June 3, 2011

ACTION

Buy

Universal Display Corp. (PANL)

Return Potential: 35%

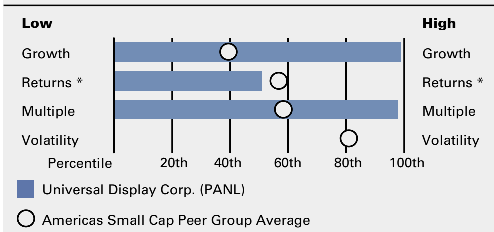
Equity Research

Improving visibility for OLEDs: Initiate on PANL with a Buy rating

Source of opportunity

We are initiating coverage of Universal Display (PANL) with a Buy rating and a 12-month price target of $55, representing 35% upside. We think Universal Display's technology leadership and its critical position in the fast-growing OLED display market will enable the company to produce compounded annual revenue growth near 60% from 2010 to 2015, with significant operating leverage in the business model. Although valuation appears high on near-term numbers and expectations are fairly elevated, we think the fundamental outlook for Universal is strong, with our estimates biased to the upside, supporting our Buy rating.

Investment Profile



* Returns = Return on Capital. For a complete description of the investment profile measures please refer to the disclosure section of this document.

Catalyst

Increasing adoption of OLED technology in the display and lighting markets should fuel Universal Display's growth. For the near term, signing of long-term commercial agreements with Universal's display partners (specifically with Samsung Mobile Display), the introduction of additional OLED production capacity, product announcements with OLED displays, and steady execution will be key catalysts for the stock. The longer-term move of OLED displays into IT applications and the TV segment, as well as growth in the general lighting market, should provide a healthy tailwind.

Key data	Current
Price ($)	40.66
12 month price target ($)	55.00
Market cap ($ mn)	1,844.4
Dividend yield (%)	0.0
Net margin (%)	(7.7)
Debt/total capital (%)	0.0

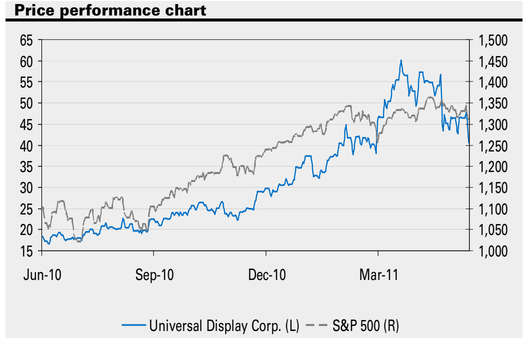
	12/10	12/11E	12/12E	12/13E
Revenue ($ mn)	30.5	48.7	98.8	168.1
EPS ($)	(0.26)	(0.08)	0.72	1.81
P/E (X)	NM	NM	56.8	22.5
EV/EBITDA (X)	NM	NM	38.4	15.2
ROE (%)	NM	NM	10.4	22.6

	3/11	6/11E	9/11E	12/11E
EPS ($)	(0.08)	(0.06)	(0.02)	0.06

Valuation

Our 12-month price target of $55, representing 35% upside, is based on our DCF analysis. Our price target implies a 27X multiple of our CY2012 sales estimate of $98.8 million, a 77X multiple on our CY2012 EPS estimate of $0.72, and a growth-adjusted P/E of 1.2X.

Price performance chart



Key risks

Slower adoption of OLED displays, lower royalty rates, and challenges to the company's IP are fundamental risks to the downside. Given these risks, the high volatility in PANL shares, and ongoing licensing negotiations, PANL shares may be more suitable for investors with higher risk tolerance.

Share price performance (%)	3 month	6 month	12 month
Absolute	1.5	50.7	121.7
Rel. to S&P 500	1.2	40.2	85.5

Source: Company data, Goldman Sachs Research estimates, FactSet. Price as of 6/02/2011 close.

INVESTMENT LIST MEMBERSHIP

Americas Buy List

Coverage View: Neutral

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Universal Display Corp.: Summary Financials

Profit model ($ mn)	12/10	12/11E	12/12E	12/13E
Total revenue	30.5	48.7	98.8	168.1
Cost of goods sold	(0.9)	(0.7)	(2.2)	(4.1)
SG&A	(13.0)	(15.7)	(17.3)	(18.9)
R&D	(21.7)	(27.3)	(30.1)	(33.0)
Other operating profit/(expense)	(5.1)	(7.7)	(9.8)	(12.3)
ESO expense	5.9	1.6	0.0	0.0
EBITDA	**(12.3)**	**(1.8)**	**41.9**	**102.6**
Depreciation & amortization	2.1	(1.1)	(2.5)	(2.8)
EBIT	**(10.2)**	**(2.9)**	**39.4**	**99.8**
Net interest income/(expense)	0.3	1.3	1.6	1.9
Income/(loss) from associates	0.0	0.0	0.0	0.0
Others	0.0	0.0	0.0	0.0
Pretax profits	**(10.0)**	**(1.6)**	**41.0**	**101.8**
Provision for taxes	0.1	(2.1)	(6.0)	(11.5)
Minority interest	0.0	0.0	0.0	0.0
Net income pre-preferred dividends	**(9.8)**	**(3.7)**	**35.1**	**90.3**
Preferred dividends	0.0	0.0	0.0	0.0
Net income (pre-exceptionals)	**(9.8)**	**(3.7)**	**35.1**	**90.3**
Post tax exceptionals	(10.1)	(8.9)	0.0	0.0
Net income (post-exceptionals)	**(19.9)**	**(12.7)**	**35.1**	**90.3**
EPS (basic, pre-except) ($)	**(0.26)**	**(0.08)**	**0.75**	**1.90**
EPS (diluted, pre-except) ($)	**(0.26)**	**(0.08)**	**0.72**	**1.81**
EPS (basic, post-except) ($)	**(0.53)**	**(0.29)**	**0.75**	**1.90**
EPS (diluted, post-except) ($)	**(0.53)**	**(0.29)**	**0.72**	**1.81**
Common dividends paid	0.0	0.0	0.0	0.0
DPS ($)	0.00	0.00	0.00	0.00
Dividend payout ratio (%)	0.0	0.0	0.0	0.0

Growth & margins (%)	12/10	12/11E	12/12E	12/13E
Sales growth	93.5	59.3	103.0	70.1
EBITDA growth	41.0	85.7	2,475.5	144.9
EBIT growth	49.5	72.0	NM	153.3
Net income (pre-except) growth	49.5	62.1	NM	157.4
EPS growth	50.9	67.6	989.1	152.3
Gross margin	97.1	98.5	97.8	97.5
EBITDA margin	(40.4)	(3.6)	42.4	61.1
EBIT margin	(33.5)	(5.9)	39.9	59.4

Cash flow statement ($ mn)	12/10	12/11E	12/12E	12/13E
Net income	(19.9)	(12.7)	35.1	90.3
D&A add-back (incl. ESO)	(2.1)	1.1	2.5	2.8
Minority interest add-back	0.0	0.0	0.0	0.0
Net (inc)/dec working capital	0.7	1.0	(7.1)	(5.3)
Other operating cash flow	17.2	10.9	0.0	0.0
Cash flow from operations	**(4.2)**	**0.3**	**30.4**	**87.8**
Capital expenditures	(0.4)	(2.7)	(2.6)	(2.4)
Acquisitions	0.0	0.0	0.0	0.0
Divestitures	0.0	0.0	0.0	0.0
Others	(11.5)	(14.4)	0.0	0.0
Cash flow from investing	**(11.8)**	**(17.1)**	**(2.6)**	**(2.4)**
Dividends paid (common & pref)	0.0	0.0	0.0	0.0
Inc/(dec) in debt	0.0	0.0	0.0	0.0
Other financing cash flows	13.7	251.0	0.0	0.0
Cash flow from financing	**13.7**	**251.0**	**0.0**	**0.0**
Total cash flow	**(2.3)**	**234.2**	**27.8**	**85.4**

Balance sheet ($ mn)	12/10	12/11E	12/12E	12/13E
Cash & equivalents	20.4	254.5	282.4	367.8
Accounts receivable	7.2	11.9	25.6	34.0
Inventory	0.0	0.0	0.0	0.0
Other current assets	54.8	70.0	73.7	76.2
Total current assets	**82.4**	**336.4**	**381.7**	**478.0**
Net PP&E	9.7	10.6	10.8	10.5
Net intangibles	0.0	0.4	0.3	0.2
Total investments	0.0	0.0	0.0	0.0
Other long-term assets	0.2	0.3	0.3	0.3
Total assets	**92.3**	**347.8**	**393.1**	**489.0**
Accounts payable	2.2	2.4	2.8	3.0
Short-term debt	0.0	0.0	0.0	0.0
Other current liabilities	22.9	15.3	25.1	30.6
Total current liabilities	**25.0**	**17.7**	**28.0**	**33.6**
Long-term debt	0.0	0.0	0.0	0.0
Other long-term liabilities	9.9	10.9	10.9	10.9
Total long-term liabilities	**9.9**	**10.9**	**10.9**	**10.9**
Total liabilities	**34.9**	**28.6**	**38.9**	**44.5**
Preferred shares	**0.0**	**0.0**	**0.0**	**0.0**
Total common equity	**57.4**	**319.1**	**354.2**	**444.5**
Minority interest	**0.0**	**0.0**	**0.0**	**0.0**
Total liabilities & equity	**92.3**	**347.8**	**393.1**	**489.0**

Additional financials	12/10	12/11E	12/12E	12/13E
Net debt/equity (%)	(35.5)	(79.8)	(79.7)	(82.7)
Interest cover (X)	(366.9)	(80.3)	1,110.1	2,812.3
Inventory days	0.1	--	--	--
Receivable days	63.3	71.9	69.3	64.8
BVPS ($)	1.53	7.25	7.23	8.90
ROA (%)	(11.4)	(1.7)	9.5	20.5
CROCI (%)	(6.6)	(2.0)	31.1	73.2
Dupont ROE (%)	**(17.1)**	**(1.2)**	**9.9**	**20.3**
Margin (%)	(32.2)	(7.7)	35.5	53.7
Turnover (X)	0.3	0.1	0.3	0.3
Leverage (X)	1.6	1.1	1.1	1.1
Free cash flow per share ($)	(0.12)	(0.06)	0.60	1.80
Free cash flow yield (%)	(0.7)	(0.1)	1.5	4.4

Note: Last actual year may include reported and estimated data.

Source: Company data, Goldman Sachs Research estimates.

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PM Summary: Improving visibility for OLEDs – Buy PANL

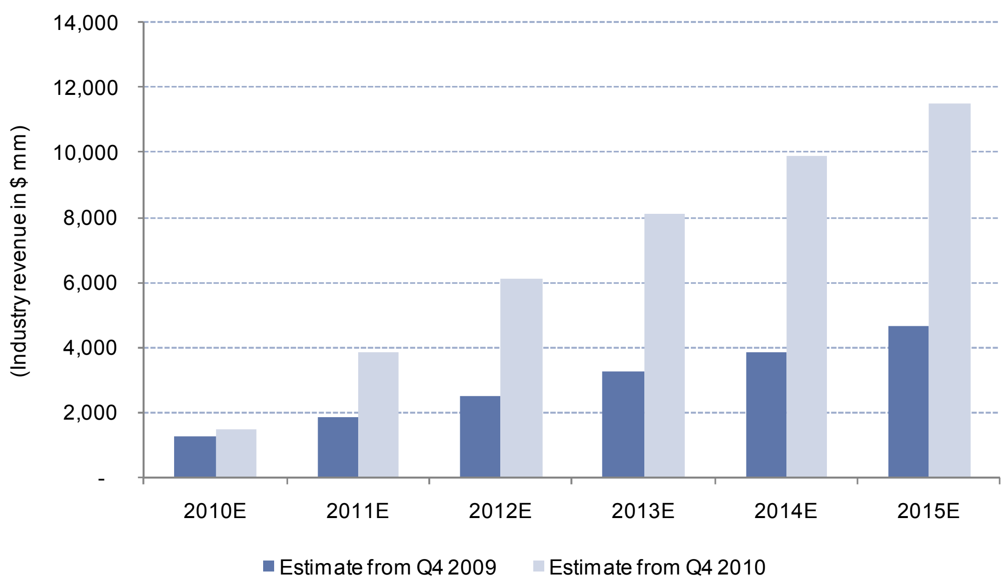
We are initiating coverage on Universal Display ("Universal", ticker: PANL) with a Buy rating and a 12-month price target of $55. Universal is a leader in Organic Light Emitting Diode ("OLED") technology and is a key supplier of material for OLED display and lighting applications. Universal's portfolio of OLED patents and its critical position in the supply chain should enable the company to drive revenue CAGR near 60% from 2010 to 2015, with significant operating leverage in the business model. Although valuation appears high on near-term estimates and expectations are elevated, we think the fundamental outlook is strong, with the bias to the upside.

Key catalysts for the near term include the signing of long-term commercial agreements with Universal's display partners (specifically, with Samsung Mobile Display), the introduction of additional OLED production capacity, new product announcements with OLED displays, and steady fundamental execution. Over the longer term, the move of OLED displays into IT applications and the TV segment, as well as growth in the general lighting market would be positives.

Key investment highlights

Commercialization of OLED technology is at a key inflection point and we expect rapid growth as the technology penetrates the display market. Although OLED technology has been in development for many years, the commercial market for OLEDs is still in its early stages, and recently started to see meaningful adoption in the display market. The development of phosphorescent OLED ("PHOLED") technology (which is significantly more energy efficient than the legacy fluorescent technology) by Universal Display and the more recent decision by Samsung Mobile Display ("SMD") to commercialize OLED displays in mobile handsets were key catalysts behind the growth in the market. While OLED displays still capture only a small percentage of the total flat panel display market (about 1% in 2010), OLEDs should garner an increasing percentage of the future market, becoming a key alternative to LCDs over the long term. See Exhibit 1.

Exhibit 1: 2011 is a key inflection point with the OLED market growing much faster than previously expected
Display Search's OLED display market revenue forecast from Q4 2009 and Q4 2010, $ millions



Source: Display Search.

Demand for OLED displays continues to outstrip industry capacity. Current demand for OLED displays is far greater than the display vendors had expected and the lack of commercial production capacity (majority of which is from Samsung Mobile Display) has been a limiting factor in the growth of the OLED market. While we think the supply/demand equation will remain tight for some time, recent investments by display vendors, including SMD and LG Display, should allow more capacity to come on line in the second half of 2011, enabling higher growth for Universal Display and the broader OLED supply chain.

