Company report

Alternative Energy
Asia Solar
Equity – China

HSBC Climate Change

HSBC Global Research

LDK Solar (LDK)

Initiate UW(V): Gloomy outlook

- **Margin erosion concerns for 2009e, as wafer prices may fall as much as polysilicon**
- **In-house polysilicon production and wafer output target are also issues. May need to cut capex if no further financing**
- **Our 2009 EPS estimate is 63% below consensus. Target price of USD10 based on 1x 2009e PB**

Price erosion. LDK is a leading manufacturer of solar wafers, the principal raw material used to produce solar cells. The company stands to benefit from the falling cost of polysilicon, the key raw material (80-85% of total cost), as prices have dropped 70% since October 2008. We expect further steep falls in 2009, but this may in turn accelerate the decline in the price at which LDK can sell wafers to customers.

Gross margin. We differ from consensus in that we do not expect the company's gross margin to expand in 2009. This is based on our assumption that wafer prices in 2009 will be 12.5% below company guidance. We believe that wafer prices will drop faster than expected for two reasons: (1) Solar cell makers may ask to renegotiate contracts if spot market prices decline to below contract prices. (2) Struggling downstream operators might start to sell wafers to generate cash, accelerating price erosion.

Production target concern. In our view, the company may also struggle to achieve its revised in-house 2009 polysilicon production target of 3,000-5,000 metric tons (mt); our estimate is c34% below the midpoint of company guidance. LDK may also have to cut capital expenditure because of balance sheet weakness. Our 09 EPS forecast is 63% below consensus. We initiate coverage with an Underweight (V) rating and a target price of USD10 (1x 2009e PB vs the industry average of 1.1x).

Catalysts and risks. Potential share price catalysts include (1) wafer price declines, (2) oil price declines, and (3) any further delays in in-house polysilicon production or lower-than-expected output. Risks include gross margin improvement on milder-than-expected price erosion on wafers, faster-than-expected ramp-up for in-house polysilicon production, and increased 2H09 output on potential improved demand visibility.

Underweight (V)

Target price (USD)	**10.00**
Share price (USD)	**13.50**
Potential total return (%)	**-25.9**

Dec	**2007a**	**2008e**	**2009e**
HSBC EPS	1.37	2.80	1.76
HSBC PE	9.8	4.8	7.7
Performance	**1M**	**3M**	**12M**
Absolute (%)	-12.8	-55.0	-72.4
Relative^ (%)	-11.0	-43.7	-24.6

Note: (V) = volatile (please see disclosure appendix)

Index^	SSE COMPOSITE IDX
Index level	1,850
RIC	LDK.N
Bloomberg	LDK US

Source: HSBC; info as of 30 December 2008

Free float (%)	100
Market cap (USDm)	1,344

Source: HSBC

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Financials & valuation

Financial statements

Year to	12/2007a	12/2008e	12/2009e	12/2010e
Profit & loss summary (USDm)				
Revenue	524	1,649	2,017	2,864
EBITDA	162	342	433	834
Depreciation & amortisation	-15	-50	-178	-242
Operating profit/EBIT	147	291	254	592
Net interest	0	0	0	0
PBT	143	346	218	556
HSBC PBT	143	346	218	556
Taxation	1	-38	-26	-66
Net profit	144	308	192	490
HSBC net profit	144	308	192	490
Cash flow summary (USDm)				
Cash flow from operations	-113	432	549	817
Capex	-305	-907	-605	-759
Cash flow from investment	-236	-315	-605	-759
Dividends	0	0	0	0
Change in net debt	149	267	518	444
FCF equity	-417	-513	-82	-8
Balance sheet summary (USDm)				
Intangible fixed assets	231	231	231	231
Tangible fixed assets	337	1,193	1,620	2,136
Current assets	742	1,228	1,141	1,293
Cash & others	83	354	261	241
Total assets	1,310	2,652	2,992	3,661
Operating liabilities	328	633	755	910
Gross debt	289	826	1,251	1,677
Net debt	206	472	991	1,435
Shareholders funds	693	1,193	985	1,075
Invested capital	899	1,665	1,976	2,510

Ratio, growth and per share analysis

Year to	12/2007a	12/2008e	12/2009e	12/2010e
Y-o-y % change				
Revenue	396.8	214.7	22.3	42.0
EBITDA	305.6	111.0	26.7	92.7
Operating profit	295.2	98.4	-12.6	132.6
PBT	376.6	141.3	-36.9	154.6
HSBC EPS	241.4	104.1	-37.4	154.4
Ratios (%)				
Revenue/IC (x)	1.0	1.3	1.1	1.3
ROIC	26.8	20.2	12.3	23.2
ROE	34.4	32.6	17.7	47.5
ROA	18.0	15.5	6.8	14.7
EBITDA margin	30.9	20.7	21.5	29.1
Operating profit margin	28.0	17.7	12.6	20.7
EBITDA/net interest (x)				
Net debt/equity	29.7	39.6	100.6	133.5
Net debt/EBITDA (x)	1.3	1.4	2.3	1.7
CF from operations/net debt		91.4	55.4	56.9
Per share data (USD)				
EPS reported (diluted)	1.37	2.80	1.76	4.46
HSBC EPS (diluted)	1.37	2.80	1.76	4.46
DPS	0.00	0.00	0.00	0.00
NAV	6.61	10.88	8.98	9.80

Key forecast drivers

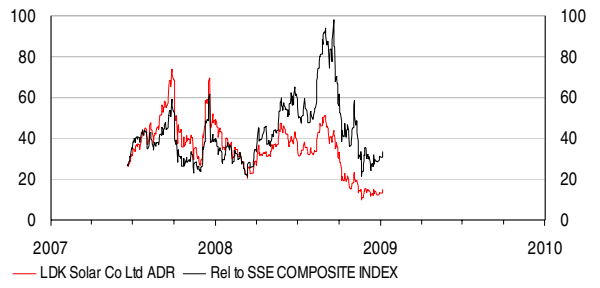
Year to	12/2007a	12/2008e	12/2009e	12/2010e
Multi wafer (USDm)	520	1,644	1,918	2,619
Mono wafer (USDm)	0	0	100	246
Others (USDm)	4	4	-1	-1

Valuation data

Year to	12/2007a	12/2008e	12/2009e	12/2010e
EV/sales	3.1	1.2	1.2	1.0
EV/EBITDA	10.1	5.6	5.6	3.4
EV/IC	1.8	1.1	1.2	1.1
PE*	9.8	4.8	7.7	3.0
P/NAV	2.0	1.2	1.5	1.4
FCF yield (%)	-29.1	-35.9	-5.7	-0.6
Dividend yield (%)	0.0	0.0	0.0	0.0

Note: * = Based on HSBC EPS (diluted)

Price relative



Source: HSBC

Note: Priced at close of 30 Dec 2008

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Valuation and business comparison among companies under our coverage

