LCD TV Association

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“LCD TV Matters”

Volume 3, Issue 4

"A Great TV in Every Room"

Contents

Chairman's Corner: The Fourth Screen…

by Bruce Berkoff

I'm sure most of you are aware of the tremendous success of Apple's iPad, which was released in April of this year. There were great expectations and hype leading up to its release, and reported sales so far have more than met the expectations, with more than 10 million units expected to be sold this year. Multiple new "Tablet PC" products will be released by other makers over the next several months, starting with the Galaxy Tab introduced by Samsung this month at IFA show in Berlin.

Actually the iPad success is part of a larger trend in display products that has been developing over the past few years, which I call the "Fourth Screen". If you think about past waves of digital display products; mobile phones, PC related devices (like laptops and PC monitors), and TVs, these each serve a different need of consumers, but each has certain limitations. Mobile phones provide affordable communication but the screen is too small for most productive work and for an immersive entertainment experience. TVs provide the perfect immersive experience, but must be viewed in one location. PCs are great tools for productivity and internet browsing and laptops are mobile, but traditional laptops are too expensive and too heavy for some casual users, who mostly want email, social networking, web browsing, and content viewing. The battery life for these is typically too short due to the power-hungry high-performance processors and LCD displays.

Thus, there is a need for a "Fourth Screen," which is a relatively inexpensive mobile device that enables browsing and an immersive display experience. Products targeted to this market have been introduced prior to the iPad, including the Kindle and other eReaders as well as mini notebooks or Netbooks. Most e-readers have reflective screens, good for battery life and outdoor reading. However, the leading electrophoretic reflective e-paper technologies on do not provide color or video. Netbooks usually have a high-performance LCD screen, but the form factor can seem clunky, with the traditional keyboard taking up too much real estate. The iPad has gotten around most of these problems with e-readers and netbooks, although the price, at $500+, clearly defines the high-end price range for fourth screen products.

Although there are many possible technologies and form factors for these "Fourth screen" devices, most of them will include a touch panel. Since the typical screen size for a fourth screen device (6-inch and up) is significantly larger than smart phones, which have been the most significant touch panel application up until now, we can expect this trend to fuel explosive growth in touch panels.

The fourth screen trend is happening now and demand for these devices is projected to grow from the 10s of millions this year into the 100s of millions over the next several years. While these display devices will not replace LCD TVs as the main area driver for the display industry any time soon, they do provide a significant new opportunity for display companies.

Mr. Berkoff is the chairman of the LCD TV Association, a global not-for-profit marketing trade association dedicated to "informing, promoting, improving and connecting" the entire LCD TV supply chain and their related companies, to help promote "a great LCD TV in every room in the house!" For over six years, residing in Seoul, Korea, Mr. Berkoff was also the executive vice president of marketing and chief marketing officer (CMO) for LG.Philips LCD, a world leading TFT LCD manufacturer. Currently he is Chief Marketing Officer (CMO) for Displays at Applied Materials. He has also been the CMO at Ascent, a thin film flexible solar PV company and CEO of a fabless semi start-up in the video processing space and general manager of Philips Flat Display Systems software and electronics business unit. Prior executive posts include positions at UMAX Computer, Radius, SuperMac, and ZD Labs. Mr. Berkoff is a visionary speaker and author in the display and electronics industry. He has display related patents both granted and pending in the USA and China. He holds an undergraduate degree in physics from Princeton and a graduate degree in biophysics from the University of California Berkeley. Mr. Berkoff has sat on the boards of at least five publicly traded companies, including LG Display (LPL), Unipixel (UNXL) and Infocus (INFS).

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LCD TV News

compiled by Veritas et Visus

Samsung maintains lead, but Vizio closes gap in Q2 US LCD TV market, according to iSuppli

The battle for the top spot in the US LCD TV market heated up in the second quarter as the gap in market share between #1 Samsung Electronics Co. Ltd. and #2 Vizio Inc. dwindled to less than 1 percentage point, according to the electronic display research firm iSuppli Corp. Samsung in the second quarter held a 0.7 percentage point lead over Vizio in terms of US LCD TV shipments, compared to 1.3 points in the first quarter. Both companies in the second quarter dramatically outperformed the overall market by offering sets with advanced features desired by US consumers. Leadership in the world's largest television market, the United States, represents the marquee position for global LCD TV brands, said Riddhi Patel. Because of this, companies are competing intensely to secure every point of market share with the most closely fought battle occurring between South Korea's Samsung and US-based Vizio. The two companies have swapped quarterly leadership multiple times during the past few years, and now are virtually tied in the race for market leadership. US LCD TV shipments rose by 12.8% in the second quarter to 7.36 million units, up from 6.53 million in the first quarter.

U.S. LCD-TV Branded Market Share in the Second Quarter of 2010

(Ranking by Unit Shipments in Thousands)

Q2 2010 Rank	Brand	Q2 2009 Shipments	Q2 2009 Market Share	Q1 2010 Shipments	Q1 2010 Market Share	Q2 2010 Shipments	Q2 2010 Market Share	Q2 2010 Sequential Percentage Change	Q2 2010 Sequenital Shipment Change
1	Samsung	1,445	18.8%	1,149	17.6%	1,448	19.7%	26.0%	299
2	Vizio	1,490	19.4%	1,066	16.3%	1,394	18.9%	30.8%	328
3	Sony	818	10.6%	722	11.1%	806	10.9%	11.6%	84
4	LG	539	7.0%	500	7.7%	646	8.8%	29.2%	146
5	Sanyo	548	7.1%	513	7.9%	506	6.9%	-1.4%	-7
6	Toshiba	570	7.4%	449	6.9%	402	5.5%	-10.5%	-47
7	Panasonic	399	5.2%	184	2.8%	227	3.1%	22.9%	42
8	Sharp	363	4.7%	263	4.0%	176	2.4%	-33.2%	-87
	Others	**1,521**	**19.8%**	**1,679**	**25.7%**	**1,758**	**23.9%**	**4.7%**	**79**
	Total	**7,693**	**100.0%**	**6,526**	**100.0%**	**7,363**	**100.0%**	**12.8%**	**837**

Samsung's shipments grew at more than twice the pace of the overall market, rising by 26% to 1.45 million units, up from 1.15 million in the first quarter. Vizio grew even faster, with its shipments rising by an industry-leading 30.8% to 1.39 million units, up from 1.07 million in the first quarter. In the past, the two companies pursued very different strategies to attain LCD TV market leadership, with Samsung focusing on premium products and Vizio stressing low-cost value-oriented LCD TVs. However, as US consumer preferences have shifted to higher-end LCD TVs, Vizio has realigned its product line to offer more advanced features. Most LCD TVs purchased in the United States in 2010 are replacements of first-generation flat panels. Because of this, US consumers are more informed and demand larger LCD TVs with better picture quality and more premium features, including 3D, LED backlighting and built-in Internet connectivity. While Samsung continues to lead these technological trends, including the nascent 3D TV segment, Vizio has significantly closed the feature gap. http://www.isuppli.com

DisplaySearch reports that large area TFT LCD shipments reached record high of 170 million in Q2'10

Shipments of large area (9.1-inch and larger) TFT LCDs climbed to achieve a quarterly record high 170 million units, with 9% Q/Q and 31% Y/Y growth rate. The revenues reached $22.9 billion, which was the second-highest quarter on record. According to the latest *Quarterly Large Area TFT LCD Shipment and Forecast Report*, panel makers are aiming to continue shipment growth in the second half of the year despite the recent drop in panel prices and supply chain inventory adjustments. All TFT LCD applications experienced Q/Q growth in Q2, with the

exception of the public display panels. Growth in LCD monitor panel shipments, which started to slide in June, was the smallest among the three major TFT LCD applications. Shipment of panels for notebook PCs, including mini-notes and slate type PCs, was the strongest, with 15% Q/Q growth. Meanwhile, panels for LCD TVs, including <26-inch LCD monitor panels used for TVs, reached 55 million units – a new record.

Original Specification	Q1'10 Shipments	Q2'10 Shipments	Q/Q Growth	Y/Y Growth
LCD Monitor – PC	49.5	50.9	3%	8%
LCD Monitor – TV	4.1	4.1	-1%	-1%
Notebook PC	42.5	49	15%	48%
Mini-Note PC/Slate	10.4	12	15%	51%
LCD TV	46.7	50.9	9%	47%
Public Display	0.5	0.4	-14%	82%
Others	2.5	2.9	15%	24%
Total	156.3	170.2	9%	31%

Large-Area TFT LCD Shipments by Original Specification and Application (Millions)

In Q2'10, Samsung Electronics led in large-area TFT LCD panel shipments on a revenue basis, with sales of $6 billion, capturing a 26.3% revenue share. LG Display ranked second, with $5.4 billion in revenues, or 23.4%. AUO was third at $3.7 billion with a 16.2% share, with ChiMei Innolux closely following with a 15.8% share at $3.6 billion. LG Display took first place on a shipment basis in Q2'10, while Samsung shipped the most by area. On a unit basis, Korea was the largest supplier of large-area TFT LCD panels in Q2'10 with a 46.5% share, compared to 47.2% in Q1'10. Taiwan's share slightly fell from 42.7% in Q1'10 to 42.5% in Q2'10. China's share increased from 4% in Q1'10 to 5% in Q2'10.

Rank	Notebook PC	Mini-Note/Slate	LCD Monitor	LCD TV	Public Display	Others	Total
1	LG Display	LG Display	LG Display	ChiMei Innolux	Samsung	Sharp	LG Display
2	Samsung	HannStar	ChiMei Innolux	Samsung	AUO	AUO	Samsung
3	AUO	AUO	Samsung	LG Display	LG Display	LG Display	ChiMei Innolux

Top Three Unit Suppliers for Each Application in Q2'10

Other key trends are described in detail in the Q3'10 *Quarterly Large Area TFT LCD Shipment and Forecast Report*, including the following:

- 2.8 million 9.7-inch panels were shipped for the iPad in Q2'10; these panels continue to be in tight supply. Samsung and LG Display are the main suppliers, and jointly plan to ship 15 million panels this year. However, excluding 9.7-inch slate type PC panels, mini-note PC panel shipments declined from Q1 to Q3 and are expected to continue to fall in 2H'10.
- In terms of area, Q2'10 shipments were a record 27 million square meters, 8% Q/Q growth.
- The average area price in Q2'10 was $849 per square meter, which increased slightly from $836 in Q1'10. However, due to panel price drops, it is expected to fall below $800 in Q3'10.
- LCD TV accounted for 64% of shipment area, while LCD monitor was 22% and notebook PC was 13%.

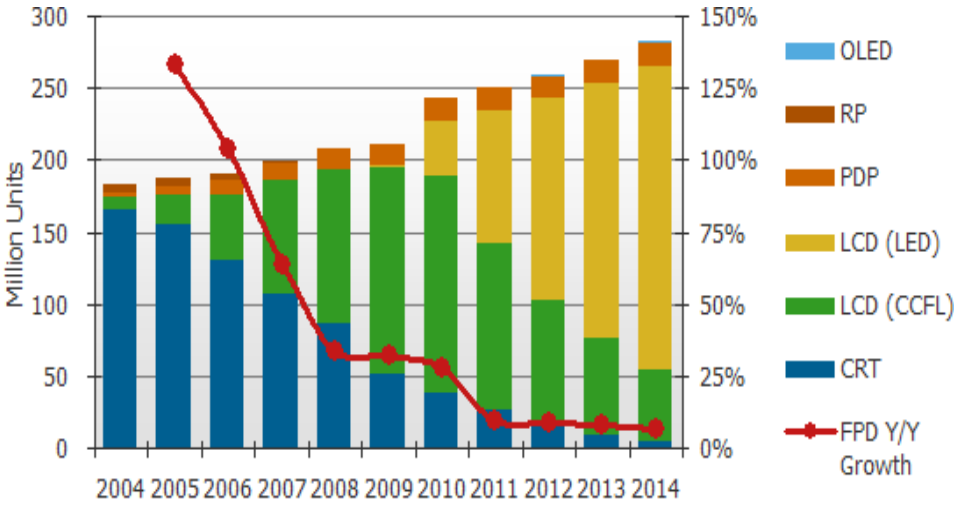
Looking forward, panel makers are targeting continuous shipment growth in Q3'10 as a result of falling panel prices. This will encourage downstream customers to purchase more panels once they adjust inventories. Meanwhile, most brands will increase their panel purchases and production in the coming months to prepare for seasonal sell-through demand in Q4. Panel makers are targeting 8% Q/Q shipment growth in Q3'10; this means panel makers are expecting to ship a large amount of panels in September, as July and August shipments are expected to decline. http://www.displaysearch.com

DisplaySearch predicts LCD TV shipments to grow to 188M units in 2010 and surpass 260M units in 2014

According to the latest DisplaySearch Quarterly Advanced Global TV Shipment and Forecast Report, total TV shipments in 2010 will pass 242 million units, a remarkable 15% increase from an anemic 2% level of growth in 2009. Not only does the level of demand for LCD TVs look strong, rising 29% to 188 million units, but both plasma and CRT TV technologies have a better outlook in 2010 than previously expected. Within LCD TV, the trend towards increased LED backlight usage is one of the most intently watched areas as an acute supply chain

shortage keeps the LED market segment from growing more quickly in 2010, although CCFL models seem well supplied. LCD continues to be the dominant TV technology worldwide, achieving more than 50% shipment share in nearly all regions, with Asia Pacific crossing 50% at the end of 2010. The key demand drivers remain compelling in 2010, including the World Cup, the completion of a digital TV transition in several Western European countries and the continued rollout of several new TV technologies, including LED-backlit LCD TVs, 3D TVs and Internet connectivity.

China continues to be a hot LCD TV growth market in 2010 due to expanding government stimulus programs and increased urbanization, with 35% Y/Y growth in 2010, down from 119% Y/Y growth in 2009. Japan has also been a surprisingly hot market, perhaps because consumers are upgrading early generation flat panels with newer, more feature-rich and energy-efficient models before government-sponsored upgrade programs end. LCD TV unit shipments in Japan are expected to rise 36% in 2010, three times faster than other developed markets like North America and Western Europe. Over the next four years LCD TV growth emphasis will shift to emerging markets like Asia Pacific, which includes India and Latin America.



Worldwide TV market by technology

Plasma TV shipments did quite well in Q1'10, rising 24% Y/Y as demand for high value-per-inch large TVs seems to have rebounded along with the improving economic conditions. Consumers want a large TV, but still feel enough of a budget pinch to seek out the best "bang for the buck". This trend is expected to continue in Q2'10, especially as large alternative LED-backlit LCD TVs remain quite expensive; DisplaySearch has increased its 2010 unit forecast for plasma TVs to 16 million units. The LCD TV shipment outlook has been increased to 188 million units in 2010, driven in part by the rapid expansion of LED-backlit models. DisplaySearch estimates that 3.6 million LED-backlit LCD TVs were shipped worldwide in 2009, with more than half of that coming in Q4'09. In 2010, companies throughout the supply chain are gearing up for a more aggressive rollout of LED models, but are constrained by component supply. DisplaySearch expects LED-backlit LCDs to account for about 20% of all LCD TVs shipped in 2010. About 9 in 10 LED-backlit LCD TV models shipped this year will use an edge-type backlight, with the remainder using some form of full array. The LED share of LCD TV shipments will rise rapidly in 2011 as the supply chain catches up and LED component prices fall, and will become the majority LCD TV backlight technology by 2012. The transition from CCFL to LED backlights for LCD TVs will happen very quickly, aided by the push to thinner and lighter designs, along with increasing awareness and regulation of energy consumption. http://www/displaysearch.com

Taiwan makers see LCD TV shipments rise 11% in 2Q10, says DisplaySearch

Shipments of large-sized (9.1-inch and larger) thin film transistor LCD panels hit a quarterly record high of 170 million units in the second quarter, with 9% quarter-on-quarter (Q/Q) and 31% year-on-year (Y/Y) growth rate, according to DisplaySearch. The revenues reached US$22.9 billion, which was the second-highest quarter on record. Panel makers are aiming to continue shipment growth in the second half of the year despite the recent drop in panel prices and supply-chain inventory adjustments. David Hsieh, Vice President, Greater China Market of DisplaySearch, attributed the industry`s new heights in the second quarter to strong purchasing and inventory preparation by downstream customers. "Despite this, over-optimism throughout the supply chain in the second quarter is causing adjustments in the third quarter as panel prices have fallen amid cuts in panel orders and unclear demand forecasts," he added. All TFT-LCD applications experienced Q/Q growth in the second quarter, with the exception of the public display panels. Growth in LCD monitor panel shipments, which started to slide in June, was the smallest among the three major TFT-LCD applications. Shipment of panels for notebook PCs, including mini-notes (netbooks) and slate-type PCs, was the strongest, with 15% Q/Q growth. Meanwhile, panels

for LCD TVs, including 26-inch and smaller LCD monitor panels used for TVs, reached 55 million units – a new record. http://www.displaysearch.com

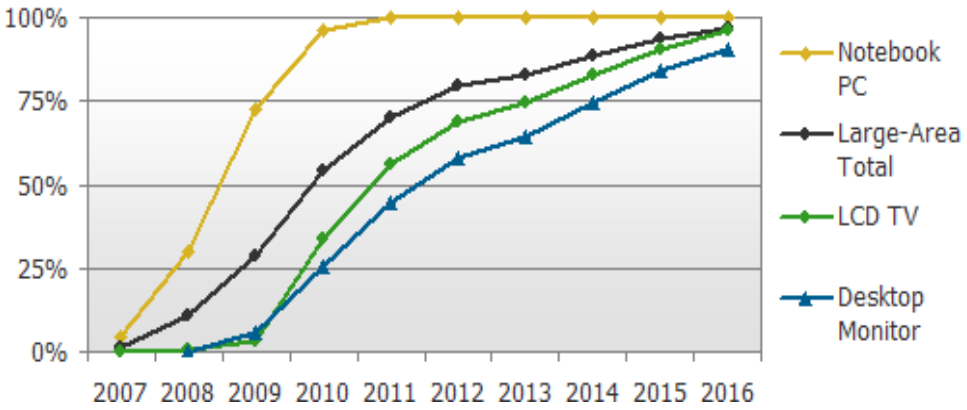
Large-sized TFT-LCD Shipments by Application
(Millions unit)

Original Specification*	Application	Q1'10 Shipments	Q2'10 Shipments	Q/Q Growth	Y/Y Growth
LCD Monitor	LCD Monitor	49.5	50.9	3%	8%
LCD Monitor	LCD TV	4.1	4.1	-1%	-1%
Notebook PC		42.5	49	15%	48%
Mini-Note PC/Slate**		10.4	12	15%	51%
LCD TV		46.7	50.9	9%	47%
Public Display		0.5	0.4	-14%	82%
Others		2.5	2.9	15%	24%
Total		156.3	170.2	9%	31%

Source: DisplaySearch Quarterly Large-Area TFT LCD Shipment Report.
* Original specification indicates the panel specification at the time of shipment. Some panels specified for LCD monitors are used for LCD TVs.
** Includes 9.1-inch and larger panels

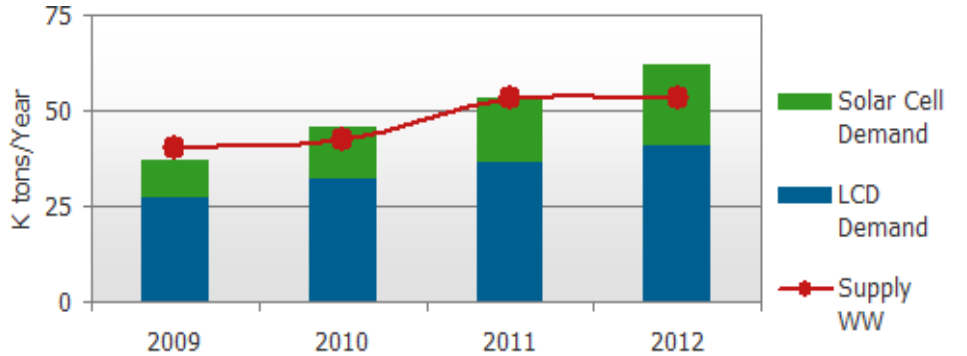
Key component shortages limit growth of LED backlight units for LCD TVs, says DisplaySearch

The LED backlight unit has emerged as a key factor in the TFT LCD industry, and is expected to maintain its growth momentum for the next several years. According to the latest DisplaySearch Quarterly LED Backlight Report, LED backlight shipments will pass those of CCFL backlights in all large-area TFT LCD panels and achieve 80% penetration in Q4'12.



LED backlight unit penetration rate in 10-inch+ TFT LCDs

There is no doubt that LED will be the mainstream light source in all LCD applications due to slim design, low power consumption and the fact that it enables high display performance. This represents an opportunity for display materials suppliers. For example, optical polymethyl methacrylate (PMMA) used in light guide plates, white polyester (PET) for reflector film, and sapphire for LED wafer substrates. However, LCD makers have been suffering from key component shortages related to LED backlights in Q1'10. PMMA shortages have limited production of TV light guide plates. Many reflector film suppliers were stretched between demand from LCD and solar cell applications. In addition, many LED makers faced a sapphire substrate shortage. "Many LCD makers didn't recognize the limited capacities of key material suppliers before fixing their LED TV panel shipment targets. In particular, PMMA and PET are in significant shortage. PMMA and PET suppliers are slowly expanding capacity since they need time to add new plants and face financial limitations," said Kevin Kwak, DisplaySearch Research Director.



Global PET supply/demand forecast

How can supply chain participants address component shortages? In the case of LEDs, multi-vendor LED qualification and improved LED BLU design minimizing the number of chips can both help. Also, joint investments between LCD makers and PMMA suppliers can be a solution for securing light guide plate material. "To expand the LED-backlit LCD TV business successfully, LCD TV panel or TV set makers need to consider product competitiveness, including effective procurement, design innovation, cell business models, and sales strategies because many consumers feel the price of LED-backlit LCD TV sets are still too high," noted Kwak. http://www.displaysearch.com

DisplaySearch says Q2'10 TV shipments show continued growth

Overall TV shipments continued to show resilience, bouncing back from dismal 2009 levels, but there were some indications of trouble in key markets. Global TV unit shipments rose 26% year-over-year (Y/Y) in Q2'10 to 56.2 million units, a 2% increase from Q1'10, according to the latest data published in the DisplaySearch Quarterly Global TV Shipment and Forecast Report. However the second-largest region worldwide, North America, had a 3% drop in TV shipments Y/Y after a weak 1% increase in Q1'10. In addition, China's LCD TV market cooled off a bit, as unit shipments rose 31% Y/Y after triple-digit growth in 2009. This was less than the Chinese brands expected, as holiday sales were weaker than forecasted. There were some bright spots, as TV shipments to Japan surged another 56% Y/Y, the most of any developed region. The government-sponsored Eco-Points program continued to encourage consumers to trade up to more energy-efficient models. Latin America was the strongest region in terms of growth, rising 70% Y/Y to a record 7.3 million TVs shipped in a single quarter. This was the one region in which the World Cup had a clear impact on TV demand. Shipments to Europe also increased due to expectations of a boost from the World Cup, but sell-through results were less than spectacular. A build-up of inventory, combined with a weaker euro, will likely lead to a correction in Q3'10 in order to make way for the holiday season in Q4'10.