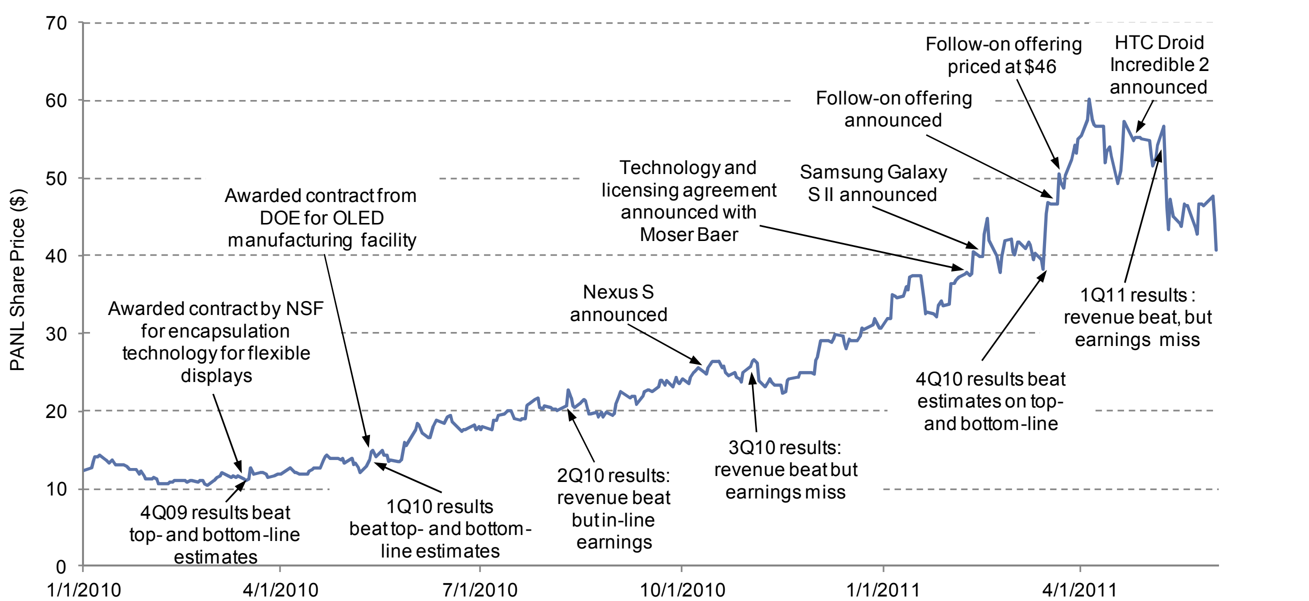
Universal Display both holds and licenses a significant portfolio of OLED patents, and is the primary supplier of phosphorescent materials. Universal Display, in conjunction with its academic partners, has developed a significant amount of intellectual property in OLED technology, and the company owns or has exclusive perpetual licenses on over 1,000+ patents. The patent portfolio spans the use of phosphorescent materials in OLED displays, device architecture, and the formulae of OLED materials. Moreover, beyond the intangible patent portfolio, Universal Display is the primary provider of phosphorescent OLED material used in the displays, providing the company with a unique position in the OLED supply chain. We think the control of the materials supply, without which PHOLED displays cannot be produced, is critical as it provides the company with more leverage in its royalty negotiations with its partners.

Universal Display has relationships with leading display and lighting vendors. Universal has established working commercial agreements with SMD and LG Display, among others, that should lead to healthy growth of commercial revenue as these display vendors ramp capacity. Although the lack of a long-term licensing agreement with SMD (Universal's primary commercial customer) remains an overhang on the stock, SMD's ongoing investments in next generation displays based on Universal's OLED technology suggest that a longer-term agreement should be forthcoming. Moreover, the company has relationships with multiple other display partners, including ChiMei Innolux and AU Optronics, for development and pre-commercial programs, providing Universal with a healthy pipeline of future commercial partners. Universal has also established multiple partnerships in the OLED lighting segment, including LG Chemical, NEC Lighting, and, mostly recently, with Moser Baer.

Universal Display's business model should drive significant operating leverage. We think Universal's IP-centric operating model is highly scalable and should lead to significant operating margin expansion with top line growth. As the company already possesses significant OLED intellectual property in its patent portfolio, from which it generates 90%+ gross margins on its royalty and commercial chemical revenue, future operating expense growth should track well below the company's revenue growth. Based on our revenue expectations, we estimate that Universal's operating margin will expand from -33.5% in 2010 to 39.9% in 2012E and to 72.1% by 2015E.

Universal Display should benefit from multiple growth drivers as OLED technology matures. Currently, the vast majority of OLED display demand is for small form factor modules, principally for mobile handsets. The growth in the smart phone market alone should provide enough demand to fuel OLED display growth near 65% per annum through 2013 (we expect total revenue CAGR of 74% in that period). As the technology matures and yields for larger substrates improve, we expect OLEDs to penetrate other segments of the display market and challenge LCDs in the broader IT (tablets, notebooks) and flat panel TV markets. Increasing penetration into new applications and larger displays should drive additional growth for Universal going forward. Beyond displays, general lighting should also provide an entirely new commercial market for OLEDs, though timing and the size of the addressable market are less certain for now.

Exhibit 2: Even with the recent weakness, PANL shares are up over 225% since the beginning of 2010



Source: Company data, FactSet.

Summary of key risks

Universal Display has not signed a new long-term licensing agreement with SMD. Following the expiration of their prior agreement on June 30, 2010 (extended via multiple 3-month extensions to date) Universal Display and SMD have not yet finalized a new long-term licensing agreement. The push-out of a licensing agreement increases the risk that royalty rates may come in lower than we estimate. Moreover, other display vendors are unlikely to sign long-term agreements with Universal until the SMD contract is finalized as that agreement will set a key precedent for royalty terms. We expect a long-term agreement will come together, but the timing is still uncertain.

Key aspects of OLED technology are still in development and the maturity of the production process is in the early stages. Phosphorescent OLED technology and the manufacturing process of OLED displays continue to mature and improve. That notwithstanding, there are concerns around commercial feasibility of full PHOLED displays, particularly on the efficacy of OLED blue material in commercial devices. Moreover, the manufacturing process for OLED displays is less streamlined than for LCD displays and production costs, despite lower bill-of-materials, is still higher for OLEDs. To the extent that PHOLED development slows and alternative high performance LCD technologies, with better aesthetics and improved power consumption, are introduced, OLED adoption may slow.

Challenges to Universal Display's IP and aging of patent portfolio raises risk to long-term royalty stream. Ongoing challenges to the company's IP portfolio pose risks to Universal's royalty revenue outlook. Most recently, three patents in Japan were deemed invalid by the Japanese Patent Office and are under appeal by the company to the Japanese IP High Court. It is our understanding that these patents were invalidated because the claims were too broad, though the underlying technology has been affirmed in Japan and other jurisdictions. Even if these patents are ultimately upheld, further challenges may add to headline risk and increase the volatility in the stock. Also, some of the company's architectural patents on phosphorescent OLEDs are set to expire later in the decade, which may allow competitors into the market and cause Universal's partners to pay lower royalties.

Valuation based on near-term estimates is elevated and Consensus estimates set a high bar. Although we see 35% upside to our price target over the next 12 months based on our DCF analysis, sales and earnings multiples on near-term estimates appear high. In addition, Street numbers (which include three estimates in 2013 and two for 2014) for forward revenue and EPS are above our estimates, which may make it more challenging for the shares to work over the intermediate term.

PANL shares are very volatile. PANL shares are up 33% in the year to date; however, the stock is also down -32% from its recent high of $60.07 on April 5, 2011, just two months earlier. Moreover, the shares have moved over +/-3% in 46 of the last 100 trading days and +/- 5% in 23 of the last 100 days, underscoring the higher volatility in the stock. Given the risks noted above, PANL's high volatility, and the current licensing negotiations (which could significantly impact our royalty assumptions), we think positions in PANL shares are more suitable for investors with higher risk tolerance.

Valuation: Our 12-month price target is $55

We are initiating coverage with a 12-month price target of $55 based on our DCF analysis. Our price target implies a 27X multiple on our calendar 2012 sales and a 77X multiple of our calendar 2012 earnings estimates, and a growth adjusted P/E of 1.2X. On our 2013 estimates, our price target implies a 16X multiple on sales and 30X multiple on earnings.

Our DCF suggests 35% upside to our price target of $55. We are using a discounted cash flow analysis (DCF) as the primary method to derive our price target for PANL due to the lack of near-term profitability, the company's fast growth rate, and to better reflect the longer-term value of Universal's royalty and materials revenue stream (see Exhibit 3). Our price target implies a 27X and 77X multiple on our 2012 sales and EPS estimates of $98.8 million and $0.72, respectively. Near-term valuation multiples are high given the turn to profitability (expected to come in late 2011) and the early stage of the commercial OLED market. Some of our key DCF assumptions include:

- Revenue CAGR of 28.3% from 2011 to 2022; slowing to single digits by 2020.
- Developmental revenue is comprised of the sales of development chemicals, contract research, and revenue for technology development for its partners.
- Commercial revenue consists of royalty revenue, commercial chemical sales, license revenue, and commercialization assistance revenue.
- Operating margin expansion from -5.9% in 2011 to the mid-70%s by 2016 and flattish thereafter; likely biased to the upside.
- 10-year DCF build to better capture the growth in various display product categories and the lighting opportunity.
- Given the company's IP-centric model, limited capital expenditures will be required to drive the top line.
- The company has roughly $176 million in federal NOLs and is not expected to be a full tax payer in the United States until 2015/16.
- Discount rate 13.3% based on a beta of 1.85.
- Terminal growth rate of 3.0% to account for long-term patent/IP risk.
- Terminal value implies a 6.5X multiple on our 2022 EBIT and EBITDA estimates.
- Timing of the valuation based on June 2012, roughly 12-months forward.

Exhibit 3: Our DCF analysis suggests at 12-month price target of $55
$ millions, except per-share items

	2011E	2012E	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	Terminal
Commercial revenue	30.3	80.7	150.4	211.6	297.2	380.4	455.8	518.9	576.5	632.5	687.8	741.2	
y/y growth	*172.5%*	*166.1%*	*86.4%*	*40.7%*	*40.5%*	*28.0%*	*19.8%*	*13.8%*	*11.1%*	*9.7%*	*8.7%*	*7.8%*	
Developmental revenue	18.3	18.1	18.2	18.4	18.7	18.9	19.0	19.2	19.4	19.6	19.8	20.0	
y/y growth	*(5.6%)*	*(1.3%)*	*0.4%*	*1.3%*	*1.5%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	
Total Revenue	**48.7**	**98.8**	**168.6**	**230.0**	**315.8**	**399.2**	**474.9**	**538.1**	**595.9**	**652.1**	**707.6**	**761.2**	
y/y growth	*59.3%*	*103.0%*	*70.6%*	*36.4%*	*37.3%*	*26.4%*	*18.9%*	*13.3%*	*10.7%*	*9.4%*	*8.5%*	*7.6%*	
Operating expense	51.5	59.4	68.3	77.2	87.3	97.8	109.1	121.1	133.2	145.1	156.0	167.3	
y/y growth	*42.9%*	*15.3%*	*15.0%*	*13.0%*	*13.2%*	*12.0%*	*11.5%*	*11.0%*	*10.0%*	*9.0%*	*7.5%*	*7.2%*	
As % of revenue	105.9%	60.1%	40.5%	33.6%	27.7%	24.5%	23.0%	22.5%	22.3%	22.3%	22.1%	22.0%	
EBIT	(2.9)	39.4	100.3	152.8	228.5	301.4	365.8	417.1	462.8	507.0	551.6	594.0	6.5x
Operating margin	*(5.9%)*	*39.9%*	*59.5%*	*66.4%*	*72.3%*	*75.5%*	*77.0%*	*77.5%*	*77.7%*	*77.7%*	*77.9%*	*78.0%*	
Taxes on EBIT	2.1	6.0	11.5	16.0	68.5	98.0	118.9	146.0	162.0	177.4	193.0	207.9	
Tax rate on EBIT	(74.8%)	15.1%	11.5%	10.5%	30.0%	32.5%	32.5%	35.0%	35.0%	35.0%	35.0%	35.0%	
Earnings before Interest	(5.0)	33.4	88.8	136.8	159.9	203.5	246.9	271.1	300.8	329.5	358.5	386.1	
Plus: Depreciation and amortization	1.9	2.5	2.8	2.5	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.3	6.5x
Minus: Capital expenditures	(2.7)	(2.6)	(2.4)	(2.0)	(2.0)	(2.2)	(2.1)	(2.1)	(2.1)	(2.1)	(2.1)	(2.3)	
Minus: Increase in working capital	1.0	(7.1)	(5.4)	(2.4)	(9.4)	(1.0)	(0.5)	0.0	0.0	0.0	0.0	0.0	
Free Cash Flow to the Firm	(4.9)	26.2	83.7	134.8	150.7	202.5	246.4	271.1	300.8	329.5	358.5	386.1	3,879.5
y/y growth	*NM*	*NM*	*219.5%*	*61.0%*	*11.7%*	*34.4%*	*21.7%*	*10.0%*	*11.0%*	*9.6%*	*8.8%*	*7.7%*	
Terminal growth rate		13.1											3.0%
WACC	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%
Discount period		0.25	0.75	1.75	2.75	3.75	4.75	5.75	6.75	7.75	8.75	9.75	9.75
Discount factor		0.97	0.91	0.80	0.71	0.63	0.55	0.49	0.43	0.38	0.34	0.30	0.30
PV of Free Cash Flow to the Firm		**12.7**	**76.3**	**108.5**	**107.0**	**127.0**	**136.5**	**132.6**	**129.9**	**125.6**	**120.7**	**114.8**	**1,153.2**

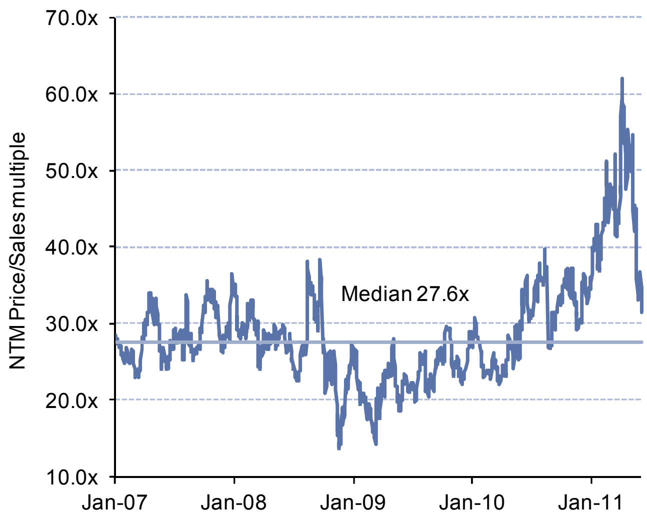
PV of FCF (10-year forecast period)	1,191.4	51%
PV of Terminal Value	1,153.2	49%
Sum PV of Free Cash Flow to the Firm	2,344.6	100%
- Net Debt	(331.8)	2Q 2012
Equity Value	2,676.4	
Shares outstanding	48.3	2Q 2012
Equity Value per Share	**$55.00**	

Discount rate	
Beta	**1.85**
10-year risk free rate	4.00%
Market risk premium	5.00%
Weighted Average Cost of Capital:	**13.25%**

Source: Goldman Sachs Research estimates.