Company		LDK Solar	Suntech	Motech	Yingli
Bloomberg Code		LDK US	STP US	6244 TT	YGE US
Business					
Polysilicon		★		★	
Wafer		★		★	★
Cell			★	★	★
Module			★		★
Thin-film			★		
Price (as of 30 Dec)		USD13.50	USD11.89	TWD74.90	USD6.21
Market cap		**USD1.53bn**	**USD1.85bn**	**USD0.53bn**	**USD0.79bn**
52-week high-low price		USD9.45/52.40	USD5.36/90.00	TWD49.40/304.50	USD2.50/39.95
Rating		**Underweight (V)**	**Underweight (V)**	**Overweight (V)**	**Neutral (V)**
Target price		**USD10**	**USD4.5**	**TWD85**	**USD4**
Target valuation PB (x)		**1.0**	**0.6**	**1.0**	**0.6**
Historical PB (x)			**1.0~6.5**	**0.8~4.0**	**0.5~3.0**
Financials		USD	USD	TWD	USD
Revenue	**FY09e**	**USD2,017m**	**USD1,939m**	**TWD25,891m**	**USD1,205m**
	y-o-y (%)	22.3%	5.1%	13.8%	10.6%
	Consensus (%)	-24.8%	-9.5%	-12.8%	-20.3%
Operating margin	**FY09e**	**12.6%**	**5.5%**	**8.5%**	**16.9%**
(%)	Consensus (%)	-8.9%	-3.3%	-2.5%	-0.1%
EPS	**FY09e**	**USD1.76**	**USD0.59**	**TWD8.53**	**USD1.25**
	y-o-y (%)	-45.1%	-30%	-7.8%	20.4%
	Consensus (%)	-62.9%	-22%	-36.1%	-4.2%
PE (x)	**FY09e**	**7.7**	**20.3**	**8.8**	**5.0**
PB (x)	**FY09e**	**1.5**	**1.6**	**0.9**	**0.9**
ROE (%)	**FY09e**	**18.7%**	**8.6%**	**10.1%**	**17.5%**
Net debt (cash)	**3Q08**	**USD664m**	**USD1,391m**	**TWD-1,258m**	**USD134m**
Net debt/equity (%)	**3Q08**	**66%**	**122%**	**-9%**	**15%**
Inventory days	**3Q08**	**153.0**	**48.5**	**48.3**	**101.8**
(3Q08 vs 2Q08)		↓	↑	↓	↑
AR days	**3Q08**	**6.8**	**35.7**	**25.6**	**48.0**
(3Q08 vs 2Q08)		↓	↓	↑	↑
Current ratio	**3Q08**	**1.3**	**1.7**	**2.0**	**2.3**
(3Q08 vs 2Q08)		↓	↓	↑	↓
Acid ratio	**3Q08**	**0.7**	**1.4**	**1.4**	**1.5**
(3Q08 vs 2Q08)		↓	↓	↑	↓
Asset turnover	**3Q08**	**0.17**	**0.18**	**0.36**	**0.22**
(3Q08 vs 2Q08)		↓	↑	↑	flat
Sales/net operating assets	**3Q08**	**0.48**	**1.03**	**1.86**	**0.73**
(3Q08 vs 2Q08)		↓	↓	↑	↓
ROA (%)	**3Q08**	**2.8%**	**1.7%**	**4.9%**	**1.5%**
(3Q08 vs 2Q08)		↓	↓	↑	↓
Capex/sales	**FY09e**	**30.0%**	**4.1%**	**5.8%**	**13.7%**

Source: Reuters consensus, HSBC estimates

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Summary

- We believe wafer prices will fall as much as polysilicon
- With weak demand and falling prices, our 2009 EPS forecast is 63% below consensus
- We are also conservative on LDK's in-house polysilicon output; initiate Underweight (V) with a target price of USD10

Overview

Solar power is one of the most rapidly growing renewable energy sources in the world. The solar industry has experienced significant growth over the past decade, producing solar wafers, cells and modules that convert energy from sunlight into electricity. According to industry group Solarbuzz's 2007 forecast, global industry revenues CAGR for 2006-11 will be 24%.

LDK is a leading manufacturer of solar wafers, the principal raw material used to produce solar cells. Its customers include Q-Cells and Suntech, the world's No.1 and No 3 solar cell makers, Qimonda, a key DRAM player, and many solar downstream players.

LDK's headquarters and manufacturing facilities are located in Hi-Tech Industrial Park, Xinyu City, Jiangxi Province in China. Its office in the US is in Sunnyvale, California. LDK was incorporated in the Cayman Islands on May 1, 2006. Its principal operating subsidiary, Jiangxi LDK Solar Hi-Tech Co., Ltd., or Jiangxi LDK Solar, was incorporated in China on July 5, 2005. It went public with an IPO on May 31, 2007.

Initiate Underweight (V), target price USD10

We initiate coverage of LDK (LDK US) with an Underweight (V) rating and a target price of USD10.

Our key concerns:

- The polysilicon price has fallen more than wafer prices in recent months, but we expect wafer prices to see similar declines in 2009, as some downstream makers may sell wafers to generate cash flow. We expect this catch-up effect to squeeze margins
- With a net debt position and higher inventory turnover days (5 months vs peers' 2.5 months), it is likely that the company will need to cut capex, or they may need further financing. Under current conditions, we believe the company will expand capacity mainly in the second half of the year. This would lower full year output
- We are less optimistic than the Street on pricing and volumes for the year. Therefore, our EPS estimate is 63% below consensus

Our target price of USD10 is based on 1x 2009 PB, which is around the industry average of 1.1x. We believe LDK is likely to suffer deeper-than-

expected pricing erosion on its wafer business in 2009 and will also struggle to achieve its in-house polysilicon production target.

The price of polysilicon

The key raw material for LDK products is polysilicon. Prices have dropped sharply – 64% and 72% for spot and contract prices, respectively, since October 2008. Spot prices are now as low as USD130/kg, compared with USD350-400/kg October 2008.

At the same time, solar wafer spot prices have declined around 42% in the same period on the back of excess capacity and low utilisation rates at major foundries. However, we believe that wafer prices are likely to fall as much as polysilicon for the following reasons:

- We believe that solar cell makers may ask to renegotiate contract prices if spot market prices decline further and fall below contract prices
- Some struggling solar cell/module makers might start to sell wafers to generate cash, accelerating price erosion

Our recent check indicates that polysilicon prices could fall 40-50% in 2009 while wafers could be down 20% for the year. We expect more downside on the wafer pricing.

How we differ

Our 2009 net income forecast is 63% below consensus because we are less positive on wafer shipments and selling prices. Our gross margin forecast also falls from 21.1% in 2008 to 16.5% in 2009; our checks indicate that this is more pessimistic than the market's expectation (although no gross margin consensus is given by Bloomberg or Reuters), and it falls below LDK's guidance of 26-31% (21% in 2008e).

HSBC vs consensus estimates

	2008e		2009e	
(USDm)	HSBC	Consensus	HSBC	Consensus
Revenue	1,649	1,757	2,017	2,680
Diff (%)		**-6.2**		**-24.8**
Gross margin (%)	21.1	n/a	16.5	n/a
Op margin (%)	17.7	20.0	12.6	21.5
Net income	308	360	192	519
Diff (%)		**-14.7%**		**-62.9**

Source: HSBC estimates and Reuters consensus

- **Wafer shipments.** On the back of lower utilisation rates and potential financial issues at some of LDK's customers, we assume 1.3GW shipments in 2009, much lower than the company's guidance of 1.57-1.67GW
- **Wafer ASP.** We are more negative on the wafer price and assume USD1.75/watt in 2009, down 25% y-o-y. This is 13% below company guidance of cUSD2/watt
- **In-house polysilicon output.** LDK lacks experience of scaling up polysilicon manufacturing, so we think the chances of the company reaching its 2009 output target of 3,000-5,000mt is low. Our estimate is 2,656mt.
- **In-house polysilicon cost.** We forecast an average polysilicon production cost of around USD150/kg, much higher than company's guidance of USD80/kg. This means in-house production will not help bring down its raw material cost, as the contract polysilicon price fell to USD80/kg in December 2008

Sensitivity analysis

We conduct a sensitivity analysis on 2009 earnings for different blended wafer selling prices and in-house polysilicon output.

