	Number of displays
27.90.20.20	1,303	43,433
27.90.20.50	14,744	491,467
Total	16,047	534,900

However, there is an extremely broad range of weight and it is therefore highly speculative to calculate an average. Also, it is unclear whether code 27.90.20.50 also includes traditional LED signs. We therefore prefer to estimate annual sales from data provided by market analyst invidis, specialized on signage displays.[7]

Invidis estimates 2012 display sales in Germany, Austria, and Switzerland (D-A-CH markets), at 157 million EUR. At the same time, they estimate this market to be 22% of the EMEA market, the latter would therefore be at 713,64 million. Non-EU countries seem to make up for a small share of this market.[8] So if we subtract 15% for non-EU countries, the EU market size would be at 606.6 million. Estimating an average price of 2500 EUR per display[9], this would render annual sales of 242,640, in

[7] Invidis Digital Signage Yearbook 2014, Invidis Digital Signage Jahrbuch 2014, invidis DooH Jahrbuch 2014

[8] Only Russia and Turkey are listed separately, with 5% and 3% respectively.

[9] Price ranges are very broad, ranging from several hundred up to 50,000 EUR per display. However, most products are in the range of 1,000-3,000 EUR. Given that there are also very expensive displays, an average price in the higher section of this

2012. In a personal communication with invidis, no specific number was given for the EU-27 market, but it was confirmed that the EMEA market would be around 500,000 annually and the EU-27 market would be well above the 200,000 threshold. We therefore continue with this figure.

Invidis reports a dynamic market development between 2009 and 2013 and expects a continuation of this dynamic in the following years. The following growth rates can be calculated from the market sizes given for displays in the D-A-CH markets.

Table 2: German, Swiss, and Austrian (D-A-CH) market in signage displays

Year	D-A-CH market in Million EUR	Growth in million EUR	Growth rate
2009	106		
2010	100	-6	-5,6%
2011	132	+32	+32%
Average 2010 / 2011		+26	+24.5%
2012	157	+25	+19%
2013	183	+26	+16.6%
2014	208,6	+25.6	+14%**

*Calculated from expected growth rate

**Given for Germany only; assumed to be the same in the other markets

With the exception of the break in 2010, this is a more or less linear growth. For the whole EMEA market, invidis projects a growth rate in displays of 15% for 2015, more or less in line with the 14% for Germany. For the coming years, we can expect that growth will slow down in saturated markets such as D-A-CH, while there are still European markets with extremely high growth rates such as Poland (over 50%) and Spain and Portugal (over 40%). For the sake of a simplified model, we therefore assume that the pattern that has been identified for D-A-CH in the past, a more or less linear growth with slowly declining growth rates, will also holds for the overall EU market in the future, and that figures will be proportional to what has been described for the D-A-CH market. Furthermore, as invidis reports a price decline between 5 and 20% in displays for 2013, we assume a price decline of 5% per year, meaning more displays sold per market value. This would render the figures described in Table 3. No further projection to 2020 is made because such projections would be very unreliable in dynamic markets like this.

With regard to stock, invidis reports that about 150,000 displays were available for Digital out of home advertising (DooH) in Germany in 2012. DooH are displays that are available for free booking for advertisement purposes. The major part of the installed base, however, is privately owned and used exclusively by the owner (e.g. a retail chain), and furthermore there are applications of Digital Signage other than advertising, such as informational and educational purposes. Invidis reports that DooH only generates 1% of the revenues of the Digital Signage market, which does however not mean that it is 1% of the installed displays. We estimate that DooH is 25% of the installed displays, and that, because Germany is one of the most advanced markets, the number of installed displays per person

range seems reasonable. A much higher average price , in contrast, would lead to lower calculated sales figures which would in turn lead to declining stocks in subsequent projections, which seems counterintuitive.

across the EU 2 is two thirds of the German number .This way, we get a figure of 1.84 million installed displays for the EU-27 in 2012.[10]

Furthermore, we assume a lifetime of five years. Although technical lifetime can be higher, signage displays are often exchanged as a result of refurbishing an area or changes in display specification and location. Also, they lose up to 50% of their brightness over their lifetime which may also lead to an exchange. Therefore, we assume that every year, 20% of the stock that existed five years earlier reach their end of life.[11]
Applying this, along with the projected sales, we get the stock figures presented in Table 3.

Table 3: Estimated sales and stock of signage displays in EU-27

Year	Market size (million EUR)	Price per display	EU-27 sales (1,000)	EU-27 stock (1,000)
2012	606.6	2500	242.64	1,837.8
2015	879.6	2143.44	410.35	2,106.3
2020	1334.5	1658.55	804.62	3,396.8

Sensitivity check

As a sensitivity check, an alternative bottom-up calculation has been applied assuming a relatively high proliferation of signage displays where most static displays have been replaced by dynamic signage displays. One assumption is that video projectors are gradually being completely replaced by signage displays (which has been the reason for not pursuing them further after the ENTR Lot 3 impact assessment). Stock figures have been taken from the DG ENTR Lot 3 impact assessment, with a peak stock of 10.1 million in 2015.