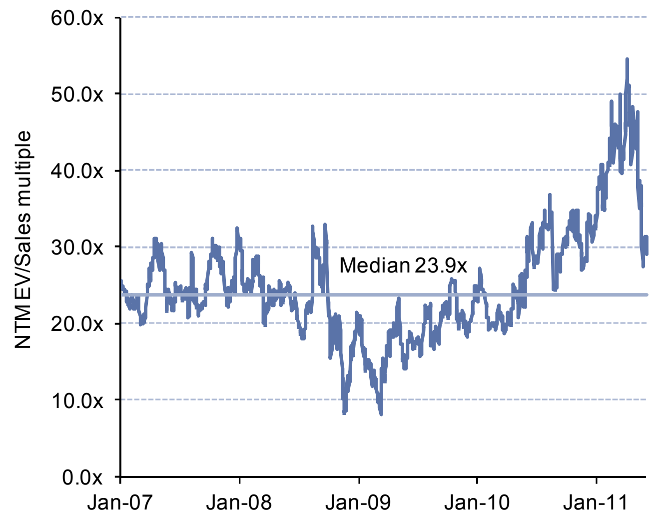
PANL's price-to-sales multiple should decline meaningfully as commercial revenue ramps. Our price target implies a 27X multiple on our calendar 2012 revenue estimate, consistent with PANL's historical trading range on forward sales. We think the move up in PANL's sales multiple starting in November 2011 through May 2012 accounts for significantly higher expectations being embedded into the stock. We expect the forward sales multiple to move lower from here over the intermediate and long term as the company's rapid revenue growth enables the shares to grow into its current multiple; i.e., based on our calendar 2013 and 2014 revenue estimates, our price target would imply multiples around 16X and 12X, respectively. See Exhibits 4-5.

Exhibit 4: Our price target implies a 27X multiple on CY2012 sales, consistent with the stock's historical trading range
Price to NTM sales



Source: FactSet.

Exhibit 5: Likewise, our price target's implied EV/S multiple of 24X is in line with its historical median
EV to NTM sales



Source: FactSet.

Likewise, PANL's P/E multiple should contract over time as earnings growth ramps. Based on our EPS estimate for 2012, 2013, and 2014, our $55 price target would imply P/E multiples of 77X, 30X, and 20X, respectively. See Exhibit 6.

Exhibit 6: PANL's valuation appears high on near-term estimates, but the multiple should contract quickly as revenue and earnings ramp
Valuation multiples based our $55 price target, $ millions, except per-share items

	2012E	2013E	2014E
Revenues	$98.806	$168.111	$227.713
EPS	$0.72	$1.81	$2.70
Price / sales	27.0x	15.9x	11.7x
EV / sales	23.8	14.0	10.3
Price / earnings	76.8	30.4	20.4

Source: Goldman Sachs Research estimates.

Consensus estimates set a high hurdle. Although consensus estimates for the out-periods (three estimates in consensus in 2013 and two in 2014) are above our estimates and set a high bar, we think that strong fundamental performance and favorable industry news flow will serve as positive catalysts for the stock and enable the shares to reach our price target over the next 12 months. See Exhibit 7.

Exhibit 7: We expect solid revenue growth and margin expansion, but our estimates are below current Street estimates in 2012 and beyond
$ millions, except per-share data

	2Q11E	3Q11E	4Q11E	2011E	2012E	2013E	2014E
Revenues							
GS	$9.999	$12.516	$16.547	$48.662	$98.806	$168.111	$227.713
Consensus	9.890	11.920	15.800	48.030	98.480	186.090	287.500
Difference	0.109	0.596	0.747	0.632	0.326	(17.979)	(59.787)
EPS							
GS	($0.06)	($0.02)	$0.06	($0.08)	$0.72	$1.81	$2.70
Consensus	(0.07)	(0.03)	0.07	NM	0.92	2.32	3.20
Difference	0.01	0.01	(0.01)	NM	(0.20)	(0.51)	(0.50)
Number of est's in consensus	7	7	7	9	8	3	2

Source: First Call and Goldman Sachs Research estimates.

Industry: OLEDs at an inflection point as commercial market ramps

Following several optimistic starts and subsequent setbacks in the past, the commercialization of OLED displays is beginning to gain meaningful traction, with OLED display modules taking a greater share in mobile handsets. With increasing demand for OLED displays well outpacing supply, higher production capacity and improving manufacturing processes should enable significant growth in the market, with our expectation for 47.5% compounded annual growth in the industry from 2010 to 2015.

OLED technology review

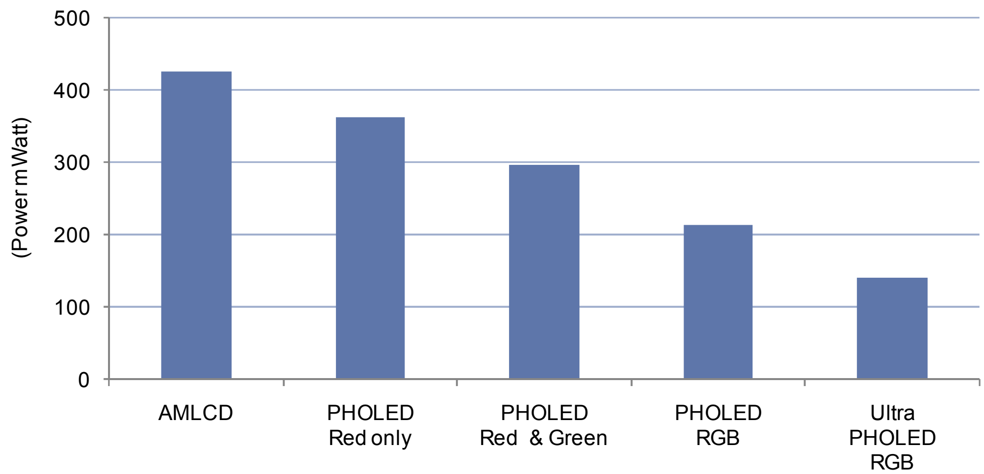
Organic Light Emitting Diodes ("OLEDs") are organic-based, solid-state devices that emit light under an electric current. The technology is highly suitable for flat panel displays and lighting applications, and is emerging as the leading technology for next-generation displays for handsets, IT applications, and TVs. The first generation of OLED devices was developed in the 1980s by Kodak based on fluorescent OLED materials. However, commercial applications using this technology were limited, in part due to power consumption and thermal issues. With the emergence of phosphorescent OLEDs – which are more efficient in converting electricity into light (nearly 100% quantum efficiency achieved in labs) and hence emit less heat – OLEDs are becoming a more viable alternative to existing flat panel display technologies.

The advantages of OLED displays should allow the technology to garner an increasing share of the display market. While still at an early stage of maturity, OLEDs present a number of benefits to display vendors versus existing flat panel display technologies that should drive increasing adoption.

- **OLEDs provide a superior visual performance.** As compared to existing flat panel displays, OLED displays generate more vibrant colors, higher contrast ratios, wider viewing angles, and produce higher refresh rates for full-motion video. This performance is mostly achieved through the basic architecture of OLED displays. Unlike traditional LCD displays, which use a backlight and color filter to generate an image (hence the inability to achieve high contrast), OLED materials emit light, allowing for greater vibrancy and higher contrast when individual pixels are turned on and off. Although OLED displays have not yet achieved the pixel density of high performance and higher cost LCDs, OLEDs are improving rapidly and should catch up with the more mature technology in these areas over time.

- **OLED displays consume less power than LCDs.** With the emergence of phosphorescent materials, OLEDs have become more power efficient than comparable LCD displays, a key area of differentiation for handset vendors given their need for longer battery life. Although current OLED displays utilize a blend of technologies, using phosphorescent material for the color red and the less efficient fluorescent technology for green and blue, OLEDs are estimated to consume about 15% less energy than a comparable active matrix LCD displays. As the technology matures, we expect the power efficiency to improve further, particularly as phosphorescent materials improve and displace florescent emitters in displays. According to Universal, OLED displays with red, green, and blue phosphorescent materials will ultimately consume 2/3 less power than comparable LCDs. See Exhibit 8.

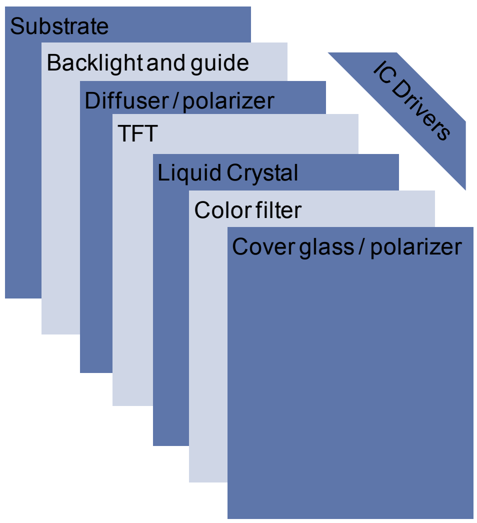
Exhibit 8: OLEDs should become more efficient with more phosphorescent colors
Power in mWatt



Source: Company data and Goldman Sachs Research estimates..

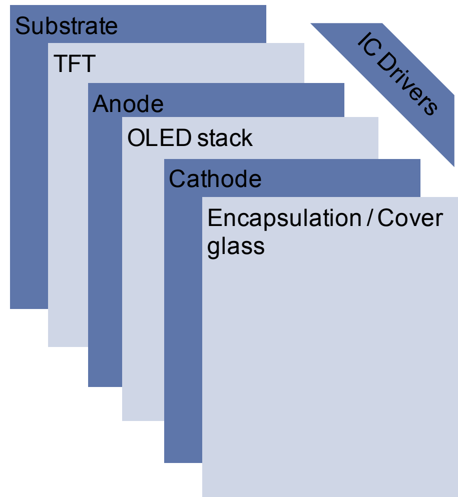
- **OLED displays should become less costly to produce as the technology matures.** Although OLED displays are estimated to cost about 20% more to produce than traditional LCDs for smaller form factor displays today (the premium is far higher for larger display modules), OLEDs should become less costly to produce than LCDs over time as volumes increase and manufacturing processes improve. Specifically, current deposition technology (the process of laying down the organic material onto the substrate) is not very scalable and yields are lower than for mass-produced LCDs. However, new deposition technologies (Organic Vapor Phase Deposition, Organic Vapor Jet Printing, or traditional inkjet methods are alternatives) and higher volumes should cut manufacturing costs significantly. Given that OLED displays require fewer components than LCDs, i.e. no fluorescent or LED backlight and color filters, the bill-of-materials is lower and there are less steps in the manufacturing process. At comparable volumes, OLEDs are expected to cost roughly 15%-20% less to produce than LCDs, according to the company. The lower production cost is a key incentive for display vendors to adopt the technology and to increase capital investments in production capacity. See Exhibits 9-10.

Exhibit 9: LCDs require backlighting and color filters that add to bill-of-material and physical thickness of displays
Simplified AMLCD display bill-of-material



Source: Goldman Sachs Research estimates.

Exhibit 10: Less component inputs should make OLEDs less expensive to produce as yields improve
Simplified AMOLED display bill-of-material



Source: Goldman Sachs Research estimates.

The roadmap for OLEDs is attractive, but the technology has key hurdles to clear. OLED is the leading technology for next-generation displays, but the technology is still maturing and missteps in development could significantly slow the pace of adoption. Specifically, there are still outstanding questions on the feasibility of producing commercial OLED displays with phosphorescent red, green, and blue pixels, which is a key factor in achieving better energy efficiency. Current OLED displays utilize a mix of technologies – phosphorescent for red pixels and legacy florescent for green and blue pixels. Phosphorescent green is nearly ready for commercial production and will likely be introduced commercially over the near term, but the color blue remains at the basic science level. To the extent that PHOLED development slows and alternative high performance LCD technologies, such the LG's "retina display" used in the Apple iPhone, improve at a faster rate with better aesthetics and lower power consumption, OLED adoption may be pushed out. Also, a slower ramp of new fabrication facilities and a delayed improvement in the manufacturing process, particularly with deposition on larger glass substrates, could stunt the growth in the overall OLED industry and slow the penetration of the technology into the important market for flat panel TVs.

Given the current state of the technology, some display vendors may look to alternative methods to accelerate the pace of production of large panel OLED displays, including the use of a white OLED and color filters in lieu of RGB OLED pixels. The use of white OLEDs will certainly cause some degradation of visual performance and increase the bill-of-materials; however, it may enable display OEMs to accelerate the time to manufacture large-screen OLED TVs until the technology improves. Also, alternative device architectures, such as four pixel RGBB, using light and deep blue pixels (which should help offset the low lifetime issues of deep blue OLED pixels), may speed up the time to market of larger consumer OLED displays. Universal would still benefit from these alternative implementations given its leadership in white OLEDs (produced using RGB materials) and the company's numerous patents in device architecture.

OLED displays should become a stronger alternative to LCDs

Commercial OLED displays are relatively new and are now beginning to transition from a niche to a more mainstream display technology. We think that as the technology matures, the image quality, energy efficiency, and lower cost to manufacture will cause display vendors to shift more of their focus and incremental production capacity to OLEDs. Moreover, we expect to see OLEDs move from small form factor modules for mobile handsets into larger-sized panels for IT products (such as tablets and notebook PCs) over the next couple of years and into TVs thereafter, though mass production of OLED TVs may not emerge until the middle of the decade. That said, we think OLEDs are unlikely to displace LCDs as the dominant display technology for quite some time (likely well beyond this decade). All combined, industry revenue for OLED displays should come reach $10 billion by 2015 (roughly 8% of the total flat panel display market) from only $1.45 billion in 2010, and driving strong revenue for Universal. See Exhibit 11.

Exhibit 11: Handsets the growth driver for now, TVs should drive next leg in 2H of decade
$ millions, except per-share data

Display market segments	2009A	2010A	2011E	2012E	2013E	2014E	2015E
Mobile handset revenue	$461.7	$1,127.7	$2,647.5	$5,117.9	$6,155.7	$6,779.6	$7,159.3
Other handheld revenue	73.4	48.6	72.5	145.2	196.5	245.7	250.6
Tablet revenue	0.0	0.0	0.0	0.0	87.0	163.7	263.8
IT revenue	0.0	0.0	80.1	362.8	635.2	686.2	783.0
Television revenue	0.6	0.6	9.1	103.6	351.0	765.5	1,435.2
AMOLED Industry revenue	$535.8	$1,176.9	$2,809.2	$5,729.5	$7,425.5	$8,640.6	$9,892.0
PMOLED	290.8	277.2	257.6	274.6	277.6	275.5	270.5
Total Industry revenue	$826.6	$1,454.1	$3,066.8	$6,004.1	$7,703.1	$8,916.1	$10,162.4

Source: Actuals from Display Search and Goldman Sachs Research estimates.