Sensitivity analysis: Wafers

Year 2009	Bull case	Base case	Bear case
Blended ASP (USD/watt)	**2.00**	**1.75**	**1.60**
Gross margin (%)	26.3%	16.5%	8.9%
EPS (USD)	**3.83**	**1.76**	**0.46**
EPS diff (%) compared with base case	118.4%	0.0%	-74.0%

Source: HSBC estimates

Sensitivity analysis: Polysilicon

Year 2009	Bull case	Base case	Bear case
Year-end polysilicon capacity (MT)	16,000	16,000	16,000
Total production volume (MT)	**6,000**	**2,656**	**1,000**
Multi-utilisation efficiency (g/W)	6.5	6.5	6.5
Total production volume (MW)	926	410	154
In-house poly % of total need	89%	39%	15%
Gross margin (%)	**19%**	**16%**	**15%**
EPS (USD)	**2.24**	**1.76**	**1.54**
EPS diff (%) compared with base case	28%	0%	-12%

Source: HSBC estimates

Potential catalysts

- Falling wafer prices
- Falling oil price
- Any further delay in in-house polysilicon production or lower than expected output

Risks to central scenario

- Milder-than-expected oversupply in 2009, resulting higher shipment
- Milder-than-expected price erosion on wafers, leading better gross margin
- Faster-than-expected ramp up for polysilicon production, boosting gross margin
- Higher output in 2H09 on better demand visibility
- New government subsidies from China or other countries, oil price rebound, positive news flow are the upside risks to the share price

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Valuation

- Initiate at Underweight (V) on rising uncertainty about wafer prices and polysilicon production
- Target price of USD10 is based on 1x 2009e PB (around the industry average)
- Near-term market re-rating unlikely due to oversupply, oil price, and weak demand, but we remain positive on the sector long term

Initiate at Underweight (V)

While LDK stands to benefit from falling polysilicon prices, it faces deeper-than-expected price erosion on its wafer business in 2009e. We also think it will struggle to meet its in-house polysilicon production target.

In addition, it may need to raise funds to meet its 2009 capital expenditure target. High inventory turnover days of around five months are also a concern. We initiate coverage of LDK (LDK US) with an Underweight (V) rating.

Financial situation

LDK's balance sheet is not one of the strongest among its solar peers. While Motech, SolarWorld, and First Solar were generating net cash in 3Q08, LDK was still exposed to net debt of USD664m. Net debt/equity in 3Q08 was still high at 66%. Given its debt position and increasing difficulties in raising money amid the credit crunch, we are afraid that its leverage and interest expense will increase. We forecast that its leverage will increase from 2.2x in 2008 to 3x in 2009.

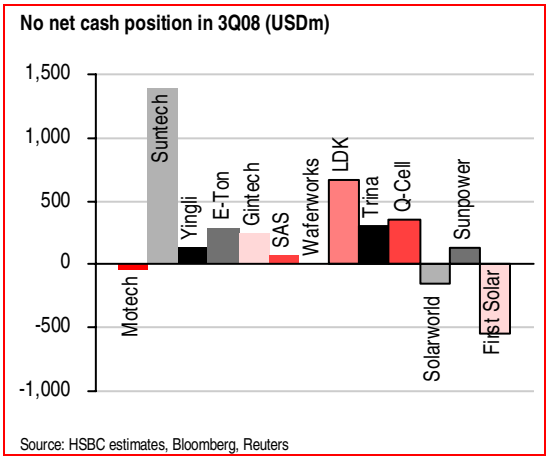
On the other hand, the company has guided that its capital expenditure for 2009 will be flattish at USD1-1.2bn (USD600-700m for polysilicon, USD400-500m for ingot/wafer). The company might need to borrow to reach this target or face cutting its capital expenditures.

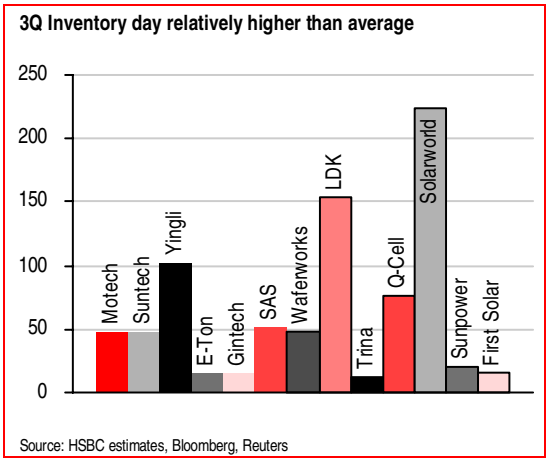
In addition, the return on equity (ROE), the return on assets (ROA), and the return on invested capital (ROIC) are all likely to be weaker in 2009.

Weakening return ratio

	2007	2008e	2009e	09e vs 08e
Sales/net operating assets	1.6	1.4	1.2	↓
Leverage	1.9	2.2	3.0	↑
ROE	20.8%	25.8%	19.5%	↓
ROA	11.0%	11.6%	6.4%	↓
ROIC	73.1%	28.8%	18.1%	↓

Source: HSBC estimates





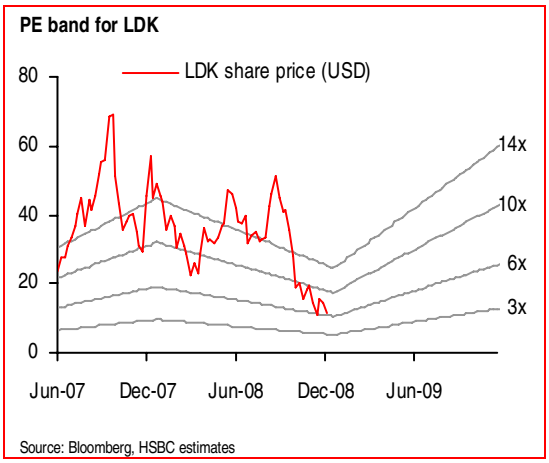
Inventories still high

Even though the inventory turnover days decreased from 181 days (six months) in 2Q to 153 days (five months) in 3Q, the number was still higher than solar wafer peers (Sino-American, Wafer Works) of around 50 days (2.5 months). Our channel checks show that current industry inventory levels through the solar supply chain is around 2-2.5 months. As 2009 looks like a year of oversupply and weakening demand, we do not expect inventory levels to drop meaningfully in the near term.

Valuation methodology

Our target price of USD10 is based on a 2009e PB of 1x, close to the industry average of 1.1x. This translates into a 2009e PE of 6x, slightly lower than the industry average of 7x.

We base our target price on relative PB for the solar stocks, given that earnings at many companies in the sector are deteriorating towards breakeven point. On a PB relative to ROE base, we reckon LDK's ROE will deteriorate from 26% in 2008 to 20% in 2009. We expect ROE will rebound in 2010 but do not think this will be a factor in the stock price.