The result, excluding video projector replacement, is not extremely higher than the calculation above, confirming that the results are relatively robust. However, the assumption that video projectors may by completely replaced by signage displays (assumption on which video projectors have been excluded from Ecodesign) would result in a four times higher stock.

Table 4: Sensitivity analysis: Bottom up calculation of possible signage display stock

Application	Number	Explanation
Video projector replacement	10,100,000	Peak stock in 2015 according to ENTR Lot 3; expected to be replaced by signage display
Hospitality sector	1,000,000	1,600,000 hotels, bars and restaurants in the EU; 2/3 of which expected to have a public screen
Electronics stores	240,000	Around 1000 Media Markt and Saturn stores in Europe, plus another estimated 1000 of other retail chains, each with 120 displays (display number per store: 2012 figures for electronics stores according to invidis)

[10] As this seems rather conservative, sensitivity checks have been done with greater stocks. However, scenarios with significantly greater stocks in 2012 would result in more signage displays taken out of service than sold in the years after 2012, which would lead to declining stocks and seems counterintuitive.

[11] An expert judgement was that the lifetime would be even lower at about four years. However, such an assumption would also render a declining stock until 2015 for most stock assumptions, which seems counterintuitive.

Application	Number	Explanation
Other retail	720,000	There are about 3.6 million retail stores in Europe (Eurostat). It is estimated that 20% of them use one screen each.
Railway / metro / bus stations	326,800	12,800 railway and metro stations in Europe with 6 screens each; 1 million bus stops, 25% of them equipped with a screen
Trains and buses	1,370,000	500,000 buses and 185,000 train carriages in the EU, with 2 screens each
Airports	72,000	360 major airports with 200 displays each
Streets	197,500	450 cities with more than 100,000 inhabitants, with a total population of 138.4 million. An estimated 395,000 streets of which 1/10 are in shopping areas, each equipped with 5 displays.
Total	**4,026,300**	
Total without video projectors	**3,926,300**	

1.3.Resource consumption

1.3.1. Energy consumption

At individual product level

Use phase energy consumption

Power rating of signage displays varies greatly, depending mainly on screen size, but also technology and functionality. In addition, typical running times will vary, too. Below, typical power ratings for example applications are given. The power ratings are taken from real products, while running times have been estimated.

Table 5: Energy consumption of different signage displays

Display type	Size	Functionality	Power rating (W)	Estimated daily Running time (h)	Annual Energy consumption (kWh)
Door sign	10,1''	Display w/ external source, WLAN	4	12	17.5
Door sign	18''	Display w/ external source, WLAN	14	12	61.3
Touchscreen Terminal	22''	Display, Touchscreen, WLAN; integrated mini PC	35	18	230
Passenger TV	21,5''	Display w/ external source	35	18	230
Advertising pillar	47''	Display, CPU, storage, touchscreen	150	24	1,314

Display type	Size	Functionality	Power rating (W)	Estimated daily Running time (h)	Annual Energy consumption (kWh)
Advertising pillar	46''	Display, CPU, storage, audio	330	24	2,891
Advertising pillar	55''	Display, CPU, storage, media player	490	24	4,292
Advertising pillar	70''	Display, CPU, storage, media player, Audio	950	24	8,322
Screen (e.g. for conference room)	22''	Display w/ external source, Audio, WiFi	30-40	8	87.6-116.8
Screen	32''	Display	47	8	137.2
Screen	40''	Display, audio	76	8	221.9
Screen, plasma	50''	Display w/ external source	330	8	963.6
Screen	82''	with or without PC, LAN, Touchscreen, Audio,	920	8	2,686.4

Gross Energy Requirement

Gross Energy Requirement could not be calculated due to missing manufacturing data. The Preparatory Study on TVs (DG ENTR Lot 5) reports that the energy consumption of TVs is dominated by the use phase, even if the EcoReport Tool is likely to underestimate manufacturing phase impacts. The same is assumed to be true for signage displays, to an even greater degree. On the one hand, signage displays might contain somewhat more electronic components than the average TV, which should drive manufacturing phase impact up. On the other hand, energy consumption in the use phase is much higher due to the brightness, size, and long use hours of the display.

At aggregate level

Use phase energy consumption

Invidis has reported the share of different screen sizes for screen sizes above 32''. In addition, we assume a 20% share of screen sizes below 32'', as this size covers the quite popular sector of passenger TV.

For each screen size, we assume a typical power rating. For sake of simplicity, we furthermore assume 16 hours daily running time for all applications. This renders the following EU aggregate Energy consumption for 2012.