Mobile handsets to remain the primary growth driver for the intermediate term. For the next few years, we think the OLED market will be made up mostly of small form factor displays for mobile handsets and other handheld devices. As illustrated in Exhibit 11, we expect revenue from mobile handset displays to account for more than 85% of the OLED industry's revenue in 2011 and 70% even by 2015. Exhibit 12 highlights our assumptions for mobile handset display units and ASPs that drive our industry revenue for the handset market, which we think will grow from about $1.1 billion in 2010 to almost $7.2 billion in 2015.

Higher penetration into mobile handsets should translate to strong revenue growth for Universal since the company's technology is in virtually all AMOLED mobile handsets in the market today. As shown in Exhibit 12, we think sales of OLED display modules for handsets contributed about $9.1 million in revenue to Universal in 2010, comprised of $3.6 million in royalty revenue and about $5.5 million in commercial chemical sales. Universal's revenue from handset displays should increase by a compounded annual growth rate of about 80% from 2010 to 2015, reaching slightly more than $170 million in revenue by 2015 or about 62% of Universal's revenue from the display segment (54% of total revenue).

Exhibit 12: Revenue from the mobile handset market should account for over 50% of Universal's revenue even in 2015.
$ millions, except display ASPs

	2009A	2010A	2011E	2012E	2013E	2014E	2015E
Total handsets in mm	1,259.9	1,440.0	1,590.0	1,730.0	1,857.4	1,975.3	2,100.7
Total smartphones in mm	172.2	287.4	450.9	614.9	788.4	994.3	1,224.2
OLED handsets in mm	19.9	44.3	98.7	215.8	304.3	395.6	506.3
Year/year growth	187.9%	121.9%	122.9%	118.7%	41.0%	30.0%	28.0%
Blended ASP per display module	$23.2	$25.5	$26.8	$23.7	$20.2	$17.1	$14.1
Year/year growth	(18.5%)	10.1%	5.3%	(11.6%)	(14.7%)	(15.3%)	(17.5%)
OLED mobile display module revenue ($ mm)	$461.7	$1,127.7	$2,647.5	$5,117.9	$6,155.7	$6,779.6	$7,159.3
Display royalty revenue ($ mm)	$1.351	$3.552	$12.076	$31.309	$55.402	$71.186	$85.911
Display material revenue ($ mm)	$2.414	$5.529	$12.690	$35.496	$60.542	$73.766	$82.548
Total revenue from handset displays ($ mm)	$3.764	$9.081	$24.766	$66.805	$115.943	$144.952	$168.460
Year/year growth	2.4%	141.3%	172.7%	169.7%	73.6%	25.0%	16.2%
% of total revenue	23.8%	29.7%	50.9%	67.6%	69.0%	63.7%	54.0%

Source: Company data and Goldman Sachs Research estimates.

General lighting represents another market for OLEDs

Beyond displays, the general lighting market provides another large addressable market for OLED technology. We think the energy efficiency, quality of light, and the potential for unique form factors, among other characteristics, will help drive adoption of OLED technology for the general lighting market. Much of the focus on next generation lighting has been on the inorganic LED-based lights, which are well suited for spot lighting, but we expect OLEDs, which provide better diffuse illumination for large areas, will gain traction as costs decline, ultimately complementing LED spot lighting in the future. Display Search estimates that there are over 100 companies and universities currently focused on OLED lighting and that the market will reach $1.5 billion by 2015 and $6.3 billion by 2018.

We think the opportunity for OLED lighting can be large, though we are somewhat conservative in our outlook given the nascent stage of development. However, if OLED lighting gains traction earlier and mass production picks up faster than we expect, the upside can be significant in the out periods. See Exhibit 13.

Exhibit 13: Lighting market is nascent, but opportunity is large
$ millions, except per-share data

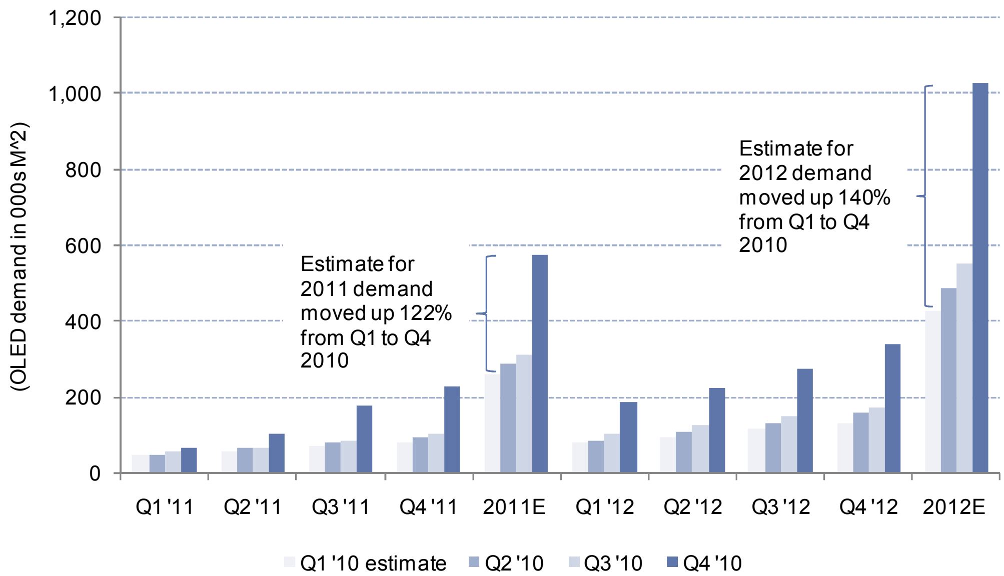
	2011E	2012E	2013E	2014E	2015E
OLED lighting market	$15.3	$98.0	$280.8	$530.2	$915.1
Royalty revenue	0.2	1.0	2.8	5.3	9.2
Materials revenue	0.0	0.2	0.7	2.6	6.3
Total revenue from lighting	$0.2	$1.2	$3.5	$7.9	$15.5

Source: Goldman Sachs Research estimates.

OLED industry capacity not keeping pace with demand

The lack of production capacity of OLED displays remains the most critical factor holding back the growth of the market. Samsung Mobile Display – the primary commercial OLED display vendor in the market today – has been unable to keep pace with demand from device OEMs, and we expect demand to increase as more vendors announce products utilizing OLED displays. According to analysis conducted by Display Search, industry demand has steadily moved higher throughout 2010 (see Exhibit 14). In the first quarter of 2010, Displays Search estimated 2011 OLED display demand of about 260 thousand square meters by surface area. By the fourth quarter, that estimate moved to 577 thousand square meters, more than double its estimate from the first quarter.

Exhibit 14: Estimates for OLED display demand have increased by over 120% for 2011 and 140% for 2012 from 1Q to 4Q2010
Thousands of m² of display demand



Source: Display Search.

Display OEMs are investing heavily to ramp OLED production capacity. Currently, SMD accounts for the vast majority of commercial production of OLED displays, with its gen 4.5 A1 facility generating an estimated 56.4 thousand square meters of displays per quarter (56 thousand gen 4.5 mother glass substrates/month). The company is expected to ramp its new A2 facility very shortly, with peak capacity in excess of 100 thousand gen 5.5 substrates/month, though we do not expect the facility to reach that peak production until 2012 at the earliest. SMD will likely remain the primary OLED vendor at least until the end of the 2011, when LG Display's gen 4.5 facility becomes fully operational. We think the near- to intermediate-term growth in OLEDs is predicated on capacity build outs, with key technology hurdles, including more efficient deposition technologies and commercially viable phosphorescent blue, becoming more important as the technology scales to larger sized displays. See Exhibit 15.

Exhibit 15: Display production capacity roadmap
$ millions, except per-share items

	2010A	Mar-11 1Q11A	Jun-11 2Q11E	Sep-11 3Q11E	Dec-11 4Q11E	2011E	Mar-12 1Q12E	Jun-12 2Q12E	Sep-12 3Q12E	Dec-12 4Q12E	2012E	2013E
DISPLAY SURFACE AREA												
Area of AMOLED displays (mm inches^2)	241.8	88.2	104.3	162.6	242.6	597.8	275.2	313.8	355.7	468.9	1,413.5	2,188.4
mm of inches to 000s of meters conversion	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Area of AMOLED displays (000s M^2)	156.0	56.9	67.3	104.9	156.5	385.7	177.5	202.4	229.5	302.5	911.9	1,411.9
AMOLED DISPLAY MANUFACTURING CAPACITY												
Samsung A1 (Cheonan)												
Number of substrates input (000/month)	168.0	56.0	56.0	56.0	56.0	224.0	56.0	56.0	56.0	56.0	224.0	224.0
Area of substrates (730 x 920 mm)	338.5	112.8	112.8	112.8	112.8	451.3	112.8	112.8	112.8	112.8	451.3	150.4
Yield	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	150.0%
Net display area (M^2)	169.2	56.4	56.4	56.4	56.4	225.7	56.4	56.4	56.4	56.4	225.7	225.7
Samsung A2 (Tangjeong)												
Number of substrates (000/month)	-	0.5	4.0	24.0	48.0	76.5	72.0	72.0	78.0	84.0	306.0	384.0
Area of substrates (1300 x 1500 mm)	-	2.9	23.4	140.4	280.8	447.5	421.2	421.2	456.3	491.4	1,790.1	257.9
Yield	-	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	348.4%
Net display area (M^2)	-	1.2	9.4	56.2	112.3	179.0	168.5	168.5	182.5	196.6	716.0	898.6
Number of substrates (000/month)	-	-	-	-	-	-	6.0	6.0	12.0	12.0	36.0	60.0
Area of substrates (2160 x 2400 mm)	-	-	-	-	-	-	93.3	93.3	186.6	186.6	559.9	40.3
Yield	-	-	-	-	-	-	30.0%	30.0%	30.0%	30.0%	30.0%	926.3%
Net display area (M^2)	-	-	-	-	-	-	28.0	28.0	56.0	56.0	168.0	373.2
LG Display												
Number of substrates (month)	-	-	4.0	6.0	18.0	28.0	18.0	18.0	18.0	18.0	72.0	96.0
Area of substrates (730 x 920 mm)	-	-	8.1	12.1	36.3	56.4	36.3	36.3	36.3	36.3	145.1	64.5
Yield	-	-	35.0%	35.0%	35.0%	35.0%	40.0%	40.0%	40.0%	40.0%	40.0%	120.0%
Net display area (M^2)	-	-	2.8	4.2	12.7	19.7	14.5	14.5	14.5	14.5	58.0	77.4
Number of substrates (month)	-	-	-	-	-	-	-	-	6.0	6.0	12.0	36.0
Area of substrates (2160 x 2400 mm)	-	-	-	-	-	-	-	-	93.3	93.3	186.6	24.2
Yield	-	-	-	-	-	-	-	-	30.0%	30.0%	30.0%	926.3%
Net display area (M^2)	-	-	-	-	-	-	-	-	28.0	28.0	56.0	223.9
Samsung A3 (Tangjeong)												
Number of substrates (month)	-	-	-	-	-	-	-	-	6.0	18.0	24.0	156.0
Area of substrates (1300 x 1500 mm)	-	-	-	-	-	-	-	-	35.1	105.3	140.4	104.8
Yield	-	-	-	-	-	-	-	-	40.0%	40.0%	40.0%	435.5%
Net display area (M^2)	-	-	-	-	-	-	-	-	14.0	42.1	56.2	456.3
GS estimate of display capacity (M^2)	169.2	57.6	68.6	116.8	181.4	424.4	267.4	267.4	351.5	393.6	1,279.8	2,255.1
Year/year growth	87.5%	78.6%	112.8%	141.6%	221.6%	150.8%	364.4%	289.8%	200.9%	116.9%	201.6%	76.2%
Display Search estimate of supply (M^2)	NM	71.3	94.8	128.7	211.8	506.6	316.3	385.0	437.4	480.4	1,619.1	NA
Year/year growth	NM	NM	NM	115.6%	200.9%	NM	343.6%	306.1%	239.9%	126.8%	219.6%	NM

Source: Display Search and Goldman Sachs Research estimates.

Company: Universal Display is well positioned in the OLED market

Universal Display is a key holder of OLED intellectual property and is the primary supplier of phosphorescent OLED material for the display and lighting markets. We think the combination of the company's patent portfolio and its control of OLED materials is significant as it provides Universal with a stronger position within the supply chain and should enable the company to see outsized benefits from the growth of the OLED market.

Significant portfolio of OLED related patents

Universal Display has developed a significant amount of intellectual property in OLED technology. With nearly $200 million invested in research and development since 2000 (conducted both within the company and in conjunction with its academic partners), the company now owns or has exclusive perpetual licenses on over 1,000+ patents in its portfolio. The patents cover a broad range of technology for the use of phosphorescent material for displays, device architecture, and the formulae of OLED materials.

Licensing this technology is a primary element of the company's strategy. To date, royalty revenue from commercial licenses has not been a meaningful contributor to the company's overall revenue as commercial sales are just now gaining traction. However, as the commercial OLED market materializes, Universal should benefit greatly and see significant growth in royalty revenue going forward (see Exhibit 16). Beyond the growth of the OLED market, Universal is also expected to benefit from higher royalty rates.

Exhibit 16: For the handset display market, we estimate that Universal's realized royalty rate will reach 1.2% by 2015
$ millions, except per-share items

	2009A	2010A	2011E	2012E	2013E	2014E	2015E
OLED mobile display module revenue ($ mm)	$461.7	$1,127.7	$2,647.5	$5,117.9	$6,155.7	$6,779.6	$7,159.3
Year/year growth	134.8%	144.2%	134.8%	93.3%	20.3%	10.1%	5.6%
Target royal rate	1.5%	1.5%	2.0%	2.0%	2.0%	2.0%	2.0%
Royalty capture percentage	19.5%	21.0%	22.8%	30.7%	45.0%	52.5%	60.0%
Realized royalty rate	0.3%	0.3%	0.5%	0.6%	0.9%	1.1%	1.2%
Display royalty revenue ($ mm)	$1.4	$3.6	$12.1	$31.3	$55.4	$71.2	$85.9
Year/year growth	116.5%	163.0%	240.0%	159.3%	77.0%	28.5%	20.7%

Source: Goldman Sachs Research estimates.

Royalty rates are expected to move higher. Currently, SMD is Universal's primary commercial licensee of its OLED technology. The relationship between SMD and Universal began in 2001, and the companies entered into a patent licensing agreement in 2005. That agreement, which expired in June 30, 2010, allowed SMD to license particular elements of Universal's technology, mainly the use of phosphorescent red in SMD's displays. Following the expiration of that agreement, Universal Display and SMD have entered into multiple three month extensions, the most recent was in April and set to expire at the end of June 2011.

