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California Energy Commission
1516 Ninth Street,
Sacramento, CA 95814

November 1, 2009

California State Energy Commission Report

Ultra-Energy Efficient and Low-Cost Laser-Driven 2D/3D Switchable Dynamic Projection Television Technology from HDI Ltd.

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Report written by Christopher Buttner and edited by Christopher Buttner and David (DK) Sweet.

A handwritten signature in black ink, appearing to read 'Christopher Buttner'.

Christopher Buttner, Media Relations, tel/voicemail: 415-233-7350, cell: 415-302-0839 and email: chris@prthatrocks.com

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California Energy Commission
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Attention:

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Jeffrey D. Byron
James D. Boyd
Arthur Rosenfeld

Julia Levin
Ken Rider
David Hungerford
Cathy Graber

Jim Bartridge
Panama Bartholomy
Paula David

November 1, 2009

Good Afternoon Esteemed Members of the California State Energy Commission,

HDI Ltd. hereby respectfully submits our detailed technical information about our new ultra-energy efficient television technology developed in California. We believe you will conclude this technology establishes a new energy efficiency benchmark that can help guide sensible regulations.

A three-page technical paper is included with this report details all HDI Ltd. technology specifications. In addition, we have taken the liberty to include HDI Ltd.'s technology talking points.

PART ONE - BACKGROUND:

I. On September 3, 2009, leading television manufacturers announced plans to introduce a "new generation" of what we consider "Humvee TVs." Estimated to cost as much as three times more than current televisions, some will also consume a three times more power. Especially in light of the global warming threat, the efforts of the Consumer Electronics Association seem almost criminal in promoting technologies the 'Grid', and the planet, simply cannot sustain.

II. On October 14, the *LA Times* reported: "California appears poised to be first to ban power-guzzling big-screen TVs".

Article here: <http://www.latimes.com/business/la-fi-bigtvs14-2009oct14.0.4908205.story> and included with this report.

III. On October 24, the *San Jose Mercury News* reported, "Electronics industry fights proposal to regulate TV energy use" - Article

here: http://www.mercurynews.com/search/ci_13623123?nclick_check=1 and included with this

report.

IV. Unfortunately, these articles failed to report that on September 3, 2009, after three-years of intensive research and design, Los Gatos, California's HDI, Ltd. introduced a new laser-driven 2D/3D projection television technology, with greater-than-high-def resolution, that draws 80% less power than existing 2D flatscreen plasma monitors of the same size. Press release here: <http://www.prthatrocks.com/pressrel/hdi3dpr.htm> and also included in this report.

PART TWO - SUPERIOR TECHNOLOGY

We believe HDI Ltd.'s technology is dramatically superior in several aspects relevant to energy use and consumer preferences:

ENERGY USE:

Energy savings from HDI's 200 watt, 100-inch diagonal screen technologies range from 20% more efficient than LED, to 80% more efficient than 1.5 kilowatt-consuming plasma "Pig" Screens.

POLLUTION, WEIGHT AND PRICE:

Additionally, HDI Ltd. offers a 95% reduction in manufacturing pollution, and a 100% reduction in harmful chemicals and radioactive components. At 10-inches thick, HDI's 100-inch diagonal display weighs 75% less than equivalent Plasma and LCD displays, and is anticipated to have a street price potentially 60% less than current 2D flatscreen Plasma and LCD displays of comparable size.

HUMAN COMFORT:

Importantly, HDI Ltd.'s technology also eliminates the adverse reactions inherent in viewing 3D content with costly powered shutter glasses, including, but not limited to, migraine headaches, dizziness, nausea, and motion sickness. HDI Ltd. delivers the most immersive, comfortable, and natural 3D viewing experience in the world with simple, low-cost, and lightweight polarized glasses.

PICTURE QUALITY:

Steve Wozniak, co-founder of Apple Computers, reacts to the demo of the HDI Ltd. laser-driven 3D TV by stating: "Without a doubt, this is the best demonstration of 3D technology I have ever seen."

HDI Ltd.'s 100-inch diagonal 2D/3D Switchable Dynamic Video Projection Display derives its stereoscopic 1,920 x 1,080p image quality from two patented RGB laser-illuminated Liquid Crystal on Silicon (LCOS) micro display imagers. HDI delivers 50% greater resolution than the public experiences in today's digital cinemas.

AVAILABILITY:

HDI Ltd. goes into limited production on their display units in November 2009. Press release here: <http://www.prthatrocks.com/pressrel/hdi3dproductionpr.htm> and also included in this report.

PART THREE: THE HDI STANDARD and THE FUTURE OF TELEVISION:

INTEL:

Years into an initiative to produce lower power consuming computer chips, Intel's Justin Rattner noted the importance of HDI Ltd.'s technology by inviting Edmund Sandberg, Chief Technology Officer and Chris Stuart, Director of Technologies, to present HDI Ltd. at the 2009 Intel Developers Conference, during Justin's keynote address, "The Future of Television." See the presentation at <http://www.youtube.com/watch?v=XmnjDhe28ZU>

HDI Ltd.'s participation in the Intel event was also covered by BBC.com. Article found here: <http://news.bbc.co.uk/2/hi/technology/8272003.stm> and also included in this report.

Correspondence to HDI from other Intel employees bears out the importance of energy efficiency: "One selling point that was mentioned, but may be even more increasingly important, is the extremely low power consumption. With the proposal, in California, to ban the sale of plasma displays due to their large current consumption, big screen viewing may be limited to only a few technologies, of which laser may be in the forefront. HDI is perfectly suited for this with your switchable 2D/3D 100-inch low power laser display."

PRESS RECOGNITION OF HDI LTD. AS "THE HOLY GRAIL":

Sean Portnoy of *ZDNet* states, "California (Los Gatos) startup HDI is already creating buzz with the 100-inch laser-based 3D HDTV it's been demoing. If the claims made by the company rep I corresponded with today turn out to be true, we could be looking at a Holy Grail of sorts for the next generation of television."

Read about HDI Ltd. in Sean's article, "More details on HDI's 100-inch laser 3D TV: more energy-efficient, lower cost, walks on water." <http://blogs.zdnet.com/home-theater/?p=1571> and also included in this report.

Read the *San Francisco Chronicle* report about HDI at: <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2009/09/21/BU1R19O5VC.DTL> and also included in this report.

Richard Hart of *KGO Television* saw the HDI Ltd. demonstration and states, "Take it from me, we've seen RealD, Dolby, Film, all kinds of 3D and this is the smoothest yet. And smoothness means no headaches." See his video report here:

http://abclocal.go.com/kgo/story?section=news/drive_to_discover&id=7013471

PART FOUR: CONCLUSION:

On September 3, the leading television manufacturers announced plans to introduce what will potentially be a new generation of 3D-capable "Humvee TVs" that will cost as much as three times more than current televisions and use 3 times more power. Again, for the record, we stress, that in light of what the computer companies, such as **Apple**, are producing with their energy efficient products, the efforts of the Consumer Electronics Association seem to be almost criminal in promoting technologies that the 'Grid', and the planet, simply cannot sustain.