Table 6: Aggregate EU-27 energy consumption of signage displays, 2012

Screen size	Typical power rating (W)	Annual energy consumption individual product (kWh)	Share	Number	Annual final energy consumption EU-27 (TWh)	Annual primary energy consumption EU-27(PJ)
< 32''	30	175,2	20	367,6	0,06	0,58
32"-40"	60	350,4	24,8	455,8	0,16	1,44
40"-50"	250	1460	23,2	426,4	0,62	5,60
50-60"	450	2628	16,8	308,7	0,81	7,30
60-70"	700	4088	10,4	191,1	0,78	7,03
>70"	950	5548	4,8	88,2	0,49	4,40
Total				1837,8	2,93	26,36

These figures are extrapolated to the years 2015 and 2020 in Table 7. These are conservative estimates, as the share of big screens is expected to grow.

Table 7: Aggregate annual EU-27 energy consumption of signage display stock (TWh for final energy and PJ for primary energy)

Year	Stock (1,000)	Final energy consumption (TWh)	End energy consumption (PJ)
2012	1,838	2.9	26.4
2015	2,106	3.4	30.2
2020	3,397	5.4	48.7

Sensitivity check

Applying the figures from the sensitivity analysis, with an assumed 60'' screen size and 2 hours per day running time for the video projector replacement, the aggregated consumption would be 9.9 TWh or 88.8 PJ.

1.3.2. Other resource consumption

Individual product level

No Bill of Materials could be obtained for signage displays. As an approximation, the Bill of Materials for LCD TVs has been taken from the Preparatory Study for TVs (DG ENER Lot 5). The parts for packaging, remote control and chassis have been subtracted, because a TV-type remote control is not commonly used with signage displays and chassis and packaging are not integral parts of the product. At the same time, the figures have been scaled up proportionally from a 32'' display to a 45'' display (average screen size calculated from the stock assumptions made here), assuming a 16:9 format. According to the DG ENER Lot 5 preparatory study, mass proportions of the various components do

not change much with size, except for the display becoming somewhat more important in comparison to the chassis. This is not relevant for the present case as the chassis is not being considered anyway.

It must be noted that the BoM is by far dominated by the category “Miscellaneous” which contains the major parts of the LCD panel. As detailed information on materials has not been available in the DG ENTR Lot 5 study, a mass dummy has been used which is reflected in this category.

Furthermore, the data will most probably have to be updated, and materials for the battery will probably have to be added as signage displays might feature considerable battery backup. On all these topics, stakeholder input is being invited.

Table 8: Estimated material composition for a 16:9, 45'' signage display, extrapolated from DG ENER Lot 5 data for TVs

Material category	Weight in g
1-BlkPlastics	132.07
2-TecPlastics	7.71
3-Ferro	263.56
4-Non-ferro	502.59
5-Coating	0
6-Electronics	3,954.12
7-Misc (LCD panel)	13,262.39
Total	**18,122.44**

EU-27 aggregate

To calculate the EU-27 aggregate, data from Table 8 has been multiplied with the estimated EU sales in the respective years.

Table 9: Estimated EU-27 aggregate material consumption

	2012	2015	2020
1-BlkPlastics	32.05	54.20	106.27
2-TecPlastics	1.87	3.16	6.20
3-Ferro	63.95	108.15	212.06
4-Non-ferro	121.95	206.24	404.40
5-Coating	-	-	-
6-Electronics	959.41	1.622.57	3.181.56
7-Misc	3,217.94	5,442.20	10,671.16
Total	**4,397.16**	**7,436.52**	**14,581.64**

Sensitivity check

The sensitivity check has been completed with the slightly higher stock figures for the general development distributed across the years 2012-2012 to generate annual sales. For video projector replacement, annual sales have been generated by taking the decline in video projector stock

between 2015 and 2020, projected by the DG ENTR Lot 3 impact assessment (1.7 million) and assuming that these would be replaced by signage displays, distributed evenly over the years.

Table 10: EU-27 aggregate resource consumption in 2020: Sensitivity check

EU-27 agg (t) 2020	General	Video projector replacement	Sum
1-BlkPlastics	115.01	80.31	195.32
2-TecPlastics	6.71	4.69	11.40
3-Ferro	229.50	160.26	389.76
4-Non-ferro	437.66	305.61	743.27
5-Coating	-	-	-
6-Electronics	3,443.26	2,404.35	5,847.61
7-Misc	11,548.92	8,064.36	19,613.28
Total	**15,781.07**	**11,019.58**	**26,800.64**

1.4.Improvement potential

1.4.1. Improvement potential – Energy consumption

The wide ranges of power ratings show that considerable energy savings are possible. Energy consumption can first be reduced in the display itself. One major option is the use of LED backlight instead of the traditional Cold Cathode Fluorescent Light (CCFL) backlight. While CCFL backlighting accounts for the major part of energy consumption in LCD panels, LED backlight has the potential to save up to 50% compared with it. Furthermore, as LED are dimmable, intelligent controls can adjust the brightness of the display to content and ambient light conditions. According to media reporting, up to 50% energy savings have been realized in computer monitors this way.[12] It must be considered, however, that LED backlighting has already been implemented for many displays. Best not yet available technology would include the use of OLEDs which might even lower energy consumption vy 50-90%. It is however not yet considered here.