With increasing advancements in OLED technology, including the near commercialization of phosphorescent green, Universal has shifted its licensing strategy. The company will now pursue long-term agreements that would require its partners to license the entire suite of its technology (all colors), rather than in part as it is today. Universal estimates that royalty rates could move to about 2% of display module ASPs. We estimate that the company currently captures a small portion of that target rate (roughly 23% in 2011), though we expect the capture rate to move higher with new agreements (roughly 60% by 2015), with the net royalty rate moving from about 0.5% in 2011 to 1.2% in 2015. Our assumption is based on our view that early adopters and vendors that produce high volume will likely pay a lower rate, while low volume producers and late entrants will be required to pay "list". Even in the downside case, where the company's proposed licensing agreement is not wholly accepted, the royalty rates should still move higher as customers begin to use phosphorescent green in their displays. It may be the case that the cost of using two phosphorescent colors may not be materially different than licensing the entire suite of Universal's technology.

Control of the PHOLED materials is a critical complement to Universal's licensing strategy. Beyond the ownership of its OLED patent portfolio, Universal is the primary supplier of phosphorescent OLED chemicals used to manufacture displays. We think the control of the material is critical, as OLED displays cannot be manufactured without the chemicals, providing Universal with more leverage in its royalty negotiations with its display partners. The chemicals are developed by Universal and its academic partners, are then patented, and are exclusively manufactured on behalf of the company by PPG

Industries. Revenue from the sale of commercial chemicals, which have gross margins in the mid-90%s, should be roughly comparable to royalty revenue for the next few years. Exhibit 17 illustrates our assumptions for chemical sales for mobile handset displays. We expect chemical unit revenue (the material is sold by weight in grams, though we use surface area as a proxy in the revenue build for our model) to be slightly down in 2011, with a step function increase in 2012 as the green PHOLED material is introduced into commercial displays. For the longer term, we expect to see downward pressure on chemical unit revenue as volumes increase.

Exhibit 17: Despite lower unit revenue, higher volumes should drive strong material revenue growth
$ millions, except per-share items

	2009A	2010A	2011E	2012E	2013E	2014E	2015E
Total surface area of all modules in mm inches^2	104.4	231.7	577.2	1,262.3	1,780.1	2,314.2	2,962.1
Material revenue per mm inches^2 ($ mm)	0.023	0.024	0.022	0.028	0.034	0.032	0.028
Year/year growth	(73.1%)	3.5%	(7.3%)	28.2%	20.6%	(6.3%)	(12.5%)
Display material revenue ($ mm)	$2.4	$5.5	$12.7	$35.5	$60.5	$73.8	$82.5

Source: Goldman Sachs Research estimates.

Universal should see fairly balanced growth in royalty and materials revenue over the next few years. As the mix of end products changes, however, we do anticipate that Universal's revenue mix will shift as well. As shown in Exhibit 18, revenue from mobile handset displays should remain fairly even. For larger panels, such as TVs, however, revenue will likely skew to commercial chemical sales.

Exhibit 18: Materials revenues will become more important as display sizes get larger
$ millions

	2009A	2010A	2011E	2012E	2013E	2014E	2015E
Mobile handset	$1.351	$3.552	$12.076	$31.309	$55.402	$71.186	$85.911
Other handheld	0.215	0.153	0.333	0.881	1.769	2.580	3.007
Tablet display	-	-	-	-	0.783	1.719	3.166
IT display	-	-	0.368	2.289	5.717	7.205	9.396
Television	0.002	0.002	0.042	0.683	3.159	8.037	17.223
Royalty revenue	$1.567	$3.707	$12.820	$35.161	$66.829	$90.726	$118.703
Mobile handset	$2.414	$5.529	$12.690	$35.496	$60.542	$73.766	$82.548
Other handheld	0.354	0.210	0.431	1.512	2.866	3.951	4.144
Tablet display	-	-	-	-	0.892	2.256	4.559
IT display	-	-	-	2.225	6.096	8.836	13.080
Television	0.003	0.001	0.026	0.611	3.978	16.020	48.232
Materials revenue	$2.770	$5.740	$13.147	$39.845	$74.373	$104.830	$152.565
Mobile handset	$3.764	$9.081	$24.766	$66.805	$115.943	$144.952	$168.460
Other handheld	0.568	0.363	0.764	2.394	4.634	6.530	7.152
Tablet display	-	-	-	-	1.675	3.975	7.725
IT display	-	-	0.368	4.514	11.813	16.041	22.477
Television	0.005	0.003	0.068	1.294	7.137	24.057	65.455
Total display revenue	$4.337	$9.447	$25.967	$75.006	$141.203	$195.556	$271.268

Source: Company data and Goldman Sachs Research estimates.

Established relationships with leading display and lighting vendors

Universal has established relationships with multiple partners in both the display and lighting markets. On the display side, Universal has working commercial agreements with SMD and LG Display, among others, that should help drive commercial revenue growth as these vendors ramp capacity. Although the lack of a long-term licensing agreement with Samsung remains a concern, SMD continues to license Universal's IP and pays royalties based on their prior contract. Moreover, the company has established relationships with other display partners, including ChiMei Innolux and AU Optronics, for development and pre-commercial programs, providing Universal with a healthy pipeline of commercial customers. The company has also established multiple partners in the OLED lighting segment, such as LG Chemical, NEC Lighting, and, most recently, with Moser Baer. See Exhibit 19.

Exhibit 19: Universal has solid commercial relationship as well as healthy pipeline of future commercial partners

Early stage partners	Development and Pre-Commerical Programs	Commercial Arrangements
10+ in evaluation phase	AU Optronics Sony Chimei Innolux Epson	Samsung Mobile Display LG Display Tohoku Pioneer Dupont
	LG Chem NEC Lighting Panasonic Electric Works Moser Baer Technologies	Showa Denko Konica Minolta
	5 Confidential programs	

Display partners   Lighting partners   Inkjet process

Source: Company data.

Royalty negotiations and challenges to IP remain headwinds

Long-term licensing agreement with SMD is not yet finalized. Despite Samsung's increasing capital investment in OLED production capacity, the companies have not yet finalized a new long-term licensing agreement. We think that some of the key sticking points involve SMD's reluctance to license Universal's entire IP stack given that it is currently only utilizing phosphorescent red in its displays. Also, we think display vendors may be pushing back on higher royalties given that they already purchase high-margin proprietary chemicals (which contain significant IP) from the company.

We expect Universal and SMD will ultimately reach a long-term agreement, though the timing remains uncertain. A new long-term agreement would clearly remove risks around future royalty revenue for Universal. For SMD, we think that finalizing a long-term agreement could allow it to better manage the bill-of-material for its displays and allow it to take firm orders from its customers in the merchant market. Moreover, other display vendors are likely to wait on the sidelines until the SMD contract is completed in order to get a precedent on royalty terms.

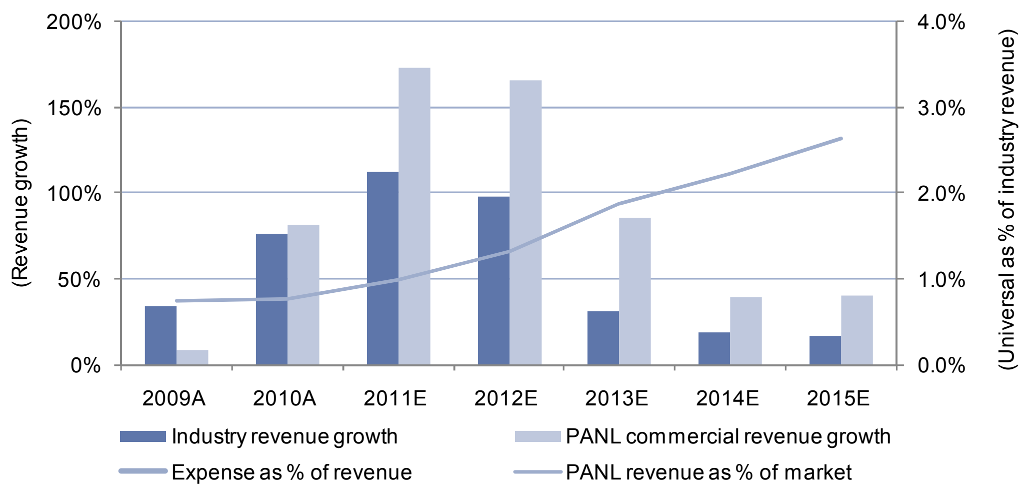
Challenges to patent portfolio will likely remain an overhang. Ongoing challenges to the company's IP portfolio pose risks to Universal's ability to generate royalty revenue.

Most recently, as mentioned above, three patents in Japan were deemed invalid by the Japanese Patent Office and are under appeal by the company to the Japan IP high court. We think further challenges to the company's IP could pose headline risks. Also, the cost to defend and affirm the company's intellectual property is a significant operating expense (accounting for roughly 17% of revenue and 13% of total expenses in the March quarter) and may continue to weigh on the company's profitability near term, while revenues are still relatively low.

Financial review: Growth should drive significant margin expansion

Universal Display, with its IP portfolio and control of PHOLED materials supply, is ideally positioned to benefit from the growth of the OLED display and lighting markets. We expect Universal's compounded annual revenue growth will exceed that of the overall OLED market at least through 2015, as royalty rates are expected to rise and new commercial chemicals are introduced. At the same time, the company's business model should drive significant operating leverage leading to robust margin expansion from current levels. See Exhibit 20.

Exhibit 20: Universal Display's commercial revenue growth should outpace the overall OLED market growth

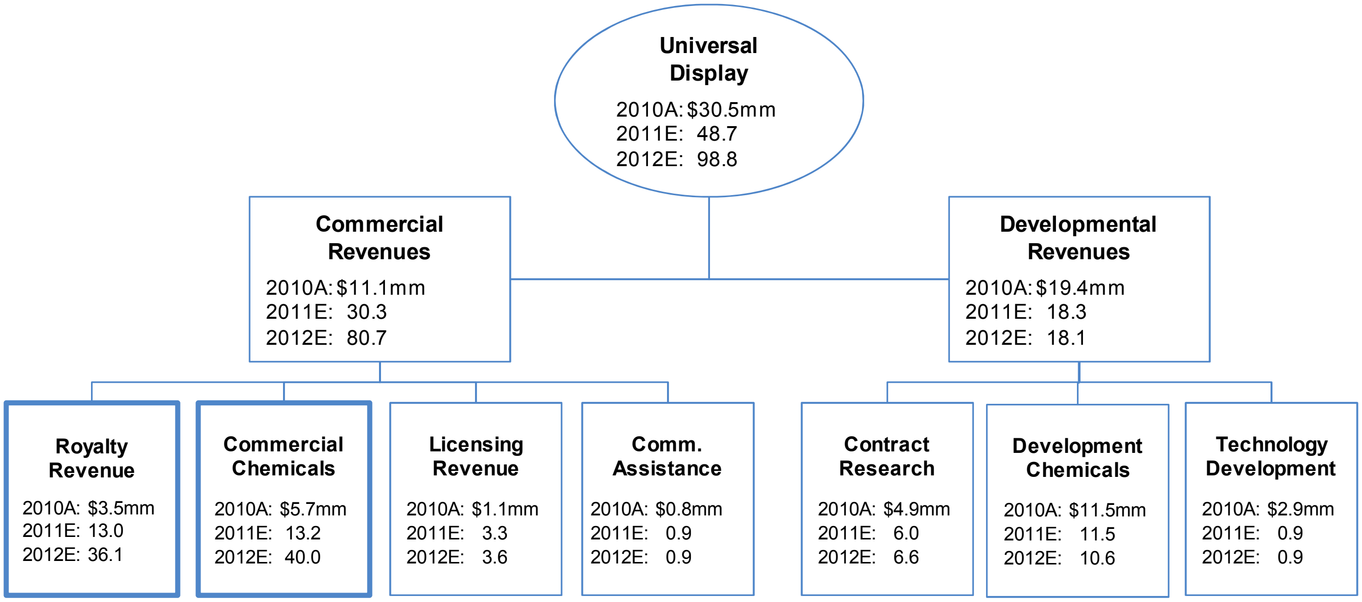


Source: Company data, Display Search, and Goldman Sachs Research estimates.

Commercial revenue should be the primary growth driver

Universal has two reportable revenue streams – Commercial and Developmental revenue. Developmental revenue (61% of LTM revenue) is comprised of the sales of development chemicals (sales of chemical to partners for pre-commercial use), contract research (paid research for lighting and flexible displays for the DOE and DOD, respectively), and revenue for technology development for its partners. Commercial revenue consists of royalty revenue (first recognized in 2007), commercial chemical sales, license revenue (up front payment amortized over life of contract), and commercialization assistance revenue (where Universal assists OEMs in bringing product to market). See Exhibit 21.

Exhibit 21: Universal Display revenue segments
$ millions, except per-share items



Source: Company data and Goldman Sachs Research estimates.

Through 2010, Universal's Developmental revenues accounted for the majority of the company's total revenue, accounting for more than 95% in 2005 and about 64% in 2010. However, we expect Developmental revenue to decline on an absolute basis and as a percentage of revenue in 2011 as LG Display launches commercial products and will require less developmental chemicals. At the same time, the growth in the OLED display market should drive yoy commercial revenue growth in excess of 170% in 2011 and become the primary driver of growth. See Exhibit 22.

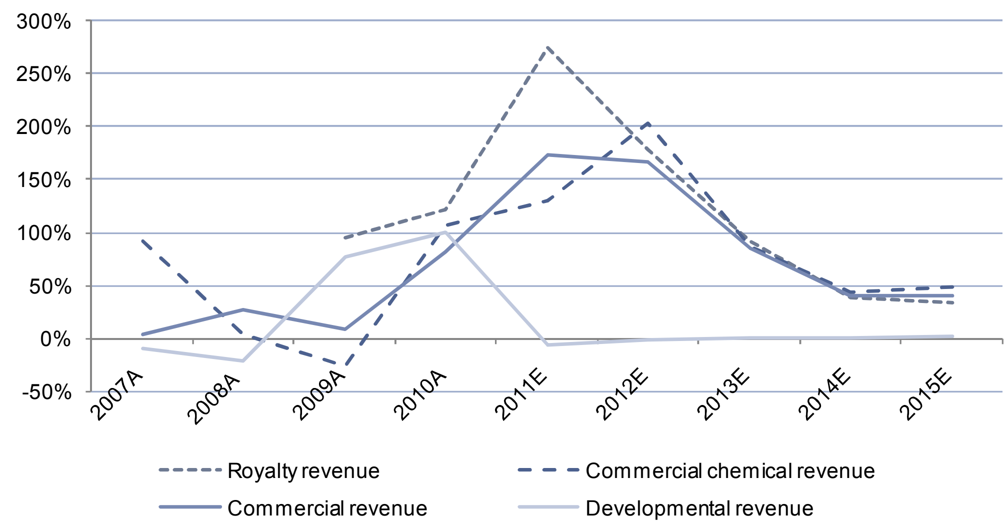
Exhibit 22: Commercial segment should be the key growth driver going forward
$ millions

	2009A	2010A	2011E	2012E	2013E	2014E	2015E
Commercial revenue	$6.118	$11.130	$30.326	$80.703	$149.943	$209.311	$293.193
Year/Year	8.7%	81.9%	172.5%	166.1%	85.8%	39.6%	40.1%
% of total revenue	38.8%	36.4%	62.3%	81.7%	89.2%	91.9%	94.0%
Development revenue	$9.669	$19.415	$18.336	$18.103	$18.168	$18.401	$18.670
Year/Year	77.6%	100.8%	(5.6%)	(1.3%)	0.4%	1.3%	1.5%
% of total revenue	61.2%	63.6%	37.7%	18.3%	10.8%	8.1%	6.0%
Total revenue	$15.787	$30.544	$48.662	$98.806	$168.111	$227.713	$311.863
Year/Year	42.5%	93.5%	59.3%	103.0%	70.1%	35.5%	37.0%

Source: Company data and Goldman Sachs Research estimates.