In a *Wall Street Journal* article of October 8, 2009, included in this report, companies such as Panasonic, appear to be back-peddling on the aggressive "3D" push they began in the media on

September 3, 2009. In this article, Panasonic President Fumio Ohtsubo said it is a “very ambitious” undertaking to persuade people to make the switch to 3D and it may take “three to four years” before it starts to gain broader appeal.

Is California's new law, and the realization that inferior 3D plasma and energy-guzzling technologies, be the reason for Panasonic’s back-peddling in the *Wall Street Journal* article?

Is California's potential new law, and the realization that inferior 3D plasma and energy-guzzling technologies, be the reason why representatives from many of the major television manufacturers, Mitsubishi, Sony, Sharp, JVC, and Hitachi, were recently in Los Gatos, California, all together in one room, almost on the same date of the aforementioned *Wall Street Journal* article, to witness a new laser-driven, low-power and low cost television technology, with better than high-def 3D resolution?

Is this true? Is there about to be a major shift in the television manufacturing industry, in spite of the lobbying efforts of Consumer Electronics Association, to adopt a new low-power alternative to the "Pig Screen" flatscreen technologies?

Variety.com reported on this meeting on October 13 here: <http://www.variety.com/article/VR1118009890.html?categoryid=1009&cs=1> and also included in this report.

We applaud the California State Energy Commission for considering, with the seriousness it deserves, the need for new television energy consumption standards in a world threatened by global warming and a fraying electricity grid. Rather than stifle innovation, we believe the commission’s actions today can help the television manufacturing industry rise to the challenge of making televisions with the features and benefits people want and the planet can tolerate.

I have taken the liberty to attach additional technical specifications about HDI Ltd.'s ultra-energy efficient television technology and product talking points.

On behalf of everyone at HDI Ltd. thank you for your consideration in this matter.

Respectfully,
Ingemar Jansson, Co-Founder
Edmund Sandberg, Chief Technology Officer
Chris Stuart, Director of Technologies
David (DK) Sweet, Brand Development Consultant



Christopher Buttner, Media Relations, tel/voicemail: 415-233-7350, cell: 415-302-0839 and email: chris@prthatrocks.com

Report written by Christopher Buttner and edited by Christopher Buttner and David (DK) Sweet.

HDI System Specification (Rev 4)

Attribute	Specification
Product:	HDI 3DTV System
<i>System Type:</i>	HDI Peripheral Projection Technology
<i>Screen Size:</i>	70" - 100" Diagonal
<i>Aspect ratio:</i>	16 : 9
<i>Cabinet Depth:</i>	4" – 6"
<i>Light Source Type:</i>	Laser
<i>Picture Resolution:</i>	1920x1080p
<i>2D/3D:</i>	Built-in 3D Optical Engine Design allows seamless change from 2D to 3D
<i>Imagers:</i>	Dual Panel LCOS (x2) (Two Imagers provide 4M White Pixels)
<i>Imager Native Resolution:</i>	1920Hx1080V 2M Physical Pixels/Imager (x2)
<i>Picture Brightness:</i>	340 nits (100 Ft-L) Screen Gain = 1.6
<i>Picture Contrast Ratio:</i>	1500:1
<i>Engine Lumen Output:</i>	2400 - 4800 lumens

Laser Light Source

<i>Lasers:</i>	HDI RGB Laser Modules
<i>White Laser Power (Optical):</i>	9W (70") – 19W (100")
<i>RGB Laser Lifetime:</i>	20,000 hours
<i>Color Primaries:</i>	635nm, 532nm, 446nm
<i>Color Primary Passbands:</i>	< 2nm

Optical Engine

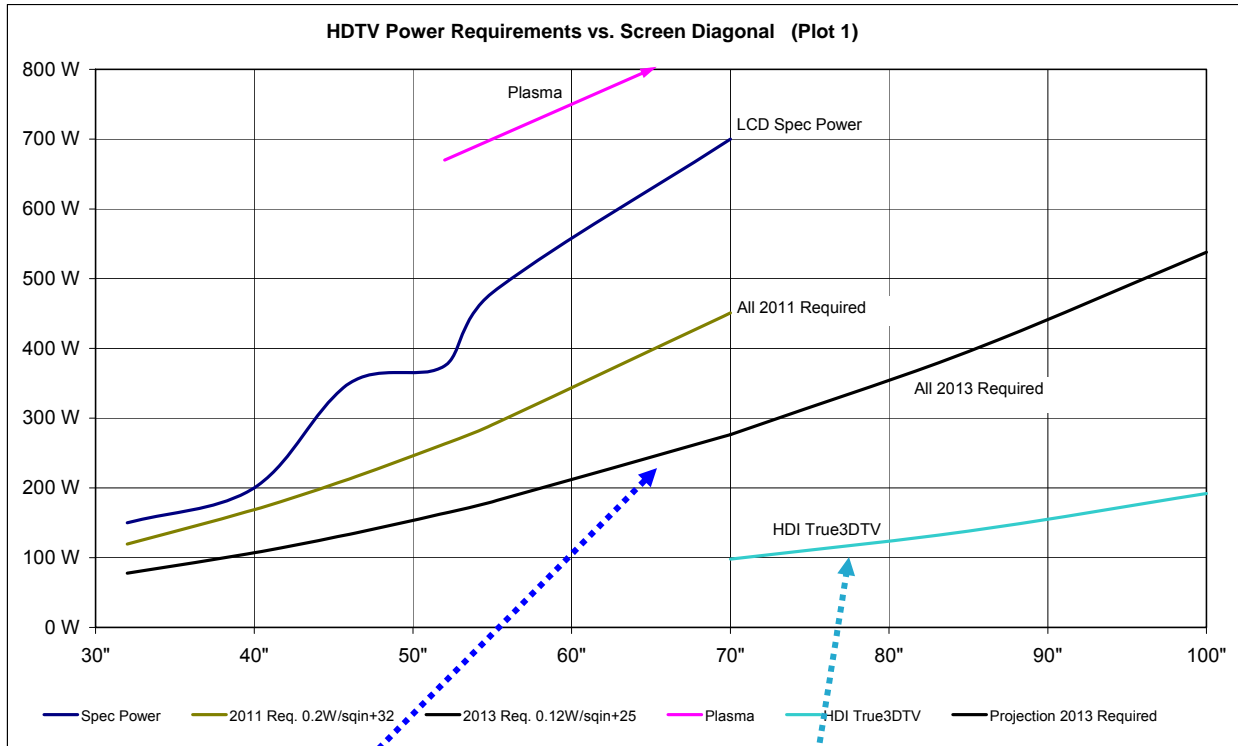
<i>Light Source:</i>	HDI Diode Laser Modules (RGB)
<i>Imagers Size:</i>	0.81" Diagonal 16 : 9
<i>Sequential Color Switching:</i>	Field-Sequential Slit-scanned
<i>Color Refresh Frames:</i>	360 Hz.
<i>Color Temperature:</i>	6500° K - 9800° K
<i>White point:</i>	TBD
<i>Color gamut:</i>	TBD
<i>Output Polarization:</i>	R _L G _L B _L = circular left R _R G _R B _R = circular right
<i>Lumen & Dark uniformity</i>	95%, 95%
<i>Image distortion & linearity</i>	0.2% & 0.3%
<i>Lateral color dispersion</i>	½ pixel
<i>Color convergence Error:</i>	None