As an example of the consumer demand for value, plasma TV shipment growth has been accelerating, increasing from single-digit growth in Q4'09 to 47% Y/Y growth in Q2'10. Plasma offers a greater value-per-inch than comparable LCD sets, and this gap widened in Q2'10. LCD TV shipments in the first half of 2010 have been below expectations, but it is still possible to have a strong second half performance. Recent declines in panel prices will probably lead to low Q4 set prices, driving increases in unit demand. Even CRTs had a better-than-expected result in Q2'10, as emerging markets purchased inexpensive sets for the World Cup.

Technology	Q2'10 Units	Q2'10 Unit Share	Q/Q Growth	Y/Y Growth
LCD TV	41,794	74.4%	3%	39%
PDP TV	4,497	8.0%	30%	47%
OLED TV	0.3	0.0%	188%	-36%
CRT TV	9,865	17.6%	-8%	-14%
RPTV	26	0.0%	-37%	-24%
Total	56,183	100%	3%	26%

Q2'10 worldwide TV shipments by technology (000s)

In line with TV manufacturers goals of raising LED backlights in their LCD TV line-ups, the share of LED-backlit LCD TVs increased from less than 8% in Q1'10 to nearly 18% in Q2'10. Considering the average LED LCD TV carried an ASP that was more than double that of a CCFL-backlit model, the impact on revenue share for LED LCD TVs was even more pronounced. The vast majority of these LED-backlit LCD TVs used an edge-lit configuration, which is understandable given the benefits of lower cost, slimmer profile and lower energy consumption.

Samsung's global flat panel TV market share increased more than two points to 24.4%, a new record for the brand. With the #1 position in LCD and a strong #2 position in plasma, Samsung is able to participate in all major TV market segments and compete effectively with products priced at a premium to the market average. Samsung also had the #1 LED and 40-inch+ market share. LGE was the #2 brand worldwide at 14.1%, unchanged from Q1, with share growth in plasma TV helping to offset some decline in LCD share. Like Samsung, LGE participates in all of the major TV categories, including LCD, plasma and CRT. LGE can address all market segments, and has a strong share position in emerging markets. Sony rounded out the top three brands in global flat panel TV revenues during Q2'10, rising to 12.8% on the strongest Q/Q growth of the top five global brands. Sony also reclaimed the #2 revenue share position in global LCD TV sales, overtaking LGE. http://www.displaysearch.com

Rank	Brand	Q1'10 Share	Q2'10 Share	Q/Q Growth	Y/Y Growth
1	Samsung	22.3%	24.4%	20%	26%
2	LGE	14.1%	14.1%	9%	34%
3	Sony	10.1%	12.8%	39%	22%
4	Panasonic	7.3%	9.0%	36%	20%
5	Sharp	6.5%	6.4%	8%	26%
	Other	39.7%	33.3	-8%	18%
	Total	100.0%	100.0%	10%	23%

Q2'10 worldwide flat panel TV brand rankings by revenue share

Quixel Research highlights increased in LED backlighting for LCD TVs

Quixel Research's recently published *LCDTV Market Review* revealed that LED-backlit LCD TV unit and value shipments were not only up Q/Q and Y/Y but accounted for almost all the LCD TV category growth in Q2'10. Volumes for the LED-backlit LCD TV segment rose 105% from Q1'10 to Q2'10 and 875% from Q2'09 to Q2'10, whereas the CCFL-backlit LCD TV segment was up only 3% from Q1'10 to Q2'10 and declined 25% from Q2'09 to Q2'10. Revenues for the LED segment rose to $1.7B in Q2 2010 compared to $1.1B in Q1 2010 or up 49% and 312% from Q2 2009 to Q2 2010. Value share for the LED segment accounted for almost 40% of the LCDTV category in Q2'10. Volume for the overall LCD TV category increased 16% from Q1'10 to Q2'10 but posted a 5% decline from Q2'09 to Q2'10. The LCD TV dollars were also up Q1'10 to Q2'10, topping $4.5 billion compared to $4.1 billion in Q1'10. Quixel Research's outlook for 2010 and beyond is still strong despite the tough economic conditions. Quixel's projections for the USA LCDTV market in units show the category growing out to 2013 with large screen models taking an increasing share in the category. http://www.quixelresearch.com

USA LCDTV
Market Shares in End User Value by Light Source
2008 - Q2 2010

	Yr 2008	Yr 2009	Q2 2009	Q3 2009	Q4 2009	Q1 2010	Q2 2010
LED	0.34%	9.66%	8.05%	11.29%	15.29%	27.73%	37.21%
CCFL	99.66%	90.34%	91.95%	88.71%	84.71%	72.27%	62.79%

CEA launches working group to develop standards for accessibility features in technology products

The Consumer Electronics Association's Video Systems Committee announced the launch of a new working group to develop standards for enhanced accessibility features in video devices. The working group - called R4 WG19 - will develop standards and guidelines focused on enhanced accessibility features in video devices, providing direction for product implementations that benefit the accessibility community and consumer electronics manufacturers. CEA seeks participation in the working group by designers, engineers, manufacturers, users with disabilities and accessibility design specialists. "The video systems and home entertainment markets are driving forces behind the global success of the consumer technology industry," said Brian Markwalter, vice president of Research and Standards for CEA. "CEA's new working group will establish standards and recommended practices that will improve accessibility features in these devices and will ultimately lead to more innovative and user-friendly technology products that benefit the accessibility community and the CE industry as a whole." The working group will initially focus on tactile feedback features of remote controls to assist in locating and distinguishing buttons and features on TV, recorder, audio and other remote-controlled devices. Further projects may include other standards surrounding accessibility issues in video devices – features critically important to consumers with visual or auditory impairments, for example. http://www.CE.org/standards

Video quality less important when you're enjoying what you're watching, reports Rice University

Research from Rice University's Department of Psychology finds that if you like what you're watching, you're less likely to notice the difference in video quality of the TV show, Internet video, or mobile movie clip. The findings come from the recently released study "The Effect of Content Desirability on Subjective Video Quality Ratings" authored by Philip Kortum, Rice professor-in-the-practice and faculty fellow. The study appears in the journal *Human Factors*. "Research was done asking if people can detect video quality differences," Kortum said. Using four studies, Kortum, along with co-author Marc Sullivan of AT&T Labs, showed 100 study participants 180 movie clips encoded at nine different levels, from 550 kilobits per second up to DVD quality. Participants viewed the two-minute clips and then were asked about the video quality of the clips and desirability of the movie content. Kortum found a strong correlation between the desirability of movie content and subjective ratings of video quality. "At first we were really surprised by the data," Kortum said. "We were seeing that low- quality movies were being rated higher in quality than some of the high-quality videos. But after we started analyzing the data, we determined what was driving this was the actual desirability of the content". The findings run counter to the popular belief that Americans are striving for and must have the best video quality at their fingertips all the time. http://www.rice.edu

EU confirms energy labeling

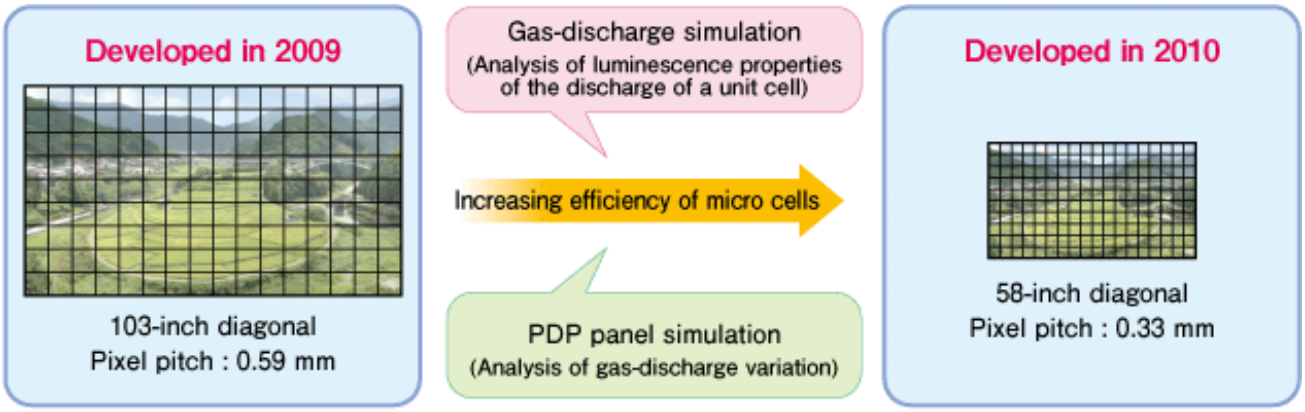
Following a political agreement between the European Parliament and the European Commission (EC), the new regulations for energy labeling of products have now been published in the Official Journal of the EU and will start to apply to products from July 2011. The EU has extended the scope of the labeling requirements, issued under the name “Energy Labeling Directive” and with the reference 2010/30/EU, to “all energy-using and energy-related products”. It also extends the scope from purely consumer products to commercial products as well. However, the issuing of precise regulations for particular products has been delegated to the Commission. Legislation to enforce the directive will be created by the national governments and the obligations for particular products will take effect one year after the delegated regulations are published in the official journal. The main decision of the Directive is to adopt a new labeling scheme for products that consists of seven levels of energy-using performance, initially from A-G, but with three new levels, A+, A++ and A+++ being added as performance improves over time. As the new levels are added, the lower levels will be withdrawn at the bottom. Adverts for products will have to carry a reference to the energy rating of the product. TVs are likely to be among the first group of products for which legislation will be created and the A-G rating should be introduced 12 months after the publication of the regulations. PCs and monitors will also come under the legislation, with a decision on monitors likely around September. According to the proposal for television labels, the higher energy labeling classes are to be introduced gradually from 2013 to 2019. Televisions placed on the market from 1 January 2013 will be labeled from F to A+; from 1 January 2016 will be labeled from E to A++; from 1 January 2019 will be labeled from D to A+++. The new directive requires that energy levels are set so that a certain proportion of products on the market will get different labels and says, “The Commission considers that the proportion of products in the two highest energy efficiency classes is considered to be significant when it can be estimated that either the number of models available on the internal market which achieve class A+++ or A++ is about one third or more of the total number of relevant models available; or the share of the annual sales of products in the internal market which achieve class A+++ or A++ is about one third or more; or both.”

In the case of monitors, the differences in annual power consumption and cost between the best and the average power used by sets have already got so small that the Commission is not proposing a labeling scheme, but is calling for a mandatory compliance with Energy Star 5.0, which has already received wide acceptance in the industry. The vote to adopt the current proposals is expected in September 2010 and is likely to come into force one year after publication of the decision. The proposal includes a requirement for monitors containing mercury to show the quantity used. http://tinyurl.com/25qyrab

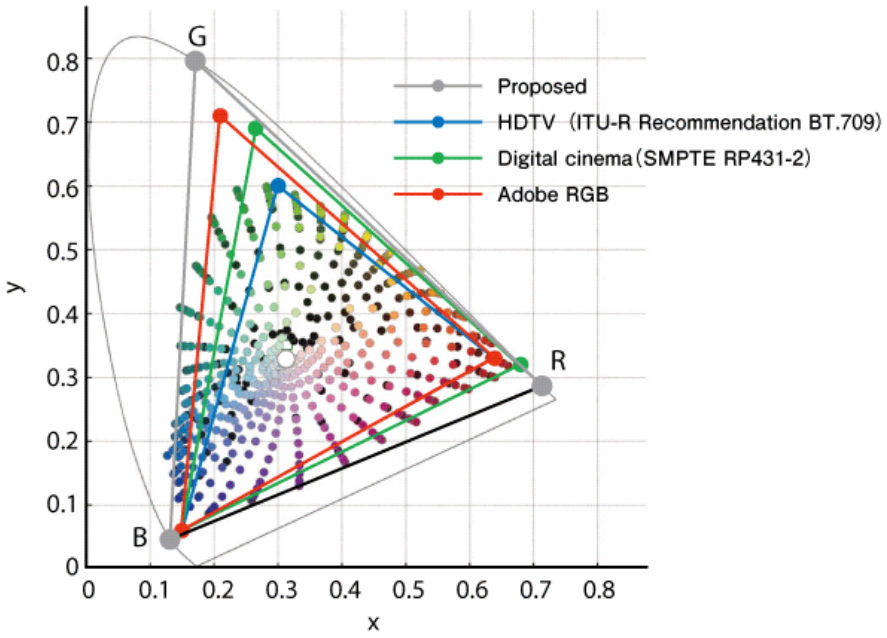
This is the label format that will be used for TVs

NHK researchers announce new developments for Ultra-HD display

NHK's Science and Technical Research Laboratories have unveiled their latest Ultra HD plasma display, one-fourth of a Super Hi-Vision display they hope will ultimately replace today's HDTV technology. When NHK started working towards Super Hi-Vision, the pixel pitch of a plasma display was about 0.9mm. Their latest prototype measures in at 58-inches, and demonstrates the strides they've made towards achieving their goal of a 0.3mm pixel pitch display, measuring 0.33mm pixel pitch. NHK currently hopes to expand their prototype into the 100-inch class, offering "ultra-high-definition" for the home. The PDP prototype has 3,840 pixels in the horizontal direction and 2,160 pixels in the vertical direction.



Additionally, to ensure that Super Hi-Vision broadcasting will convey an unparalleled sense of quality and realism, the NHK researchers believes that SHV should have a wide color gamut with more vivid colors than conventional TV can produce. They favor a new colorimetry that uses monochromatic RGB primaries on the spectrum locus. Such primaries can be obtained from laser light sources. The color gamut proposed completely covers those of Hi-Vision (HDTV), Digital Cinema, and the de facto standard for electronic video (Adobe RGB), reproducing almost all real object colors (99.9% of the gamut of Pointer's colors). http://www.nhk.or.jp



X-Y chromaticity diagram proposed by NHK researchers working on the Super Hi-Vision technologies

Amtran, Everlight, and LG Display to form LED packaging JV for LCD TV market

Taiwan-based LCD TV maker Amtran Technology has announced a plan to form an LED packaging joint venture in China with LED packager Everlight Electronics and TFT LCD panel maker LG Display. The new company will be located in Wujiang City in China's Gangs Province, said Amtran, a major manufacturing partner for its US affiliate Vizio. The three companies aim at pooling together their respective strengths and resources to expand their share of the LED-backlit LCD TV market, Amtran said. The capital investment of the new company, which is expected to start operations in the second half of this year, will amount to $30 million. Amtran will utilize its core competence in R&D on flat-panel TVs and dedicate to playing a key role forming strategic alliances linking the upstream and downstream, it said. Taiwan-based Everlight is one of the biggest LED packaging companies in the world, while Korea-based LG Display is a major player in the global LCD panel market and a key panel supplier for Amtran. Amtran is looking to ship 7-8 million LCD TVs in 2010. Industry sources said LED-backlit models will account for 30% of Amtran's LCD TV shipments in the second half of 2010.

IMS Research announces deadline for entries to the 2010 TV Innovation Awards

The deadline for the 2010 TV Innovation Awards award is Friday October 15th, 2010. IMS Research will host the second annual TV Innovation Awards immediately following day one of the TV 3.0 – Innovations in TV & Content Delivery Conference. The event will take place in Los Angeles, California on the evening of December 7th 2010 at the Hyatt Regency Century Plaza Hotel. http://www.imsconferences.com/television

The awards are administered by IMS Research, and judged by an independent panel of industry experts thus creating a level playing field for all entries. In addition, winners in each category will receive:

- A co-authored press release with IMS Research promoting your company's victory
- An impressive physical award to display at future tradeshows
- Photo opportunities with IMS Research and the press

This year's TV Innovation Award categories include

3D Television	On Demand Solutions
Interactive TV	Advanced User Interfaces
Content Protection	Green Technology
Semiconductor Solutions	Set-Top Box Technology
On Demand Solutions	Mobile TV
TV Performance	TV Design
Immersive Television	Content Storage Solutions
Home Networking	Innovator of the Year

University of York reports that LCD TV waste may prevent infections

The fastest-growing waste in the EU could soon be helping to combat hospital infections, according to scientists at the University of York in England. The latest developments from the York Green Chemistry Center of Excellence and the York Liquid Crystal Group were presented recently by Dr. Andrew Hunt. Researchers in the university's department of chemistry have discovered a way of transforming the chemical compound polyvinyl-alcohol (PVA), a key element of television sets with liquid crystal display (LCD) technology, into an antimicrobial substance that destroys infections such as *Escherichia coli* and some strains of *Staphylococcus aureus*. The team earlier had found a method of recovering PVA from television screens and transforming it into a substance that, because of its compatibility with the human body, could be suitable for use in tissue scaffolds that help parts of the body regenerate. It also could be used in pills and dressings that are designed to deliver drugs to particular parts of the body. The project's next steps will be to test the PVA-based substance against commercial compounds to determine relative effectiveness and to secure approval from regulatory agencies regarding the suitability of silver nanoparticles for human health applications. The research is a development from a long-term project funded by the UK government's Technology Strategy Board. http://www.york.ac.uk/chemistry

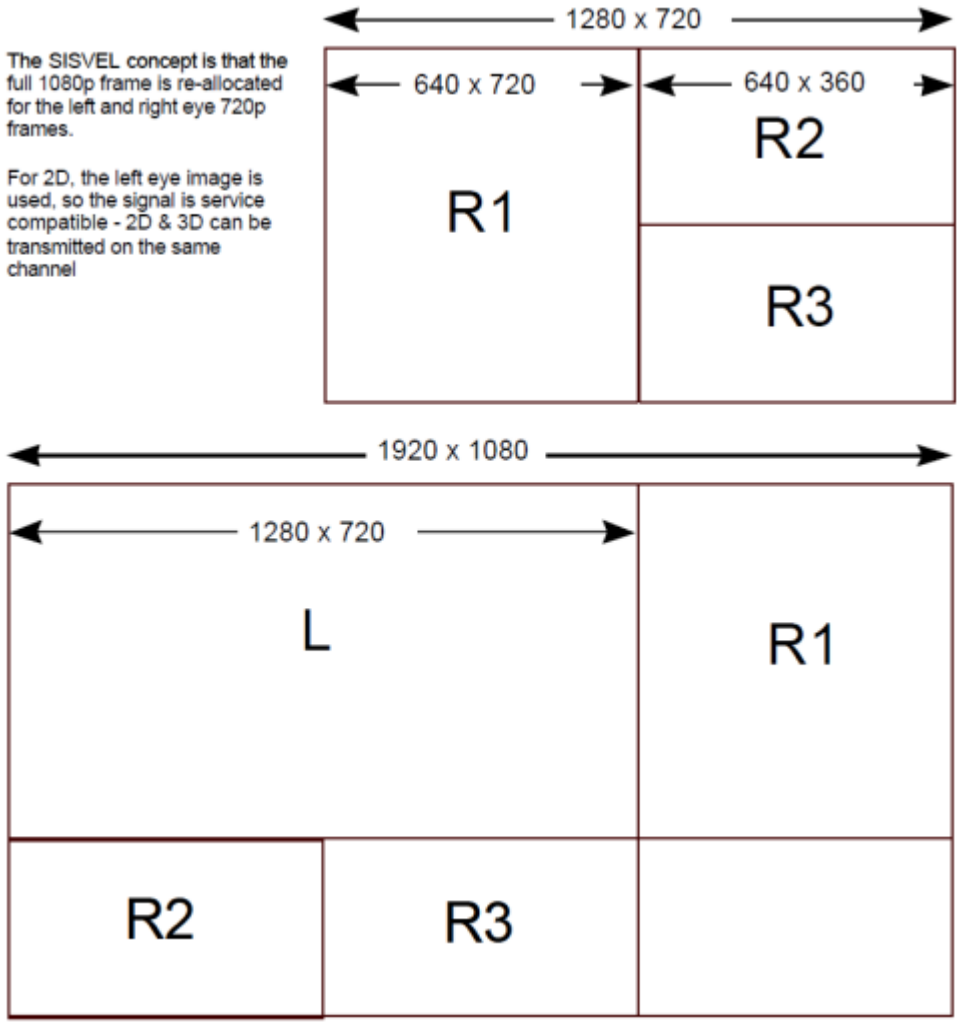
Corning announces new capacity investments

Corning Incorporated announced that its board of directors has approved a capital expenditure plan to expand the company's LCD glass and Gorilla glass manufacturing in response to strong market demand. The company will invest approximately $800 million to construct a new LCD glass substrate facility in the People's Republic of China. With the support of the Beijing municipal government, Corning will locate the new facility in the Beijing Digital TV Industry Park within the Beijing Economic Technological Development Area. The manufacturing plant will have up to Generation 8.5 glass-melting and finishing capabilities. Groundbreaking is planned for September of this year, with production slated to begin in the first half of 2012.