More favorable royalty rates from new long-term licensing agreements and the introduction of commercial phosphorescent green material should keep commercial revenue growth well ahead of the overall OLED market growth. The mix of revenue should skew more to chemicals as display panels get larger. Universal derives royalty revenue as a percentage of the display module ASPs, which are unlikely to scale linearly with panel sizes. On the other hand chemicals sales should see more linearity, even unit revenue declines, as the surface area of the displays increase. We expect a compounded annual growth for the royalties and commercial chemicals of 106% and 94%, respectively, from 2010 to 2015. See Exhibit 23.

Exhibit 23: Royalties and commercial chemicals should both experience strong growth

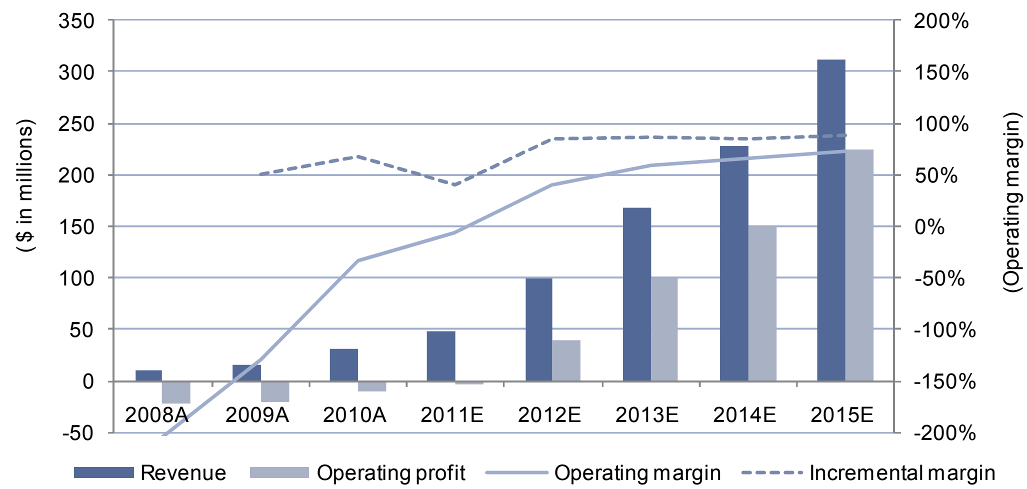


Source: Company data and Goldman Sachs Research estimates.

Revenue growth should drive significant operating leverage

We think Universal's IP-centric operating model is highly scalable and should lead to significant operating margin expansion with top line growth. The company generates 90%+ gross margins on its royalty and commercial chemical revenue, and other operating expenses should grow well below the pace of revenue growth. In fact, even while the company was still unprofitable in 2010, with operating margins of -33.5%, its margin on incremental revenue was 68%. Higher profit contributions from incremental sales should enable Universal to become profitable by the end of 2011 and reach operating margins of 39.9% by 2012 and 59.4% by 2013. See Exhibit 24.

Exhibit 24: We anticipate significant margin expansion with revenue growth
$ millions



Source: Company data and Goldman Sachs Research estimates.

Positive cash flow should strengthen Universal's already-solid financial position

Following multiple years of burning cash, Universal is poised to generate its first full year of positive cash flow from operations in 2011. Cash from operations is expected to grow as the company turns the corner to profitability. With the recent equity capital raise in the first quarter, Universal's financial position is healthy, with no debt and roughly $325 million in cash and marketable securities as of March 2011. We think the cash will be deployed to further build out Universal's IP portfolio via strategic acquisitions, such as the recently purchased patents from Motorola. The cash position should also provide financial stability to withstand significant unforeseen shocks in demands and should serve as an important asset for the company as it negotiates for long-term licensing agreements with its display partners, enabling Universal to be aggressive without the prospect of burning through its cash in the event of protracted negotiations. See Exhibit 25.

Exhibit 25: CFO should turn positive in 2011E, with profitability coming in 2012E
$ millions

	2007A	2008A	2009A	2010A	2011E	2012E	2013E
Revenue	$11.306	$11.075	$15.787	$30.544	$48.662	$98.806	$168.111
Pro forma Net income	(15.976)	(19.140)	(19.474)	(9.840)	(3.732)	35.075	90.290
Cash flow from operations	(10.439)	(7.785)	(14.610)	(4.200)	0.298	30.439	87.842
Cash & marketable sec's	83.660	77.454	63.874	73.163	321.355	349.195	434.637

Source: Company data, Goldman Sachs Research estimates.

Universal Display's NOLs should keep US taxes minimal until 2015. At the close of the 2010, Universal Display had accumulated federal net operating loss carry-forwards of roughly $176 million. We expect that the bulk of the NOLs will be utilized starting in 2012 when the company becomes profitable for the full year. The current balance of NOLs should shield Universal from federal taxes until 2015. We assume that the company will become a full tax payer in the United States, with a long-term tax rate of 35%. However, to the extent that Universal is able to move its IP assets – via transfer or from new R&D – to a lower tax jurisdiction, the tax rate could be lower, and may represent upside to our model. See Exhibit 26.

Exhibit 26: Universal has a significant amount of NOLs to be utilized once profitable
$ millions

	Related Tax Deduction	Deferred Tax Asset	Expiration
Loss carry forwards:			
Federal net operating loss	$176.277	$59.934	2011 to 2030
State net operating loss	129.820	7.695	2011 to 2030
Total loss carry forwards	$306.097	$67.629	
Tax credit carry forwards:			
Research tax credit	NA	$6.451	2020 to 2030
State tax credits	NA	1.943	2019 to 2025
Total credit carry forwards	NA	$8.394	

Source: Company data.

Despite the NOLs, we do expect the company to report a tax expense on its P&L going forward due to a withholding tax of 16.5% on royalty revenue derived in Korea, where the company generates the vast majority of its commercial sales. The company is required pay the royalty tax on revenue (actually withheld by the display vendor) regardless of the level of profitability. Once Universal becomes a full tax payer in the United States, this royalty tax is unlikely to impact the P&L as it would offset the company's federal tax liability.

Risks: Slower OLED adoption and lower royalties are primary risks

Key risks

Universal Display has not signed a new long-term licensing agreement with Samsung Mobile Displays, (its primary commercial partner. Following the expiration of their prior agreement in June 2010, Universal and SMD have not yet signed a new long-term licensing agreement, instead relying on multiple three-month extensions of its previous contract. The push-out of a long-term agreement increases the risk of the future revenue for Universal as royalty rates may ultimately be lower than we estimate. Moreover, we suspect that other display vendors are unlikely to sign licensing agreements until the SMD contract is completed in order to provide a precedent on royalty terms, creating further uncertainty of future revenue.

Key aspects of OLED technology are still in development and the maturity of production processes are in the early stages. Commercial OLED technology is still maturing, with only phosphorescent red used in commercial products. There are still concerns around the commercial feasibility of full phosphorescent OLED displays. To the extent that PHOLED development slows and alternative high performance, higher-cost LCD technologies improve at a faster rate with better aesthetics and lower power consumption, OLED adoption may slow. Also, given the supply imbalance, slower introductions of new production capacity and delayed improvement the manufacturing processes – to increase yields and scale the technology for larger displays – may stunt the growth in the overall OLED market.

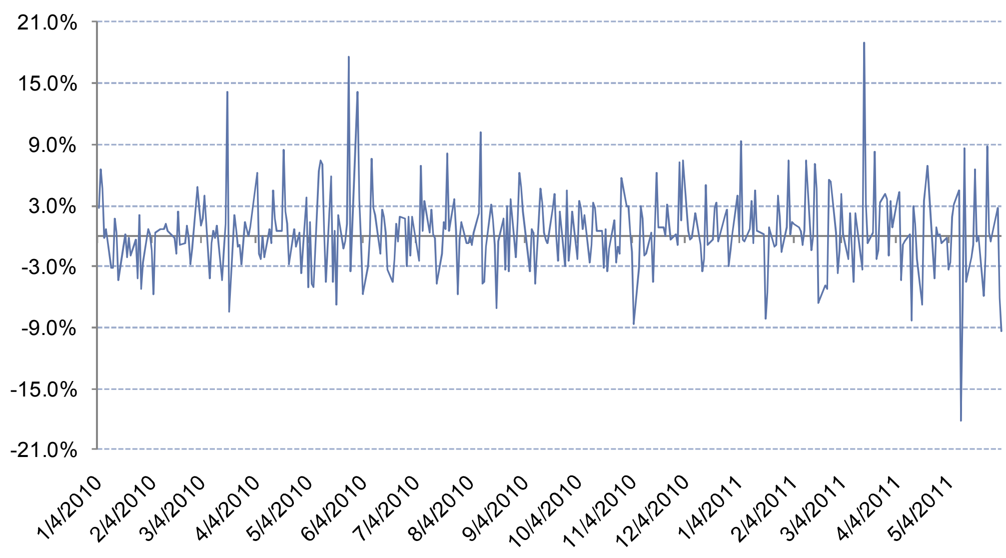
Challenges to Universal Display's IP portfolio and aging of patent portfolio raises risk to long-term royalty steam. Ongoing challenges to the company's IP portfolio pose risks to Universal's ability to generate royalty revenue. Most recently, three patents in Japan were deemed invalid by the Japanese Patent Office and are under appeal by the company to the Japanese IP High Court. Even if these patents are ultimately upheld, further challenges to Universal's IP may add to headline risk and increase the volatility in the stock. Also, the cost to defend and affirm the company's intellectual property is a significant operating expense (accounting for roughly 17% of revenue and 13% of total expenses of total expenses in the March quarter) and may continue to weigh on the company's P&L going forward.

Moreover, some of the company's key patents on phosphorescent OLED technologies are set to expire in 2017 and 2018 (effectively 2020-2022, when the company's patents around the use of organometallic materials expire). While extensions of these patents are possible and the company has a host of others around its key architectural patents, the expiration could cause its partners to pay lower royalties and enable competitors to move into the market.

Valuation based on near-term multiples appear high and Consensus estimates set a high bar. Despite the recent decline the PANL shares post the company's March quarter results, the shares are up 33% year to date and over 225% since the beginning of 2010, suggesting that a lot of optimism is in the stock. Consensus estimates for forward revenue and EPS, particularly for the out periods, are also above our estimates, and we think these high expectations could make it more difficult for the shares to work. That said, we think the fundamentals are strong and expect positive results and industry news flow to drive the shares to our 12-month price target of $55.

PANL shares are very volatile. PANL shares are up 33% year to date; however, the stock is also down -32% from its recent high of $60.07 on April 5, 2011, just two months earlier. Moreover, the shares have moved over +/-3% in 46 of the last 100 trading days and +/- 5% in 23 of the last 100 days, underscoring the higher volatility in the stock. See Exhibit 27.

Exhibit 27: PANL shares have seen +/-3% daily moves in 46 of last 100 trading days



Source: FactSet.

Universal Display Financial Model

Exhibit 28: Universal Display Income Statement
$ millions, except per-share items