3D

<i>3D Type:</i>	Polarization-based Field-Continuous Parallel Stereo Pair
<i>Separation Method:</i>	Passive Glasses, Polarization Preserving Screen
<i>Polarization Type:</i>	Circular polarization
<i>Active Components:</i>	None
<i>Stereo Resolution:</i>	2M pixel left-eye Imager + 2M pixel right-eye Imager provides 4M pixel stereo <u>without sequential switching</u> .
<i>Content Frames:</i>	60 left content frames/sec. + 60 right content frames/sec. Left and Right content frames exposed simultaneously

Power Consumption (See Plot 1 Below)

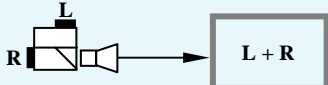



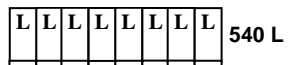
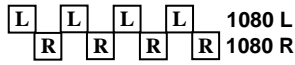
Total wall plug power: True3DTV (70"): **98 W** (100"): **190 W**
 Wall watts / screen sqft. 6.5 W / Sqft.
 Spec power comparison: LCD (70"): **700 W** Plasma (70"): **920 W**
 Power / sqft. comparison: LCD (70"): **50 W/Sqft.** Plasma (70"): **83 W/Sqft.**



CALIFORNIA 2013 ENERGY EFFICIENCY STANDARDS!

EXCEEDS CALIFORNIA 2013 ENERGY EFFICIENCY STANDARDS!

HDI 3DTV System
Competing 3D Systems Comparison

Attribute			
3D Product:	HDI 3DTV System	Interleaved 3D LCD Panel	3D Plasma, LCD & DLP
3D Technology:	L & R Continuous 3D (via HDI Peripheral Projection) Two separate full-res imagers integrated as one projector 	L & R Interleaved 3D (via structured panel polarizers) Panel pixels divided into two interleaved L & R groups 	L & R Sequential 3D (via electronic shutters) One sequential imager or flat panel switches to L then R image 
3D Native Resolution:	1920 x 1080p x 2 4M pixels continuous	1920 x 1080p 2M pixels continuous	1920 x 1080p 2M pixels sequential
3D Glasses:	Passive Polarized	Passive Polarized	Active Shuttered
3D Method:	Separate L & R images are continuously in view	Interleaved L & R images are continuously in view	L & R Images are sequentially switched into view
3D Performance Impact:	<u>No Loss</u> Full Resolution, Full Temporal	<u>Half Spatial Resolution Loss</u> Half Resolution, Full Temporal	<u>Half Temporal Resolution Loss</u> Full Resolution, Half Temporal
3D Content Density:	Content Frames  → 16 Frames Viewed	Content Frames  → 16 Frames Viewed	Content Frames  → 8 Frames Viewed
3D Total Content Density:	248M 3D pixels/sec Viewed	124M 3D pixels/sec Viewed	124M 3D pixels/sec Viewed
Physiological Factors			
3D Picture Brightness:	+50% No Polarization Loss	-50% Polarization Loss	-50% Sequential On-time Loss
3D Line Aliasing:	Minimal (1080 lines)	Significant (540 lines)	Moderate (1080 lines half-speed)
3D Frame Refresh:	360 Hz	120 Hz	120 Hz
3D Pair Timing Lag:	None	None	Significant (L-R Sequential Timing Lag)
3D Waste Spatial Frequency:	None	Interleaved image and panel structures	None
3D Physiological & Eye Strain Issues Summary:	None	High spatial frequency structures Line Aliasing Brightness Loss Slower frame Refresh	Sequential Timing Lag Line Aliasing Brightness Loss Slower frame Refresh

latimes.com/business/la-fi-bigtvs14-2009oct14,0,4908205.story

latimes.com

California appears poised to be first to ban power-guzzling big-screen TVs

Industry lobbying efforts appear to elicit little sympathy from the state Energy Commission, which may vote as soon as Nov. 4.

By Marc Lifsher

October 14, 2009

Reporting from Sacramento

The influential lobby group Consumer Electronics Assn. is fighting what appears to be a losing battle to dissuade California regulators from passing the nation's first ban on energy-hungry big-screen televisions.

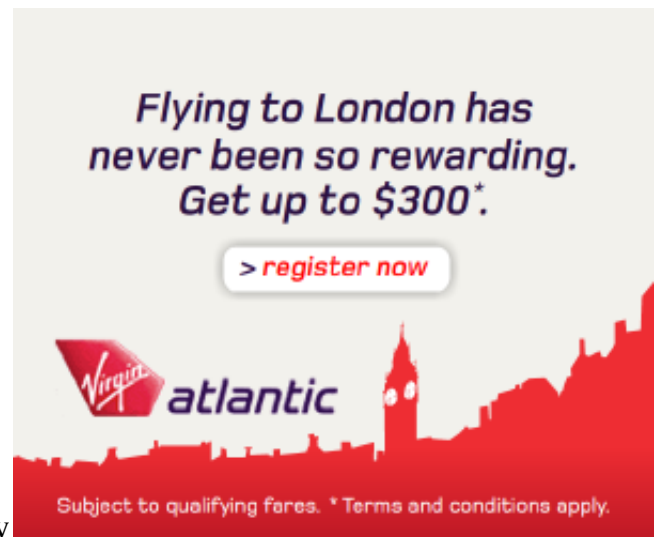
On Tuesday, executives and consultants for the Arlington, Va., trade group asked members of the California Energy Commission to instead let consumers use their wallets to decide whether they want to buy the most energy-saving new models of liquid-crystal display and plasma high-definition TVs.

"Voluntary efforts are succeeding without regulations," said Doug Johnson, the association's senior director for technology policy. Too much government interference could hamstring industry innovation and prove expensive to manufacturers and consumers, he warned.

But those pleas didn't appear to elicit much support from commissioners at a public hearing on the proposed rules that would set maximum energy-consumption standards for televisions to be phased in over two years beginning in January 2011. A vote could come as early as Nov. 4.

The association's views weren't shared by everyone in the TV business. Representatives of some TV makers, including top-seller Vizio Inc. of Irvine, said they would have little trouble complying with tighter state standards without substantially increasing prices.

"We're comfortable with our ability to meet the proposed levels and implementation dates," said Kenneth R. Lowe, Vizio's co-founder and vice president.