Corning's investments will also include construction projects in other regions to expand capacity for two of its flagship products: EAGLE XG LCD glass substrates and Gorilla glass. As previously announced, the company has restarted an expansion project at its Taichung (Taiwan) LCD glass facility and is ramping up idled capacity at its facility in Shizuoka, Japan to produce Gorilla glass for various applications. The company now intends to expand further in Taichung under the new capital expenditure plan, with additional capacity projected to come on line in the first half of 2012. http://www.corning.com

DVB Project approves S3D commercial requirements

The DVB Project has approved and published the commercial requirements for a S3D TV Frame Compatible Plan-Stereoscopic system. This system is usually deployed in a side-by-side format, delivering alternate left and right images to each eye in a "spatial multiplex". This allows the viewer to watch the S3D content when wearing active shutter glasses. The DVB's 12-page document on the topic has defined the commercial requirements for S3D transmissions broadcast by DVB members and it also clarifies issues such as S3D subtitling on graphics and text display. The DVB Project hopes that the requirements will see members broadcast in the Frame Compatible method over existing S3D infrastructure, which is already used by some pay-TV operators for HD TV broadcasts. In addition, the DVB says that the S3D TV specifications must support Frame Compatible S3D formats, detailed in the HDMI specification, up to 1080p at 24Hz, and that the S3D specification should be flexible enough to support future frame compatible formats. However, despite the DVB Project approving the commercial requirements for S3D TV, the group also admitted that some of its members would prefer an alternative format, namely the Frame Compatible system. Talks on this format are said to be ongoing and this issue was not covered in the DVB document (which can be found at http://www.dvb.org/technology/standards/a151_CR_for_DVB-3DTV.pdf). The DVB is now working on Phase 2 of its commercial requirements for S3D TV. It is likely to center around other S3D work being undertaken by SMPTE, Dolby and HDMI. The DVB is also planning to look at introducing additional frame compatible formats in a bid to improve S3D picture quality, and the group's Technical Module has been charged with summarizing these alternative formats into a "pros and cons" list.



Vishay supplies components for 3D TV glasses

Vishay Intertechnology Inc. has come out with two infrared receivers for the liquid-crystal shutter glasses used with 3D-ready television sets. The receivers are designed to be built into the glasses, where they receive infrared signals from the TV set, causing the glasses' shutters to open and close at the times necessary to create a 3D effect. The receivers operate at a frequency and a wavelength that are different from the frequency and wavelength used by remote controls to TVs and set-top boxes so they won't interfere with them and vice versa. Liquid-crystal shutter glasses don't have physical shutters that open and close. Instead, they have liquid crystal layers that darken when voltage is applied to them, creating the effect of shutters closing. A 3D television shows images designed for one eye or the other in conjunction with the proper lens of the glasses darkening to create a 3D effect. The glasses retail from around $100 to around $200, depending on the model. Vishay is selling its receivers at $1 a piece in small quantities. http://www.vishay.com

Freescale and Vestel Electronics collaborate to jointly develop RF remote controlled LCD TV

Freescale Semiconductor and Vestel Electronics announced that they have been working together to develop an LCD TV with radio frequency (RF) remote control that uses Freescale's BeeStack Consumer ZigBee-RF4CE platform. Vestel, one of the largest TV manufacturers in Europe, worked with Freescale to design the RF target board to replace infrared in the TV and implement the RF4CE network. Freescale provided technical expertise for the RF design and a fully operational software solution using Freescale's BeeStack Consumer protocol stack. The design is compatible with ZigBee RF4CE, a standard that is replacing IR in many new remote controls. RF4CE offers several advantages over aging IR, notably removal of line-of-sight and field-of-vision restrictions, elimination of interference caused by large screen TVs, improved power consumption and new features only feasible with a modern bi-directional technology. http://www.freescale.com/ZigBee

Taiwanese FPDs will enjoy free tariffs for shipment to the EU

Taiwanese-made flat panel display (FPD) will be exempt from the 14% tariff rate for shipment to the European Union (EU), enabling domestic FPD makers to save some NT$19.6 billion in annual tariff payment, as the World Trade Organization (WTO) is expected to render a ruling against the imposition of tariffs by the EU on FPD and two other information products from Taiwan, the U.S., and Japan for violation of the Information Technology Agreement (ITA), according to the Chinese-language Economic Daily News (EDN), sister publication of Taiwan Economic News (TEN). AU Optronics is expected to benefit most from the ruling, due to the higher share of its shipment to the EU, while the ruling will also benefit ChiMei Innolux, Chunghwa Picture Tubes, and HannStar Display at various extents, thereby giving their share prices a strong boost. This is the first and only time for Taiwan to win out in trade dispute as a "plaintiff" since its accession to the WTO eight years ago. The Ministry of Economic Affairs (MOEA) pointed out that the victory will not only directly benefit domestic FPD makers but also consolidate Taiwan`s status as a leading ICT (information communications technology) supplier in the global market. An MOEA official that shortly after the suit was filed in 2008, the EU already implemented a moratorium exempting the three information products from the tariff. In addition, a similar moratorium on tariff payment has also been applied to other emerging consumer electronic products, such as smart phones, in order to avoid dispute concerning the applicability of ITA to such products. In 2008, Taiwan joined hands with the U.S. and Japan in charging against the EU for levying tariff ranging 6-14% on Taiwanese FPD sized over 19 inches with DVI terminal, TV set-top box with hard disk drive of the U.S., and Japan`s multi-functional office machine, in violation of the free-tariff requirement of the ITA. After two years of litigation, the WTO rendered an initial ruling in mid-June in favor of the charge, which is expected to be upheld by the final ruling on July 23. In addition to FPD, the major target of Taiwan, Taiwanese STB and multi-function office machines, as well as smart phones, will also benefit from the ruling. http://www.moea.gov.tw

Mediacom integrates cloud technology with Clearleap's TV technology platform

Clearleap, the Web-based TV technology platform, announced the successful integration of Web-based content and advertising management technologies for Mediacom Communications, the nation's seventh largest cable television company. The deployment of Clearleap's TV technology platform enables Mediacom to better manage and deploy advertising assets in VOD and linear channels, giving their local advertisers greater reach, precision, and faster time to market, while allowing the MSO to maximize revenues generated from VOD. In addition, integration of the Web-based technologies allows Mediacom to manage and program content for VOD and linear channels, expanding their abilities to quickly deliver more local and special interest programming to subscribers across the more than 1,400 communities in its network. http://www.clearleap.com

Philips to sell LCD TV business in China to TPV

Royal Philips Electronics plans to sell its LCD TV business in the Chinese market to Admiral Holdings Ltd, a wholly owned subsidiary of Hong Kong-listed TPV Technology Limited. The agreement allows TPV to use the Philips brand for its TV products for 5 years. At the same time, the sales and distribution business of Philips TV in China including both its inventories and employees will be transferred to TPV. The announcement did not reveal the specific price and date of the deal. It only emphasized that the letter of intention having no legal binding force could be terminated at any time before the contract signed. Philips already sold out its TV business in the European market and in North America. Its market share in China is also very small, ranking 11th in the first half of 2010. Some 20,000 Philips TV sets were sold per month in the country, accounting for only 1.7 percent of the total, according to figures from the marketing consultant company AVC.

Philips brings out extra-wide 3D cinema TV

Philips announced at IFA in Berlin that it will be bringing a 3D version of its ultra-wide 21:9 cinema television to the market. It will cost £3999.99 in the UK. It has a 21:9 aspect ratio, so movies in the 2.39:1 format completely fill the screen without black bars. Introduced in 2009, this years' Cinema 21:9 has received a powerful performance upgrade that includes picture quality innovations from the Philips 9000 series, including direct lit LED, 400Hz and Perfect Pixel HD Engine picture processing, packaged in a 58-inch Full HD screen in 21:9 aspect ratio. The TV will also come with three-sided Ambilight Spectra, which completely immerses you in the movie. http://www.philips.com

Philips begins shipping S3D TV range

Philips' stereo 3D-ready TV, the 8605H series, is now shipping. It is a member of the 8000 collection and features models boasting Full HD resolution, a response time of 1ms, Ambilight technology, LED backlighting, a Net TV function and 200Hz refresh rate technology. The range allows the viewer to watch S3D content in conjunction with separately acquired active shutter glasses and a S3D transmitter. The Philips 8605H will be available in Europe in sizes of 32, 37, 40, 46 and 52 inches and these will be called the 32PFL8605H, 37PFL8605H, 40PFL8605H, 46PFL8605H, and 52PFL8605H. Only the 40, 46 and 52-inch models are S3D ready. http://www.philips.com

STMicroelectronics unveils new high-performance digital TV system-on-ship with integrated 3DTV

STMicroelectronics announced a new TV system-on-chip (SoC) IC offering 3DTV support and advanced 120Hz MEMC (motion estimation, motion compensation). Designed for next–generation 1080p full-high-definition (FHD) integrated digital TVs (iDTVs), ST's new FLI7525 SoC enables a new class of mid-range, 3DTV-enabled, 120Hz Internet TVs. The FLI7525 is the flagship product in ST's new Freeman Premier series of SoCs and is the industry's first TV SoC with integrated 3DTV support and 120Hz MEMC processing. ST implements MEMC with a proprietary technology that reduces film judder and motion blur to preserve 3D effects with fast motion. The FLI7525 is compliant with HDMI v1.4a and its required 3DTV formats. The FLI7525 also includes proprietary 2D to 3D conversion with its proprietary judder reduction technology and depth control for video and on-screen displays. In addition to offering high-performance H.264/MPEG audio/video decoding and comprehensive integrated features, the FLI7525 SoC delivers an enhanced user experience with full support for broadband-Internet iDTV functionality and expanded graphics capabilities, enabling compelling services and new premium-content business models. The FLI7525 is pin and software compatible with the FLI7510, which was introduced at CES 2010, and is the culmination of the integration of world-class technologies from ST's industry-leading set-top-box chips and the Emmy Award winning Faroudja video processing technologies. http://www.st.com

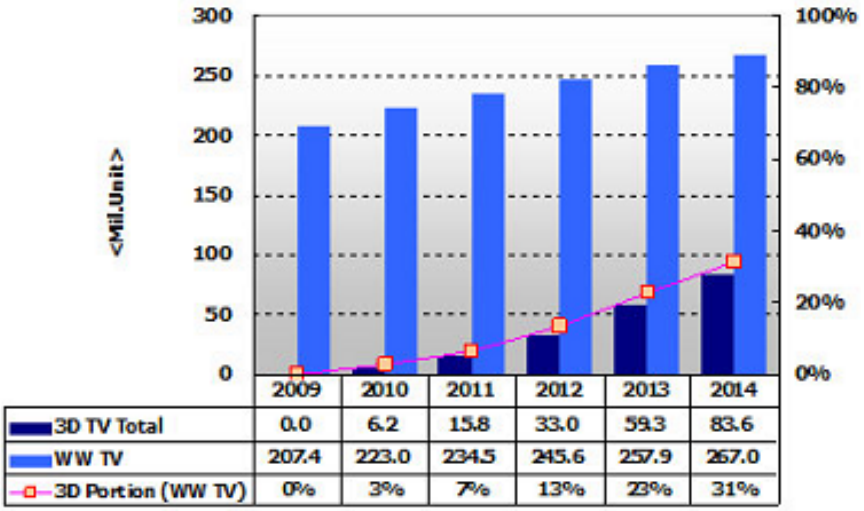
CEA ups 3DTV forecast to 2.1 million units for 2010

The Consumer Electronics Association now expects 2.1 million 3DTV sets to ship in the US in 2010, double its forecast from earlier this year, with revenue in the segment expected to exceed $2.7 billion. The trade group's predictions for the nascent 3D television market have vacillated over the last several months. In December 2009, it pegged 2.2 million unit shipments for the US in 2010, then upped that to 4 million at the Consumer Electronics Show in January before revising that down to 1.05 million after the event. Now CEA has circled back to being more bullish on 3DTV. For 2011, the association is forecasting more than 6 million units to be sold, generating more than $7 billion in revenue. http://www.cea.com

Displaybank publishes 3DTV industry trend and market forecast

The 3DTV market is expected to represent 3% of the all TV market with 6.2M units in 2010 and among these, 5M units are expected to be 3D LCD TV and 1.2M units for PDP TV.

Total 3D TV market forecast (unit based)



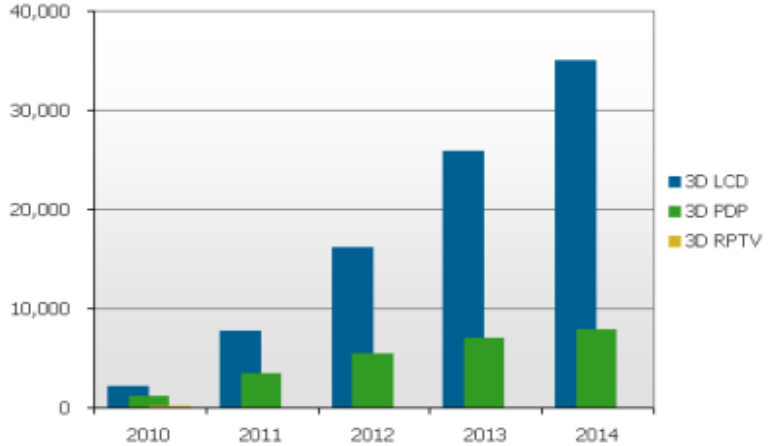
	2009	2010	2011	2012	2013	2014
3D TV Total	0.0	6.2	15.8	33.0	59.3	83.6
WW TV	207.4	223.0	234.5	245.6	257.9	267.0
3D Portion (WW TV)	0%	3%	7%	13%	23%	31%

Displaybank forecasts 6.2M 3DTVs will be sold in 2010 growing to 33M units in 2012 and 83M units by 2014 to represent 31% of the all TV market. In terms of device type, the 3D LCD TV market is expected to reach 5.1M units in 2010 to represent 81% of the total 3D TV market and is expected to be mainly applied to premium products utilizing Full HD and 240Hz in large-sized TVs over 40 inches in size. By 2014, 3D LCD TV market size would reach about 70M units to represent 28% of the LCD TV market. In 2010, 3D PDP TV is expected to penetrate 8% of the PDP TV market but by 2014, most of PDP TV makers are expected to apply 3D as one of TV's functions so 3D PDP TV is expected to represent 99% of all PDP TVs. The shutter glass type would be the mainstream 3D TV technology type in 2010. Excluding LG Electronics, other major TV makers including Samsung Electronics, Sony and Panasonic are launching 3D LCD TV with shutter glass type and polarizer glass type would only show 2% penetration in 2014. Displaybank expects that the glassless type 3DTV will be unveiled by the year 2014. http://www.displaybank.com

3D TV shipments expected to reach 3.4 million in 2010 and 42.9 million in 2014 says DisplaySearch

A new generation of TVs has reached retail, with 3D models now available from all leading TV manufacturers. DisplaySearch forecasts 3.4 million 3D TVs to be shipped in 2010, with the market expected to reach 42.9 million in 2014. Based on this forecast, 3D TV market penetration is expected to grow from a 5% share of total flat panel TVs in 2010 to 37% in 2014. The emerging 3D TV market is tracked in the latest issue of the DisplaySearch Q2'10 *Quarterly TV Design and Features Report*. Despite the forecasted growth for 3D TVs, the consumer electronics industry is running ahead of content availability, as 3D content for TV remains limited to a small number of movies, plus some sports events on pay TV, which are dependent on cable providers. Blockbuster movies in 3D, such as Avatar, will not be available for 3D TV in 2010. In addition, the low penetration of Blu-ray players, and especially HD broadcasts, outside of North America and Japan affects content availability. Consumers may be tempted to wait for the ecosystem to develop in order to have enough material to watch. This, coupled with other significant obstacles for 3D implementation in the home, like consumer perceptions of 3D glasses, remain unresolved.

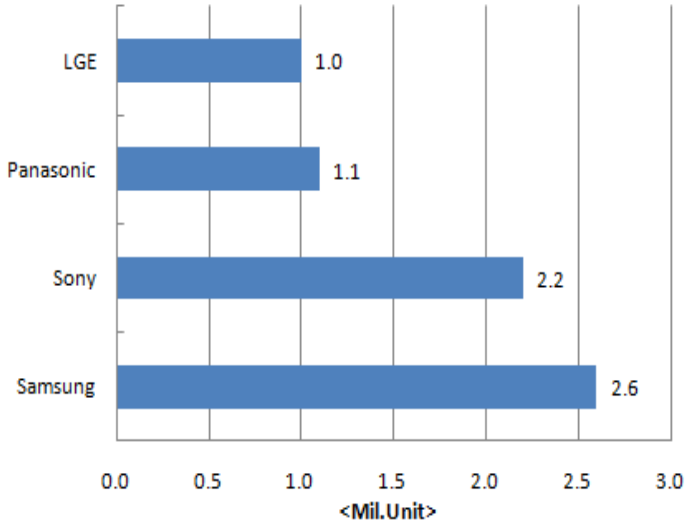
3D TV Forecast



DisplaySearch research also shows how other technologies, such as LED backlighting, are important. Analyses of the latest energy regulations and the best sets on the market shows how much progress has been made. The 200+ page report examines and forecasts video processor and signal processing IC market development, including 120/100 and 200/240 Hz frame rates and market shares for major IC vendors. In addition, the report also features forecasting for MPEG-4 decoding and the digital broadcast environment around the world; TV connectivity, such as wired and wireless networked TVs; LED backlighting; 3D capability and implementation; remote controls and chassis design; and power consumption. http://www.displaysearch.com

3D TV market growth to be led by TV makers in 2010 says Displaybank

The TV market is not a consumer-led but instead is a manufacturer-led market. In the past, FPD, FHD, LED and 120Hz have all seen growth through makers' marketing and sales strategy. With makers' aggressive strategies, 3D is also expected to see sharp growth in the\future. In 2010, major global TV makers including Samsung, LG, Sony, and Panasonic and all are expected to show aggressive 3D TV sales strategy in order to maintain each company's competitive edge. The number of 3D TV models that are either launched or planned to be launched in 2010 by these 4 makers reach 42 models and their combined sales target is 6.9M units. In the second-half of 2010 when 240Hz panels will actively supplied the market, the number of models and sales quantity will sharply jump as other makers begin participating in 3D TV sales.



3D TV sales target by maker in 2010

SEMI introduces 3D display terminology standard

SEMI D59-0710 – This standard was technically approved by the global Flat Panel Display – Metrology Committee. This edition was approved for publication by the global Audits & Reviews Subcommittee on April 30, 2010. This standard is written to provide better communication between parties in the supply chain, as well as between resale and consumers. This standard starts with the basic and most necessary terms which are used in 3D display (especially for those different from 2D displays). Establishment of other related terminologies will follow. http://www.semi.org

SEMI brings out test method for scratch resistance for FPD polarizing films

SEMI D60-0710 – This standard was technically approved by the global Flat Panel Display – Materials & Components Committee. This edition was approved for publication by the global Audits & Reviews Subcommittee on May 21, 2010. This standard establishes implementation practice for the test method of scratch resistance for the surface of FPD polarizing film and its materials. This method can be applied to manufacturing, quality control, and development work. http://www.semi.org

WHDI to Support 3D, 2Kx4K and WHDI-Wi-Fi integration

WHDI LLC announced the technical features that will be included in upcoming versions of the WHDI specification. Significantly, WHDI LLC will release a WHDI 3D specification update that will document WHDI support for all 3D formats required by the HDMI 1.4a specification. This release is targeted for Q4'10. To showcase the 3D capabilities, AMIMON demonstrated 3D HDTV using the current release of the WHDI technology at the Computex show in Taipei, Taiwan. Following the 3D update, the next version of the WHDI standard, "WHDI 2.0," will include the following:

- Full 3D support (in addition to all HDMI 1.4a required 3D modes, WHDI will support the next generation 1080p 60Hzx2 3D format)
- Support for the 2Kx4K HD format with four times the resolution of 1080p (4096x2160 pixels)
- WHDI-Wi-Fi integration and same channel co-existence
- Mobile device integration through reduced power consumption and footprint

The WHDI 2.0 specification is targeted for release in Q2 of 2011. A recent industry report from West Technology Research Solutions (WTRS), a leading wireless industry analyst, stated that WHDI technology will grow from nearly 70% of the 2010 market share for wireless video products to over 75% of the 2015 market. This contrasts sharply with other technologies that could be used for wireless video such as WiDi, WirelessHD and WiGig, where WTRS projects marginal uptake in the wireless video market. http://www.whdi.org

IMS Research predicts worldwide 3D sales to top 5.99 million units in 2010

According to IMS Research, 5.99 million 3D TV sets will ship worldwide in 2010 and forecasts that over 218 million 3D TV sets will ship cumulatively from 2010 to 2015. In a recently published study entitled *3D Video & Gaming in the Home*, IMS Research identifies popularity of 3D theatrical releases and intense competition in the home entertainment space as some of the key drivers behind the deployment and aggressive pricing of 3D TV sets.

Anna Hunt, report author and principal analyst at IMS Research, said in statement, "Within five years, the majority of high-end large-screen TV sets and Blu-ray Disc players are likely to offer 3D capability. The price premium of 3D models in these markets over similar 2D products is expected to diminish quickly. Without a significant price premium, consumers are likely to future proof their purchases by opting for devices with 3D." The company forecasts that by the end of 2015, over 241 million homes will have a 3D Blu-ray Disc player and over 280 million TV households will have an HD set-top box. Hunt added, "Aside from Blu-ray, many HD set-top boxes can facilitate delivery of 3D service from operators that use a frame compatible format. With such a large installed base of 3D-capable devices, content makers should see enough of an incentive to aggressively pursue 3D content creation." Numerous pay-TV operators are offering or planning to offer 3D content to HDTV subscribers at no additional cost over the existing HDTV package pricing. Initially, this may be a common practice until more 3D content is available. http://www.imsresearch.com

In-Stat reports explosive market growth in the US for mobile Internet devices/tablets and 3DTVs

Demand for consumer electronic (CE) devices is soaring in the US – especially in key segments like 3DTVs and mobile Internet devices (MIDs)/tablets. Year-over-year shipment growth for these two segments will be 142% and 231%, respectively, between 2010 and 2011, reports In-Stat. 3DTVs and MIDs/Tablets will also represent a bright spot for CE manufacturers and content providers because the installed base for these segments will continue to expand steadily. "The US installed base units for 3DTVs and MID/Tablets will double from 2010 to 2011 and on through 2013," says Stephanie Ethier, In-Stat analyst. "In fact, In-Stat expects the total US installed base of CE devices to almost double between 2009 and 2013." Recent research by In-Stat found: the US installed base for smart phones to reach 198 million by 2013; mobile PCs will continue to lead the computing category in units shipped through 2013; despite many bright spots in the US CE market, maturing segments like portable media players (PMPs) and desktop PCs will show declining growth rates through 2013; by 2013, there will be 1.9 billion installed CE devices in the US. http://www.in-stat.com

iSuppli says 3DTV sales forecast to triple in 2011

Consumer electronics manufacturers are on track to sell 4.2 million 3DTV sets worldwide in 2010, with the market projected to triple to 12.9 million units next year, according to research firm iSuppli. The emerging category initially will be a fraction of the overall TV market, given that 170 million LCD TVs are expected to ship this year. In the first quarter of 2010, 4% of US consumers that purchased a new television indicated they were buying one that was 3D capable, according to iSuppli. By 2012, 27.4 million 3DTVs will ship worldwide and by 2015 shipments will reach 78.1 million units, representing a compound annual growth rate of 80.2% between 2010 and 2015, iSuppli projected. Three issues need to be resolved before there is mass consumer acceptance of 3DTVs, iSuppli analyst Riddhi Patel said: standardized video formats, content available and 3D glasses interoperability. In the US, the Consumer Electronics Association has projected that around 1 million 3DTV sets will ship this year. According to iSuppli, the majority of 3DTV sales in 2010 will occur in the US, Japan and Western Europe. Other countries primed for 3DTV include South Korea and Australia. http://www.isuppli.com

Hillcrest Labs brings motion control to first 3D Internet-connected LED-backlit LCD HDTVs

Hillcrest Labs disclosed today that LG Electronics is using its patented Freespace in-air pointing and motion control technology for LG's first 3D-ready, Internet-connected HDTVs that are currently shipping in the Korean market and will be available globally. LG and Hillcrest have entered into a worldwide license agreement for LG to use Hillcrest Labs' patented Freespace in-air pointing and motion control solution in current and future products. The "Magic Wand" remote, powered by Hillcrest Labs' Freespace technology will be included in certain models within LG's new INFINIA line of LED LCD HDTVs. The INFINIA sets combine a slim design, a thin bezel, and an enhanced Internet connectivity package with a variety of entertainment options, including LG's NetCast Entertainment Access. In addition to the wired Ethernet jack in the INFINIA sets, these NetCast-enabled TVs can integrate into a wireless home network by using a USB wireless broadband adaptor (sold separately). The INFINIA

models are the first to use LG's unique "Magic Wand" remote control system. LG's "Magic" user interface brings together Internet-based applications, television menus, embedded games, and more using simple hand motions to control an on-screen cursor on the television. Consumers using the Magic Wand remote with Netcast will be able to access and navigate Internet-based applications specifically designed for the TV, without the need of a computer.