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Peer valuation comparison

Company	Ticker	Price (local currency)	Market cap (USDm)	PE (x) 08e	PE (x) 09e	PE (x) 10e	PB (x) 08e	PB (x) 09e	PB (x) 10e	ROE (%) 08e	ROE (%) 09e	ROE (%) 10e
Integrated players												
REC (Norway)	REC NO	64.50	4,535	15.4	10.3	5.9	2.3	1.9	1.4	16.7	19.3	26.0
SolarWorld (Germany)	SWV GR	15.10	1,199	10.6	9.6	8.0	2.0	1.7	1.4	19.6	19.1	19.6
Poly Silicon												
MEMC (US)	WFR US	13.73	3,082	4.2	5.5	4.3	1.4	1.1	0.9	30.0	21.4	24.3
Sumitomo (Japan)	5726 JP	2,220.00	904	6.7	7.7	9.0	2.0	1.6	1.5	28.9	21.5	15.7
Tokuyama (Japan)	4043 JP	746.00	2,276	11.7	11.3	10.1	0.9	0.9	0.8	8.5	7.7	8.1
Wacker-Chemie (Germany)	WCH GR	74.71	2,769	7.1	7.9	6.9	1.7	1.5	1.3	25.4	18.5	19.9
Ingots & Wafers												
***LDK (China)**	**LDK US**	**13.50**	**1,438**	**4.2**	**7.7**	**3.0**	**1.2**	**1.4**	**1.3**	**28.4**	**18.7**	**43.8**
Renesola (China)	SOLA LN	2.00	130	4.1	3.1	2.1	0.5	0.4	0.3	19.9	19.0	19.7
SAS (Taiwan)	5483 TT	64.90	453	6.8	7.4	7.5	2.1	1.9	1.6	31.0	24.7	22.8
Wafer Works (Taiwan)	6182 TT	43.30	319	6.5	7.5	6.7	1.6	1.4	1.3	31.8	29.0	25.0
Solar Cells & Modules												
E-TON (Taiwan)	3452 TT	92.70	294	6.0	6.6	4.9	1.8	1.5	1.3	29.1	24.8	25.4
First Solar (US)	FSLR US	135.65	11,000	34.8	19.4	14.9	7.5	5.3	3.8	25.5	33.7	31.6
Gintech (Taiwan)	3514 TT	68.5	333	4.4	4.7	4.9	1.2	1.1	0.8	37.1	36.7	20.1
***Motech (Taiwan)**	**6244 TT**	**74.9**	**592**	**8.1**	**8.8**	**11.6**	**1.1**	**0.9**	**0.8**	**13.4**	**10.1**	**6.6**
Q-Cells (Germany)	QCE GR	25.3	2,027	15.8	13.5	8.4	1.4	1.3	1.1	9.5	9.9	13.2
Sunpower (US)	SPWR US	36.34	2,845	16.6	12.6	9.7	2.9	2.4	1.9	16.7	19.4	16.7
***Suntech (China)**	**STP US**	**11.89**	**1,830**	**14.2**	**20.3**	**6.8**	**1.7**	**1.6**	**1.2**	**13.5**	**8.6**	**20.6**
Trina Solar (China)	TSL US	10.10	296	3.9	8.1	8.7	0.6	0.6	0.5	19.2	8.1	4.9
***Yingli (China)**	**YGE US**	**6.21**	**788**	**6.0**	**5.0**	**4.5**	**1.1**	**0.9**	**0.7**	**17.6**	**17.5**	**16.3**

*HSBC estimates
Note: Market prices as of 30 December 2008
Source: Company data, Bloomberg, HSBC estimates

DCF model

Our DCF model delivers a price of USD11, close to our PB-based target price. We assume a cost of equity of 17%, due to LDK's high gearing ratio, and a WACC of 8%. On a longer term basis, the gearing ratio should fall, bringing down the Cost of Equity (COE) to 11.5%, the HSBC hurdle rate.

Based on above assumptions for ((ROE-g)/(COE-g)), and assume a long term growth rate of 3%, we arrive at a price-to-book multiple of 1.1x. This is around the PB multiple of our target price.

Under our research model, for stocks with a volatility indicator, the Neutral band is 10% above and below the hurdle rate for US stocks of 11.5%. For LDK, this translates into a Neutral band of 1.5% to 21.5% around the current share price. Our target price for LDK implies a total return of -25.9%, which is below the Neutral band; thus we have an Underweight (V) rating on LDK stock.

Near term: We do not expect PB, PE to re-rate

PB and PE ratios have fallen significantly in 2008 due largely to the oversupply outlook in 2009. Falling oil prices are a key factor.

The sharp drop in oil prices (from USD145.3/bbl on 23 July 2008 to USD39/bbl on 30 December 2008) has hit solar stocks. We see strong correlations between oil prices and solar stock prices (coefficient of 0.8-0.9) in certain periods, such as from May 2003 to April 2006 and February 2008 to present.

HSBC forecasts that the Brent crude oil price will average USD75/bbl in 2009, down 20% from 2008 (please refer to Anisa Redman's report of 14 November 2008 on Petroleo Brasileiro SA). As the current price is already below the trough level reached in 2004, we think this is the tail-end of a de-rating of solar stocks. A re-rating is highly unlikely given the oversupply outlook for 2009.

Long term: Still positive

Despite the oversupply situation in 2009, a near-term price war and industry consolidation, we are still positive on the sector in the long term. We still expect solar unit growth will be around 45% CAGR 2008-12.

Climate change remains an important global issue and an increasing number of countries now recognise there is a growing need for alternative energy sources and more stringent environmental policies. In our view, the global financial crisis is unlikely to affect government subsidies to an industry that can also help creation new jobs.

Risks

Major upside risks include the following:

- Better-than-expected gross margin in 1H09 due to milder-than-expected price erosion on wafers
- Faster-than-expected ramp up for polysilicon production. This would benefit gross margin
- Higher output in 2H09 on potential better demand
- New government subsidies from China and other countries
- Oil price rebound

HSBC

Wafer price at risk

- The polysilicon price has dropped 70% in the last two months; we expect another 40-50% correction in 2009
- Wafer price have fallen only 40% in the same period but we think it is likely to drop as much as polysilicon
- Sensitivity test on blended wafer price shows earnings downside risk of 74% if wafer price is 10% lower than expected in 09

Polysilicon price in free fall

The price of polysilicon has dropped sharply in recent months; spot is down 64% and contract 72% since October as demand has weakened due to the global financial crisis and Spain's cut in subsidies. Spot prices are now as low as USD130/kg, compared with USD350-400/kg in October 2008.

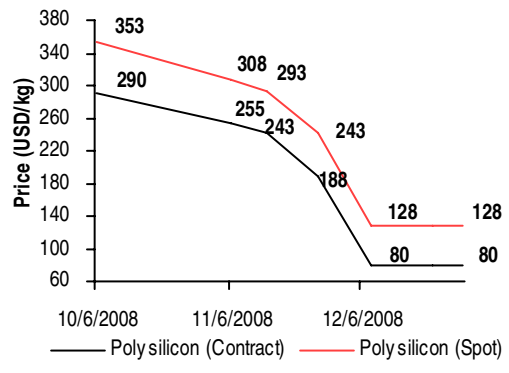
Lower utilisation rates by solar cell makers in 4Q08 and potentially 2009, oversupply and excess polysilicon inventories in the weakening semiconductor industry are all negative factors for polysilicon prices. Several solar players in China expect another 40-50% y-o-y fall in 2009. This is positive for the downstream players, especially those with flexible raw material sourcing strategies.

Wafers to follow

Wafer spot prices have declined around 42% since October. However, we believe wafer prices will drop as far as polysilicon for the following reasons:

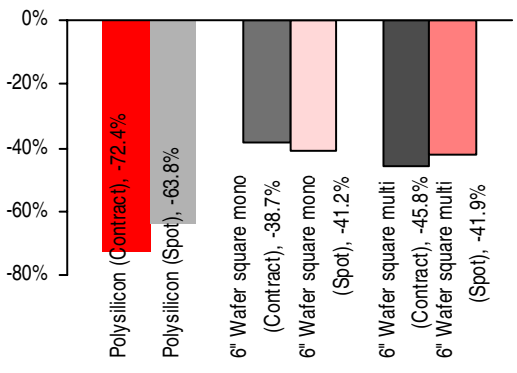
- **Renegotiation**. Current spot prices for 6" multicrystalline wafers are around USD6.5/pcs; this is around the contract prices of 6" monocrystalline wafers. We believe solar cell makers may ask to renegotiate contract prices if the spot market prices further decline

Polysilicon price (contract price vs spot price)



Source: Solar Exchange

Price downside (%) from Oct 08 to early Dec 08



Source: Solar Exchange, Solar Buzz

- **Downstream dumping**. Oversupply in 2009 will lead to price erosion across the supply chain. We believe many newer and smaller cell/module companies may struggle to survive and will start to sell wafers to generate cash. Potential dumping of wafers by these downstream companies represents a huge risk and we expect wafer price erosion will be more severe than expected
- **Monocrystalline over multicrystalline**. Our data also shows that contract prices for multicrystalline wafers declined more than contract prices for monocrystalline wafers (-46% vs -39%). Our channel checks indicate that high efficiency/high quality products are more popular heading into the oversupply situation in 2009. We believe there will be stronger demand for more efficient monocrystalline wafers. Multicrystalline wafers also will face competition from UMG wafers (efficiency is 1-2ppt lower than multicrystalline, but price is 20% lower)

Sensitivity analysis

We conduct a sensitivity analysis on 2009 earnings for different blended wafer selling prices. Our analysis shows up to 74% earnings downside in 2009e if the blended wafer price is 10% below our expectation of USD1.75.