Last month, the commission formally unveiled its proposal to require manufacturers to limit television energy consumption in a way that has been done with refrigerators, air conditioners and dozens of other products since the 1970s.

"We would not propose TV efficiency standards if we thought there was any evidence in the record that they will hurt the economy," said Commissioner Julia Levin, who has been in charge of the two-year rule-making procedure. "This will actually save consumers money and help the California economy grow and create new clean, sustainable jobs."

Tightening efficiency ratings by using new technology and materials should result in "zero increase in cost to consumers," said Harinder Singh, an Energy Commission staffer on the TV regulation project.

California's estimated 35 million TVs and related electronic devices account for about 10% of all household electricity consumption, the Energy Commission staff reported. But manufacturers quickly are coming up with new technologies that are making even 50-inch-screen models much more economical to operate.

New features, such as light-emitting diodes that consume tiny amounts of power, special reflective films and sensors that automatically adjust TV brightness to a room's viewing conditions, are driving down electricity consumption, experts said.

The payoff could be big for TV owners, said Ken Rider, a commission staff engineer. Average first-year savings from reduced electricity use would be an estimated \$30 per set and \$912 million statewide, he said.

If all TVs met state standards, Rider added, California could avoid the \$600-million cost of building a natural-gas-fired power plant. Switching to more-efficient TVs could have an estimated net benefit to the state of \$8.1 billion, the commission staff reported.

Consumer Electronics Assn. officials disputed that figure, arguing that it was based on out-of-date numbers that fail to account for recent industry innovations. "With voluntary compliance, manufacturers can meet the targets over time, managing the cost impact, yet not in any way impeding innovation," said Seth Greenstein, an association consultant.

marc.lifsher@latimes.com

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The Mercury News

MercuryNews.com

Electronics industry fights proposal to regulate TV energy use

By Dana Hull
dhull@mercurynews.com

Posted: 10/24/2009 05:00:00 PM PDT

California's effort to regulate the energy efficiency of televisions has sparked an enormous backlash from the electronics industry, which is banking on consumers' love affair with large and multiple TV sets to defeat the proposal.

A newly formed coalition called Californians for Smart Energy, which represents small home theater businesses and larger electronics manufacturers, is fighting hard against the proposed regulations.

"Do you really want unelected bureaucrats telling you what kind of TVs you're allowed to buy?" asks the group's Web site.

California has 35 million televisions — about one for every resident of the state. The California Energy Commission, which could vote on the proposal as early as Nov. 4., says that TVs, as well as DVD players and cable boxes, now consume about 10 percent of a typical home's electricity. But the amount of electricity that TVs suck from the power grid is rising because of the growing popularity of power-hungry flat-screen LCD and plasma TVs, and because many households have more than one television.

The proposed standards would apply only to new TVs with a screen size of 58 inches or less sold in California after Jan. 1, 2011.

The love affair between Americans and their televisions is well-documented. Nielsen Media Research has found that the average American home has more television sets than people; half of all homes have three or more TVs. And a study by the Kaiser Family Foundation found that one in four children under the age of 2 has a television set in their bedroom.

The Consumer Electronics Association argues that the new regulations are unnecessary and will limit consumer choice.

"The television is the hearth of the modern home," said Doug Johnson, senior director of technology policy for the CEA, who flew to Sacramento from Washington to lobby against the proposed regulations last week. "If you turn off your lights to watch TV or a movie, you're probably saving more energy than the TV consumes."

Johnson and others also argue that the regulations, if approved, will cost California jobs and much-needed dollars as consumers rush to Nevada or online retailers to buy the TVs they want.

Adam Gottlieb, a spokesman for the energy commission, dismissed the notion as nothing more than scare tactics.

"If you take a road trip to Reno, you'll be able to buy a TV that costs you more money in your utility bill," said Gottlieb. "Why would someone go out of their way, and spend gas that costs \$3 a gallon, to buy an inefficient television?"

The American Council for an Energy Efficient Economy ranks California as the most energy-efficient state in the country, a reputation Sacramento is largely proud of. The state's energy commission says the proposed regulations on new TVs will generate an estimated 6,515 gigawatt hours

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(GWh) in annual energy savings, or enough to power 864,000 single-family homes annually in California.

Peter Fannon, vice president of corporate and government affairs at Panasonic, said the regulations are cumbersome.

"We don't want regulations microdesigning products," said Fannon. "Today's typical mid-size flat-panel TV is vastly more efficient than the old CRT tube television sitting on your shelf."

One manufacturer, Visio, has gone on record supporting the regulations and says several of its LCD model televisions already meet the proposed standards.

Instead of regulation, Fannon would love to see California implement something along the lines of the federal Cash for Clunkers program, where consumers could trade in an old car and get credit toward the purchase of a new one.

"We make and sell TVs, so we're happy if consumers buy TVs," said Fannon. "We'd much rather help consumers get rid of their old TV, responsibly recycle it and help them make a smart decision about a new TV."

But so far, there's no Cash for Clunker TVs program under discussion.

"We understand how passionate people are," said Gottlieb of the energy commission. "California has a proud and distinguished record of using efficiency standards to save money and energy. We're trying to save you money and energy."

Contact Dana Hull at 408-920-2706.

Numbers to know

California has

35 million televisions. Under proposed regulations, new televisions sold in California would be required to use 30 percent less electricity by 2011 and

50 percent less by 2013.

The California Energy Commission estimates the regulations would save the state \$8.1 billion by 2021.

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For Immediate Press Release

For more info, please contact:

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[To download the HDI LTD., 3D Technology press release as a WORD document, please click here.](#)

HDI Ltd. Reveals 3D Projection Display Technology with Greater Than High-Definition Resolution Revolutionary Laser-Driven Technology Uses 80% Less Power and Costs 60% Less Than Existing Flat Screens

September 3, 2009: Los Gatos, California – Research and design firm HDI Ltd., announces the release of its laser-driven 3D projection display technology with a **Greater Than High-Definition Resolution**. Among the first products to emerge from over three-years of intensive R&D is HDI Ltd's 100-inch diagonal 2D/3D Switchable Dynamic Video Projection Display that derives its stereoscopic 1,920 x 1,080p image quality from two RGB laser-illuminated Liquid Crystal on Silicon (LCOS) micro display imagers. HDI's 2D/3D Switchable Dynamic Video Projection Display, at a mere 10-inches thick, draws 80% less power than existing 2D flatscreen plasma monitors of the same size, and HDI projection displays are anticipated to have a street price potentially 60% less than current 2D flatscreen plasma displays.

Click on image below to enlarge or download high-res version for print publication.



Co-founder and Chief Scientist Edmund Sandberg, left, Co-founder Ingemar Jansson, center, and Director of Technology Chris Stuart, right.



Previewed over four months to several dozen invitation-only observers, early reports indicate an enthusiastically positive consensus.