Hillcrest Labs' Freespace technology is a complete solution for in-air pointing and motion control that can be added to a wide range of CE devices, including: remote controls, game controllers, mobile handsets, PC peripherals and more. The LG Magic Wand system utilizes Freespace to make a remote control with the most advanced in-air pointing and motion control capabilities on the market today. These include: high resolution pointer accuracy (the Magic Wand is a highly precise pointing remote control which allows users to easily select icons and images, small and large, on a high-resolution screen); orientation compensation (regardless of the orientation of the Magic Wand remote in space, e.g. pointing at the ground, turned sideways, etc., Freespace technology generates intuitive cursor motions on the screen. MEMS (Micro-Electro-Mechanical Systems) sensors combined with Hillcrest's proprietary software enable consistent control of the device from any position - standing, sitting or reclining. Adaptive tremor removal: Hillcrest's technology can distinguish between intentional and unintentional movement, including natural hand tremors. This means the Magic Wand's cursor does not shake or jiggle on screen like that of a Wii-like game controller. Instead of employing simple filtering techniques, which would reduce the accuracy of the pointer, the Magic Wand dynamically measures and removes each individual user's tremor while maintaining low latency of motion. No line-of-sight: unlike conventional infrared devices and optical motion-sensing devices that require line-of-sight operation, the Magic Wand remote uses RF (radio frequency) technology, so users do not need to point directly at the computer or TV screen. This gives users greater freedom to move around at a range of up to 30 feet across the living room. Freespace technology enables full six degree-of-freedom motion, and is the same award-winning technology used in Hillcrest's Loop pointer - an in-air mouse designed for consumers who connect their computers to a television. Companies that have licensed Freespace for use in their products include: Eastman Kodak, LG Electronics, Logitech, Universal Electronics (UEI), and others. Hillcrest Labs' solution is backed by a broad set of intellectual property including more than 40 issued patents, out of more than 200 filed by the company. http://www.hillcrestlabs.com http://www.lg.com

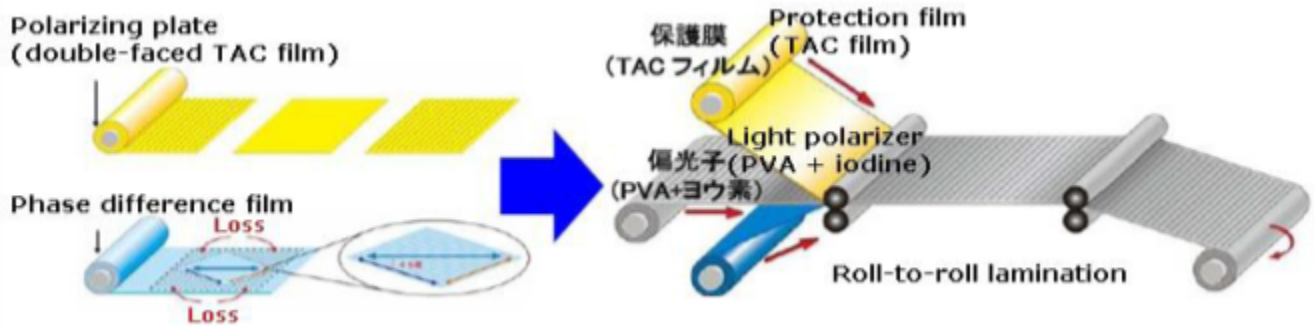
3D movie streaming receives a boost with new standard from Heinrich Hertz Institute

Movies in 3D could soon stream to PCs and TV sets with the development of a new video file compression standard. Researchers at the Heinrich Hertz Institute (HHI) are developing the new MVC (Multiview Video Coding) video compression standard, which would allow compressed 3D video to be transmitted over the Internet or satellite without interruption, the institute said. The institute, based in Berlin, showcased streaming of 3D movies based on the standard over the Internet and satellite at the International Broadcasting Convention (IBC). The research is being done by the Fraunhofer Institute for Telecommunications, which is a part of HHI. 3D movies and broadcast content are being created for new devices like 3DTVs and Blu-ray 3D players, but an efficient way to transmit them over broadband networks is missing, the institute said. The content requires considerably more bandwidth than regular video feeds, and observers have said that a large percentage of homes do not have capacity to play streaming 3D movies. MVC could potentially resolve quality-of-service and buffering issues by squeezing 3D movies into compact files that can be transmitted over existing broadband networks. The trick is to load files quickly so 3D video can be viewed without interruption, and the standard packs two separate images, each for the left and right eyes, needed to provide the stereoscopic 3D effect. The MVC standard helps reduce the bit rate significantly, which helps transmit the movies faster. The latest 3DTVs and Blu-ray 3D players will be able to decode the separate images from MVC-coded movies to display the 3D effect. The MVC file format is a 3D add-on to the existing H.264/MPEG-4 AVC video compression standard. Movie services like Netflix are already delivering movies in HD format, but do not yet offer 3D streaming. Samsung has said it will start streaming 3D movie trailers from content providers later this year, but not full 3D movies. http://www.hhi.fraunhofer.de/ip

Zeon to mass-produce highly-productive phase difference film for 3DTVs

Zeon Corp announced that it will start volume production of a highly-productive phase difference film for LCD panels. Expecting that about 40% of the 40-inch and larger TVs will be 3DTVs in 2014, Zeon aims to acquire a large share in the market with the new phase difference film. The phase difference film can be attached to a polarizing plate in a continuous manner by controlling the array direction of molecules and using a roller. This

method is called “roll-to-roll lamination”. Other phase difference films are attached to a polarizing plate by punching out the films into desired shape and size, cutting the polarizing plate and attaching them together (batch method). The new phase difference film is expected to streamline such manufacturing processes and lower costs. Zeon will build new facilities at a manufacturing plant in Toyama Prefecture, Japan, to have an annual production capacity of 15,000,000 m^2 and start volume production in October 2011. http://www.zeon.co.jp



The “roll-to-roll lamination” method, in which a phase difference film and a polarizing plate are attached together in a continuous manner

ESPN wants discrete left/right 3D for affiliates

Frame Compatible 3DTV is the technology of choice for delivering 3D content to customer homes, whether over satellite, cable or IPTV, because it is effectively an HDTV signal that can therefore use HD encoders and set-top boxes. It looks as if Frame Compatible will be around for some time for direct-to-home broadcasting so attempts to advance 3D technology will happen first in the contribution segment. At the FIFA World Cup in South Africa recently, contribution from the stadia to the International Broadcast Centre (IBC) was performed as separate left eye and right eye streams using JPEG2000 compression and feeds out of the country (via satellite) were in side-by-side Frame Compatible format using MPEG-2 HD. GlobeCast expects the broadcast contribution market to evolve so that it uses simultaneous left eye and right eye contribution signals, synchronized for live content. And that is exactly what ESPN, the US sports broadcast network, is already doing today with its ESPN 3D channel, which launched in June and is available in the US via DIRECTV (satellite), Comcast (cable) and AT&T (IPTV). ESPN is using discrete left and right eye HD signals from its event locations to its main broadcast facility in Bristol, Connecticut. This requires the use of specialist encoders and decoders with left/right eye feed synchronization. The company is then transforming the dual HD feed into a Frame Compatible signal for transport to its distribution partners. Delivering Frame Compatible 3D content to a distribution partner (like a platform operator) means they can simply pass the signal through without adjustments. However, ESPN wants to move another step forward and reach the point where it is delivering discrete left and right HD feeds all the way to its partners. Effectively, delivering discrete HD left and right feeds is viewed as the raw materials from which distribution partners can create their own Frame Compatible output or move towards any of the Full HD 3DTV compression solutions that are currently being talked about. The key point is that the format supplied by ESPN will not force anybody to compromise what they are doing further down the chain. http://www.wspn.com

3M demonstrates suite of display film solutions

3M showed at SID its field sequential 3D optical film for handheld devices enabling true auto stereoscopic 3D viewing on mobile phones, gaming and other handheld devices without the need for glasses. The film only requires one LCD panel, operating at a 120Hz refresh rate. Backlight module assembly is nearly identical to existing systems allowing for simple integration at the assembly stage. http://www.mmm.com

Polaroid and Real D launch deluxe 3D eyewear

Polaroid and Real D announced a global licensing agreement for Polaroid to use the Real D brand on a new line of Premium 3D Eyewear that can also be worn for sunglasses. Under deal terms, Polaroid Eyewear will distribute Real D-certified 3D glasses through movie theaters, eye care professionals and other retail channels in its global network of subsidiaries and distributors. The new glasses will be compatible with Real D-equipped 3D theaters around the world (Real D's quarterly results indicate 7,500 screens are equipped.) The specs will come in a "range of custom frames with precisely curved lenses". Polaroid says the lenses are different from standard 3D cinema glasses because of their particular curvature. They'll also have UV protection and so can double as sunglasses. For folks with prescription lenses, Polaroid is making styles that fit over "any optical frame," it said. http://www.reald.com

SENSIO teams with Trident Microsystems to offer premium-quality 3D viewing in the home

SENSIO Technologies announced a new collaboration with Trident Microsystems, a leading provider of 3D-capable set-top box and TV semiconductor solutions. Trident's system-on-chip and discrete semiconductor solutions target the digital home entertainment environment, and the company will be integrating SENSIO 3D technology into its products to reflect industry demand for a high-end 3D viewing experience in the home. First among the Trident products to feature SENSIO technology is the TV550 3DTV SoC, which will be followed by the release of new 3D chips, featuring SENSIO 3D, for 3DTVs. SENSIO 3D is a proprietary frame-compatible format for high-quality stereoscopic signal processing, easily integrated into TV products. Developed by SENSIO more than ten years ago and deployed in the field for seven years, this mature technology has been used in all commercial live 3D events produced around the world, and is the only proprietary format recognized by the live 3D industry, the company says. http://www.sensio.tv http://www.tridentmicro.com

CableLabs issues 3D encoding specification

Cable Television Laboratories (CableLabs), a non-profit R&D consortium, has announced the publication of a new specification for producers and others involved in 3DTV content. "Content Encoding Profiles 3.0 Specification OC-SP-CEP3.0-I01-100827" provides details of the requirements for formatting or "panelizing" 3D content into a frame-compatible format for cable television systems. "This new CableLabs specification was developed with support from cable operators, programmers and equipment vendors and will be publicly available for any industry to use," said Paul Liao, CableLabs president and CEO. The new document replaces a previous video-on-demand spec, building on the 2D coding framework set forth in the earlier document. It is intended to be used as a reference for both 2D and 3D CATV formats. A key part of this specification includes the definitions for signaling 3D content over existing digital video infrastructure that uses either MPEG-2 or MPEG-4 (AVC/H.264) coding. This signaling is critical for the receiver/decoder to enable automatic format detection and simplified user experiences when going between 2D and 3D programs. Cable Television Laboratories was founded in 1988 by members of the cable television industry. The new specification can be found at the organization's website, under OpenCable Specifications (PDF). http://www.cablelabs.com

Middle East and Latin American nations show most interest in 3DTV

Middle East nations, Africa, and Pakistan (MEAP) are far ahead of other regions in terms of interest in, and ownership of, 3DTVs, says a new study from Nielsen. Younger consumers, those ages 25-29, have the highest interest and intent. To date, just 12% of online consumers own or have definite interest in purchasing a 3DTV, writes MarketingCharts. Interest in 3DTV is highest in MEAP nations. MEAP has an ownership/definite interest index score of 200, meaning those residents are twice as likely as the global average to own or plan to buy a 3DTV. Latin America has the second-most interest, with a score of 175. After those two regions, there is a significant drop-off, with Asia-Pacific having a score of 100 (as likely as the global average to own or plan to buy a 3DTV), while North America and Europe both have index scores of 75 (residents are 25% less likely to own or plan to buy a 3DTV). Mexico is the first North American country on the list in terms of 3DTV ownership, tied for seventh with India. The US comes in tied with Switzerland for the 27th-highest index score. The top six countries are Saudi Arabia, Egypt, Pakistan, Colombia, Venezuela, and Vietnam. By the end of this year, over 50 broadcasters and pay-TV operators globally will offer 3DTV services, according to a new report from IMS Research; the production of 3D content specifically for home consumption will increase significantly over the next few years, the report says. http://www.nielsen.com

TDVision claims its 3DTV technique conserves bandwidth

TDVision Systems claims it has a way to deliver 3D in full high-resolution format – without needing twice the bandwidth. The firm is pitching its "2D+Delta" encoding technology, which delivers one full HD signal along with a subset of information for the second eye. That "delta" includes only the differences between the left-and-right-eye images, allowing two full-HD streams to be reconstituted on a compatible 3DTV. Initially, cable and satellite-TV operators are delivering 3DTV in so-called frame-compatible format, which squeezes left-and- right-eye views into one screen. While that has the advantage of working with existing set-tops and transmission equipment, the approach amounts to "just mercilessly ripping out half the pixels and throwing them away," said Ethan Schur, TDVision's head of marketing. According to Schur, a frame-compatible 3DTV broadcast requires roughly 115% of the bandwidth for a regular 2D channel, to account for some overhead, while delivering only half the resolution of 1080i HD. Using TDVision's 2D+Delta encoding, a "full-resolution" 3D stream would need about 145% the bandwidth of its 2D counterpart. TDVision is planning to license its technology to video-encoder makers and other equipment vendors through Italy's Sisvel, which handles licensing for patents associated with international standards. Its first partner on this front is Magnum Semiconductor, which plans to embed the 2D+Delta codec into its video-compression chip sets. http://www.tdvision.com

Doremi's Dimension-3D format converter now supports frame packing

Doremi Labs Inc., a leading broadcast and digital cinema hardware manufacturer, announced the implementation of Frame Packing 3D support on the Dimension-3D. Frame Packing is defined in HDMI 1.4 as the standard format for Blu-ray 3D playback and all new consumer 3D TVs now hitting the market will have Frame Packing support. The Dimension-3D was introduced in late 2009 and became one of Doremi's most popular broadcast hardware devices. An ideal device for use in post-production, live events, and theme parks, the Dimension-3D is a compact, versatile format converter that converts any 3D format to another as well as changing of the frame rates. Frame Packing does not apply any scaling to the left and right eye images like Side/Side and Top/Bottom, so the 3D quality is comparable to Dual Stream HD-SDI. Adding this support broadens the versatility in the stereoscopic workflow as the demand for 3D content becomes more and more prevalent. http://www.doremilabs.com

DIRECTV and Panasonic launch nation's first suite of 3D channels

DIRECTV and Panasonic launched three 3D channels, including n3D powered by Panasonic - a linear channel dedicated exclusively to 3D programming and viewable on 3D television sets including Panasonic's line of VIERA Full HD 3D TVs. n3D is now available at no additional cost to millions of DIRECTV HD customers on channel 103. Throughout the month of July, n3D customers will have access to exclusive, original 3D programming such as Guitar Center Sessions with Peter Gabriel and Jane's Addiction, as well as additional titles such as "Dinosaurs: Giants of Patagonia", "Wild Safari: A South African Adventure", "N Wave Picture's S.O.S Planet", "African Adventure: Safari in the Okavango", and "Encounter in the Third Dimension". In addition to n3D, DIRECTV is also launching DIRECTV Cinema(TM) in 3D on channel 104, which is currently offering IMAX titles "Deep Sea 3D" and "Under the Sea 3D", and n3D On Demand on channel 105, which is currently delivering replays of ESPN's 3D coverage of the 2010 FIFA World Cup matches. DIRECTV also launched ESPN 3D on channel 106 on June 11. http://www.panasonic.com/3D

Toshiba announces a glasses-less 3D TV

Toshiba has unveiled a 3D HDTV that doesn't require viewers to wear glasses. Toshiba's mobile display division has built the 21-inch auto-stereoscopic high-definition display using the same technology that will power Nintendo's upcoming 3D handheld. The only difference is that Toshiba's display uses it on much bigger screen real estate. Toshiba's technology uses an integral imaging system called a "light field" display to create 3D without glasses over a thirty degree viewing angle. The 3D effect without glasses is done using a "multi-parallax" method. This reduces eye fatigue and makes the 3D image change depending on where the viewer is placed while watching the screen. The display supports a 1280x800 wide screen with 480cd/m^2 brightness. Toshiba claims its built-in lens sheet controls luminosity to make its brightness on a par with normal 2D screens. http://www.toshiba.com

Vizio announces passive 3D HDTV

Vizio is one of the first to announce a passive 3D HDTV with tuner that uses cheap polarized glasses. Most 3D TVs for the home market require active glasses that cost $150 to $200 per pair. Vizio showcased two 3D televisions that demonstrate active and passive 3D HDTV solutions. The 55-inch TruLED active 3D HDTV incorporates a frame sequential display and active-shutter glasses that work together with Vizio's 480Hz SPS high frame rate technology for Full HD 3D images. The Vizio 65-inch passive 3D HDTV uses less expensive polarized glasses. Some argue that passive solutions don't give the full resolution of an active 3D display. http://www.vizio.com

Sony delivers the industry's largest array of 3D-capable HDTVs

Sony announced that its 3D-capable BRAVIA HDTVs are now available for pre-sale at Sony Style stores and that its new integrated Blu-ray 3D devices will hit retail shelves beginning July. Sony now offers consumers the most diverse line of 3D-capable home entertainment products including 19 BRAVIA HDTVs, Blu-ray Disc players and theater systems, and audio/video components that offer various levels of performance and features. Focusing on that high quality experience, Sony's 3D-capable BRAVIA HDTVs incorporate a frame sequential display with active-shutter glasses that work together with Sony's proprietary high frame rate technology reproducing smooth, full high-definition 3D images. The line-up includes the 3D-integrated BRAVIA XBR-LX900 HDTV, which features a built-in 3D sync transmitter and two pair of active shutter glasses and the 3D ready BRAVIA XBR-HX909 and KDL-HX800 series 3D ready models which offer the option of adding the 3D sync transmitter and glasses at an additional cost. The line features screen sizes including 40-, 46-, 52-, 55-, and 60-inches and ranges in price from around $2,100 (KDL-40HX800) to about $5,000 (XBR-60LX900). Consumers who purchase and register one of the new 3D BRAVIA models will receive a copy of Sony Pictures Home Entertainment's Blu-ray 3D title "Cloudy with a Chance of Meatballs" as well as Blu-ray 3D title "Deep Sea". The sets will also include a PlayStation Network voucher enabling 3D BRAVIA purchasers to download stereoscopic 3D gaming experiences on the PlayStation3 system (sold separately). The titles include PAIN (partial game) and MotorStorm: Pacific Rift (demo) and full game downloads of WipEout HD and Super StarDust HD. http://www.sony.net/united/3D

Arqiva now testing terrestrial 3D over DVB

British transmission firm Arqiva confirms it is currently working on a series of tests to transmit 3D over the air. In closed-group tests, the company said it's deploying the so-called "Service Compatible format" used primarily by public service broadcasters in the United Kingdom and Ireland. The first test transmissions are taking place at various locations outside the London metroplex. Arqiva said it was currently seeking rights to some undisclosed 3D (apparently for use following the testing) and has filed for some early licenses with Ofcom, the UK's media regulatory agency, according to Broadband TV News in London. Arqiva said its tests are focusing on what may be the best techniques to employ if, for example, the BBC would want to seriously consider 3D OTA broadcasts. The DVB-T2 network that Arqiva currently is rolling out in HD is specifically for the BBC's public service channels, so the firm said the BBC's future plans for (or against) 3D transmissions will greatly affect its own plans. The Service Compatible format typically broadcasts HD 2D signals to viewers, while 3D would likely require additional spectrum, depending on future compression modes and other factors, Arqiva said. http://www.arqiva.com

Strategy Analytics says HDTV is no barrier to 3DTV adoption

Britons who have purchased an HD television set are more than twice as likely to buy a 3D television within the next 12 months than those who have not made the step. The findings from analysts Strategy Analytics, based on a survey of 700 UK consumers, runs counter to the commonly held assumption that people who have already bought an HDTV are not likely to upgrade to a new 3DTV set any time soon. The survey is based on consumer perceptions, so will include both HD Ready sets and those with a built in HD tuner. Six percent of those UK residents who don't currently own an HDTV set said they would be "somewhat likely" or "very likely" to buy a 3DTV set in the coming 12 months, whereas more than twice, or 13%, of HDTV owners indicated an intention to purchase a 3DTV set, according to the study. http://www.strategyanalytics.com

Strategy Analytics reports public unsure on 3DTV health risks

Seventeen percent of Americans believe that viewing 3DTV poses health risks to the eyes, and a further 55% "aren't sure", a new survey of two thousand US consumers from Strategy Analytics' Digital Consumer Practice reveals. The findings underline a critical task ahead for both vendors and service providers, according to the firm. With 72% of the market either unconvinced of or unsure about potential 3DTV health and safety risks, the number one priority for 3DTV vendors and service providers needs to be messaging. While there is little published scientific evidence linking 3DTV and eye problems, anecdotal reports of eye strain, dizziness, headaches and nausea are common. http://www.strategyanalytics.com

SES ASTRA takes initiative on minimum specifications for 3D satellite broadcasting

SES ASTRA announced a new initiative to support the introduction of 3D television in Europe. As part of the initiative, the industry reached a common understanding of the minimum technical specifications for the introduction of 3D television and broadcasting. The initiative is backed by SES ASTRA and major European broadcasters including public and private TV channels as well as representatives from the consumer electronics industry. Initial satellite 3D transmissions will use either the side-by-side (for 1080i resolution) or top-bottom (for 720p resolution) formats which make them compatible with existing High Definition (HD) set top boxes. Side-by-side and top-bottom are two transmission formats for 3D satellites broadcasts whereby two pictures will be arranged either horizontally or vertically in one frame. The delivery of two different images for the left and right eye is necessary in order to create a 3D stereoscopic experience for the viewer. Free-to-air 3D services will be signaled using mechanisms defined under an updated Digital Video Broadcasting (DVB) standard which will allow automatic switching of the display from 2D to 3D and from 3D to 2D broadcasts. http://www.ses-astra.com

3D@Home Consortium and MPEG publish glossary on 3D video quality

The 3D@Home Consortium and the MPEG Industry Forum (MPEG IF) announced the release of a new glossary of terms for providing a common language for discussing, identifying and improving the subjective quality of stereoscopic (i.e. 3D) video. Over 235 terms are defined within this comprehensive glossary, targeted at 3D videographers and their crews, post production, and test facilities. It is designed to facilitate their communication on the many distinctive aspects of digital production, testing, encoding and compressing, when considering three dimensions rather than just two. The terms were identified and defined in a joint effort by a project team of the 3D@Home's Consortium's Content Committee (ST1) and MPEG IF's 3D Working Group, both lead by Sean McCarthy from Motorola Mobility. McCarthy notes, "As a vision scientist, I am pleased to have, in one place, a reference guide to this new terminology. When all individuals involved in a project are referencing a similar vocabulary, then communication can be clear and unambiguous. That shortens creation, evaluation and development cycles and avoids costly errors." The glossary is considered a living document and subsequent revisions and updates are anticipated. Because, when working with video creation, many of the terms are often more easily demonstrated visually than in written form, plans are in place to expand the written definitions with multimedia examples available online. The glossary can be found at http://www.3DatHome.org.