Sensitivity analysis : Wafers

2009	Bull case	Base case	Bear case
Blended ASP (USD/watt)	**2.00**	**1.75**	**1.60**
Gross margin (%)	26.3%	16.5%	8.9%
EPS	**3.83**	**1.76**	**0.46**
EPS diff (%) compared with base case	118.4%	0.0%	-74.0%

Source: HSBC estimates

Bull case – 2009 blended ASP = USD2.00/watt

- **Assumption:** 2009e blended ASP will be USD2.00/w based on 2009e multi-wafer year-end capacity reaching 2,300MW (in-house production: 1,258MW) and mono-wafer year-end capacity 200MW (in-house production: 60MW)
- **Outcome:** 2009e gross margin will be 26.3%; 2009e EPS will be USD3.83, 118% higher than the USD1.76 in the base case

Base case – 2009 blended ASP = USD1.75/watt

- **Assumption:** 2009 blended ASP will be USD1.75/w based on 2009e multi-wafer year-end capacity reaching 2,300MW (in-house production: 1,258MW) and mono-wafer year-end capacity 200MW (in-house production: 60MW)
- **Outcome:** 2009e gross margin will be 16.5%, with 2009e EPS of USD1.76

Bear case – 2009 blended ASP = USD1.60/watt

- **Assumption:** 2009e blended ASP will be USD1.60/w, based on 2009e multi-wafer year-end capacity reaching 2,300MW (in-house production: 1,258MW) and mono-wafer year-end capacity 200MW (in-house production: 60MW)
- **Outcome:** 2009e gross margin will be 8.9%, with 2009e EPS of USD0.46, 74% lower than the USD1.76 in the base case

HSBC

Upstream strategy

- Polysilicon accounts for 80-85% of total wafer cost
- We forecast 2009 in-house polysilicon output will be about two-thirds of company's revised guidance of 3,000-5,000mt
- We estimate gross margin will drop from 21% in 08 to 17% in 09; company guidance for 09 is 22-27%.

Vertical integration

Polysilicon: 80-85% of cost

We think the oversupply of polysilicon will last until 2010, but the demand boom created by industry consolidation and price wars should enable solar cell capacity to exceed the polysilicon supply.

As polysilicon accounts for 80-85% of wafer makers' total costs, we believe upstream vertical integration is critical as ensuring a stable supply at a reasonable price is important for downstream operators. It also represents a competitive advantage.

In house vs long term contracts

Polysilicon can be produced in-house or bought via long-term contracts or on the spot market. Long-term contracts are generally based on take-or-pay agreements for 3-10 years, and customers have to pay 10% to 25% of the total amount for the contract period in advance. In essence, PV wafer/cell makers subsidise the construction of new polysilicon capacity.

Barriers to entry for polysilicon production in terms of technology and capex are the highest among the whole PV food chain. We are more conservative on newer, smaller players with limited experience of raising capacity or implementing new technology.

LDK has hired industry experts to set up new polysilicon production facilities and we think the company is better placed than other new players in China. However, we have doubts about the company reaching its ambitious 2009 in-house production targets.

In-house production

Capacity and output

The company revised down its total 2008 polysilicon output from 100-350mt to 15-25mt in November 2008 due to production ramp-up delays. Moreover, the company revised down its 2009 output target to 3,000-5,000mt from 5,000-7,000mt on January 6, citing another delay. This is probably due to its aggressive plan of ramping up the polysilicon plant within one year versus an average of two to three years in the industry.

The company has limited experience producing polysilicon. As a result, we expect only 10mt and 2,656mt to be produced in 2008 and 2009, respectively. Another two to three quarters of ramping up might be needed after its first polysilicon output. We think in-house polysilicon production will account for only 25% of its total

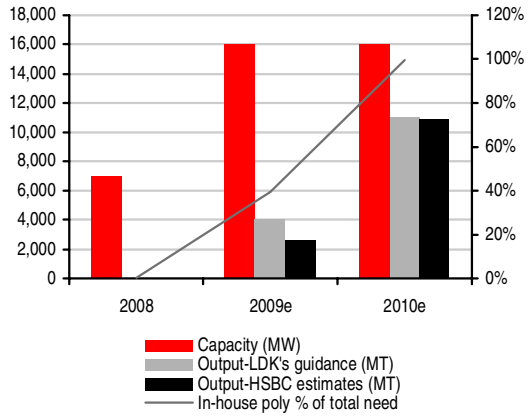
raw material needs in 2009, much lower than the company's target of 50%. Even so, we expect LDK's in-house polysilicon will account for 100% of its total needs by the end of 2010.

Polysilicon production in LDK

	2008	2009	2010
Capacity (MW)	7,000	16,000	16,000
Output-LDK's guidance (MT)	15-25	3,000-5,000	
Output-HSBC estimates (MT)	10	2,656	10,925

Source: HSBC estimates, company data

Polysilicon production in LDK



Source: HSBC estimates and company data

Margin expansion unlikely

Based on the assumption that total cost of producing in-house polysilicon will be lower than the spot price in 2009, we estimate that LDK's blended silicon cost will drop 24% y-o-y from USD236/kg to USD178/kg.

Unlike consensus, we think gross margin expansion is unlikely because the sharp fall in the price of wafers will negate the savings generated by in-house production and the falling polysilicon price. We estimate gross margin will drop from 21% in 08 to 17% in 09, below the company's guidance of 22-27%.

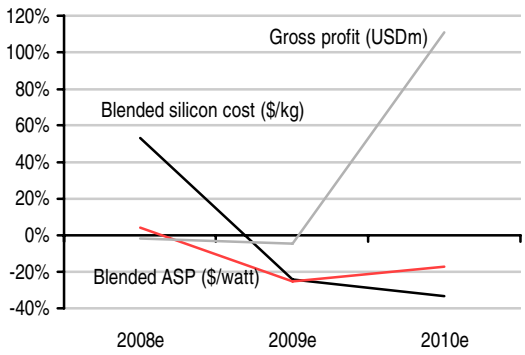
Please note that we assume LDK's polysilicon production cost at the initial stage will be around USD150/kg, much higher than company guidance of cUSD80/kg. Our view is based on the fact that the company is in the early stages of ramping up capacity, so the level of trichlorosilane (TCS, an important raw material and a by-product of the polysilicon process) recycling efficiency is unknown.