Says HDI Ltd., co-founder Ingemar Jansson, "We believe our patented technology is the only one offering the visual quality consumers will demand in order for 3D to become a permanent fixture in home entertainment any time soon."

Jansson chose to announce HDI's new technology after learning several months ago of another company preparing to offer consumers a cable channel with 3D content through technology viewers already say is visually "5 on a scale of 10." Continuing, Jansson says, "Offering people disappointing, cheap 3D virtually guarantees yet another false start for 3D

in the home. Ultimately, that's going to set the entire entertainment industry back - again." Jansson even has a term for over-hyped 3D technology that disappoints consumers: "We call it 'two and a half D,'" he quips.

Comments like these indicate HDI's technology yields considerably more enthusiasm than the others that are vying for the home theater market. Stressing that HDI's technology will be considerably more than affordable to create a mass market, Jansson claims, "It costs \$4 billion to get a large screen plasma or LCD plant on line. Our technology will require five percent of that investment to produce HDI 2D/3D Switchable Dynamic Video Projection Displays

in quantity."

But what about 2D? According to HDI's chief scientist Edmund Sandberg, HDI's current technology easily enables 2D playback at a resolution higher than current HD standards. "We've already achieved effective resolution of 1,080p per eye resolution for 3D with deep color saturation that looks incredible in a well-lit room," Sandberg claims. "In 2D mode, by slightly overlaying the two pixel arrays we're getting an effective pixel resolution of around 3k, which is 50% greater than today's digital cinema resolution. No one else is even close to that," Sandberg states as a matter of fact.

Because Jansson is in talks with a number of entities representing Hollywood, gaming, home theater, medical, and national defense, his silence regarding pending deals is understandable. The one thing he isn't silent about is the so-called "3D Explosion" hyped in a March 2009 issue of *Time Magazine* (<http://bit.ly/1aivNu>).

Jansson concludes his remarks with a warning and a promise. "If the early adopters in the home theater market experience 3D as the cheap trick, as described in the March 2009 *Time Magazine* article, 3D demand is going to be killed off for years. We have too much invested to let that happen without a fight."

For additional information, to arrange an interview with Ingemar Jansson or Edmund Sandberg, or to arrange a demonstration of HDI Ltd's 3D HD display technology, please contact Christopher Buttner, contact info above.

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HDI Ltd. Begins Manufacturing of High-Definition Laser-Driven 2D/3D Televisions Low-Cost, Extremely Energy Efficient 100-inch Diagonal Displays Fast-Tracked for 2010

October 30, 2009 – Los Gatos, CA - HDI Ltd. announces it has entered into a manufacturing agreement to mass produce their proprietary 100-inch diagonal Laser-Driven 2D/3D Switchable Dynamic Video Projection Televisions. HDI Ltd.'s 2D/3D switchable system delivers a stunningly superior 2D image, with a 50% greater resolution than today's digital cinemas, and derives its greater-than-high definition stereoscopic 1920 x 1080p "3D" image quality from two RGB laser-illuminated Liquid Crystal on Silcon (LCOS) micro display imagers. At full 1080p HD, the HDI Ltd. screen refreshes at 360 fields per-second on each eye, the fastest refresh rate on any mass produced television or projector.

HDI Ltd. has completely eliminated the adverse effects, such as migraines, dizziness, nausea, and motion sickness, long associated with inferior and expensive shutter glasses and substandard 3D technology. HDI Ltd. delivers the most immersive, comfortable, and natural 3D viewing experience in the world with low-cost and light-weight proprietary polarized glasses. Technology journalist Richard Hart called HDI Ltd.'s picture quality, "[the smoothest yet, and smoothness means no headaches,](#)" and Steve Wozniak, co-founder of Apple Computers, stated, "Without a doubt, the best demonstration of 3D technology I have ever seen."

Click on image below to enlarge or download high-res version for print publication.



Co-founder and Chief Scientist Edmund Sandberg, left, Co-founder Ingemar Jansson, center, and Director of Technology Chris Stuart, right.



In addition, HDI Ltd. displays draw 80% less power than existing 2D plasma displays of the same size, offer a 95% reduction in manufacturing pollution, and a 100% reduction in harmful chemicals and radioactive components currently used in existing televisions. At 10-inches thick, HDI's 100-inch diagonal display weighs 75% less than equivalent Plasma and LCD displays, and is anticipated to have

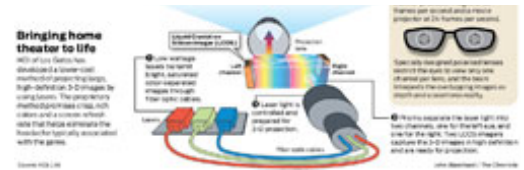


Top execs, engineers and S3D experts from six of the eight leading television manufactures recently crowded together into HDI Ltd.'s tiny Los Gatos lab to see their prototype 100-inch, rear-projection S3D television.

The two men wearing goggles are projected at an astounding rate of 360 images per second for a 3D image. The man in the center is wearing a 3D image in his hand. A standard color monitor is visible in the background.

a street price potentially 60% less than current 2D flatscreen Plasma and LCD displays.

HDI's September 2009 announcement of their potential new standard for switchable 2D/3D television technology came on the same day several major manufactures announced plans to release new energy-guzzling plasma televisions with 3D capabilities via shutter glasses, all of which featured price tags as much as 100% or more than current 2D televisions.



At full 1080p HD, the HDI Ltd. screen refreshes at 360 fields per-second on each eye, the fastest refresh rate on any mass produced television or projector.

HDI Ltd. quickly caught the interest of the consumer electronics industry and, as reported on [Variety.com, top execs, engineers and S3D experts from six of the eight leading television manufactures recently crowded together into HDI Ltd.'s tiny Los Gatos lab to see their prototype 100-inch, rear-projection S3D television.](#)

[David Cohen of Variety.com](#) reported, "HDI's approach shows the promise of laser-driven 3D TV could be a reality surprisingly soon," and [Sean Portnoy of ZDNet](#) said, "We could be looking at a Holy Grail of sorts for the next generation of television."

According to co-founder Ingemar Jansson, "The first production-run of 100-inch HDI Ltd. 2D/3D switchable displays should quickly put product into a multitude of B2B and public demonstration venues." He's mum as to when leading American retailers will be able to put units into homes, but stresses that the simplistic and inexpensive design and manufacturing techniques required to produce HDI Ltd. televisions, "will have product in the marketplace faster than one would expect," and adds, "either with the HDI logo or that of another leading manufacturer."

Offering a thought on the fact that [California appears poised to be the first state to ban power-guzzling big-screen TVs](#), Jansson states, "In light of the energy efficient products emerging from companies such as [Apple](#), the lobbying efforts of the Consumer Electronics Association strikes me as almost criminal in promoting antiquated technologies that the 'Grid', and the planet, simply cannot sustain."

For additional information, to arrange an interview with Ingemar Jansson or to arrange a demonstration of HDI Ltd's 3D HD display technology, please contact [Christopher Buttner](#), contact info above.