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To make your reservations by phone, please reference "DisplaySearch" when calling 1-619-702-3000.

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The USFPD Conference offers a wide variety of sponsorship options including table-top exhibits and your logo on promo items given to all attendees.

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Agenda-at-a-Glance

Session I:	The TV Ecosystem
Session II:	Personal Computers
Session III:	Public Display
Session IV:	E-Paper/Mobile Devices
Session V:	Touch Screens
Session VI:	3D Display Technologies
Session VI:	Manufacturing and Materials
Session VII:	Panel Technology and Supply

Connected TV in Europe

by Paul Gray

Paul Gray is Director of European TV Research, and also covers broadcast, signal processing, and semiconductor technology. He has worked his entire career in the TV supply chain, and has more than 15 years of experience in market intelligence, marketing and product management. His work includes forecasting, investment and R&D decisions, and product strategy. Before DisplaySearch, Gray worked at NXP Semiconductors as a Market Intelligence manager and also as Product manager for TV semiconductors. Before NXP, he held increasingly responsible positions in Philips Display Components (later LG.Philips Displays) including as Director and International Account Manager in both Asia and Europe. Gray started as a Production Shift Leader in a CRT factory. He holds a bachelor's degree in electrical engineering and a management diploma in industrial studies.

Connected TV has been a long hard struggle so far. This has been because while the objective is reasonably obvious (Internet content on the TV screen) the difficulty has been in the detail:

1. Finding out what consumers want,
2. Having an infrastructure to deliver it,
3. Solving navigation and interface design
4. Marketing and explaining it to consumers
5. Persuading them to make the final step to plug the TV into the network.

Connected TV can only happen in countries with a mature broadband internet market – and even then success brings a burden of extra investment to cope with the vast amount of extra data to be transported. In the UK, Internet Service Providers have complained about the heavy traffic caused by the success of the BBC iPlayer. However, in Europe we largely have that infrastructure, and the task is now shifting towards developing services. TV set makers are rushing to build robust and attractive portals, while Broadcasters and service providers are bringing their catch-up services from being PC-based towards Connected TV. However, with multiple brands and common services, there is a huge duplication of effort, and these investments will be marginal with small volumes. Similarly, platforms that fail to deliver large viewer numbers will be unable to attract new services on favorable terms. In future TV brands will face an innovation race, and shared resources or common platforms are likely to be able to deliver innovations faster. In the earlier days of the Internet, consumers rapidly escaped from portals such as AOL and sought out what they wanted in the wider Internet. So history suggests that open platforms are likely to win in the long term.

TV navigation is at the starting point of rapid change. While it is clear that consumers do not want a keyboard on their laps, at the same time remote controls have changed little in 30 years, being a box with some buttons and an infrared link. Neither is really up to the job, and a rethink is necessary. The most significant limitation is the communications link: infrared requires a line of sight and the remote control positioning is critical. Wireless remotes using ZigBee/RF4CE or Bluetooth standards have begun to establish a small foothold, but networked TVs can also communicate with WiFi devices. We are beginning to see the first TV's which can talk to smart phones and similar handhelds and Samsung already has sets controllable by iPhone.

Samsung remote control and (right) iPhone remote control app.Note the identical keypad layout!

Once the restrictions of infrared are removed, many other possibilities emerge – motion sensing, touchpads and two-way communication. With the complexity of tasks that will be required by extra functions, remote controls can be expected to evolve rapidly, and the user interface may move entirely onto the handheld.

Probably the biggest challenge for connected TV will be the consumer him- or herself. What has become clear is that the value proposition for TV really is 'watching TV', and the numerous attempts to make TV interactive have largely failed. However, research such as the Ofcom Communications Market Report in the UK shows that anticipated activities (such as social networking during viewing) are happening – but consumers are happy to multitask across devices. http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr10/

Consumers historically have been prepared to use their devices to perform new tasks which are very similar to existing functions (such as viewing photos on a TV), but have been less willing to re-purpose them for something completely new. The experience of connected TV services will have to feel very much like channel zapping or Program Guide usage at first. Adding services which are simply more convenient on the TV (such as Skype calling and catch-up services) should be attractive. However, it is also clear that consumers tend to put a low value on convenience: universal remote controls have existed for many years, but most of us do not own them simply because the small inconvenience of six remotes does not justify a replacement. In the same way, media center extenders have never taken off – the extra utility (bringing images from the PC to the TV) has never seemed quite worth the cost and time necessary to install them. The message is that the reward for connecting up a TV needs to be quick and significant. Ethernet might work well, but for most consumers will be too much trouble – wireless is least painful.

Connected TVs are potentially complicated. Their success (and added value) will depend on their ease of use, simple setup and ensuring that their powerful capabilities are carefully communicated at point of sale. This will be a big challenge to set makers and retailers. Companies that succeed should be able to enjoy enhanced margins – those that fail will be risking consumer dissatisfaction or apathy.

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Interview with Tushar Dhayagude from mSilica

Tushar Dhayagude co-founded mSilica in 2006 and serves as its Vice President of Marketing & Business Development. mSilica provides system-centric ICs for driving LEDs in LCD TVs, monitors, and general lighting. Tushar has been instrumental in raising several rounds of funding from top tier VC firms and strategic customers. Tushar holds several patents on large panel LED driver architectures. Tushar has presented at several LED and display conferences around the world. Prior to mSilica, Tushar worked at National Semiconductor and Maxim Integrated Products in various technical, marketing, and business management roles. Tushar holds a MSEE from the University of Arkansas and a MBA/MEM from the Kellogg School of Management at Northwestern University.

Please give us some background information about mSilica. mSilica Incorporated supplies system-centric mixed-signal LED driver ICs for the backlighting and general illumination markets. This broad based and rapidly growing market includes LCD TVs, PC monitors, specialty panels (industrial, military, medical, avionics, etc.) and general illumination (commercial, residential, industrial and government). Founded in 2006, the company has raised over $20 Million from leading Silicon Valley investors and strategic customers. mSilica is shipping its products in production volume to some of the leading OEMs in the consumer and industrial markets world-wide. mSilica's team comes from leading analog and mixed-signal semiconductor companies. Their combined experience empowers the company to deliver industry leading products based on detailed system level expertise, proven IC design know-how and extensive customer application knowledge.

What differentiates mSilica's LED drivers from those designed by other companies? mSilica's fundamental differentiation is its unique LED voltage sensing technique that "ALWAYS" enables the highest efficiency constant current LED driver, while enabling TVs with over 20,000,000:1 of dynamic contrast. mSilica's LED drivers utilize a proprietary and patented combination of analog and digital circuit techniques combined with a intelligent algorithmic approach. mSilica was the first company to take a system-centric approach to LED backlighting and provide solutions for local and global dimming, power management, signal conditioning and smart interfacing.

Is there a significant difference between LED driving technology and CCFL-based technology? Is there a significant price difference? LEDs are far more efficient and provide greater control (optical and electrical) over CCFLs. For example, LEDs enable direct backlight/zone dimming that is not possible with CCFL. Furthermore LEDs also enable contrast ratios, motion picture response time and color quality comparable to that of Plasma TVs, but with significantly reduced power consumption. LED Backlighting is more expensive today, but costs are coming down significantly with increased adoption in LCD TVs. OEMs and analysts estimate that by end of 2010, the premium on LED backlight units compared to the CCFL backlight units will be less than 1.5x.

Tell us about some of the unique things that your LED drivers enable in the LCD TV market. The architecture of our LED driver ICs enables our customers to design the most efficient TVs without compromising on picture quality and cost. These advantages apply to both direct backlit TVs as well as edge-lit TVs. For example our patented adaptive power scaling technology (Efficiency Optimizer) allows us to cut power dissipation by more than 15% over our nearest competitor. Our Efficiency Optimizer architecture also enables our drivers to provide over 10000:1 dimming range that allows the highest contrast ratios in the industry. Furthermore we can daisy chain up to 16 devices on a single serial bus which makes our solution extremely scalable and attractive for the Direct Backlight and Scanning backlight applications. In the edge-lit topology, mSilica's LED driver ICs can drive ultra-high voltage strings of LEDs without external protection devices, thus providing the LOWEST COST, robust and simplest solutions.

What are some of the factors that are helping drive LED adoption in the LCD TV market? The key drivers for LED adoption in TVs are reduced power consumption, thinner TVs/elegant industrial design, and image quality. LEDs trump CCFL by enabling dynamic modulation of the backlight, while they trump Plasma TVs by reducing power by a factor of 2x to 3x. Additionally, the cost of manufacturing LEDs is rapidly declining, while the luminous efficacy is improving, thus reducing the number of LEDs required to backlight the TVs.

Are your LED drivers agnostic when it comes to the LEDs being incorporated, or do you need to design customized drivers for each LED solution? Our LED drivers are extremely flexible – allowing the same design to be used across multiple platforms with simple configuration changes. This is one of our biggest advantages and our design simplifies the final firmware code making it extremely appealing. We have enabled direct backlight designs which used over 3000 LEDs that consumed only 50mW/LED to edge type designs where about 400 LEDs consuming over 500mW/LED were used.

Most LED backlighting today uses edge-mounted white LEDs. Please give us your opinions about a shift to behind-the-screen LED placements. Almost every LCD TV OEM has developed both edge-mounted white LED TV systems and behind-the-screen LED systems. Our observation is that most first generation LED TVs are CCFL replacements and hence edge mounted designs were easier and less expensive to design. Also, TV OEMs are following the trend set by the world's leading TV OEM. However the picture quality, contrast ratio, motion picture response and power consumption are far from what can achieved with direct backlit systems. Several OEMs have shown that direct LED backlit TVs can be made comparable in thickness to the edge-type LED TVs. Furthermore, the diffusers and light guides can be more expensive for the edge-mounted white LED systems. These factors lead us to believe that direct backlight and also scanning backlight (hybrid between edge and direct) will dominate the next year models.

Describe the pros and cons of edge-lit versus direct backlit LED design solutions. Edge lit designs are lower cost and simpler to implement. However there are severe constraints in terms of power consumption, contrast and video quality. Some of our customers have also complained that there has been shortage of light diffusers and this has resulted in increase of overall solution cost. Direct Backlight is more difficult to design but everyone who sees the picture and video quality falls in love with the TV. The table below shows how the CCFL backlit, edge-lit, enhanced edge-lit and direct backlit LED solutions stack against each other. The table is self explanatory on the advantages of the direct backlit.

INDOOR LIGHTED SCENE

Dimming Control	None	0-D	1-D	2-D	2-D (Fine)
Power Level	100%	80%	70%	60%	50%
Contrast Ratio	1200:1	1200:1	2000:1	4000:1	5000:1

DARK SCENE

Dimming Control	None	0-D	1-D	2-D	2-D (Fine)
Power Level	100%	90%	80%	70%	60%
Contrast Ratio	1200:1	1200:1	5000:1	10000:1	12000:1

DAYLIGHT SCENE

Dimming Control	None	0-D	1-D	2-D	2-D (Fine)
Power Level	100%	100%	90%	85%	75%
Contrast Ratio	1200:1	1200:1	2000:1	3000:1	4000:1

0-D* Dimming is Global Dimming Control

Dimming Type	Backlit Type
None	CCFL
0-D (Global)	CCFL-replacement Edge-lit LED
1-D (Scanning)	Advanced Edge-lit or direct backlit
2-D (Local)	Direct backlit, zoned edge-lit

How much power does a typical LED-backlit LCD TV consume as compared to a similar CCFL-based solution? What are the opportunities for further improvements in this area? Please refer to the table shown above. It shows relative power consumption levels. LED's luminous efficacy and optics will further reduce power consumption of LED-backlit TVs. I see a further 15% to 20% overall improvement in power consumed by TVs over the current LED backlit ones. Additionally, LED manufacturers and BLU makers are in a better position to comment on this.

Will LED backlighting shift to RGB solutions or do you think white LEDs will remain dominant for the foreseeable future? Does mSilica have any preferences? We have seen a Sony TV that was introduced a year ago that had RGB LEDs, so there is a precedent. However RGB solutions are more expensive, power hungry and also firmware intensive and have therefore taken a backseat. A lot of the TV designs are now

focusing on 3D so for the next year or two we will still be seeing White LED backlit TVs. However I expect the RGBs to make a comeback in a couple of years, particularly if color sequential techniques start getting adopted. From a color quality perspective, I would like to see RGB LEDs being adopted in TVs again. mSilica is currently supporting RGB LED projectors and is ready to support RGB solutions in LCD TVs.

Dimming technologies are becoming increasingly important to LCD TVs using LED backlighting. Please tell us how mSilica helps in this area. mSilica's versatile and wide dimming options provides unparalleled contrast ratio has earned design wins at manufacturers who are household names in the demanding world of consumer electronics. mSilica's proprietary dimming control and phasing engine achieves perfect synchronization with the frame and eliminates all waterfall noise. As I mentioned previously our patented power control architecture makes our driver ICs the only one in the industry to fully utilize 12-bit to 14-bit PWM dimming. mSilica's driver ICs can deliver over 2x to 5x better dynamic contrast to the LCD TVs compared with our nearest competitors' solutions.

About how many LEDs are needed to properly light a 50-inch LCD TV? Does your technology help reduce this number, or is it pretty much a function of light dispersion technologies across a certain area? The TV Backlight Unit (BLU) architecture (direct or edge-lit), the diffusers and light guides and the LED power dictate how many LEDs are used. In direct backlit TVs, about 1000 to 3000 lower power LEDs can be used, while in edge-lit TVs, about 300 to 600 higher power LEDs are required . We have seen different topologies and there is no clear winner on which scheme (more parallel and less series or vice versa) is better. Our technology works for ANY of the combinations and helps in optimizing the backlight design but the number or LEDs or architecture is determined by the required brightness level.

How many drivers are required to drive the LEDs in a typical solution? What sorts of things are you doing to minimize the number of drivers and what tradeoffs do you run into as driver count is decreased? mSilica driver ICs have 4 channels, 6-channels, 8-channels and 16-channels. For an edge-lit design 1 to 4 ICs per TV suffice depending upon the BLU scheme and the size of the TV. For direct backlight systems 6 to 16 of our ICs have been used by different OEMs depending upon the size of the TV and number of independent zones.

Can you give us some clues about next-generation solutions and the sorts of differentiators we might see in the future? Next generation solutions significantly improve cost, color depth and dimming contrast, while allowing complete elimination of power stages. We also have 3D features built into all our new ICs. I expect to see 3D RGB LEDs enter the market in 2-3 years and we are prepared for that as well.

Tell us about LED binning and the problems you encounter in this regard. Can your driving technology help minimize the need for extensive binning in any way? Our power control technology controls up to 256 strings with just one power supply. For example we have designs where we control the offline supply for the entire TV. We can tolerate higher mismatch voltages with our efficiency optimizer scheme. For LED drivers with internal current string large voltage mismatch results in higher power dissipation. However with our LED drivers with external current sinks binning can be minimized.

Is your support for the LCD TV industry limited to LED drivers, or are you also supplying other solutions to the LCD TV market? Our current released LED driver ICs are targeted towards all segments of LED backlighting in LCD TVs. The accompanying chart shows the segments we deliver solutions for. However we do have some very interesting and compelling solutions that will be introduced in a few quarters that will bring a disruptive change in LCD TV architectures.

Type	LED Backlight Segment	mSilica Offering
Direct	Area Dimming	Products have been released and shipping for each segment.
	Scanning	
Edge	Zoned Dimming	
	High Contrast	
	CCFL replacement	
3D	Edge & Direct	

Do you think the driving force behind LED backlighting is due to superior front-of-screen performance, or do you think "green" factors are more significant? Watching TV is a visual experience first and hence I believe that superior front-of-screen performance in terms of motion picture response time, color quality and contrast ratio

(deeper blacks) supersedes "green" factors. But consumers are far more energy and environment conscious now than even 5 years ago and increasing value reduced energy consumption. Additionally, industrial design is becoming important in many economies.

Please tell us more about your "green" initiatives. mSilica has been dedicated towards improving energy efficiency and the user experience, in LCD TV backlighting where innovative technology has a significant impact on the quality of the image. A proprietary efficiency optimizer interfaces with the power supply to ensure that the power used in every mode of operation is carefully metered to eliminate waste. This technique was perfected and proven three years before energy efficiency standards for large LCD-TV panels were introduced in California. Assuming that on average a LED backlight dissipates about 100W, a power supply input of 125W would be needed with conventional ICs. With mSilica's ICs, the input power needed would be close to 112.5W, thus saving 12.5W per TV. If all 150M TVs shipped would have this technology about 1875MW of power consumption could be reduced, a whopping $3.6B per day!

How is mSilica positioned in terms of market share in the area of LED drivers for the LCD TV market? Being one of the first-movers in area of large TV LED drivers, we believe that we can get significant market share towards the end of 2011, as several design-ins with OEMs, ODMs and panel makers in Taiwan, Korea, Japan, China and the US go into production. We also believe that some of the panel makers not using our ICs, will realize that by switching to mSilica LED drivers significant improvement in picture quality and power dissipation can be realized. As more models with our ICs gain market acceptance, a snowball effect will occur. With this, we believe that in some segments of LED backlighting, we could get over 30% share.

As a portion of total LCD TV pricing, about how much finds its way back to mSilica? The actual dollars per TV depends on the backlighting configuration. For simpler CCFL replacement solutions, mSilica makes less than a few dollars per TV, whereas on a high-end zoned dimmed TV, mSilica gets a multiple of that due to use of significantly more drivers.

Is there a backlighting technology "beyond LEDs" that gets you excited, (or that threatens your development work)? For now, we do not see any backlighting technology "beyond LEDs" that is exciting. But we do see developments in LED technology, packaging, optics, TFT technology that can change the current configuration of LEDs or alter the number and/or power level of the LEDs. We are always looking out for such trends. In addition to backlighting technology, we are looking at emissive technologies such as OLEDs and have been filing for patents to address them when they mature.

Are CCFL backlights going to die, or is there still room for innovation that might again spur competitiveness against LEDs? CCFLs will eventually die as backlight sources in LCD TVs. Look at the notebook market. In 2006 there was hardly <5% penetration of LEDs in notebooks. In 2011, >90% of the notebooks will have adopted LEDs in backlights. Almost every OEM has either brought LED manufacturing in-house or made LED capacity agreements with LED makers. As this capacity comes on line, the cost of LEDs will drop dramatically and approach the cost of CCFL backlights, making it impossible for CCFLs to compete.

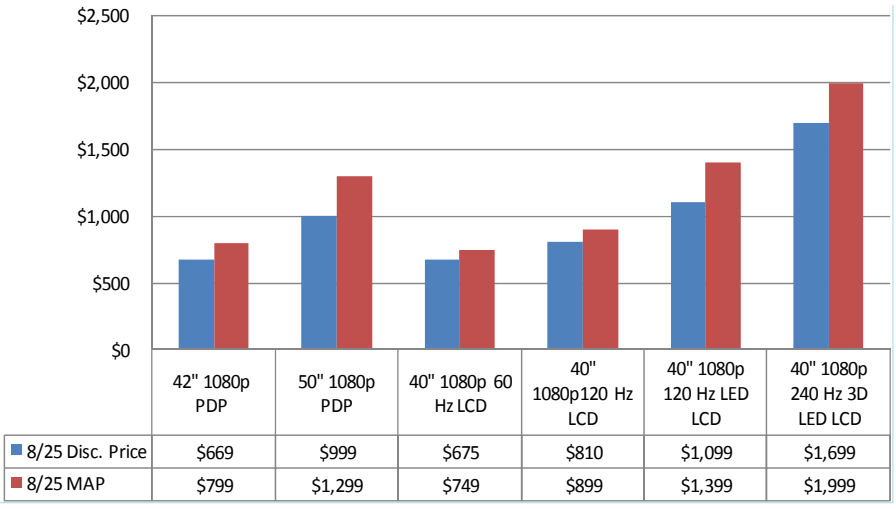
Feature creep slows down the LCD TV market

by Ross Young

Ross Young is SVP, Displays and PV at IMS Research USA. Prior to joining IMS Research in November 2009, Young co-founded Young Market Research (YMR) with Barry Young in May of 2009 which IMS Research acquired in November. Prior to forming YMR, Young was VP of New Market Creation at Samsung Electronics' LCD Business, reporting to the LCD CEO, where he tracked, analyzed and assessed the solar market and supported their market intelligence efforts in notebooks and TVs. Prior to Samsung, Young was the founder and CEO of DisplaySearch, the leading flat panel display market research, consulting and events firm. Young ran DisplaySearch from 1996 to 2007. was educated at UCSD, Australia's University of New South Wales, UCSD's Graduate School of International Relations and Pacific Studies and Japan's Tohoku University.