Blended silicon cost:

	2007	2008	2009	2010
Blended silicon cost (USD/kg)	154	236	178	119
y-o-y (%)		53.1%	-24.4%	-33.4%

Source: HSBC estimates

LDK: y-o-y (%) comparisons



Source: HSBC estimates

HSBC

Earnings sensitivity analysis

Bull case –
2009e total production volume = 6,000mt

- **Assumption:** 2009e total production volume of 6,000mt based on 2009e year-end polysilicon capacity of 16,000mt and multi-utilisation efficiency of 6.5g/W
- **Outcome:** 2009e total production volume of 926MW; in-house percentage of polysilicon of total needs will be 89%; gross margin 19%; 2009e EPS USD2.24, 28% higher than USD1.76 in the base case

Base case –
2009e total production volume = 2,656mt

- **Assumption:** 2009e total production volume of 2,656mt based on 2009e year-end polysilicon capacity reaching 16,000mt and multi-utilisation efficiency of 6.5g/W
- **Outcome:** 2009e total production volume of 410MW; in-house percentage of total needs will be 39%; gross margin 16%; 2009e EPS USD1.76

Bear case –
2009e total production volume = 1,000mt

- **Assumption:** 2009e total production volume of 1,000mt based on 2009e year-end polysilicon capacity of 16,000mt and multi-utilisation efficiency of 6.5g/W
- **Outcome:** 2009e total production volume of 154MW; in-house poly percentage of total need will be 15%; gross margin 15%; 2009e EPS USD1.54, 12% lower than the USD1.76 in the base case

Sensitivity analysis: Polysilicon production

Year 2009	Bull case	Base case	Bear case
Year-end polysilicon capacity (mt)	16,000	16,000	16,000
Total production volume (mt)	**6,000**	**2,656**	**1,000**
Multi-utilisation efficiency (g/W)	6.5	6.5	6.5
Total production volume (MW)	926	410	154
In-house poly % of total need	89%	39%	15%
Gross margin (%)	**19%**	**16%**	**15%**
EPS (USD)	**2.24**	**1.76**	**1.54**
EPS diff (%) compared with base case	28%	0%	-12%

Source: HSBC estimates

Comparison among Asian wafer makers

Company	LDK Solar	Sino America	Waferworks	Green Technology	Renesola	Trina Solar	REC	Yingli	Solargiga
Production base	China	Taiwan	Taiwan	Taiwan	China	China	Norway	China	HK
Established	2006	1981	1997	2004	2005	1997	1994	1998	2004
Vertical integration strategy									
Polysilicon	★	★		★	★		★		
Wafer	★	★	★	★	★		★		★
Cell		★					★	★	
Module						★	★	★	
Thin-film	★			★					
Wafer capacity (MW)									
FY07 capacity (MW)	420	120	100	100	378	150	506	200	100
FY08e capacity (MW)	1500	280	200	200	645	350	630	400	200
FY09e capacity (MW)	2500	580	400	300	1000	400	1100	600	400
FY08e product mix	8% mono 92% multi	25% mono 75% multi	Largely for mono	Largely for multi	50% mono 50% mult	66% mono 33% multi	8% mono 92% mult	100% multi	100% mono
FY08e source of materials	18% scrap silicon 82% virgin polysilicon	Largely virgin polysilicon	Largely virgin polysilicon	Largely virgin polysilicon	Largely scrap polysilicon	80% scrap silicon	Largely virgin polysilicon	51% scrap silicon	Largely virgin polysilicon
Polysilicon suppliers	Komex, Kunical E-mei, Luoyang silicon recyclers,	Hemlock, Wacker	Tokuyama DC Chemica	MEMC DC Chemica	Linzhou Zhongsheng Steel Joint Venture silicon recyclers	Wacker DC Chemical silicon recyclers	REC Silicon	Xingguang Wacker DC Chemica	Wafer Works Space Energy Corp.
Key customers, by geography	29% China 26% Asia 4% America 42% Europe	47% Taiwan 24% JP& Korea 9% China 15% USA 5% Others	11% Taiwan 38% Japan 36% China 6% Europe 8% America 1% Others	50% Taiwan 22% Asia 17% Europe 11% Others	48% China 22% Germany 22% Asia 8% Others	32% Germany 32% Spain 17% Italy 11% Belgium 6% France 4% Others	Germany Japan	70% Europe 21% China & HK 6% USA 3% Others	74% China 13% Taiwan 11% Japan 2% Others
Blend ASP (USD/watt)	2Q08 2.60/w 3Q08: 2.50/w 4Q08: 2.50/w				2Q08: 2.60/w 3Q08: 2.73/w 09: 2.3/w	3Q08: 4.09/w 4Q08: 3.45/w	2008 price will go down by around 3%	2Q08: 4.20/w 3Q08: 4.04/w	
Financials									
FY07 sales (USDm)	524	217	261	151	249	302	949	556	130
FY08e Sales (USDm)	**1649**	**282**	**183**	**277**	**664**	**813**	**1,217**	**1,089**	**230**
FY07 op margin	28%	28%	26%	15%	17%	12%	39%	17%	34%
FY08e Op Margin	**18%**	**22%**	**16%**	**18%**	**15%**	**13%**	**31%**	**17%**	**30%**
FY07 ROE	21%	33%	29%	23%	43%	6%	11%	8%	46%
FY08e ROE	**26%**	**31%**	**26%**	**44%**	**41%**	**9%**	**16%**	**18%**	**39%**
FY09e ROE	20%	27%	19%	25%	9%	11%	21%	18%	25%
FY09e ROA	6%	10%	12%	8%	10%	10%	16%	11%	19%
FY09 PE (x)	**8**	**6**	**7**	**7**	**2**	**4**	**8**	**4**	**5**
FY09 PB (x)	**2**	**2**	**1**	**2**	**1**	**1**	**2**	**1**	**2**
3Q08 net debt (cash) (USDm)	664	52	5	47	165	301	408	134	(69)
FY09 net debt (cash) (USDm)	140	42	65	15	281	190	1,767	88	(81)
3Q08 Net debt/equity	**66%**	**24%**	**2%**	**32%**	**32%**	**70%**	**20%**	**15%**	**-40%**
FY09 Net debt/equity	**14%**	**20%**	**32%**	**10%**	**55%**	**44%**	**88%**	**90%**	**-47%**
3Q08inventory days	153	284	295	263	n.a.	165	n.a.	102	192
3Q08 AR days	7	214	171	56	225	161	314	48	61
3Q08 Current ratio	**131%**	**144%**	**209%**	**120%**	**162%**	**130%**	**171%**	**232%**	**769%**
3Q08 Acid ratio	71%	109%	157%	91%	75%	103%	144%	140%	625%
3Q08 Asset turnover	17%	15%	18%	22%	20%	30%	8%	22%	45%
FY09 Capex sales	30%	11%	8%	4%	18%	14%	80%	14%	22%

Source: Company data, HSBC estimates and research

HSBC

HSBC

Company basics

- LDK is a leading China-based solar wafer provider with a strong international customer base
- It aims to source 100% of its polysilicon needs in-house to reduce cost and guarantee supply
- Production of polysilicon starts from 4Q08 and the company expects to produce 3,000-5,000mt in 2009

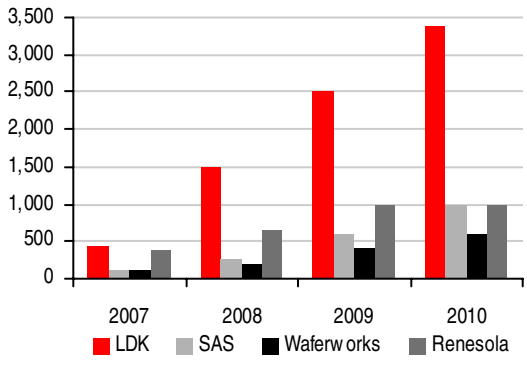
Company description

LDK Solar is a pure upstream solar manufacturer dedicated to the design, development, manufacturing and distribution of solar wafers. Wafers are the principal raw material used to produce solar cells. In addition, LDK provides wafer processing services to both monocrystalline and multicrystalline solar cell/ module manufacturers.

The company manufactures multicrystalline ingots from polysilicon feedstock in its directional solidification system furnaces (DSS furnaces) as an interim step in producing wafers. LDK sources polysilicon from different sources, including solar-grade virgin polysilicon and recycling wafers from numerous providers.