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Future is TV-shaped, says Intel

By Maggie Shiels
Technology reporter, BBC News, San Francisco

By 2015 more than 12 billion devices will be capable of connecting to 500 billion hours of TV and video content, says chip giant Intel.

It said its vision of TV everywhere will be more personal, social, ubiquitous and informative.

"TV is out of the box and off the wall," Justin Rattner, Intel's chief technology officer, told BBC News.

"TV will remain at the centre of our lives and you will be able to watch what you want where you want."

Mr Rattner said: "We are talking about more than one TV-capable device for every man and woman on the planet.

"People are going to feel connected to the screen in ways they haven't in the past."

Speaking at Intel's Developer Forum (IDF) in San Francisco, he said the success of TV was due to the growing number of ways to consume content.

Today that includes everything from the traditional box in the corner of the living room to smartphones, laptops, netbooks, desktops and mobile internet devices.

Continuing the theme, Malachy Moynihan, Cisco's vice-president of video product strategy, told IDF attendees to expect an explosion of content for such devices.

"We are seeing an amazing move of video to IP (internet) networks," he said. "By 2013 90% of all IP traffic will be video; 60% of all video will be consumed by consumers over IP networks."

Infinite choice

Developers keen to tap into this growth were told by Eric Kim, Intel's digital home group boss, to "keep it simple and easy".

"Don't make my TV act like a PC. This is what we hear consistently from the consumer," said Mr Kim. "The key challenge is how to bring the power and richness of the internet but keep it TV simple."

Mr Kim unveiled some hardware Intel hopes developers will adopt to make more devices TV capable.

He showed off the Atom CE4100 system-on-a-chip (SoC) that can be used to bring internet content and services to digital TVs, DVD players and advanced set-top boxes.

Codenamed Sodaville, it is the first 45 nanometre manufactured consumer electronics SoC based on Intel architecture.

IDF attendees also heard from speakers about what promises to be a new kind of TV experience as broadcast content, video content, internet content and personal content is all blended together.

Eric Huggers, director of the BBC's Future Media and Technology, who has driven development of the iPlayer, said: "It's about unlocking a whole raft of new capabilities and services.

"Think of TV as an opportunity to give consumers a gateway to infinite choice," he added.

IMAX quality

Mr Rattner also took time to highlight another technology gaining ground - 3D TV.

"It seems like there is an announcement every week on 3D," he told the audience.

He said he planned to use a high-definition TV during his presentation but changed his mind when he heard about a Silicon Valley start up called HDI.

HDI claimed a world first with the launch of its 100in (2.5m) 3D laser set in early September.

Big manufacturers such as Sony and Panasonic have announced plans to release 3D TV sets in 2010, while Samsung and Mitsubishi have recently released their products.

Speaking in early September at the IFA consumer electronics show in Berlin, Howard Stringer, Sony's chief executive, said: "3D is clearly on the way to the mass market. The train is on the track and Sony is ready to drive it home."

Analyst firm Screen Digest forecasts 1.2 million 3D capable sets in American homes by the end of 2010. That figure is expected to rise to 9.7 million, or 8% of households, by 2013.

Fading fast

To drive home the point about 3D, Mr Rattner's presentation incorporated a live 3D broadcast.

While he was inside the auditorium, Mr Rattner spoke to a 3D projected version of Howard Postley, technology boss of 3ality Digital, who was outside in the hallway.

The two men talked about a new high-speed optical technology from Intel codenamed Light Peak aimed at speeding and simplifying the complexity and cost of digital downloads.

The conference was told that 50 copper-based cables on the set of a 3D shoot today may one day be replaced with a single optical cable that can use Light Peak technology.

Intel hopes to start shipping Light Peak in 2010.

The overall 3D market is expected to grow to an estimated \$25bn (£15.6bn) by 2012 according to the research firm Piper-Jaffray.

"The old TV world is fading fast and the future is here," said Mr Rattner.

Story from BBC NEWS:
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/8272003.stm>

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Home Theater

Sean Portnoy

September 21st, 2009

More details on HDI's 100-inch laser 3D TV: more energy-efficient, lower cost, walks on water

Posted by Sean Portnoy @ 7:12 pm

California startup HDI is already creating buzz with the 100-inch laser-based 3D HDTV it's been demoing. If the claims made by the company rep I corresponded with today turn out to be true, we could be looking at a Holy Grail of sorts for the next generation of television.

According to the spokesperson, the set draws 80-percent less power than a 100-inch plasma, which equates to 200 watts instead of 1.5 kilowatts. More green claims about HDI technology: It reduces manufacturing pollution by 95 percent and offers a 60-percent cut in chemical and radioactive materials compared to current HDTV manufacturing. HDI also says that its technology could be used by a third-party manufacturer to create the laser set that would have a street price 60-percent lower than an equivalently sized plasma. Of course, that plasma would set you back 50 grand, more or less, so you wouldn't be an 100-inch HDI-powered TV at Wal-mart, but the manufacturer could create a smaller set (say, 65 or 70 inches) with a market that wouldn't exclusively be multimillionaires. As for such a manufacturers, HDI would not comment on if it was in discussion with any to actually produce this set commercially.

The HDI prototype's most eye-popping spec is its 1080Hz refresh rate, which means that over 1,000 frames per second are being sent to each eye (for the brain to pull together as the 3D effect). The rep claims that it solves the issues with shutter-based 3D glasses, such as the nausea and headache that some people suffer from after watching 3D video using slower refresh rates. I guess it would be a (literal) case of seeing is believing.

HDI has been invited to be part of Intel CTO Justin Rattner's keynote address on the future of television at the upcoming Intel Developers Conference later this week. The company also quotes Steve Wozniak's reaction to a demo of the laser 3D TV: "Without a doubt, this is the best demonstration of 3D technology I have ever seen." The question that remains for the rest of us is when will the viewing public get a demonstration of the technology in the form of a set it can purchase.



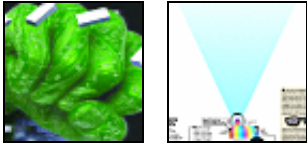
Sean Portnoy spent several years as an editor at Computer Shopper magazine, most recently serving as online executive editor. See his full profile and disclosure of his industry affiliations.

Email Sean Portnoy

3-D TV is coming soon to your living room

Ryan Kim, Chronicle Staff Writer

Monday, September 21, 2009



(09-20) 17:30 PDT -- With the price of high-definition TVs sliding, display manufacturers are looking to 3-D in the home to drive the next big video experience.

Heavyweights Sony and Panasonic have announced plans to release 3-D television sets next year, while other major players such as Samsung and Mitsubishi have recently released 3-D-ready TVs. LG and Philips are also preparing for a 3-D future.

Add to that list of titans a small Los Gatos startup called HDI, which hopes it can help shape this emerging market.

HDI came out of stealth mode earlier this month to show off its 3-D laser projection technology, which it says provides a better quality image using simple polarized glasses.