There has been a lot of talk recently amongst the financial press about channel inventory growth in the LCD TV market. Slower growth for LCD TVs in developed countries should not be a surprise due to the significant emphasis on high-end TVs this year and the growing price differential between LCD TVs and Plasma TVs. Most brands became enamored with Samsung's LED-edge-lit LCD TVs last year and introduce competitive offerings. While prices have come down, they are still expensive. The significant emphasis in the stores and in the media has caused many consumers to wait for lower prices or, buy a lower priced Plasma TV instead.

As shown in the Figure below, LCD TVs are carrying significant premiums to add faster refresh, LED backlights and 3D, what I am calling Feature Creep as TV brands continue to add additional features to differentiate their products and raise their prices. As a result, manufacturers and retailers are pricing themselves out of the market in some cases, widening the pricing advantage for Plasma. For example, while a 40-inch 1080p LCD TV with 60Hz refresh and CCFL backlights is priced similarly to a 42-inch 1080p Plasma TV, when 120Hz refresh and an LED backlight is added, it is priced 57% higher than the Plasma TV. In fact, Samsung's 40-inch LED TV is priced even higher than its 50-inch 1080p Plasma TV. I have numerous anecdotal stories of people who asked me to recommend them an LCD TV (with LED backlighting) and I provided pricing, etc., but they ended up coming home with a PDP TV as they couldn't justify the price differential. The fact that Plasma TVs often share the same ID and are also getting thinner and thinner also supports their competitiveness.



	42" 1080p PDP	50" 1080p PDP	40" 1080p 60 Hz LCD	40" 1080p120 Hz LCD	40" 1080p 120 Hz LED LCD	40" 1080p 240 Hz 3D LED LCD
8/25 Disc. Price	$669	$999	$675	$810	$1,099	$1,699
8/25 MAP	$799	$1,299	$749	$899	$1,399	$1,999

Samsung TV Prices via Best Buy

LEDs may be the best thing to happen to Plasma. LCD TV panels with an LED backlight have carried a 50% premium for most of the year. LEDs have been tight for most of the year as well due to growth in penetration in all applications. LED manufacturers have responded by significantly increasing capacity by purchasing more than 4X as many MOCVD tools as last year. However, materials suppliers are struggling to keep up. LED manufacturers are complaining that sapphire substrates are in tight supply and their prices are increasing significantly. As a result, LED manufacturers are passing along some of these cost increases in the form of higher prices to backlight manufacturers, but likely seeing some margin loss. This means to boost the competitiveness and flush out their LED-backlit LCD TV inventories, either panel or set manufacturers will need to lower their margins. Thus, because LED costs are actually rising, the effort to flush out inventory and lower prices will be painful for LED, panel and set manufacturers for a short time. Eventually, LED materials will catch up with demand and with 4X more capacity, will result in higher yields and lower LED costs narrowing the gap with Plasma. While LED suppliers will be affected in the near term, the rest of the LED supply chain appears to be in good shape as they gear up for lighting and benefit from subsidies in China.

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Past Editions of "LCD TV Matters"





You can download prior editions of "LCD TV Matters" from:

http://www.veritasetvisus.com/lcdtva.htm





Letter from Europe…

by Bob Raikes

Bob Raikes is an experienced sales and marketing specialist in distribution and in the PC displays business in particular. Pursuing a keen interest in micro-computers, he joined the PC industry in 1982 at Data Efficiency. Following a spell to establish the distribution company DDL, he helped to set-up Taxan UK as the UK sales manager. From there he spent seven years with Japanese monitor and graphic board maker Eizo, initially as sales director and later as managing director of the company's UK subsidiary. He established Meko Ltd in 1994. As well as being managing editor of Display Monitor, Bob was for several years the displays editor for The Peddie Report and a regular contributor to Computer Shopper and other titles. Bob long ago decided that if Moore can have a law, he can have one too. Bob's First Law, first developed in the mid-1980s, states: "Everyone that buys a computer, always buys another". Bob's Second Law states: "Anything that increases the visual bandwidth wins in the end". This observation dates from slightly later, after years of hearing the questions: "Who needs graphics?", "Who needs color?", "Why does anyone need more than 256 colors or a 15-inch screen/VGA resolution?". The law predicts that there will be a continuous development of electronic displays until they match the capabilities of human visual perception.

I'm just back from IFA and IBC – a heavy trade show load and here are some quick highlights...

On one level, there were not a great number of significant surprises. As last year, for the TV brands the topics were 3D, connected TV and LED backlights. This year, 3D was much more to the fore and Göksen, our TV analyst, made the point that many of the brands were emphasising the availability *o*f content rather than the sets. There were relatively few new models on public display as makers try to clear the inventory of current ranges.
New 3D camcorders were being shown and Panasonic had an impressive demonstration using the camcorders live with 3D displays. Apart from the 152" PDP (with 4K x 2K resolution and looking very good), I think almost all of Panasonic's displays were 3D this year (I should have had this thought while I was there and I could have checked!).

One of the most impressive display technology developments was LG's nano LED sets which are very slim but use direct LED backlighting to give high dynamic range. I didn't expect to see anything that slim and that good this year, but deliveries of the sets are expected in Q4. We couldn't get much information on the booth, but our guess is that the sets may use the Nanosys quantum dot LED technology that was licensed by LG Innotek at the beginning of the year and that we saw and reported at SID.

The Nanosys technology is based on quantum dots that convert blue light to red or green (according to the dots used). The dots are put into thin tubes, called quantum rails by Nanosys, and the tubes are simply laid alongside blue LEDs. The blue light is then converted to red or green light to create white. If so, the development of the technology in this timescale is impressive indeed.

Nanosys quantum rail

The LG Nano sets are just 8.8mm thick at 57- and 55-inches – that's very thin for direct lit panels. The Nano set uses a slim "ribbon" cable between the set and the circuit box, although LG has had wireless "two box" sets in the past. We haven't finished going through all the details of all the brands, but in discussion, none of us (four Display Monitor staff attended the show) could remember anybody talking about a new 'two box' or wireless TV, that is to say, a set where the display is separated from the control and input circuitry and connected by wireless (although Haier had the completely wireless – including power – TV that it showed at CES). There seemed to be continued problems in getting the right price and performance for wireless.

LG was also more innovative than most in showing its display technology with some new tiled PDPs for public display applications and OLED TVs, of course. It was notable that there was little emphasis on OLED on the Samsung booth. Vestel, which had a good looking stand and lots of technology announcements, also had some 15-inch OLED TV samples, using, as we understand it, LG's panels.

Sharp had much better products this year and highlighted its latest LCD technologies including the Quatron fourth pixel and the UV alignment technology and its FRED driving scheme.

Turning to 3D, there was lots of average to bad 3D TV being shown at both IFA and at IBC. At the first show, it was clear that PDP still has the edge over LCD when it comes to image quality in stereo 3D, but we know the relentlessness of the LCD makers in improving their technology so we don't expect that advantage to last long. Europeans are buying 3D sets with around 100,000 sold from May to IFA, but according to the latest research around 40% are buying 3D sets, but without the glasses.

This is because Europeans are very conservative and expect their sets to last eight to ten years (they replace the one in the living room more often, but then the old one will typically be moved to another room). So they want to be 'future proof', but there is little 3D content (even HD content is years behind in most countries in Europe) at the moment, so they expect to buy glasses later.

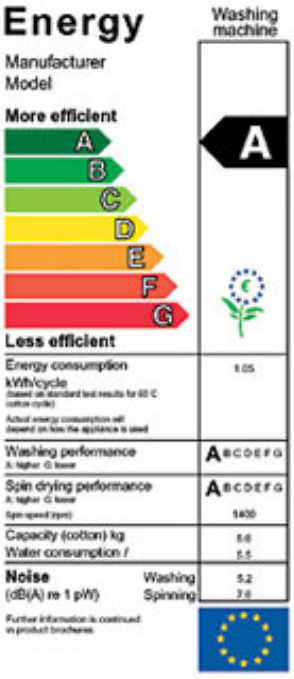
LED backlit TVs are very popular in Europe, especially in Germany, where economic conditions are relatively good at the moment and, as Germany did unexpectedly well in the World Cup, new TVs have been high on consumers' agendas. There is resistance to the price premium at the moment over the rest of Europe and our data has shown a big growth in inventory of TV sets over the summer. However, declining panel prices will help to solve this problem and we expect to see a lot of offers. Sony sold its main European TV factory to Foxconn earlier this year and announced just a week or so ago that it would sell its remaining factory in Barcelona (and 50% of its R&D facility there). That has made the company more competitive in pricing and our research has shown that Sony has significantly moved down in price against other vendors, particularly Samsung. This competitive action combined with over-inventory should mean a happy Q4 for consumers of LCD TVs in Europe.

The final big topic at IFA and a huge topic at IBC was connected TV. There are many ways of doing this, from the 'walled garden' approach of Panasonic's VieraCast, the platform approach of Yahoo! and Google, and the standards based hybrid approaches from the broadcasting side such as the UK's Connected TV/Project Canvas initiative and the Franco/German (more German than Franco, we detect) HbbTV approach.

As usual, there is the usual horribly complex European mess of approaches and for hybrid TV (combining broadcast and Internet) alone we see five different concepts in the five main markets.

The other big development has been the CI+ slot. This is a conditional access system, standardised this time across Europe, that allows content providers to protect their content on TVs or STBs fitted with the slot. This is enabling consumers to buy CI+ TVs and access premium and pay TV without the need for a dedicated STB. CI+ is going to be a significant part of the European TV landscape in the future.

Finally, the European Parliament has finally approved legislation on TV set energy labelling (and on other power-using devices such as STBs). Detailed regulations are expected soon and will become law in around a year's time. At that time, all retailers in Europe will have to have stickers in a standard format that show the power rating. Europeans have had many years of seeing these labels on white goods and we expect the development to be very significant, very quickly. In the UK, the Energy Saving Trust (who will be speaking at the Meko conference, GLADE 2010 on green issues in early November), has persuaded retailers to adopt the new regulations as soon as they are published and not to wait for the legislation.



The TV label will be similar to this washing machine label.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DISPLAYSEARCH

Retrevo Gadget Census Looks at TVs and Other Electronics

by Andrew Eisner

Andrew Eisner is a former test manager for Ziff Davis Labs and is currently director of content for Retrevo.com a website specializing in consumer electronics. Retrevo has reviews, manuals, and buying information for all popular gear and gadgets.

As the U.S. Census was winding down in July, Retrevo was starting to tabulate data from its own Gadget Census that looked at responses from over 7500 households across the country and around the world to determine what gadgets people own, and how they use them.

The States with the Most Gadgets: When the Gadget Census data was used to look at households from state to state to see which ones have the latest gadgets, some states stood out for having more of a certain type of gadget per capita than other states. For example, maybe it's the ultimate subway companion or a lot of New Yorkers were able to come up with a reason they needed an iPad but New York State came out on top with 52% more households with at least one iPad. Who would have thought Maryland would have the more flat panel TVs per capita? It might be that crabs cakes go well with TV watching or all those government workers need to watch the news shows but Maryland has 13% more homes with at least one flat panel TV. California didn't beat out any state in a household gadget analysis but they did come up on top as the state with the most households recycling gadgets. California households are 47% more likely to have recycled an old gadget in the last year than the average home in other states.

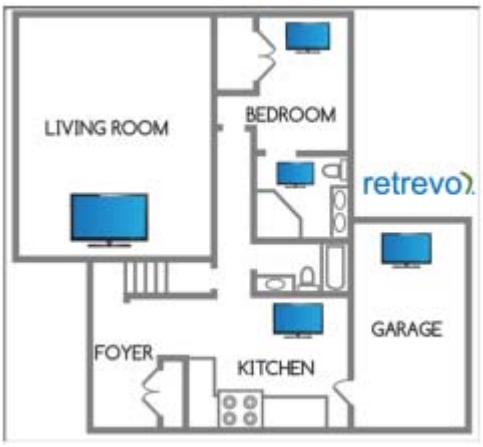
America's Love Affair with TV: Only in America could there be more TV sets than there are people to watch them. America's infatuation with TVs is illustrated in the Gadget Census as 1.16 TVs per capita across the United States.

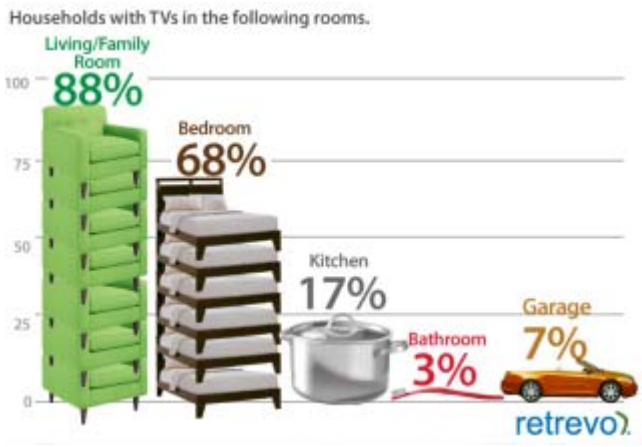
A TV in Every Room of the House: When you have more TVs than people in the household, you know TVs are going to show up all around the house. Of course, you'd expect the living room and family room to be the most popular spots for a TV but did you know that a TV in the bedroom is almost as common? Close to three quarters of the respondents (68%) indicated they had a TV in the bedroom, that's an impressive number! Georgia came out on top with the most households (82%) likely to have a TV in the bedroom.

Kitchen TVs can be handy for watching cooking shows and Connecticut the home of Jacques Pepin leads the nation with 27% of the households likely to have TVs in kitchens. A TV in the garage is a social phenomenon and Louisiana wins the prize for the most TV-equipped garages with 11%.

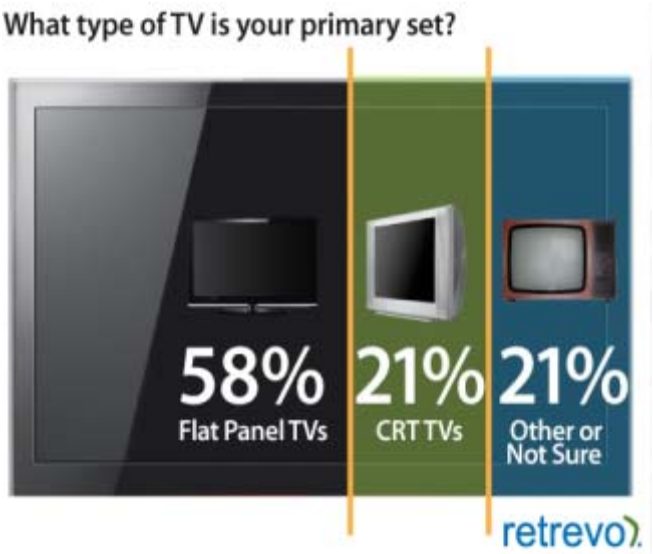
How Much TV Do Americans Really Watch? According the Gadget Census, Americans spend (or waste) an average of over 5 hours a day watching TV. Some interesting findings on TV viewing habits include:

- Americans watch about 30 minutes more TV than viewers outside the United States.
- Single women watch almost a half an hour more TV than single men.
- Rural households tend to watch TV about 20 more minutes a day than suburban and urban areas





With all those TVs in American households, you'd think that a lot of them would be flat panel TVs, and there are, however there are still plenty of old CRTs being used as primary TV sets. In fact of the 72% of U.S. households that have a flat panel TV, 14% percent do not use them as their primary TV. In other words, there are a lot of households with perhaps smaller flat panel TVs used somewhere in the home while the living room set used for primary viewing, might be a CRT or Rear Projection TV. Michigan has the highest number of CRTs being used as a primary set with 35% while Florida has the highest number of Rear Projection TVs with 16%. LCD TVs are the most common types of TVs with almost half (46%) of U.S. households claiming to be using an LCD TV as their primary set and another 12% using Plasma TVs. About 7% of the respondents didn't know what kind of TV they had; Minnesota had the most TV owners in the dark on their TV type with 13%, Washington State had savviest with only 3%.



*Note to Sony, Samsung, LG, Panasonic, and others: Could there be an opportunity to replace some of these older primary TV sets with new flat panel TVs?

Conclusion: The modern equivalent of prosperity and a chicken in every pot appears to be a TV in every room. With Americans owning more TVs than people to watch them you have to wonder if America's love affair with TVs has gone too far. Wait a minute, I forgot it's time for 30 Rock, gotta go…uh actually, I recorded it.

About the Gadget Census: The Gadget Census was conducted online from March, 2010 through July, 2010 and received over 7,500 individual responses from Retrevo users distributed across gender, age, and location. Responses were weighted based on reported demographics to gain accurate estimations of gadget ownership and usage within and across demographics. All data is therefore reported as weighted data in which most responses have a confidence interval of +/- 4% at a 95% confidence level.

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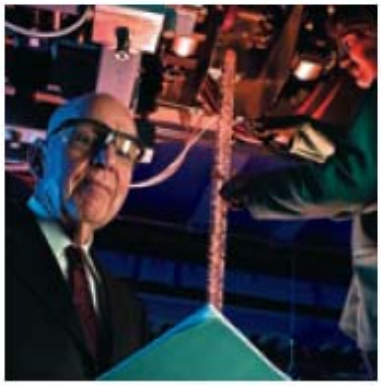
History



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What Next?

by Norman Hairston

This is the first recession where TV has meant LCD and not CRT. Norman Hairston is a third generation TV professional in that many of the people that he worked with early in his career had worked with the inventors of color TV set technology. He has held technical, commercial and strategic planning positions in the display industry and has worked with a variety of technologies including CRT, LCD, laser based displays, Telaria and CRT projection. He began his display career at Corning developing their early strategic plans for the LCD substrate business. He has since held display positions at Honeywell, Gemfire, Intel, and as a consultant. He holds both Chemical Engineering and Materials Science degrees from MIT and an MBA from Stanford.

One could have done quite well over the past 3 years listening to the pundits' forecasts of the TV market and heading in the opposite direction. Leading into the recession in mid 2008, when the market was up due to a "Beer Can" surge and forecasts were rosy, a plunge was clearly in the offing. When the plunge happened and forecasts turned decidedly negative, clearly Spring was in the air. When the TV market recovered ahead of a general recovery, the TV market was pronounced "Recession Proof", obviously the glut of panels was building as these words were spoken. Now that the US recovery is sputtering and inventories are building, the recession proof TV set market is wilting as well. To be sure, I said in the winter of 2008-2009, that there very well could be severe shortages of TV set by the 4th quarter of 2010. That quarter is almost here and those shortages obviously are not going to happen. Further, the economic ills that are stymieing the recovery are global, deeply rooted, and any solutions will be difficult to implement.

It is also worth noting that, at least in the US, there is a tremendous amount of unoccupied housing, unused manufacturing capacity, very low interest rates for those willing and able to borrow, and retail sales are actually rising, albeit slowly. There is a lot of slack in the economy, there is slack in the housing market offering the potential for a rapid rise in new household creation, and my belief is that there is still considerable pent up demand for replacement TV sets. It would not take much of an acceleration in the US economy to re-ignite talk of a recession-proof TV set market. However, although I do not think that another serious downturn is in the offing, I do not know if an acceleration in US economic activity will come any time soon. Though the recovery in TV set sales was led by China as much as the US. Slack demand in the US very much has its echo in China and other nations given the US appetite for imported goods. What there was of a global recovery was largely lead by increased exports to the US; see "Return of the Killer Trade Deficit" http://www.nytimes.com. Given this increased uncertainty, this brings to the fore, What Next?

I Got My Two: My friend Tom Rossi, who also graces the *Veritas et Visus* pages on occasion, tells a story about a sales manager for a company that he used to work for that was invited to a dinner party. It seems that 12 guests showed up when the host had only prepared 10 steaks. When the sales manager was asked how the situation was resolved, he replied, "I don't know what everyone else did; but I got my two." Not only did he get more than his share, no doubt they were the two nicest steaks as well.

This is a good lesson for business in general and for the LCD industry's position at this particular point in time. Growth in the industry has attracted new players and may are arriving with new factories just at the point when the number of steaks is inadequate for those already at the table. While sharing in social situations is something that is normally admired, unfortunately, in previous episodes of oversupply, the industry has decided to share customers, hence the current spate of headlines regarding price fixing in the global LCD supply. Instead of focusing on how to get my share, those committed to this industry need to focus on how they will get their two (or three). Indeed the failure of those in a position to go after their two during the last demand famine is, at least, partially responsible for even more hungry mouths at the table now.

There is an easy a convenient example of a company getting its two in the form of Apple. Though there are many aspects to the Apple business strategy, in large part, instead of focusing on how it would grow its share of a decelerating PC market, the company, largely enabled by display technology, started unbundling all of the

services that a PC could provide and began focusing on application specific hardware that was oriented around a particular service. Though the panache of Apple insured juicy prices for its hardware, the draw for the device and the income really rested on the service rather than the hardware. Apple got its two or three by taking not by sharing and by focusing on the income stream from services.

Similarly, the highest profile retailer in the US TV market, Best Buy has been shifting its focus from product to services. Though profitability in TV sales has traditionally rested on hardware attachments, these days the services can be much more lucrative. Many Best Buy stores have Comcast Kiosks and there are frequently Comcast sales people in the store. Not coincidentally, we see these headlines, "Buy Reports 60% Rise in Income" http://www.nytimes.com/2010/09/15/technology/15best.html?ref=business. However, it is not revenue from Comcast that is driving this but largely cell phone revenue; phones being completely inseparable from the service.

For those in the LCD TV industry, the lesson and the warning should be clear. The biggest customer in the US, one that had been focusing on video sales, now is deriving an increasing portion of its income from another category. No doubt, as stores get reset, increasing floor space will be given to what is making them the most money. What is needed in the TV market is innovation to increase the rate of services attached TV set sales.