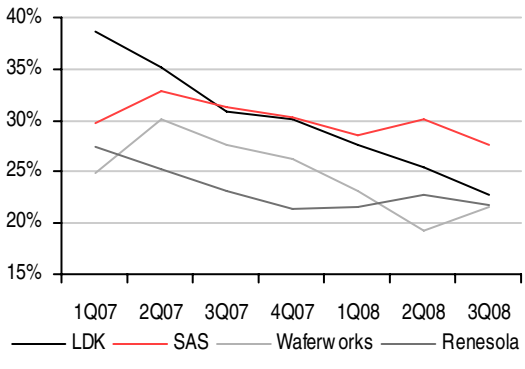
LDK Solar's headquarters and manufacturing facilities are located in Hi-Tech Industrial Park, Xinyu City, Jiangxi Province in China. Its office in the United States is located in Sunnyvale, California. LDK was incorporated in the Cayman Islands on May 1, 2006. Its principal operating subsidiary, Jiangxi LDK Solar Hi-Tech Co., Ltd., or Jiangxi LDK Solar, was incorporated in China on July 5, 2005. It went public with an IPO on May 31, 2007.

LDK vs peers : Capacity (MW)



Source: Company data, HSBC estimates

LDK vs peers – quarterly gross margin (%)



HSBC: Company data

Expansion plans

Capacity expansion: Wafer

In its 3Q08 earnings conference call, LDK raised its year-end wafer capacity guidance for 2008 and 2009 by 17% and 5%, respectively, to 1.4 and 2.3GW from 1.2 and 2.2GW.

Multicrystalline wafer capacity expansion of 233% for 2008e and 64% for 2009e was based on strong wafer order backlog in 3Q08.

Expansion plan: Wafers

	2006	2007	2008e	2009e	2010e
Multi-wafer production					
Year-end capacity (MW)	**178**	**420**	**1,400**	**2,300**	**3,200**
y-o-y (%)		136%	233%	64%	39%
In-house production (MW)	**45**	**259**	**809**	**1,258**	**2,058**
y-o-y (%)		473%	212%	56%	64%
Mono-wafer production					
Year-end capacity (MW)	**0**	**0**	**100**	**200**	**200**
y-o-y (%)				100%	0%
In-house production (MW)	**0**	**0**	**0**	**60**	**168**
y-o-y (%)					179%

Source: Company data, HSBC estimates

Capacity expansion: Polysilicon

In August 2007, the company started the construction of a polysilicon production plant near its solar wafer manufacturing facilities in Xinyu City, Jiangxi province. The plant consists of two factories, one with an expected annual installed polysilicon production capacity of 15,000mt and the other 1,000mt.

LDK also intends to construct HCl and TCS production facilities near the 15,000mt factory to make production inputs for its polysilicon factories.

Its in-house polysilicon already covers 100% of its multicrystalline solar wafer production.

LDK has engaged Fluor Corporation to provide general engineering, procurement, construction and management services for its polysilicon manufacturing plant. The company has also hired CDI Engineering Solutions to provide basic engineering services (front-end engineering design) for its TCS plant. In addition, it intends to purchase and install a separate TCS plant for its 1,000mt factory.

By the end of 2007, LDK has received the completed basic engineering phase, or BEP, package for its TCS plant on time and on budget from CDI Engineering Solutions. The BEP defines the parameters of the plant design and is used to prepare detailed construction drawings.

LDK expects to achieve an aggregate installed annual production capacity of approximately 7,000mt of polysilicon by the end of 2008 and approximately 16,000mt by the end of 2009.

The company had no prior experience in manufacturing polysilicon and encountered delays in 4Q08, so we do not expect it to reach its output target. We forecast 2008 and 2009 output to be 10mt and 2,656mt, respectively, compared with company guidance of 15-25mt and 3,000-5,000mt.

Expansion plan: Polysilicon

	2008e	2009e	2010e
Year-end poly capacity	7,000	16,000	16,000
y-o-y (%)		128.6	0.0
Total production volume (ton)	10	2,656	10,925
y-o-y (%)		265	311

Source: Company data, HSBC estimates

Raw material sourcing

LDK's polysilicon feedstock consists of polysilicon scraps, recyclable polysilicon and virgin polysilicon. Around 50% of the polysilicon it needs came from the spot market in 3Q08. This ratio is set to decrease depending on its in-house polysilicon output.

- **Polysilicon scraps/recyclable polysilicon.** LDK purchases polysilicon scraps and recyclable polysilicon from semiconductor materials trading companies, including Komex Inc., Petro International, Sunbridge, and Targray Technology International

- **Long term/short term contracts on virgin polysilicon**. Some of its polysilicon supply agreements are subject to fluctuating market prices or price negotiations with suppliers
- **Spot market**. LDK also sources polysilicon feedstock from the spot market depending on the price and its requirements
- **OEM deals**. Some customers, including BP Solar, Canadian Solar, GE Energy, and Q-Cells, have supplied LDK with polysilicon feedstock for OEM orders

Principal customers

LDK has successfully expanded its customer pool from China/Asia Pacific to Europe, and now has more than 30 customers worldwide. Sales to China as a percentage of the total sales decreased from 75.5% in 4Q06 to 29% in 3Q08, while sales to Europe as a percentage of sales increased from 10% in 1Q07 to as high as 42% in 3Q08. Europe is now the company's most important sales area.

Principal customers include top solar cell/ module companies around the world, such as Q-Cells (Germany) and Qimonda (Germany) in Europe, as well as Suntech (China), Canadian Solar (China), Hyundai Heavy (Japan), Mosel Vitalic (Taiwan), Gintech (Taiwan) and Neo Solar (Taiwan) in Asia.

As its top three customers account for 36% of total sales, LDK intends to continue to enhance and broaden the revenue and customer base by targeting other leading global solar cell and module manufacturers.

Customer breakdown by geography

	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08F
China	38%	23%	30%	29%	34%	33%	29%
Asia-Pacific	46%	45%	34%	41%	30%	34%	26%
Europe	10%	20%	27%	25%	33%	29%	42%
North America	6%	12%	10%	5%	3%	4%	4%

Note: Asia-Pacific excludes China & Taiwan. Europe includes Germany
Source: Company data, HSBC research

Technologies

Wafering technology

LDK has been improving its technologies and expertise to clean and optimise the mix of polysilicon feedstock of different grades and to ensure and improve its polysilicon yield. It uses wire saws rather than band saws in its squaring. This enables LDK to reduce silicon material loss in the squaring processes, or kerf loss. It has purchased automatic wafer cleaning and sorting equipment to improve sorting efficiency and reduce breakage.

LDK recovers some of its slurry through third-party service providers. LDK has also purchased slurry recovery systems from HCT Shaping and GT Solar to recover the slurry internally. In January 2007, LDK installed its first line of the slurry recovery systems. It intends to install additional slurry recovery systems as it expands its production capacity. The slurry recovery ratio of these systems is over 75%. Through additional research and development, the company will endeavour to recycle and re-use as many of its production consumables as possible. This is not only a cost reduction measure, but also an important part of its environmentally friendly programme.

Polysilicon production technologies

LDK will use metallurgical silicon as a raw material to produce TCS, which will then be used to produce polysilicon. Its technology will enable a high degree of hydrogen, HCI, TCS and STC to be recycled and reused during the production process, thereby reducing waste output and lowering raw material cost.

This continuous closed-loop process increases production capacity per reactor, while reducing overall energy consumption and capital investment for a given level of production. Its advanced distributed control system, or DCS, will improve production capacity and safety while reducing human-resource related operating expense.

Its production process, including production, cleaning, packaging and transportation, will conform to relevant international standards and its comprehensive waste management system is compliant with national environmental protection standards.

Management team

Xiaofeng Peng, only 33 years old, is the chairman, CEO and founder of LDK. He was named "The Most Respectable Young Entrepreneur of China" by *Hurun Report* in October 2008.