The company, which has been self-funded, is hoping to license its technology or build its own front-projection systems and flat-panel displays. HDI says its technology consumes less power and costs less than comparable systems.

"With our technology, we hope to raise the bar of what's available now," said Chris Stuart, director of technology at HDI. "We're trying to give the quality of IMAX in the home."

HDI's hopes reflect a larger optimism about the 3-D market. Hardware manufacturers hard-pressed by the commoditization of HD displays have cast an envious eye at the success of 3-D movies, which command a 40 percent premium on ticket prices and yet are outselling their 2-D counterparts.

The hope is to replicate that success in the living room, giving consumers a new reason to open up their wallets.

"This is a massive opportunity for consumer electronics manufacturers and studios to drive sales of TV sets and hardware and sustain, if not boost, the prices of Blu-ray discs," said Marie Bloomfield, an analyst with Screen Digest, a media research company.

Blu-ray discs will be necessary because they have the capacity to handle 3-D content, which can't be contained on traditional DVDs.

Screen Digest is forecasting 1.2 million 3-D-capable sets in U.S. homes by the end of next year, but that number is expected to rise to 9.7 million - or 8 percent of households - by the end of 2013.

Sony CEO Howard Stringer earlier this month showed off a 3-D Bravia display at the IFA consumer electronics show in Berlin, saying the company was poised to lead the 3-D revolution.

'On the way'

"3-D is clearly on the way to the mass market," he said. "The train is on the track and Sony is ready to drive it home."

Sony, Panasonic and others are pushing a standard of delivery that utilizes active shutter glasses. The powered lenses block each eye alternately with the display to create two images.

The industry is hoping to quickly rally around new standards for 3-D delivery, preventing a potential format war that could frustrate adoption. The Blu-ray DVD Association is expected to finalize a standard in the coming year that will help usher in a new wave of Blu-ray DVD players and TVs.

It's against that backdrop that HDI is trying to gain some attention.

HDI combines lasers with a propriety optical engine that can project images to both eyes at 1080 hertz. After separating the picture into three colors, the image reaches each eye at 360 frame refreshes per second, about six times that of a competing 3-D television. That in turn smooths out the image and reduces flickering and some of the nausea-inducing effects of previous generations of 3-D.

Using lasers is more efficient, which cuts down on energy consumption, said HDI. An HDI projection system can power a 100-inch image for less than 200 watts while a comparable plasma display consumes more than 1,000 watts. And with HDI's technology, users only need to wear cheap polarized glasses that separate the image for each eye as opposed to shutter glasses, which can cost \$100 or more.

"We're really trying to create a system that's comfortable for the user," said HDI Chief Technology Officer Edmund Sandberg.

Lower cost

He said the company can work with whatever standard is approved but is concentrating on larger screens, 70 inches or more, which produce a more immersive effect. With a front or rear projection system, HDI can produce a 100-inch image for about \$10,000 to \$15,000, far less than a comparable plasma TV, which can sell for several times that.

Sandberg said the company is working on projection sets now but can fit the technology into enclosed displays. HDI expects to have its technology ready for production in the next 18 months.

HDI and others still face a number of challenges aside from the standards question. Even with 30 3-D movies released this year, there is not much content available in 3-D. Aside from new movies filmed in 3-D, the studios won't have a big incentive to do the costly work of converting old 2-D movies until the installed base of 3-D TVs grows considerably.

Cable and consumers

Cable and satellite providers in the United States will also need to sort out how to transmit a 3-D signal, which can require twice the bandwidth of a 2-D video.

And getting consumers to buy new 3-D sets and Blu-ray DVD players can be a tough sell - in good or bad economic times - especially because many people recently stepped up to HD and Blu-ray.

"Over the next two years it's really a small marketplace," said Paul Gagnon, director of North America TV research for Display Search, a research firm. "But that's the imperative for TV makers, to find some way to innovate, and 3-D is one of the more promising avenues."

E-mail Ryan Kim at rkim@sfgchronicle.com

<http://sfgate.com/cgi-bin/article.cgi?f=/c/a/2009/09/21/BU1R19O5VC.DTL>

This article appeared on page **ED - 1** of the San Francisco Chronicle

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MARKETPLACE

Panasonic Cites Hurdles for 3-D TV

Sales Could Stall as Consumers Absorb Flat Screens; Maker Focuses on Offsetting Yen

By DAISUKE WAKABAYASHI

TOKYO—Even as the electronics industry pushes televisions for watching three-dimensional videos as a future growth area, **Panasonic Corp.** acknowledged that it will be challenging to get consumers to upgrade to 3-D sets so soon after many purchased new flat-screen TVs.

The electronics company also said it is sourcing more components from places where the currency is tied to the U.S. dollar to offset the strength of the Japanese yen, which it said was putting the company at a disadvantage to rivals, particularly from South Korea.

Japanese electronics makers, along with South Korean rivals Samsung Electronics Co. and LG Electronics Inc., see 3-D as the next major technological breakthrough to spur sales of televisions and Blu-ray players, similar to how high-definition video helped to drum up demand for liquid-crystal-display and plasma televisions.

Viewing Habits

However, there is still only a limited amount of 3-D content, and consumers would need to change viewing habits, since the televisions require special glasses to enable the 3-D effect. The new televisions will also be more expensive than conventional models.

Panasonic President Fumio Ohtsubo said it is a "very ambitious" undertaking to persuade people to make the switch to 3-D and it may take "three to four years" before it starts to gain broader appeal.

Panasonic has said it plans to introduce a 3-D TV next year.

Osaka-based Panasonic says 3-D looks better on plasma displays, and the company sees the technology as a strategic way to keep plasma televisions in demand to counteract widespread adoption of LCD televisions.

Sony Corp. is also making a big push into 3-D with LCD televisions.

Last month, Sony Chief Executive Howard Stringer said the



Panasonic plans to launch a 3-D television next year. Above, a woman views a model of the electronics maker's 50-inch plasma display panel TV last month.

company plans to introduce its own 3-D television in 2010.

He also said Sony will put 3-D compatibility into many of its devices, including its PlayStation 3 game console.

Speaking to reporters at an event during Japan's CEATEC electronics show, Mr. Ohtsubo said the company is currently focused on large 3-D televisions, but it expects many future innovations within the field, such as

smaller TVs and even portable devices for 3-D video.

"In the beginning, we think glasses are a must, but in the future, we think that we can enjoy 3-D content without glasses," said Mr. Ohtsubo.

Upgrading Old TVs

Even without 3-D televisions, Panasonic expects to increase shipments of plasma-display and LCD televisions by 54% in the fis-

cal year to March 31, as consumers continue to upgrade from their older TVs.

But Panasonic's big push into 3-D comes amid heavy losses at its main consumer-electronics business, which has been pressured by price competition.

In August, Panasonic reported a net loss of 52.98 billion yen, or about \$596.6 million at current rates, for the April-June period.