The HDTV transition was great in that respect as the first HDTV purchased by a household inherently involved a new service or service upgrade. 3D TV is much less attractive in that sense as there is no service step up to go along with the product. Indeed the lack of service is often cited as a reason to not buy. If a TV set maker was committed to 3D, a remedy for this situation, particularly a proprietary remedy could pay off in terms of both increased hardware sales and service revenues. Such a service need not launch in a national rollout. Given the lack of 3D content, local content generation will be needed to fill a service line up so if the service is local as well there is no mismatch.

In any case, while the TV set market is in something of a pause, the major TV retailer in the US is growing its profits by focusing on services. An increased focus on services and service attachment at TV set point of sale will benefit the industry regardless of when the overall economy recovers. The fact that there is not enough stakes to go around does not prevent an aggressive manufacturer from getting his two.

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Samsung: Android TV

by Jin Kim

Jin Kim is the founder and president at DisplayBlog, bringing together news, information and analysis from the high-tech display industry to help, educate and entertain. By combining the experiences and knowledge gained serving as senior marketing manager at LG Display and as director of TFT LCD Market Research at DisplaySearch, Kim brings a fresh look at the display industry and products such as LCD TVs, LCD monitors and notebook PCs. Kim received a BA at UC Berkeley and an MBA at from Claremont Graduate University.

Boo Keun Yoon, head of Samsung's TV business, spoke with reporters in Korea on September 7th about the possibility of using Google's Android OS as part of the company's Internet-connected TV strategy. http://www.bloomberg.com/news/2010-09-07/samsung-electronics-may-use-google-s-android-software-in-tvs.html Yoon's concern is whether or not South Korean movie, TV and music providers will work with Google to make the venture successful. Google already has Google TV so the simple road to take would be to integrate Google TV into its TVs. And Samsung needs to make a decision fast. According to Yoon, Internet-connected TVs will grow to 87.6 million units by 2013, about six times the number today. Google TV-enabled Internet-connected TVs from Sony are expected to be available during the Christmas season this year.

Android has been built as a mobile OS. Samsung has seen success incorporating Android into its smart phones with its Galaxy S line being a great example. The Galaxy Tab should also do very well, based on Apple's example. Apple's iOS started off on the iPhone and was incorporated into the iPad, a tablet, and it has done extremely well. And Samsung is following in Apple's footsteps. By thinking of incorporating Android into a TV Samsung is venturing off on its own.

Or maybe not. Google is developing Android as an OS that will work with Google TV. Sony and Intel are working together with Google to make this happen.

Sony, Intel, Google and now maybe Samsung too wants to build Internet-connected TVs where you can download apps taking advantage of the strong momentum with Android. I think they are missing something. Smart phone users want to download apps because they are mobile and want to do a variety of things, things like search for nearby Korean restaurants with four-star or higher ratings from Yelp, or update his Facebook profile with a photo he just took of something interesting, etc. With a TV I think we can all agree that what we're primarily looking for is video content to watch. I don't think we need thousands of apps just to do that. And as mentioned above Google TV seems to be one perfect app that can be integrated into the TV. I guess I wouldn't mind a Flickr app…

Personally, I like my TVs real dumb. All I want my TV to be doing is doing its best to make sure the stuff I'm watching looks great. That's it. Leave everything else to something else. Maybe that's why I'm leaning toward checking out the new $99 Apple TV. It sure beats having to spend $1500 on a new TV just to have access to the weather forecast in Seoul or stock prices for Samsung.

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Approximately Right

Over the Top of 3D

by David Barnes

David Barnes brings more than forty years of experience in the capital equipment, semiconductor and TFT LCD markets to bear on client concerns. He introduced market-leading test-repair systems for TFT manufacture (ArrayChecker and ArraySaver lines) in the mid 1990's. Later that decade, he negotiated joint ventures between Philips Electronics and LG Electronics through due diligence, then stayed in Seoul to support the board from conception through the IPO in 2004. After the first dual listing on NYSE and KSE, he provided similar services to more clients as VP of Strategic Analysis for DisplaySearch. Assignments in recent years include IPO, project funding, underwriting, due diligence and debt restructuring. He now provides services through BizWitz, LLC. He attended the University of California at Santa Cruz.

A lot of suppliers and retailers have pinned their hopes on 3D TV this year. The bad news is that demand for 3D is not as robust worldwide as hoped. The good news is that US consumers are more eager for 3D than most and that several features present in some 3D sets are valued highly, worldwide. Advance retail data for July released by the Census Bureau shows provides good news, also. Year-to-date sales in Electronics and Appliance Stores (NAICS code 443) are up 3% over January–July 2009. Sales at Warehouse and Superstores (NAICE 45291) are up 3% through June as well.

Weak employment numbers spoil the party, however. The percentage of people employed remains near a 27-year low of 58.4% (July). Rising AMLCD capacity and sluggish economic recovery make dark headlines. In recent weeks, we have seen stories such as these.

- Conventional 42-inch AMLCD prices fell 6% M/M and 15% Y/Y in early August.
- Panel price premiums for LED backlights are not declining, some are rising.
- Leading AMLCD producers plan reduced utilization from 1H'10 to 2H'10.
- Blockbuster prepares for bankruptcy while Netflix expands on-line.
- Some journalists worry that 3D movie premiums may decline quickly.
- Some 3D TV brands worry about 2D to 3D program conversion quality.
- Most equity analysts worry about US consumer spending this year.

Read individually, each story seems dark, but read together they shine some light on market conditions. They indicate healthy market demand for television in general that benefits some companies more than others. We note a shift from bricks to clicks, a shift toward video-on-demand "over-the-top" of cable or satellite services, and a shift from status seeking to value seeking behavior. Companies that position themselves in front of these trends can prosper, even in difficult times. LCD TV sets that offer better color in slimmer packages with LED illumination and internet connections may capture consumer attention, even when money is tight.

How People Watch: The Nielsen Company published results of an international survey this month that underscores such insights and describes other implications. The study, *How People Watch: a Global Nielsen Consumer Report,* collected information from 27,000 on-line consumers in 55 countries. On-line surveys of people through social media sample only a portion of the global market. We should keep that in mind when interpreting the data but not discount the importance of such people. They represent the cutting edge of consumers in their country and they often influence neighbors or friends.

One of the first things revealed by the study is how diverse viewing habits are around the world. People surveyed in Germany watch television 32% less frequently at home than the global average of 55 nations. At the other extreme, people in Hong Kong reported watching television at home 9 % more frequently than average. Other countries near the top of this rating include Brazil, China and India. Respondents in Australia represented the global average in frequency but they reported watching TV only three hours a day (02:59) compared to five hours a day (05:04) in the USA. US respondents watched TV only 1% more frequently than average but they watched longer.

From this we may conclude that demand for TV at home in the USA is favorable. The domestic market favors sales of LCD TV sets in general and sale of sets with certain features in particular.

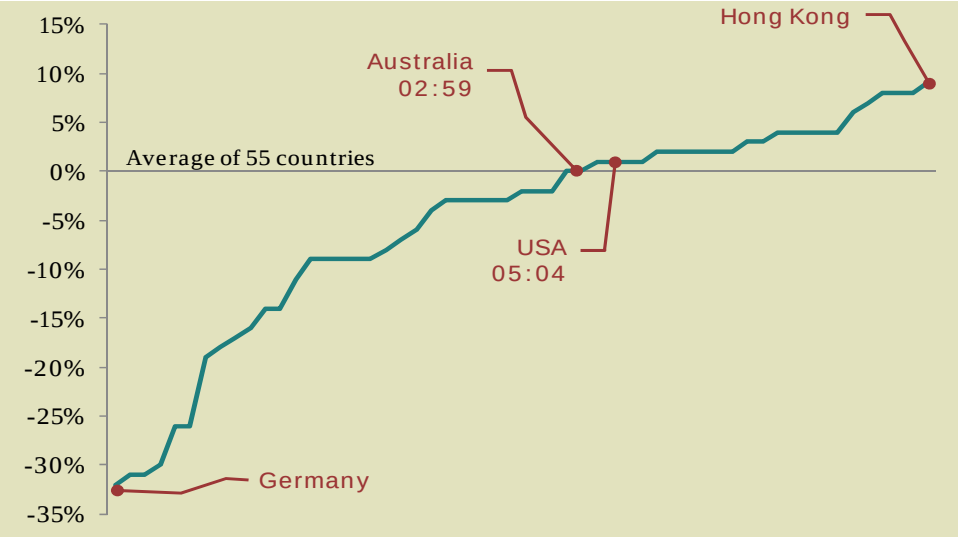


Figure 1: Deviation from Global Average Frequency of TV Consumption by Nation

Source: The Nielsen Company, August 2010; BizWitz analysis

Getting the set of features right is not so easy, however. For example, the study showed more deviation regarding HD demand than it showed for TV demand overall. Respondents in Australia were average in the frequency of their TV viewing but they were 90% more interested in HD TV than the global average. Respondents in the USA were near the average in TV watching but near the top in HD interest at 57% above the index. In contrast, some countries had little interest in HD TV. People in Indonesia expressed interest 73% below the average. We should note here that HD interest in Japan and India were both 50% below average. That seems reasonable for India where digital broadcasting is just getting underway but curious for Japan, where digital broadcasts first aired.

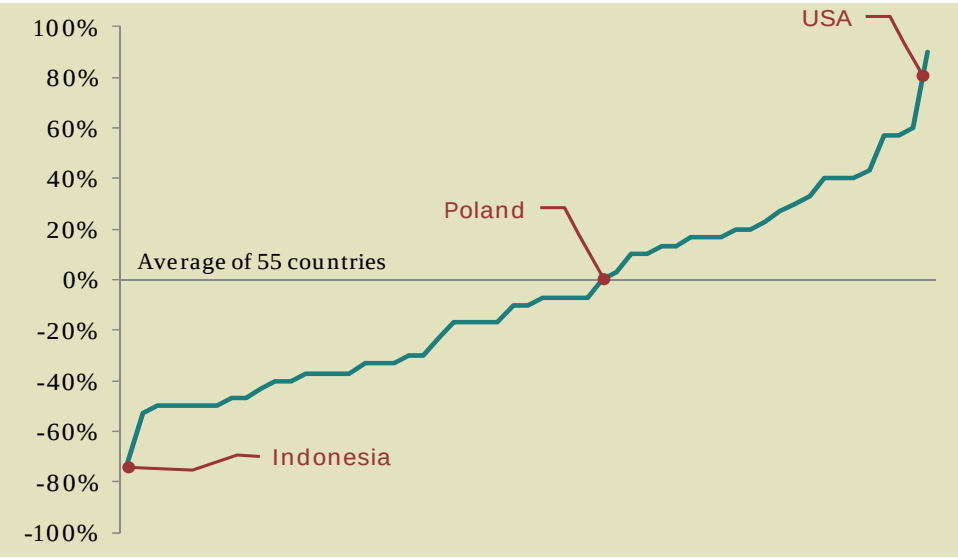


Figure 2: Deviation from Global Average Interest in HD TV by Nation

Source: The Nielsen Company, August 2010; BizWitz analysis

When asked about 3D TV, Indonesian respondents were the least interested again. That does not seem surprising. The surprise comes in above-average interest coming from the Middle East, India, Brazil and other Latin American countries. Respondents in Saudi Arabia led the poll by expressing interest 133% above average in 3D TV. They were joined in the 100% above average regime by Egypt, (pre-flood) Pakistan, Columbia and Venezuela. South Korea represented the global average, which may explain the interest in producing 3D LCD panels there. Consumers in the USA reported 25% below-average interest in 3D TV, which may help explain the sluggish demand seen this summer. Conditions in Japan seem even less favorable. Consumers there were 83% less interested than average in 3D TV. Such data suggests that 3D appeals more to people with high aspirations in developing nations than to jaded consumers in developed ones.

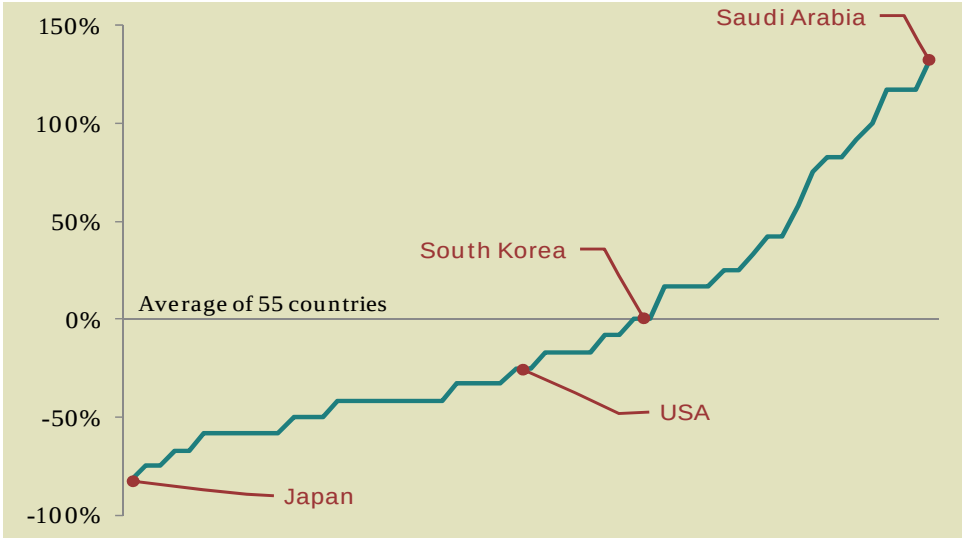
When asked about internet-connected TV (IPTV), respondents were more closely aligned around the world. Pakistan, Columbia and Venezuela led the ranking in this category also, but their interest levels were not so much higher than average. More important, perhaps, is the observation that respondents in the USA expressed average interest.

In summary, the survey indicates that US consumers watch TV as frequently as the average on-line consumer does but watches longer than most do. This finding underscores the observation that advertisements support a variety of business models in the USA. Consumers in the USA expressed much stronger interest in HD TV than most respondents did but less than average interest in 3D TV. On the subject of IPTV, US consumers represent

the global average in terms of interest and we note that there is more global consensus on the importance of IPTV than there is on HD or 3D TV.

Figure 3: Deviation from Global Average Interest in 3D TV by Nation

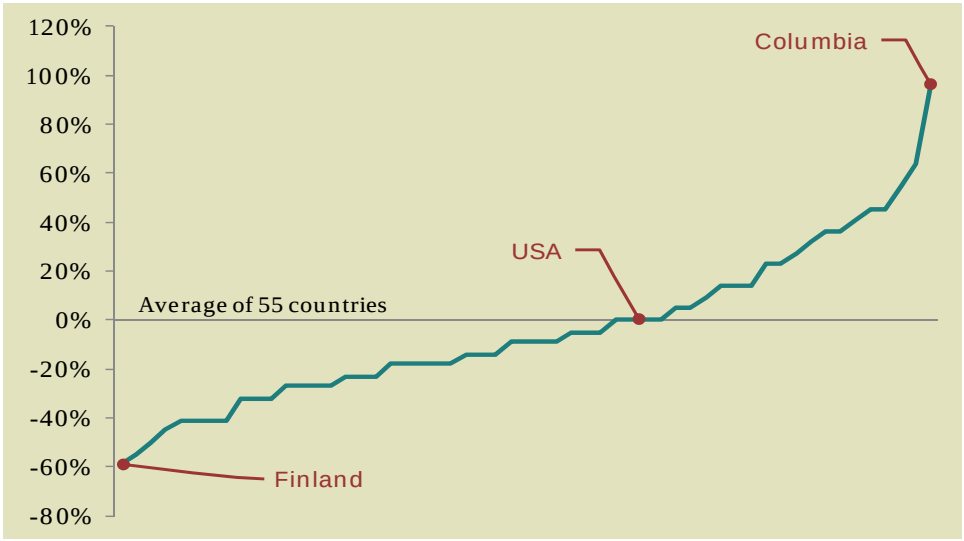
Source: The Nielsen Company, August 2010; BizWitz analysis



This leads to consideration of data regarding on-line viewing interest. Worldwide in March 2010, 70% of respondents reported watching video programs on-line. As detailed in the following table, respondents in richer nations reported much less than this average. Known for its aging population, it does not seem surprising that European consumers reported 33% less on-line video activity than average… and these were all people on-line! US consumers reported watching on-line 11% less than the global average while people in Asia-Pacific reported 11% more than average. Poorer nations in Latin America and MEAP (defined as the Middle East, Africa and Pakistan by Nielsen) watched 14% more.

Figure 4: Deviation from Global Average Interest in IPTV by Nation

Source: The Nielsen Company, August 2010; BizWitz analysis



The data breaks-out TV viewing in the office (on the employers' networks) and on mobile devices. In those venues, people in richer countries reported numbers farther removed from those reported by consumers in poorer countries. Respondents in Asia-Pacific were much more likely to consume video at work or on the go than respondents in Europe or North America were.

Venue	Europe	North Am.	AP	Latin Am.	MEAP
Office	-40%	-40%	28%	12%	19%
Mobile	-45%	-55%	45%	18%	36%
Home & All	-33%	-11%	11%	14%	14%

Source: The Nielsen Company, August 2010

This seems favorable for domestic IPTV demand. Savvy consumers in the USA are more likely to want internet TV at home than at the office or in the car. In addition, as Nielsen noted in its report, PC and tablet products seem unlikely to reduce demand for connected TV sets in the USA. Mobile, wireless products may reshape the way people consume TV in the future but that is many years away. In the meantime, on-line consumers in the USA prefer internet-connected, HD TV sets.

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- Cooper lines helps the panel to handle movie data at high speed and volume without any data loss
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Touch Screen Interactive Functions

- Horizontal aligned Liquid Crystal does not have image retention in video streaming condition when it is touched
- It has 10 times faster recovery rate after the array is scattered by touching the panel
- Representative sample of an interactive function is to be used in Public display, IPTV, Home Network and Game area

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- High aperture ratio and simple BLU structure with EEFL bring users' low power consumption
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- Environment friendly sources which dose not contain Pb.

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- The colors are the same regardless of the view at any angle with lowest Color shift and Gamma Shift of IPS
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2011 HDTV Buying Guide coming soon

Authored by Bruce Berkoff and edited by Alfred Poor, the 2008 edition of the HDTV Buying Guide is newly available. The 68-page paperback book can be ordered at Amazon for $13.45, qualifies for free shipping status, and is available immediately: http://www.amazon.com/HDTV-Buying-Guide-Bruce-Berkoff/dp/0965197530

"After an easy 2-hour read, I was off again to the electronics store to compare the seemingly endless choices of HDTV's. This time I knew the proper size and features of the LCD I wanted to buy for my living room and had a list of meaningful questions to ask the salesperson regarding price guarantee, warranty, and extras (cables and external speakers). The money saved on cables alone offset the cost of the book many times over. I especially found the "myth busting" boxes and "what to look for" paragraphs informative. The title of the book says it all...HDTV Buying Guide".

-- P. Molisani

HDTV Buying Guide

If you're ready to buy an HDTV, this book is all you need to understand the various choices and choose the right one.

This book covers all the bases, but is so easy to understand that I'd give it to anyone in my family who wants to buy an HDTV. It will make holiday gift buying easy.

Alfred Poor, HDTV Almanac

Bruce Berkoff knows just how to explain HDTV so you can put your new understanding to work right away. I think my Mom can benefit from this book, too.

Ross Young, Founder, DisplaySearch

Print edition ISBN 978-0-9651975-3-3: $14.95
E-book edition ISBN 978-0-9651975-4-0: $7.95

Sometimes you think you may know something but then someone explains it in terms you can understand you all of a sudden say, "Oh, I get it now." This is the case with Bruce Berkoff's book about HDTV. Bruce obviously has a command of the subject matter and a talent for explaining it. He tells you what's important and what not to bother with like manufacturers' specs on contrast ratios which are measured under so many different conditions they become a meaningless comparison. I enjoyed this book and learned a few things about HDTV, I'd recommend it to anyone shopping for HDTV or just wanting to enhance their knowledge of this subject.

-- Andrew Eisner

From the professor…

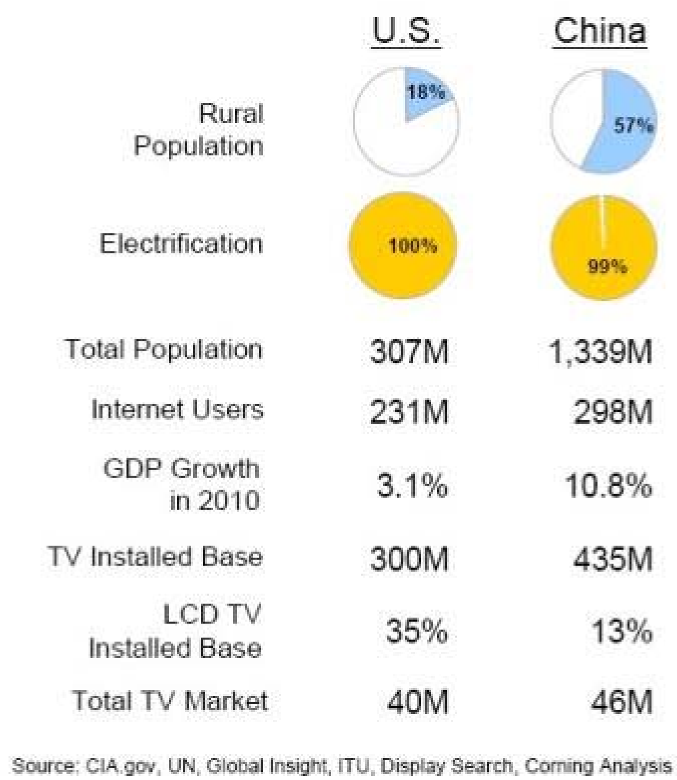
by Alfred Poor

Alfred Poor is the editor and publisher of "HDTV Almanac", a free daily service of news and commentary on the HDTV, digital television, and home entertainment electronics markets: http://hdtvprofessor.com/HDTVAlmanac. This article comprises three recent entries about the TV industry, providing some insights into just how diverse and continuously interesting the market has become; still not without some substantial problems.

Here Comes China!

I know, I know, you've heard that "sleeping giant" stuff too much lately. China's economy is becoming inexorably tied to that of the U.S., but there may be some ways that you haven't considered yet. For example, thanks to cheap manufacturing costs, many of our consumer electronics products are priced at just a fraction of what they were a few years ago, including HDTVs. Okay, maybe that's not news either.