			Mar-11	Jun-11	Sep-11	Dec-11		Mar-12	Jun-12	Sep-12	Dec-12				
	2009A	2010A	1Q11A	2Q11E	3Q11E	4Q11E	2011E	1Q12E	2Q12E	3Q12E	4Q12E	2012E	2013E	2014E	2015E
Commercial revenue	6.118	11.130	4.744	5.588	8.130	11.864	30.326	13.304	14.798	21.779	30.822	80.703	149.943	209.311	293.193
Year/Year	8.7%	81.9%	159.2%	186.3%	186.6%	163.0%	172.5%	180.4%	164.8%	167.9%	159.8%	166.1%	85.8%	39.6%	40.1%
Qtr/Qtr			5.2%	17.8%	45.5%	45.9%		12.1%	11.2%	47.2%	41.5%				
Developmental revenue	9.669	19.415	4.856	4.411	4.386	4.683	18.336	4.300	4.510	4.516	4.778	18.103	18.168	18.401	18.670
Year/Year	77.6%	100.8%	101.0%	(32.1%)	4.0%	(25.5%)	(5.6%)	(11.5%)	2.2%	3.0%	2.0%	(1.3%)	0.4%	1.3%	1.5%
Qtr/Qtr			(22.7%)	(9.2%)	(0.6%)	6.8%		(8.2%)	4.9%	0.1%	5.8%				
Total Revenues	**15.787**	**30.544**	**9.601**	**9.999**	**12.516**	**16.547**	**48.662**	**17.604**	**19.308**	**26.295**	**35.600**	**98.806**	**168.111**	**227.713**	**311.863**
Year/Year	42.5%	93.5%	126.1%	18.4%	77.4%	53.3%	59.3%	83.4%	93.1%	110.1%	115.1%	103.0%	70.1%	35.5%	37.0%
Qtr/Qtr	21,496.5		(11.1%)	4.1%	25.2%	32.2%		6.4%	9.7%	36.2%	35.4%				
Cost of chemicals	0.294	0.880	0.103	0.132	0.205	0.302	0.742	0.337	0.388	0.585	0.891	2.201	4.131	5.910	8.738
Research and development	21.202	21.703	6.555	6.749	7.009	7.032	27.345	7.217	7.424	7.710	7.722	30.072	32.974	36.049	39.221
Selling, general, and administrative	10.922	13.041	3.872	3.949	3.942	3.971	15.735	4.259	4.340	4.333	4.360	17.293	18.858	20.545	22.312
Patent costs	3.240	4.271	1.613	1.650	1.690	1.704	6.657	1.833	1.872	1.925	1.942	7.573	8.336	9.109	9.928
Royalty and license expense	0.395	0.876	0.202	0.205	0.268	0.370	1.045	0.389	0.430	0.604	0.837	2.259	3.975	5.450	6.936
Other expenses (gains)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Operating Expenses	**36.053**	**40.771**	**12.345**	**12.685**	**13.114**	**13.380**	**51.524**	**14.035**	**14.455**	**15.156**	**15.752**	**59.398**	**68.274**	**77.062**	**87.135**
Year/Year	6.9%	13.1%	45.7%	22.5%	19.9%	21.6%	26.4%	13.7%	13.9%	15.6%	17.7%	15.3%	14.9%	12.9%	13.1%
Qtr/Qtr			12.2%	2.8%	3.4%	2.0%		4.9%	3.0%	4.9%	3.9%				
As % of revenue	228.4%	133.5%	128.6%	126.9%	104.8%	80.9%	105.9%	79.7%	74.9%	57.6%	44.2%	60.1%	40.6%	33.8%	27.9%
Operating income (EBIT)	**(20.267)**	**(10.226)**	**(2.744)**	**(2.687)**	**(0.598)**	**3.167**	**(2.862)**	**3.569**	**4.853**	**11.138**	**19.848**	**39.408**	**99.837**	**150.650**	**224.728**
Operating margin	(128.4%)	(33.5%)	(28.6%)	(26.9%)	(4.8%)	19.1%	(5.9%)	20.3%	25.1%	42.4%	55.8%	39.9%	59.4%	66.2%	72.1%
Interest income	0.670	0.279	0.095	0.405	0.404	0.402	1.306	0.404	0.411	0.420	0.431	1.666	1.979	2.532	3.227
Interest (expense)	(0.007)	(0.028)	(0.010)	(0.008)	(0.008)	(0.010)	(0.036)	(0.010)	(0.008)	(0.008)	(0.010)	(0.036)	(0.036)	(0.036)	(0.036)
(Loss) on stock warranty liability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other income (expense), net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Income	0.663	0.252	0.086	0.397	0.396	0.392	1.271	0.395	0.403	0.412	0.421	1.630	1.943	2.496	3.192
Pre-tax income (loss)	(19.604)	(9.975)	(2.658)	(2.290)	(0.203)	3.559	(1.592)	3.963	5.256	11.550	20.268	41.038	101.780	153.147	227.919
Tax expense (benefit)	(0.130)	(0.134)	0.296	0.366	0.587	0.891	2.141	0.996	1.093	1.666	2.208	5.963	11.490	15.845	68.376
Effective tax rate	0.7%	1.3%	(11.2%)	(16.0%)	(289.6%)	25.0%	(134.5%)	25.1%	20.8%	14.4%	10.9%	14.5%	11.3%	10.3%	30.0%
Net Income	**(19.474)**	**(9.840)**	**(2.955)**	**(2.655)**	**(0.790)**	**2.668**	**(3.732)**	**2.968**	**4.162**	**9.884**	**18.061**	**35.075**	**90.290**	**137.302**	**159.544**
Net Income margin	(123.4%)	(32.2%)	(30.8%)	(26.6%)	(6.3%)	16.1%	(7.7%)	16.9%	21.6%	37.6%	50.7%	35.5%	53.7%	60.3%	51.2%
Basic EPS	(0.53)	(0.26)	(0.08)	(0.06)	(0.02)	0.06	(0.08)	0.06	0.09	0.21	0.39	0.75	1.90	2.84	3.23
Diluted EPS	**(0.53)**	**(0.26)**	**(0.08)**	**(0.06)**	**(0.02)**	**0.06**	**(0.08)**	**0.06**	**0.09**	**0.20**	**0.37**	**0.72**	**1.81**	**2.70**	**3.08**
Basic share count	36.5	37.6	38.9	45.5	45.7	45.9	44.0	46.2	46.4	46.6	46.9	46.5	47.4	48.4	49.4
Diluted share count	36.5	37.6	38.9	45.5	45.7	48.4	44.0	48.7	48.9	49.1	49.4	49.0	49.9	50.9	51.9
End of period Basic share count	36.8	39.5	45.4	45.6	45.8	46.0	46.0	46.3	46.5	46.7	47.0	47.0	47.9	48.9	49.9

Source: Company data and Goldman Sachs Research estimates.

Exhibit 29: Universal Display Balance Sheet
$ millions, except per-share items

	2009A	2010A	1Q11A	2Q11E	3Q11E	4Q11E	2011E	1Q12E	2Q12E	3Q12E	4Q12E	2012E	2013E	2014E	2015E
Cash and cash equivalents	22.701	20.369	258.106	256.646	255.323	254.536	254.536	258.334	264.960	273.443	282.375	282.375	367.817	503.391	653.770
Short-term investments	41.173	52.795	66.820	66.820	66.820	66.820	66.820	66.820	66.820	66.820	66.820	66.820	66.820	66.820	66.820
Accounts receivable	3.344	7.248	5.985	5.599	9.011	11.914	11.914	10.915	10.812	18.932	25.632	25.632	34.019	44.058	63.932
Inventory	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other current assets	0.411	1.988	1.683	1.200	1.252	3.177	3.177	3.086	2.317	2.629	6.835	6.835	9.331	12.016	17.152
Total Current Assets	**67.630**	**82.400**	**332.594**	**330.264**	**332.405**	**336.446**	**336.446**	**339.154**	**344.909**	**361.824**	**381.662**	**381.662**	**477.986**	**626.285**	**801.674**
Property and equipment, net	11.049	9.711	9.815	10.143	10.421	10.649	10.649	10.772	10.845	10.868	10.841	10.841	10.534	10.101	10.093
Acquired technology, net	1.234	-	0.435	0.410	0.385	0.360	0.360	0.335	0.310	0.285	0.261	0.261	0.161	0.061	(0.038)
Investments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other assets	0.227	0.217	0.332	0.332	0.332	0.332	0.332	0.332	0.332	0.332	0.332	0.332	0.332	0.332	0.332
Total Assets	**80.140**	**92.327**	**343.176**	**341.149**	**343.543**	**347.788**	**347.788**	**350.594**	**356.397**	**373.310**	**393.096**	**393.096**	**489.014**	**636.780**	**812.062**
Current portion of long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	1.276	2.155	2.278	2.030	1.836	2.408	2.408	2.590	2.313	2.122	2.835	2.835	2.978	3.385	3.921
Accrued expenses	5.239	6.906	4.969	5.328	6.295	8.028	8.028	5.649	6.071	7.275	9.451	9.451	9.217	11.285	12.199
Deferred license fees	6.047	4.028	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred revenue	1.404	1.295	5.081	5.599	8.010	7.281	7.281	9.317	10.812	16.829	15.664	15.664	21.383	29.372	43.661
Stock warrant liability	-	10.660	13.110	13.110	13.110	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	**13.966**	**25.045**	**25.437**	**26.066**	**29.251**	**17.717**	**17.717**	**17.556**	**19.196**	**26.225**	**27.951**	**27.951**	**33.578**	**44.042**	**59.781**
Long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred license fees	2.826	2.775	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred revenue	-	-	3.612	3.612	3.612	3.612	3.612	3.612	3.612	3.612	3.612	3.612	3.612	3.612	3.612
Stock warrant liability	3.720	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Retirement plan benefit liability	-	7.078	7.310	7.310	7.310	7.310	7.310	7.310	7.310	7.310	7.310	7.310	7.310	7.310	7.310
Total Liabilities	**20.512**	**34.898**	**36.359**	**36.988**	**40.172**	**28.639**	**28.639**	**28.478**	**30.118**	**37.147**	**38.872**	**38.872**	**44.500**	**54.964**	**70.702**
Preferred stock, par value $0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Common stock, par value $0.001	0.368	0.389	0.454	0.454	0.454	0.454	0.454	0.454	0.454	0.454	0.454	0.454	0.454	0.454	0.454
Additional paid in capital	256.341	280.102	541.146	541.146	541.146	541.146	541.146	541.146	541.146	541.146	541.146	541.146	541.146	541.146	541.146
Accumulated deficit	(197.109)	(217.026)	(228.907)	(231.562)	(232.352)	(216.575)	(216.575)	(213.607)	(209.445)	(199.560)	(181.500)	(181.500)	(91.210)	46.092	205.636
Comprehensive income/(loss)	0.026	(6.038)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)	(5.877)
Shareholder's Equity	**59.628**	**57.430**	**306.817**	**304.162**	**303.371**	**319.149**	**319.149**	**322.117**	**326.279**	**336.163**	**354.224**	**354.224**	**444.514**	**581.816**	**741.360**
Total Liabilities & Equity	**80.140**	**92.327**	**343.176**	**341.149**	**343.543**	**347.788**	**347.788**	**350.594**	**356.397**	**373.310**	**393.096**	**393.096**	**489.014**	**636.780**	**812.062**

Source: Company data and Goldman Sachs Research estimates.

Exhibit 30: Universal Display Statement of Cash Flows
$ millions, except per-share items

	2009A	2010A	1Q11A	2Q11E	3Q11E	4Q11E	2011E	1Q12E	2Q12E	3Q12E	4Q12E	2012E	2013E	2014E	2015E
Cash flows from operating activities:															
Net Income (as reported)	(20.505)	(19.917)	(11.881)	(2.655)	(0.790)	2.668	(12.658)	2.968	4.162	9.884	18.061	35.075	90.290	137.302	159.544
Adj'ts to reconcile NI to CFO:															
Amort of def license fees & revenue	(3.986)	(4.891)	(0.705)	-	-	-	(0.705)	-	-	-	-	-	-	-	-
Depreciation	2.070	1.707	0.372	0.422	0.472	0.522	1.788	0.527	0.577	0.627	0.677	2.408	2.708	2.433	2.008
Amortization of intangibles	1.695	1.234	0.005	0.025	0.025	0.025	0.080	0.025	0.025	0.025	0.025	0.100	0.100	0.100	0.100
Amort of pre/dis on investments, net	(0.426)	(0.173)	(0.064)	-	-	-	(0.064)	-	-	-	-	-	-	-	-
Stock-based employee comp	3.156	4.554	1.039	-	-	-	1.039	-	-	-	-	-	-	-	-
Stock-based non-employee comp	0.007	0.047	0.000	-	-	-	0.000	-	-	-	-	-	-	-	-
Non-cash exp for materials agreement	1.170	1.173	0.009	-	-	-	0.009	-	-	-	-	-	-	-	-
Stock-based comp for boards	0.755	1.333	0.529	-	-	-	0.529	-	-	-	-	-	-	-	-
Loss on stock warrant liability	1.031	10.077	9.308	-	-	-	9.308	-	-	-	-	-	-	-	-
Changes in assets and liabilities:															
Account receivables	(0.894)	(3.904)	1.262	0.386	(3.412)	(2.902)	(4.666)	0.999	0.102	(8.120)	(6.700)	(13.718)	(8.387)	(10.039)	(19.874)
Inventory	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other current assets	0.052	(1.577)	0.305	0.483	(0.052)	(1.925)	(1.189)	0.091	0.769	(0.313)	(4.206)	(3.658)	(2.496)	(2.685)	(5.137)
Other assets	(0.158)	0.011	(0.116)	-	-	-	(0.116)	-	-	-	-	-	-	-	-
Accounts payables	(0.211)	2.388	0.253	0.111	0.773	2.306	3.443	(2.198)	0.145	1.013	2.890	1.850	(0.092)	2.475	1.450
Deferred license fees	-	0.792	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred revenue	1.632	1.919	1.300	0.518	2.411	(0.729)	3.499	2.037	1.495	6.016	(1.165)	8.383	5.719	7.989	14.289
Retirement plan benefit liability	-	1.026	-	-	-	-	-	-	-	-	-	-	-	-	-
Other, net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total changes in working capital	0.423	0.655	3.005	1.499	(0.280)	(3.251)	0.972	0.929	2.512	(1.403)	(9.180)	(7.143)	(5.255)	(2.260)	(9.272)
Net cash flows from operations	**(14.610)**	**(4.200)**	**1.617**	**(0.710)**	**(0.573)**	**(0.037)**	**0.298**	**4.448**	**7.276**	**9.133**	**9.582**	**30.439**	**87.842**	**137.574**	**152.379**
Cash flows from investing activities:															
Purchases of property and equipment	(0.259)	(0.369)	(0.475)	(0.750)	(0.750)	(0.750)	(2.725)	(0.650)	(0.650)	(0.650)	(0.650)	(2.600)	(2.400)	(2.000)	(2.000)
Purchase of ST investments	(61.345)	(91.394)	(37.346)	-	-	-	(37.346)	-	-	-	-	-	-	-	-
Proceeds from sales of ST inv.	69.630	79.933	23.396	-	-	-	23.396	-	-	-	-	-	-	-	-
Other items, net	-	-	(0.440)	-	-	-	(0.440)	-	-	-	-	-	-	-	-
Net cash flows used in investing	**8.026**	**(11.830)**	**(14.865)**	**(0.750)**	**(0.750)**	**(0.750)**	**(17.115)**	**(0.650)**	**(0.650)**	**(0.650)**	**(0.650)**	**(2.600)**	**(2.400)**	**(2.000)**	**(2.000)**
Cash flows from financing activities:															
Proceeds from common stock	0.130	0.246	249.803	-	-	-	249.803	-	-	-	-	-	-	-	-
Proceeds from options and warrants	1.702	14.619	5.120	-	-	-	5.120	-	-	-	-	-	-	-	-
Withholding taxes for ESO comp	(0.869)	(1.167)	(3.938)	-	-	-	(3.938)	-	-	-	-	-	-	-	-
Issuance/(repayment) of debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net cash flows provided by financing	**0.964**	**13.698**	**250.985**	**-**	**-**	**-**	**250.985**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Cash and equivalents, beginning of year	28.322	22.701	20.369	258.106	256.646	255.323	20.369	254.536	258.334	264.960	273.443	254.536	282.375	367.817	503.391
Net change in cash and equivalents	(5.620)	(2.332)	237.737	(1.460)	(1.323)	(0.787)	234.167	3.798	6.626	8.483	8.932	27.839	85.442	135.574	150.379
Cash and equivalents, end of year	22.701	20.369	258.106	256.646	255.323	254.536	254.536	258.334	264.960	273.443	282.375	282.375	367.817	503.391	653.770

Source: Company data and Goldman Sachs Research estimates.