Like other companies, Pana-

sonic has seen its results pressured by the strengthening yen, which makes TVs and other devices more expensive when exported for sale to consumers in other countries.

Hitoshi Otsuki, a senior managing director in charge of Panasonic's overseas business, also cited the weak South Korean won, which he said puts Panasonic at a 25% price disadvantage to South Korean makers.



http://www.variety.com/index.asp?layout=print_story&articleid=VR1118009890&categoryid=1009

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Posted: Tue., Oct. 13, 2009, 8:00pm PT

Laser TV's future: a big step forward

HDI more energy efficient compared to plasma

By [DAVID S. COHEN](#)

Since laser video was first proposed in 1996, it has been a tech holy grail, especially for stereoscopic 3D (S3D).

Laser-driven projection TVs, in theory, are supposed to deliver huge size, brilliant color, long life and low power consumption in a cheap, thin box.

Mitsubishi introduced its LaserVue projection set about a year ago, which delivered on some of those promises. Recently, though, *Daily Variety* got a peek at a laser TV system that represents a leap forward from the Mitsubishi sets in size, speed and 3D capability.

And so, too, did a group of top execs from consumer electronics makers.

Engineers and S3D experts from Sony, Sharp, JVC, Hitachi and even Mitsubishi crowded into a workshop in Los Gatos, Calif., last week to see a prototype 100-inch, rear-projection S3D television from startup HDI. That's far bigger than Mitsubishi's 65-inch LaserVue.

The light for HDI sets comes from a trio of small red, green and blue lasers. The red and blue are off-the-shelf parts, but HDI had to develop the green to meet its specs.

As promised, HDI's design is energy efficient, no small thing with California eyeing power consumption limits for TVs. HDI's 100-inch prototype draws 190 watts. Today, an Energy Star-qualified 50-inch Panasonic plasma pulls 388 watts. Overall, HDI promises 80% power savings compared to plasma.

It's also fast. For S3D, at full 1080p HD, the screen refreshes at 360 fields per second on each eye. Today's state-of-the-art consumer sets are touting the smooth picture they get from speedy 240 hz, but that's for 2D;

they can only do 120 hz per eye for S3D.

Mitsubishi's laser TVs are only 120 hz for 2D, and while they can be adapted for S3D, they're not built for it. Mitsubishi's sets need expensive shutter glasses and an infrared emitter for S3D. HDI uses less expensive polarized glasses similar to RealD's.

For a projection system, HDI's approach is compact, too, though not as thin as flatscreens. Their goal is to make their 100-inch diagonal screen fit in a cabinet just 10 inches deep, and to keep that 10:1 ratio at any size.

Last but not least, its sets should be cheap -- compared to plasma, anyway. They promise their sets will cost just 40% of the same size plasma; they estimate \$10,000-\$15,000 for a consumer version of that 100-incher with costs dropping as volume increases. Moreover, they say, a plant to manufacture their system would need just 5% of the investment for a plasma plant, and would be greener to boot.

HDI hopes someone, even Mitsubishi, will buy their tech in hopes of leapfrogging the LaserVue. They say they could be in production in as little as 24 months.

Even if no one bites on HDI's approach it shows the promise of laser-driven 3D TV could be a reality surprisingly soon.

There's been plenty of gloom about the state of the visual effects business in California, which lacks tax incentives and has high labor costs. Some vfx companies have looked to diversify, emulating Lucasfilm's portfolio, which includes feature films, games, animation and vfx.

But George Lucas said his company has been thriving because it resisted the temptation to diversify further.

"That word 'diversification' makes Harvard Business School logic but in the real world, we're better off doing what we know how to do, and protecting what we have," Lucas said.

Speaking about the contributions of Lucasfilm prexy Mich Chau, who was profiled in *Variety's* Women's Impact Report, Lucas credited her with resisting temptations to get into new businesses in search of quick money.

As a result, he said, "We're in unbelievably good shape," and Lucasfilm even benefited from the recession.

By contrast, ILM rival Digital Domain *is* diversifying, expanding to Vancouver and Florida, ramping up internal project development and eyeing its own animation productions. DD Florida will also pursue military training and simulation projects.

DD's move into military work doesn't really point the way to a new revenue stream for showbiz companies, though, according to Eric Haseltine, president, Haseltine Partners and an expert on the intersection of military and entertainment tech.

"Hollywood companies aren't going to want to do business with the government," Haseltine said. "It's such a pain in the ass. All the contracting and the certifications and the accounting standards and EEOC requirements and subcontractor requirements and federal acquisition regulations, it's a nightmare that only

special companies that live and breathe military contracts want to get into. There's no percentage in it."

Read the full article at:

<http://www.variety.com/article/VR1118009890.html>

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www.hdi3d.com

Press Contact: Christopher Buttner – 415-302-0839 – email: chris@prthatrocks.com

HDI Ltd., High-Def 3D Technology Talking Points

Imagine an 80% reduction in global television electricity consumption.

Imagine a 95% reduction in television manufacturing pollution and expense.

Imagine a 60% reduction in harmful chemicals and radioactive components used in the manufacture of existing television technologies.

Imagine a 60%-plus price decrease in large-scale television technologies, 60-inches diagonal and larger.

Imagine a laser-driven 2D image resolution on a home television that delivers 50% greater resolution than today's digital cinemas.

Imagine that this television is a switchable laser-driven technology that delivers stereoscopic 1,920 x 1,080p for high-definition 3D image playback in the home.

Imagine being able to watch this kind of video playback with no adverse effects, such as headaches or nausea.

Imagine that leading television manufacturers can tool-up and have these televisions in production and in the marketplace in under 24-months.

Imagine a 95% reduction in the expense of the tools required to create and capture 3D HD content.

Imagine the increased revenue from content production, DVD, and delivery infrastructure.

Imagine the dramatic reduction in content piracy.

Imagine no more.

On September 3, 2009, research and design firm HDI Ltd., announced what will potentially become the new standard in laser-driven home 3D projection display technology that has a *Greater Than High-Definition Resolution*.

On the same date, leading manufacturers announced that they are rushing 3D televisions to the home market in 2010... without a standard for home 3D video content delivery in place.

These 3D televisions are anticipated to use 3 to 5-times more electricity than current television technologies and they are anticipated to cost 2 to 3-times more than current 2D televisions.

They are, essentially, offering delivery of the Hummer of Televisions to an energy-strapped world that cannot afford such shortsightedness.

They will use antiquated and ineffective 3D video technologies that will deliver disappointing and cheap 3D that will virtually guarantee yet another false start for 3D in the home.

Ultimately, that's going to set the entire 3D entertainment industry back - again.

HDI is confident that its patented technology will become the industry standard to offer the visual quality consumers will demand in order for 3D to become a permanent fixture in home entertainment in the very near future.

For a demonstration of HDI Ltd.'s revolutionary laser-driven television technology, please contact Christopher Buttner, at 415-302-0839 or email at chris@prthatrocks.com