Furthermore, the performance of the other in-built electronic components such as CPUs, media players and graphic cards can be improved, using in principle the same improvement options that are available for computers. To be elaborated in final version. Also, the use of timers, auto-power down functions and sensors enables the display to go into sleep mode at defined times or when it is not being watched.

On the assumption of 20% more efficient products and 2 hours reduced running time per day due to the use of timers and auto-power down functions (that is 14 instead of 16 hours a day), the following savings potential can be calculated.

[12] http://www.pcwelt.de/news/Gruene-Welle-Dell-baut-energieeffiziente-LED-Displays-310190.html

Table 11: Improvement potential individual product level – Signage displays

Screen size	Improved power rating (W)	Improved annual energy consumption individual product (kWh)	Improvement (kWh/year)
< 32''	24	122.64	52.56
32"-40"	48	245.28	105.12
40"-50"	200	1022	438
50-60"	360	1839.6	788.4
60-70"	560	2861.6	1226.4
>70"	760	3883.6	1664.4

Table 12: Improvement potential at EU-27 aggregate level – Signage displays (TWh for final energy and PJ for primary energy)

Year	Optimized End energy consumption (TWh)	Improvement potential end energy (TWh)	Improvement potential primary energy (PJ)
2012	2.05	0.88	7.91
2015	2.35	1.01	9.06
2020	3.79	1.62	14.62

In the sensitivity variant, the assumptions for displays that are not video projectors remain the same. For video projectors, we assume a 20% efficiency increase, but daily running time would remain the same. Taken together, this would render annual savings of 2.6 TWh or 23.4 PJ.

1.4.2. Improvement potential – Other resource consumption

To be completed

1.4.3. Cost calculation

The following table gives an overview of the purchase price of typical products and relates it to the energy cost savings that would be possible with a 20% lower power rating and, for the advertising pillars which run 24 hours, a day 2 hours less running time (for the products assumed to be running only 8 hours a day, the figure was kept constant). A commercial EU electricity price of 0.12 EUR / kWh (excluding VAT) was assumed.

Table 13: Cost calculation: Signage displays

Display type	Size	Functionality	Purchase price (EUR)	Annual energy savings	Annual cost savings (EUR)
Advertising pillar, screen technology undisclosed	46''	Display, CPU, storage, audio	1,990	770.9	92.51
Advertising pillar, screen technology undisclosed	55''	Display, CPU, storage, media player	2,490	114.6	137.36
Advertising pillar, screen technology undisclosed	70''	Display, CPU, storage, media player, Audio	11,990	2219.2	266.30
Screen, LCD w/ LED backlight	32''	Display	499	27.4	3.29
Screen, LCD w/ LED backlight	40''	Display, audio	699	44.4	5.33
Screen, plasma	50''	Display w/ external source	1,099	192.7	23.13
Screen, LCD	82''	with or without PC, LAN, Touchscreen, Audio	49,999	770.9	92.51

1.5.Summary

Table 14 presents a summary of the product group "Signage displays".

Limitations of the above approach concerns the lack of more detailed sales and stock data on signage displays, as well as the broad range of products with strongly differing specifications and energy consumption figures.

Table 14: Summary – Signage displays (TWh for final energy and PJ for primary energy)

Year		
Market data		
Sales (1,000)	**2012**	202.2
Stock (1,000)	**2012** **2015** **2020**	1,837 2,106 3,397
EU-27 Energy consumption		
Over the life cycle	**2012** **2015** **2020**	
In use phase (per year)	**2012** **2015** **2020**	2.9 TWh / 26.4 PJ 3.4 TWh / 30.2 PJ 5.4 TWh / 48.7 PJ – 9.8 TWh / 88.5 PJ

Year		
EU-27 Energy savings		
In use phase (per year)	**2015** **2020**	1.01 TWh / 9.06 PJ 1.62 TWh / 14.62 PJ – 2.6 TWh / 23.3 PJ
Confidence in the energy savings estimates (from + to +++)		
		+

1.6. Topics for discussion

- Sales and stock data need further verification.
- A Bill of Material could not yet be obtained. The rather rough extrapolations here need to be refined, especially with respect to electronic components, display composition and battery.
- Further input on technical options for energy savings and their potentials would be welcomed.