But I just received a presentation that was made by Lia Fang, President of Corning Display Technologies China, at the DisplaySearch China 2010 conference. It was full of fascinating information, but this was the slide that caused me to pause. China nearly matches the U.S. in terms of the availability of electricity, which as we saw in this country in the last century, can be a driving force for building a middle class. As they acquire labor-saving devices, people have more time to be more productive. This increases their earning power, and they can start acquiring more consumer goods. But look at the signs of middle class in China now. They outnumber us in terms of Internet users by 68 million. They have 45% more televisions in use than in the U.S. but only about half as many LCD TVs. They already buy more TVs per year than we do in the U.S. What will happen as they start to replace those existing TVs with LCDs? And what happens when the remaining 0.9 billion people decide that they want and can afford a TV?



One thing that will happen is that we are likely to shift from a surplus to a shortage for LCD and plasma TVs. And when the market faces a shortage instead of a surplus, prices are likely to stop dropping. There is always the hope that increased production will lead to greater efficiencies which will help drive down costs, but this presumes that all the supply chains for materials and other resources are able to keep pace.

The US has been in the enviable position of being in the driver's seat, with our demand defining the features and functions of consumer electronics, especially HDTVs. The picture presented by Corning has me wondering how much longer that will remain true.

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Good News for HDTV Buyers

I know that the economy is tough and lots of people are out of work. Even more people are walking on eggshells, hoping that they get to keep their current job. This is the point in the economic cycles where cash is king and bargains are to be had. And that's the case for HDTVs as well.

There's a huge traffic jam in the inventory pipeline. The summer was even slower than projected, which is really slow. The Labor Day/back-to-school buying season looks disappointing, and I won't be surprised to see retailers hanging snowflakes and deep price cuts in October. Once again, Black Friday and the holiday shopping season is shaping up to be a consumer electronics blood bath, with lots of red ink spilled all over the place.

DisplaySearch has a service that tracks the price of LCD panels. These are not complete HDTV sets, but just the display panel itself. A 42-inch 1080p panel sold for about $333 in May, but that has dropped to $288 in the beginning of September. That's $45 less, or a 13.5% price drop in less than four months. A 32-inch WXGA (720p) panel went from $205 to $174 in the same period, down $31 or more than 15%.

In order to generate sales, HDTV manufacturers are going to have to cut prices, and they are going to look the panel makers to share some of the pain. The panel makers are already starting to lower their production, which is expensive. Their plants are designed to run flat out in order to maximize the return on the cost of building these expensive factories, yet some Taiwan plants are reported to be running at just 80% of capacity. And the retailers are going to be slow to order more product until they can sell off what they've got on hand already.

So all this bad news adds up to good news for you; you can expect to get some great bargains this fall on flat screen TVs, if you've got the money on hand. And you won't have to wait until after the holidays; you'll be able to find bargains now so that you don't have to watch football on your old set this season.

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Monitor vs. TV: What's in a Name?

I long for the old days, when things were simpler. Back when a computer monitor was a computer monitor and a TV was a TV. It's not that way anymore. Almost all TVs now have a way that lets you connect it to a laptop or desktop computer: either a VGA connector, or an HDMI connector that can hook up to a DVI port. But we still have computer monitors that don't have TV tuners, so you can't watch television programming on them (unless you stream it over the Internet or something like that).

Well, not so fast. Samsung has announced their 30 series of "computer monitors" that are available now, and a new 90 series of monitors that will ship in September. The 24-inch FX2490HD has an LED backlight, 1080p resolution, two HDMI connectors in addition to VGA and component video connectors, and a USB port that lets you play content stored on a thumb drive. And it includes tuners and a coax connection for cable or over-the-air signals. It even can do picture-in-picture.

Hey, I don't know about you, but this waddles and quacks like a familiar waterfowl. I really don't get why it's not an HDTV. I do get that it's a compact display, and if I were sending a kid off to college, this would be just the sort of space-saving convenience that I'd want to send along. But why this would do the job better than some other 24-inch display that is called an HDTV escapes me at this point.

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Display Industry Calendar of Events

A detailed calendar with active URLs is maintained by Veritas et Visus. Please notify mark@veritasetvisus.com to have your future events included in the listing. http://www.veritasetvisus.com/industry_calendar_2010.htm.

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July 2010		
July 7-9	China International Flat Panel Display Exhibition	Shanghai, China
July 7-9	China International Touch Screen Exhibition & Seminar	Shanghai, China
July 7-9	International Symposium on Flexible Organic Electronics	Halkidiki, Greece
July 8-11	SINOCES	Qingdao, China
July 11-16	International Liquid Crystal Conference	Krakow, Poland
July 12-14	Nanosciences & Nanotechnologies	Halkidiki, Greece
July 13-14	International Conference on Stereoscopic 3D for Media and Entertainment	New York, New York
July 13-14	TV 3.0 Summit and Expo	Los Angeles, California
July 13-14	Korea Display Conference	Seoul, Korea
July 13-15	Semicon West 2010	San Francisco, California
July 13-15	Intersolar North America	San Francisco, California
July 14-19	National Stereoscopic Association Convention	Huron, Ohio
July 16	Mobile Display Forum	Taipei, Taiwan
July 20	Semiconductor Industry Forecast Seminar Mid-Term Update	London, England
July 25-29	SIGGRAPH 2010	Los Angeles, California
July 28-29	Japan Forum	Tokyo, Japan
August 2010		
August 6	3D Asia Symposium	Singapore
August 8-10	Australasian Gaming Expo	Sydney, Australia
August 12	Social TV and Brands Summit	San Francisco, California
August 16-20	Designing Interactive Systems	Arhus, Denmark

August 17-18	Symposium on Flexible Electronics	Binghamton, New York	CAMM
August 17	Digital Signage	San Jose, California	DisplaySearch
August 18	TV Ecosystem Conference	San Jose, California	DisplaySearch
August 19	Emerging Technologies Conference	San Jose, California	DisplaySearch
August 24-27	European Conference on Cognitive Ergonomics	Delft, Netherlands	ECCE 2010
September 2010			
September 3	IFA DisplaySearch Business Conference	Berlin, Germany	IFA DisplaySearch Business Conference
September 3-8	IFA 2010	Berlin, Germany	IFA
September 6	Silicon Chip Industry Training Seminar	London, England	FutureHorizons
September 6-10	HCI 2010	Dundee, Scotland	hci2010
September 7-10	Mobile HCI 2010	Lisbon, Portugal	MOBILEHCI2010
September 8-9	Ink Jet Technology Showcase 2010	Baltimore, Maryland	IMT
September 8-10	Semicon Taiwan	Taipei, Taiwan	semi
September 9-10	China FPD	Shanghai, China	DisplaySearch
September 9-14	IBC 2010	Amsterdam, Netherlands	ib
September 13-16	PLASA '10	London, England	plasa2010
September 15	Displaybank US Display Conference	Santa Clara, California	Displaybank
September 15-16	3D Entertainment Summit	Universal City, California	3D Entertainment Summit
September 19-23	International Conference on Digital Printing Technologies	Austin, Texas	NIP25
September 19-23	Digital Fabrication 2010	Austin, Texas	Digital Fabrication
September 20-21	Organic Electronics UK	London, England	SID
September 21 - 26	Photokina	Cologne, Germany	photokina
September 22-23	Createasphere/EXPLORE	New York, New York	createasphere
September 22-26	CEDIA Expo	Atlanta, Georgia	CEDIA
September 24-26	The 3D Experience	New York, New York	3D Experience
September 27-29	OLEDs World Summit 2010	San Francisco, California	Intertech Pira

September 29-30	RFID Europe	Cambridge, England	IDTechEx
September 27 - October 1	International Workshop on Inorganic and Organic Electroluminescence; International Conference on the Science and Technology of Emissive Displays and Lighting; Advanced Display Technologies International	St. Petersburg, Russia	SID
October 2010			
October 3-6	Symposium on User Interface Software and Technology	New York, New York	UIST
October 5	3D Stereoscopic Games Summit	Austin, Texas	GDC 10
October 5-6	Digital Signage Investors Conference	New York, New York	Digital Signage Investor Conference
October 5-9	CEATAC Japan 2010	Tokyo, Japan	CEATEC JAPAN
October 6-10	CeBIT Bilisim EurAsia	Istanbul, Turkey	CeBIT
October 11-14	Showeast	Orlando, Florida	SHOWEAST
October 11-14	Taipei Int'l Electronics Autumn Show	Taipei, Taiwan	
October 11-15	IMID/IDMC/Asia Display	Seoul, Korea	iMiD
October 12-14	Solar Power International	Los Angeles, California	SOLAR POWER INTERNATIONAL
October 12-15	Korea Electronics Show	Seoul, Korea	KES 2010
October 13-14	Printed Electronics/Photovoltaics Asia	Hong Kong, China	IDTechEx
October 13-14	3D World	New York, New York	3D WORLD
October 13-14	Mastering the Principles of Printed Electronics	Kalamazoo, Michigan	WMU
October 13-16	ElectronicAsia 2009	Hong Kong, China	electronicAsia
October 17-20	AIMCAL Fall Technical Conference	Myrtle Beach, South Carolina	AIMCAL
October 18-21	Digital Hollywood Fall	Santa Monica, California	Digital Hollywood
October 18-24	3DDD Film Festival and Stereoscopic World Congress	Barcelona, Spain	3DDD
October 19-21	Semicon Europa 2010	Dresden, Germany	semi
October 19-21	Plastic Electronics 2010	Dresden, Germany	Plastic Electronics
October 19-21	SATIS 2010	Paris, France	SATIS
October 21-23	Viscom	Milan, Italy	viscom
October 24-28	Frontiers in Optics	Rochester, New York	OSA
October 25-26	Workshop on the Impact of Pen-based Technology on Education	Blacksburg, Virginia	wipter

October 25-27	LEDs 2010	San Diego, California	
October 25-29	International Conference on Multimedia	Florence, Italy	
October 26-28	SMPTE 2010	Hollywood, California	
October 28-30	Viscom Frankfurt	Frankfurt, Germany	
November 2010			
November 2	DisplayForum: Green Large Area Displays in Europe	London, England	
November 3	DisplayForum: 3D Vision Europe	London, England	
November 3	Taiwan TV Supply Chain Conference	Taipei, Taiwan	
November 3-4	Createasphere/EXPLORE	Burbank, California	
November 3-4	International Workshop on 3D Geo-Information	Berlin, Germany	
November 7-11	Annual Meeting of the IEEE Photonics Society	Denver, Colorado	
November 8-9	WCPC Annual Technical Conference	Swansea, Wales	
November 8-10	Tabletops and Interactive Surfaces	Saarbrucken, Germany	
November 8-12	Color Imaging Conference 2010	San Antonio, Texas	
November 9-10	Digital Signage World ASIA	Singapore	
November 9-11	VISION 2010	Stuttgart, Germany	
November 9-12	electronica	Munich, Germany	
November 10-11	Digital Signage Show 2010	New York, New York	
November 10-12	FPD International	Tokyo, Japan	
November 16-18	Latin Display/IDRC	Sao Paulo, Brazil	
November 17-19	InfoComm Asia	Hong Kong, China	
November 18	TV of Tomorrow	New York, New York	
November 19	Future of Television East	New York, New York	
November 21-24	International Conference on Electronic Materials and Nanotechnology for Green Environment	Cheju Island, Korea	
November 22	Silicon Chip Industry Training Seminar	London, England	
November 25-27	China International Touch Screen Exhibition & Seminar	Shanghai, China	

November 29 - December 1	International Symposium on Visual Computing	Las Vegas, Nevada	ISVC
December 2010			
December 1-2	Printed Electronics US	Santa Clara, California	IDTechEx
December 1-3	SEMICON Japan	Tokyo, Japan	semi
December 6-8	Virtual Reality Software & Technology	Hong Kong, China	VRST
December 7-8	TV 3.0: Innovations in TV and Content Delivery	Los Angeles, California	IMS CONFERENCES
December 7-9	CineAsia	Hong Kong, China	CINE ASIA
December 8-10	3D Stereo Film & Technology Festival	Liege, Belgium	3D MEDIA STEREO
December 15-18	SIGGRAPH Asia	Seoul, Korea	SIGGRAPH
January 2011			
January 4-5	Storage Visions Conference	Las Vegas, Nevada	STORAGE VISIONS
January 5-7	Digital Hollywood CES	Las Vegas, Nevada	Digital Hollywood
January 6-9	2011 International CES	Las Vegas, Nevada	International CES
January 19-20	NEPCON World Japan	Tokyo, Japan	NEPCON WORLD JAPAN
January 19-21	LED/OLED Lighting Technology Expo	Tokyo, Japan	LED/OLED Lighting Technology Expo
January 22-26	Tangible, Embedded, and embodied Interaction	Funchal, Portugal	TEI
January 22-27	Photonics West 2011	San Francisco, California	SPIE The International Society for Optical Engineering
January 23-27	Electronic Imaging 2011	San Francisco, California	Electronic Imaging
January 24-27	Stereoscopic Displays and Applications	San Francisco, California	Stereoscopic Displays and Applications
January 25-27	ICE Totally Gaming	London, England	ICE
January 25-29	MacWorld Expo	San Francisco, California	Macworld Conference & Expo
January 26-27	DisplaySearch Japan Forum	Tokyo, Japan	DISPLAYSEARCH
January 26-28	Semicon Korea	Seoul, Korea	semi
January 31 - February 3	Nanomaterials, Nanofabrication, and Organic Electronics	Adelaide, Australia	SPIE The International Society for Optical Engineering
February 2011			
February 1-3	Integrated Systems Europe	Amsterdam, Holland	infoComm

February 4	Organic Displays, Lighting, & Electronics	Los Angeles, California	SID
February 7-10	Flexible Electronics and Displays Conference	Phoenix, Arizona	FlexTech Alliance
February 12-17	Medical Imaging	Orlando, Florida	SPIE The International Society for Optical Engineering
February 13-16	Intelligent User Interfaces	Palo Alto, California	IUI
February 15-17	Broadcast Video Expo	London, England	bve
February 15-18	Hollywood Post Alliance 2011 Tech Retreat	Rancho Mirage, California	HPA Hollywood Post Alliance
February 18-20	Symposium on Interactive 3D Graphics and Games	San Francisco, California	i3D
February 22-25	Digital Signage Expo	Las Vegas, Nevada	DSE
February 25-27	Sound & Vision 2011	Bristol, England	SOUND&VISION
February 28 - March 4	Game Developers Conference	San Francisco, California	GDC
March 2011			
March 1-2	US FPD Conference	San Diego, California	DisplaySearch
March 1-4	LED China 2011	Guangzhou, China	LED
March 1-5	CeBIT 2011	Hanover, Germany	CeBIT
March 2-3	Electronic Displays Conference 2011	Nuremberg, Germany	ED
March 2-4	PV Expo 2011	Tokyo, Japan	PV EXPO 2011
March 3	Createasphere/Entertainment Technology Exposition	Universal City, California	createasphere
March 3-4	International Thin-Film Transistor Conference 2011	Cambridge, England	iTC
March 5-7	International Conference on Imaging Theory and Applications	Algarve, Portugal	IMAGAPP 2011
March 6-9	Focus on Imaging	Birmingham, England	Focus on Imaging
March 8-10	Air Traffic Control	Amsterdam, Holland	ATC Maastricht
March 14-18	2011 Measurement Science Conference	Pasadena, California	
March 15-17	FPD China	Shanghai, China	semi
March 15-17	Laser World of Photonics China	Shanghai, China	
March 17-19	EHX Spring	Orlando, Florida	EHX
March 19-20	Symposium on 3D User Interfaces	Singapore	IEEE
March 19-23	Virtual Reality 2011	Singapore	IEEE

March 22-24	Phosphors Summit	San Antonio, Texas	
March 22-24	Image Sensors Europe	London, England	
March 23	Korea FPD Conference	Seoul, Korea	
March 28-31	Cinemacon	Las Vegas, Nevada	
April 2011			
April 4-6	Smart Fabrics 2011	London, England	
April 4-8	MIPTV	Cannes, France	
April 5-6	Printed Electronics Europe	Dusseldorf, Germany	
April 5-6	Photovoltaics Europe	Dusseldorf, Germany	
April 5-7	Photovoltaic Technology Show	Stuttgart, Germany	
April 8-9	2011 Taiwan FPD Conference	Taipei, Taiwan	
April 9-14	NAB 2011	Las Vegas, Nevada	
April 12-14	Sign UK/Digital Signage Showcase	Birmingham, England	
April 13-14	International Eye Tracking Conference	Reno, Nevada	
April 13-15	FineTech Japan & Display 2011	Tokyo, Japan	
April 13-15	Touch Panel Japan	Tokyo, Japan	
April 22	DisplaySearch Japan Forum	Tokyo, Japan	
April 25-26	Interactive Displays 2011	Sacramento, California	
April 27-28	Digital Signage Show 2011	San Francisco, California	
April 27-28	3D Gaming Summit	Universal City, California	
April 28-30	International Sign Expo	Las Vegas, Nevada	
May 2011			
May 3-6	International Conference on Animation, Effects, Games, and Digital Media	Stuttgart, Germany	
May 7-12	CHI 2011	Vancouver, British Columbia	
May 9-11	Digital Holography and Three Dimensional Imaging	Tokyo, Japan	
May 10-12	SEMICON Singapore	Singapore	

May 11-13	CEDIA Expo Asia Pacific	Sydney, Australia	CEDIA
May 15-20	SID International Symposium	Los Angeles, California	SID
May 16	SID Business Conference	Los Angeles, California	SID DisplaySearch
May 18-19	Screen Media Expo Europe	London, England	screenexpo
May 19-20	DisplaySearch China FPD TV and HDTV Conference	Shenzhen, China	DisplaySearch
May 23-26	Laser World of Photonics	Munich, Germany	
May 24-26	Dimension3 Expo	Seine Saint Denis, France	Dimension 3
May 24-26	Digital Signage Expo 2011	Essen, Germany	DIGITAL SIGNAGE
May 31 - June 2	CeBIT Australia	Sydney, Australia	CeBIT
May 31 - June 4	Computex 2011	Taipei, Taiwan	
	June 2011		
June 2-5	SIIM 2011	Washington, DC	SIIM
June 7-9	E3 Media and Business Summit	Los Angeles, California	
June 11-17	InfoComm '10	Orland, Florida	infoComm
June 13-14	Infocomm DisplaySearch Digital Signage Conference	Orlando, Florida	infoComm DisplaySearch
June 13-16	Nanotech Conference & Expo	Boston, Massachusetts	Nanotech
June 14-16	Photonics Festival: OPTO Taiwan , SOLAR, LED Lighting, Optics	Taipei, Taiwan	OPTO
June 14-16	SEMICON Russia 2011	Moscow, Russia	semi
May 16-18	3DTV-CON 2011	Antalya, Turkey	3DTV-CON
June 21-24	CEDIA Expo Europe	London, England	CEDIA
June 21-24	OLED Expo 2011	Seoul, Korea	
June 21-24	LED & Solid State Lighting Expo	Seoul, Korea	
June 22-24	Electronic Materials Conference	Santa Barbara, California	
June 22-24	Haptics Symposium	Istanbul, Turkey	HAPTICS
June 27-30	Cinema Expo	Amsterdam, Holland	
June 28-30	LOPE-C -- Large Area, Organic and Printed Electronics Convention	Frankfurt, Germany	LOPE-C

About the LCD TV Association

The LCD TV Association is a global, non-for-profit marketing trade association, formed to help the entire LCD supply chain and retail channel through to the end consumer via various communication tools, including speeches, interviews, sponsored research, as well as industry newsletters, meetings and standards settings – resulting in better information and distribution of this information, as well as better understanding of the rapidly changing world of flat TVs and HDTVs for all related parties. Participating at the many industry trade and consumer shows around the world to help promote members' interests, as well as create better LCD TV products for everyone, our goal is to serve both the industry needs and promote the consumers best interests. We encourage and engage in discussions to promote the industry overall, as well as helping foster healthy competition and create better products with higher value propositions for consumers and retailers alike. The LCD TV Association can help fight the growing "specsmanship" in trade publications and refocus conversations on true image quality and understanding for consumers, and help the whole LCD TV ecosystem to improve and thrive. For more information on the LCD TV Association, it's membership, or to join at one of the various levels available, please visit us on the web at http://www.LCDTVAssociation.org.

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INFORM the public on the many benefits of LCD technology (vs. CRT and projection, PDP and the coming set of laser RPTV players). The LCD TV Association will debate the claims of competing technologies, as well as sponsor, post and distribute white papers on industry research and relevant topics - as determined by LCD TV Association Advisory Board.

PROMOTE the industry and technology via speeches, debates, interviews, PR and publicly available white papers on topics that promote these goals. The founder's history with the industry ensures many lively and engaging interviews on the industry's strategies and will put a human face on this huge and influential industry. The press is constantly seeking validation from neutral, yet knowledgeable industry experts such as those at the LCD TV Association.

IMPROVE the products and functions of LCD TV products by inventing and promoting new specifications that benefit the whole industry, such as an industry-wide 'Green TV' program. There are many activities that will benefit our members from early compliance and the associated PR. The emphasis is on perceived value for little or no cost, and use this to promote the industry via positive reviews and branding. The founder's experience ensures that these programs will not add cost, but rather help to relieve the relentless pressures on margin for the manufacturer.

CONNECT the industry supply chain with face-to-face meetings and regular communications, via white papers, presentations, quarterly newsletters for members. The Advisory Board members has quarterly meetings – telecon or in person – to facilitate win/win relationships for the industry partners. With better communication we can speed time to market with better features and functions, particularly for members and their customers, with the ultimate goal of creating more value for the TV vendors and their suppliers, while making TVs more attractive to consumers.

"A Great TV in Every Room"

LCD TV Association

Inform • Promote • Improve • Connect

For more information on the LCD TV Association, membership, or to join, please visit us on the web at www.LCDTVAssociation.org or email membership@LCDTVAssociation.org

Sustaining Members

CORNING, APPLIED MATERIALS, LG Display, NOVA Chemicals, MERCK, AmTRAN, UNIPIXEL, retrevo, DISPLAYSEARCH, FlexTech Alliance, Ventas et Visus, Fusion optix, mSilica, QUINN PACIFIC, rallypoint, Supertex inc., DOLBY, LG Electronics, Westinghouse, VIZIO, LG Innotek, TAOS

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