Revenue build up by product category

Exhibit 31: Revenue build up by product category
$ millions, except per-share items

	2009A	2010A	Mar-11 1Q11A	Jun-11 2Q11E	Sep-11 3Q11E	Dec-11 4Q11E	2011E	Mar-12 1Q12E	Jun-12 2Q12E	Sep-12 3Q12E	Dec-12 4Q12E	2012E	2013E	2014E	2015E
MOBILE HANDSETS															
Total handsets in mm	1,259.9	1,440.0	367.9	385.0	395.0	436.0	1,590.0					1,730.0	1,857.4	1,975.3	2,100.7
Total smartphones in mm	172.2	287.4	90.0	97.0	115.0	148.9	450.9	122.7	132.3	156.8	203.0	614.9	788.4	994.3	1,224.2
OLED handsets in mm (DS / GS outlook)	19.9	44.3	15.0	17.5	26.7	39.5	98.7	42.8	48.5	54.0	70.6	215.8	304.3	395.6	506.3
Year/year growth	187.9%	121.9%	112.7%	113.0%	97.5%	155.0%	122.9%	185.0%	177.5%	102.5%	78.5%	118.7%	41.0%	30.0%	28.0%
Qtr/qtr growth			(3.2%)	16.4%	52.7%	48.2%		8.2%	13.4%	11.4%	30.7%				
Blended ASP per display module	23.2	25.5	27.4	26.9	26.5	26.8	26.8	25.4	24.2	23.2	22.8	23.7	20.2	17.1	14.1
Year/year growth	(18.5%)	10.1%	30.1%	15.0%	(1.5%)	(2.0%)	5.3%	(7.5%)	(10.0%)	(12.5%)	(15.0%)	(11.6%)	(14.7%)	(15.3%)	(17.5%)
Mobile display module revenue (in mm)	461.7	1,127.7	411.2	470.2	706.9	1,059.3	2,647.5	1,083.9	1,174.4	1,252.5	1,607.2	5,117.9	6,155.7	6,779.6	7,159.3
Diag screen size (16x9)			3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Surface area of display in inches^2	5.2	5.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Total surface area in mm inches^2	104.4	231.7	87.8	102.2	156.0	231.2	577.2	250.1	283.6	315.9	412.8	1,262.3	1,780.1	2,314.2	2,962.1
OTHER HANDHELDS															
OLED handhelds in mm (DS)	2.4	1.5	0.1	0.3	0.8	1.2	2.3	1.1	1.2	1.3	1.5	5.1	7.9	11.6	13.9
Year/year growth	115.5%	(37.9%)	(89.8%)	(49.5%)	164.9%	476.4%	52.2%	2100.0%	380.0%	73.3%	25.0%	126.7%	54.9%	46.8%	20.0%
Blended ASP per display module (DS)	30.9	32.9	32.1	32.2	32.2	32.2	32.2	29.7	29.0	28.2	27.4	28.5	24.9	21.2	18.0
Year/year growth	(34.9%)	6.5%	(2.2%)	(2.0%)	(2.0%)	(2.0%)	(2.0%)	(7.5%)	(10.0%)	(12.5%)	(15.0%)	(11.6%)	(12.6%)	(14.9%)	(15.0%)
Handheld display module revenue (in mm)	73.4	48.6	1.6	8.1	24.2	38.6	72.5	32.7	34.8	36.6	41.1	145.2	196.5	245.7	250.6
Diag screen size (16x9)			4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Surface area of display in inches^2	6.8	6.8	8.7	8.7	8.7	8.7	8.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Total surface area in mm inches^2	16.3	10.1	0.4	2.2	6.5	10.4	19.5	11.8	12.8	13.9	16.0	54.5	84.4	123.9	148.7
TABLETS															
Total tablets in mm (HW through 2012)	0.0	17.9	9.5	12.5	16.9	21.2	60.1	14.1	17.5	21.3	27.4	80.3	100.4	125.4	156.8
OLED tablets in mm	-	-	-	-	-	-	-	-	-	-	-	-	1.0	2.6	6.0
Penetration of OLED in tablets	NM	NM	0.0%	0.0%	0.0%	0.0%	NM	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	2.1%	3.8%
Year/year growth	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	168.8%	130.3%
Blended ASP per display module (GS / DS)	NM	NM	-	-	-	-	NM	-	-	-	-	NM	90.0	63.0	44.1
Year/year growth	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	(30.0%)	(30.0%)
Tablet display module revenue in mm	-	-	-	-	-	-	-	-	-	-	-	-	87.0	163.7	263.8
Diag screen size (16x9)		-	-	-	-	-	-	7.5	7.5	7.5	7.5	7.5	8.0	8.0	8.0
Surface area of display in inches^2	NM	NM	-	-	-	-	NM	24.0	24.0	24.0	24.0	NM	27.4	27.4	27.4
Total surface area in mm inches^2	-	-	-	-	-	-	-	-	-	-	-	-	26.4	71.1	163.6

Source: Display Search and Goldman Sachs Research estimates.

Exhibit 32: Revenue build up by product category
$ millions, except per-share items

	2009A	2010A	Mar-11 1Q11A	Jun-11 2Q11E	Sep-11 3Q11E	Dec-11 4Q11E	2011E	Mar-12 1Q12E	Jun-12 2Q12E	Sep-12 3Q12E	Dec-12 4Q12E	2012E	2013E	2014E	2015E
PC DISPLAYS															
Total tablets in mm (HW estimate through 20	305.1	347.1	84.9	85.3	95.6	103.3	369.1	93.3	93.6	102.8	111.3	401.0	421.1	442.1	464.2
OLED PC displays in mm (DS)	-	-	-	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.4	1.1	2.5	3.8	6.5
Penetration of OLED in tablets	NM	NM	0.0%	0.0%	0.1%	0.1%	0.0%	0.2%	0.2%	0.3%	0.4%	0.3%	0.6%	0.9%	1.4%
Year/year growth	NM	NM	NM	NM	NM	NM	NM	NM	2581.7%	360.7%	276.9%	499.7%	133.5%	54.3%	69.1%
Blended ASP per display module (GS / DS)	NM	NM	450.0	450.0	450.0	450.0	450.0	340.0	340.0	340.0	340.0	340.0	255.0	178.5	120.5
Year/year growth	NM	NM	NM	NM	NM	NM	NM	(24.4%)	(24.4%)	(24.4%)	(24.4%)	(24.4%)	(25.0%)	(30.0%)	(32.5%)
PC display module revenue in mm	0.0	0.0	0.0	3.5	30.1	46.5	80.1	55.5	70.0	104.8	132.4	362.8	635.2	686.2	783.0
Diag screen size (16x9)	-	-	-	-	-	-	-	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Surface area of display in inches^2	NM	NM	-	-	-	-	-	72.2	72.2	72.2	72.2	72.2	72.2	72.2	72.2
Total surface area in mm inches^2	-	-	-	-	-	-	-	11.8	14.9	22.3	28.1	77.1	179.9	277.6	469.4
TELEVISIONS															
Total flat panel TVs in mm	159.9	206.9	51.0	51.5	54.4	69.5	226.3	55.0	58.1	62.1	77.9	252.9	278.0	288.7	300.2
OLED TVs in mm (Display search)	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	1.6	4.5
Penetration of OLED in TVs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.2%	0.6%	1.5%
Year/year growth	(63.0%)	(38.4%)	(100.0%)	(100.0%)	NM	NM	1103.4%	NM	NM	1571.3%	739.4%	1095.3%	351.9%	211.5%	177.8%
Blended ASP per display module (DS/GS)	500.0	700.0	950.0	950.0	950.0	950.0	950.0	900.0	900.0	900.0	900.0	900.0	675.0	472.5	318.9
Year/year growth	(16.7%)	40.0%	35.7%	35.7%	35.7%	35.7%	35.7%	(10.0%)	(10.0%)	(10.0%)	(10.0%)	(5.3%)	(25.0%)	(30.0%)	(32.5%)
TV display module revenue in mm	0.6	0.6	-	-	1.2	7.9	9.1	8.0	13.2	19.4	63.0	103.6	351.0	765.5	1,435.2
Diag screen size (16x9)	13.0	13.0	17.0	17.0	17.0	17.0	17.0	20.0	20.0	20.0	20.0	20.0	23.0	27.0	30.0
Surface area of display in inches^2	72	72	123.5	123.5	123.5	123.5	124	170.9	170.9	170.9	170.9	171	226	312	385
Total surface area in mm inches^2	0.1	0.1	0.0	0.0	0.2	1.0	1.2	1.5	2.5	3.7	12.0	19.7	117.6	504.7	1,730.7
PMOLED															
Passive panels	53.0	58.6	10.8	16.5	16.8	17.5	61.6	15.3	17.4	17.6	16.4	66.8	70.4	73.0	74.9
Diag screen size (16x9)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Surface area of display in inches^2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total surface area in mm inches^2	53.0	58.6	10.8	16.5	16.8	17.5	61.6	15.3	17.4	17.6	16.4	66.8	70.4	73.0	74.9

Source: Display Search and Goldman Sachs Research estimates.

Exhibit 33: Revenue build up by product category
$ millions, except per-share items

	2009A	2010A	Mar-11 1Q11A	Jun-11 2Q11E	Sep-11 3Q11E	Dec-11 4Q11E	2011E	Mar-12 1Q12E	Jun-12 2Q12E	Sep-12 3Q12E	Dec-12 4Q12E	2012E	2013E	2014E	2015E
DISPLAY ROYALTY REVENUE															
Mobile handset display module revenue	461.7	1,127.7	411.2	470.2	706.9	1,059.3	2,647.5	1,083.9	1,174.4	1,252.5	1,607.2	5,117.9	6,155.7	6,779.6	7,159.3
Other handheld display module revenue	73.4	48.6	1.6	8.1	24.2	38.6	72.5	32.7	34.8	36.6	41.1	145.2	196.5	245.7	250.6
Tablet display module revenue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	87.0	163.7	263.8
IT display module revenue	0.0	0.0	0.0	3.5	30.1	46.5	80.1	55.5	70.0	104.8	132.4	362.8	635.2	686.2	783.0
Television display module revenue	0.6	0.6	0.0	0.0	1.2	7.9	9.1	8.0	13.2	19.4	63.0	103.6	351.0	765.5	1,435.2
AMOLED Industry revenue (in millions)	535.8	1,176.9	412.8	481.7	762.3	1,152.3	2,809.2	1,180.1	1,292.4	1,413.3	1,843.7	5,729.5	7,425.5	8,640.6	9,892.0
PMOLED	290.8	277.2	44.8	77.4	70.9	63.5	257.6	67.3	76.8	69.2	61.3	274.6	277.6	275.5	270.5
Total Industry revenue (in millions)	826.6	1,454.1	457.5	559.2	833.3	1,215.8	3,066.8	1,247.4	1,369.3	1,482.5	1,904.9	6,004.1	7,703.1	8,916.1	10,162.4
Target royal rate	1.5%	1.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Royalty capture percentage	19.5%	21.0%	21.8%	23.0%	23.0%	23.0%	22.8%	25.0%	25.0%	35.0%	35.0%	30.7%	45.0%	52.5%	60.0%
Realized royalty rate	0.3%	0.3%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.7%	0.7%	0.6%	0.9%	1.1%	1.2%
Display royalty revenue (in millions)	1.567	3.707	1.796	2.216	3.507	5.301	12.820	5.900	6.462	9.893	12.906	35.161	66.829	90.726	118.703
DISPLAY MATERIAL REVENUE															
Mobile handset display module surface area	104.4	231.7	87.8	102.2	156.0	231.2	577.2	250.1	283.6	315.9	412.8	1,262.3	1,780.1	2,314.2	2,962.1
Other handheld display module surface area	16.3	10.1	0.4	2.2	6.5	10.4	19.5	11.8	12.8	13.9	16.0	54.5	84.4	123.9	148.7
Tablet display module surface area	-	-	-	-	-	-	-	-	-	-	-	-	26.4	71.1	163.6
IT display module surface area	-	-	-	-	-	-	-	11.8	14.9	22.3	28.1	77.1	179.9	277.6	469.4
Television display module surface area	0.1	0.1	-	-	0.2	1.0	1.2	1.5	2.5	3.7	12.0	19.7	117.6	504.7	1,730.7
Total surface area of all modules in (mm inche	120.8	241.8	88.2	104.3	162.6	242.6	597.8	275.2	313.8	355.7	468.9	1,413.5	2,188.4	3,291.5	5,474.6
Material revenue per mm inches^2 (in mm)	0.023	0.024	0.021	0.022	0.022	0.022	0.022	0.022	0.022	0.030	0.034	0.028	0.034	0.032	0.028
Year/year growth	(73.1%)	3.5%	16.9%	22.0%	(2.5%)	(27.5%)	(7.3%)	5.0%	1.0%	35.0%	55.0%	28.2%	20.6%	(6.3%)	(12.5%)
Materials revenue	2.770	5.740	1.863	2.311	3.587	5.385	13.147	6.104	7.019	10.592	16.129	39.845	74.373	104.830	152.565

Source: Display Search and Goldman Sachs Research estimates.

Exhibit 34: Revenue build up by product category
$ millions, except per-share items

			Mar-11	Jun-11	Sep-11	Dec-11		Mar-12	Jun-12	Sep-12	Dec-12				
	2009A	2010A	1Q11A	2Q11E	3Q11E	4Q11E	2011E	1Q12E	2Q12E	3Q12E	4Q12E	2012E	2013E	2014E	2015E
LIGHTING															
OLED light module units (mm)	-	-	-	-	0.1	0.1	0.2	0.2	0.2	0.3	0.5	1.2	5.6	22.2	66.7
Year/year growth	NM	NM	NM	NM	NM	NM	NM	NM	NM	500.0%	400.0%	680.0%	375.0%	300.0%	200.0%
ASP of light module	NM	NM	-	-	105.0	100.0	101.7	90.0	75.0	68.3	95.0	83.7	50.5	23.9	13.7
Year/year growth	NM	NM	NM	NM	NM	NM	NM	NM	NM	(35.0%)	(5.0%)	(17.6%)	(39.7%)	(52.8%)	(42.5%)
OLED lighting industry revenue in mm (displa	-	-	-	-	5.3	10.0	15.3	13.5	16.5	20.5	47.5	98.0	280.8	530.2	915.1
Target royal rate	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	1.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Royalty capture percentage	NM	NM	0.0%	0.0%	50.0%	50.0%	0.1%	50.0%	50.0%	50.0%	50.0%	0.1%	0.1%	0.1%	50.0%
Realized royalty rate	NM	NM	0.0%	0.0%	1.0%	1.0%	0.0%	1.0%	1.0%	1.0%	1.0%	0.0%	0.0%	0.0%	1.0%
Display royalty revenue (in millions)	0.000	0.000	0.000	0.000	0.053	0.100	0.153	0.135	0.165	0.205	0.475	0.980	2.808	5.302	9.151
Blended surface area of display module in inches^2			-	-	12.5	12.5		12.5	12.5	12.5	12.5				
Surface area of lighting modules in mm inche	-	-	-	-	0.6	1.3	1.9	1.9	2.8	3.8	6.3	14.6	72.2	311.2	1,000.4
Material revenue per mm inches^2 in millions	NM	NM	-	-	0.013	0.013	0.013	0.013	0.013	0.011	0.011	0.012	0.010	0.008	0.006
Year/year growth	NM	NM	NM	NM	NM	NM	NM	NM	NM	(10.0%)	(10.0%)	(6.8%)	(12.5%)	(17.5%)	(25.0%)
Display material revenue (in millions)	-	-	-	-	0.008	0.016	0.023	0.023	0.034	0.042	0.070	0.170	0.736	2.616	6.307

Source: Goldman Sachs Research estimates.

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