Mr Peng believes in the future of solar power. His goal is to lead LDK to become one of the largest solar companies in the world. Unlike most of his competitors in the solar cell/module business, Mr Peng has chosen to focus on improving the quality of raw materials. This has proved an effective strategy for the company, given its strong order backlog and pre-payments from its customers. Apart from investment in financial capital, human capital, and electricity supplies, he plans to spend more on R&D and recruit top expertise in the industry to increase the company's competitiveness. He is known for thinking outside the box and for his willingness to take risks. We believe his innovative and energetic management style will lead to continued successes for LDK.

LDK Management, Directors, and Executive Officers

Name	Age	Experiences
Xiaofeng Peng Chairman, CEO and founder	32	Has been CEO at LDK since the inception in July 2005, having previously founded and held the CEO position at Suzhou Liouxin, a manufacturer of personal protective equipment in Asia since March 1997. Mr Peng graduated from Jiangxi Foreign Trade School in 1993 with a diploma in international business and from Beijing University Guanghua School of Management with an executive MBA degree in 2002.
Jack Lai Chief Financial Officer and Secretary	54	Has been CFO at LDK since August 2006, having gained over 20 years of experience in corporate finance. Previously, was CFO at Silicon Storage Technology (2003-06), Inc. and at San Jose-based Aplus Flash Technology (2000-03) and at Wirex Corporation (1998-00). Mr Lai graduated from Tamkang University with a bachelor's degree in business administration in 1976, from Chinese Culture University with an MBA degree in 1978 and from San Jose State University with an MBA degree in 1982.
Xingxue Tong Chief Operating Officer and Director	43	Has been COO since January 2007, having gained over 10 years of experience in the solar industry. Previously, he served as GM for south-east Asia business development with GT Solar from 2004. He was the executive president of commerce of CSI in 2004 and vice general manager of an affiliate of Tianwei Yingli (1999-2004). Mr Tong received a diploma in industrial economic management from Renmin University of China in 1988 and a diploma in English from Hebei University in 1998.
Yuepeng Wan Chief Technology Officer	42	Has been CTO since February 2007, having gained over 15 years of experience in R&D in silicon and materials engineering. Previously, was a R&D manager at GT Solar (2000-07), focusing on DSS furnaces. Dr. Wan received a Bachelor of Science degree in materials engineering from University of Science & Technology of China in 1986, a Master of Science degree in mechanical engineering from University of Science & Technology of China in 1989 and a PhD. degree in mechanical engineering from Aachen University of Technology of Germany in 1997.
Liangbao Zhu Director and executive vice president	41	Joined LDK in November 2005. With over 15 years of experience in managing marketing and sales operations in China and overseas. Previously, held multiple management positions in manufacturing, investment and trading companies in China and overseas (1993-2005). Dr. Zhu graduated from Yangzhou Normal College with a bachelor's degree in 1982, from Suzhou University with an MBA degree in 2002 and a doctor's degree in business management in 2005.
Nicola Sarno Senior Vice President of Manufacturing	55	Has been SVP of manufacturing since April 2006. With over 20 years of experience in silicon manufacturing, having held multiple positions in the areas of production, process engineering and strategic material supply globally. He was a manufacturing director, engineering manager of crystal growing and operations/strategic materials manager of MEMC (1985-2002) and a production manager of S.E.H. America, Inc (1981-85). Mr Sarno received a diploma in mechanical engineering from Mander College in 1971.
Pietro Rossetto Chief Engineer	57	Has been as Chief Engineer since June 2006. Previously, taught electrical engineering and computer science in Merano, Italy (2003-05). He held multiple positions at MEMC (1976-2002), including senior manager for single crystal technology and manager for various special projects. Mr Rossetto received his college degree in physics from University of Milan Institute of Physical Science in 1975.
Gang Wang Non-executive Director	39	Became a Non-executive Director at LDK in July 2006, having been the chief representative in China of Natexis Private Equity Asia Limited since 2002. Previously held various senior financial management positions in New Zealand and China (1999-2002). Mr Wang received his bachelor's degree in mechanical engineering from the Hefei University of Technology of China in 1989 and an MBA degree from the Massey University in New Zealand in 1995.
Louis T. Hsieh Independent Director	43	Became an Independent Director at LDK in May 2007. He has been the CFO and board member of New Oriental Education & Technology Group since 2005. He has 4 years CFO Experience in China and the US, seven years private equity and investment banking experience and seven years general counsel and securities and corporate law experience. Mr Hsieh received the B.S. Engineering in Stanford University, M.B.A. from Harvard Business School and J.D. from UC Berkeley Boalt Law School.

Source: Company's website

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Appendix I: Polysilicon market outlook

Global Solar PV Industry

Solar power is one of the most rapidly growing renewable energy sources in the world. The solar industry has experienced significant growth over the past decade, producing solar wafers, cells, modules and systems that convert energy from sunlight into electricity. According to Solarbuzz's forecast in 2007, the global solar PV industry (by MW of installations and revenue from 2006 through 2011) is expected to reach 7,630MW and USD31.5bn respectively, rising at a CAGR of 34% and 24% respectively.

Germany, Japan and Spain are currently the major markets in the solar photovoltaic (PV) industry. With the implementation of California's Million Solar Roofs initiative and the increasing efforts in developing the solar PV industry in other parts of the country, the US is expected to increase the installation capacity to 7,000MW by 2020. As one of the largest energy consumers in the world, China continues to possess immense market opportunities while Korea and Australia are expected to be the emerging countries in the solar industry.

In addition, the Chinese government has strongly supported the development of renewable energy by promulgating the Renewable Energy Law of PRC in January 2006. This has accelerated the promotion of clean energy technologies effectively. The Chinese government has also encouraged the use of solar energy as a clean energy by implementing subsidy programmes and incentive schemes. According to a white paper entitled China's Energy Conditions and Policies issued by the State Council of China on 26 December 2007, China will actively develop renewable energy and increase the utilisation of renewable energy with the target to reach 10% and 15% of overall energy consumption in 2010 and 2020 respectively.

Polysilicon market

Major suppliers of polysilicon, the raw material for wafers used in the solar and electronics industries, are located in Europe, the US and Japan. Owing to the rapid growth of the solar energy industry, there is a serious shortage of polysilicon supply due to insufficient output, leading to escalating prices of this type of raw materials until 3Q08. As the current polysilicon producing countries increase polysilicon output, along with new producers in China, Japan and Korea entering the market, the shortage is expected to be alleviated.

According to Solarbuzz, polysilicon-based technologies accounted for approximately 88.4% of total solar production in 2007. The solar industry consumed 54% of the polysilicon production while the electronics industry consumed the remaining 46% in 2007.

Key polysilicon providers include Hemlock, MEMC, Mitsubishi, Osaka Titanium, REC, Tokuyama and Wacker, who accounted for 82% of total polysilicon production capacity in 2007. The major incumbent polysilicon suppliers worldwide have announced new capacity

Polysilicon production (annual capacity in tons)

	2005	2006	2007	2008e	2009e	2010e
Hemlock	7,700	9,800	10,000	14,500	19,000	21,000
Wacker Chemie	5,500	6,500	8,000	10,650	15,150	22,150
REC	5,300	5,600	6,000	7,000	11,000	18,000
Tokuyama	5,200	5,200	5,200	5,200	8,200	8,200
MEMC	4,500	4,950	6,475	7,238	8,000	8,000
MM	1,600	1,600	2,850	3,150	3,300	3,300
MP	1,250	1,250	1,550	1,550	1,550	2,800
Sumitomo	900	900	1,300	1,400	1,400	1,400
Others	4,450	1,900	1,025	6,113	18,700	27,750
Total production	36,400	37,700	42,400	56,800	86,300	112,600

Source: HSBC Research

expansion plans in response to the growing demand from the solar industry. In addition, many new entrants have either commenced or announced plans to produce polysilicon.

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Appendix II: Polysilicon manufacturing process

There are currently three common methods commercially employed to produce polysilicon: the Siemens process, metallurgical purifying process and fluidised-bed reactor (FBR) process.

Siemens Process

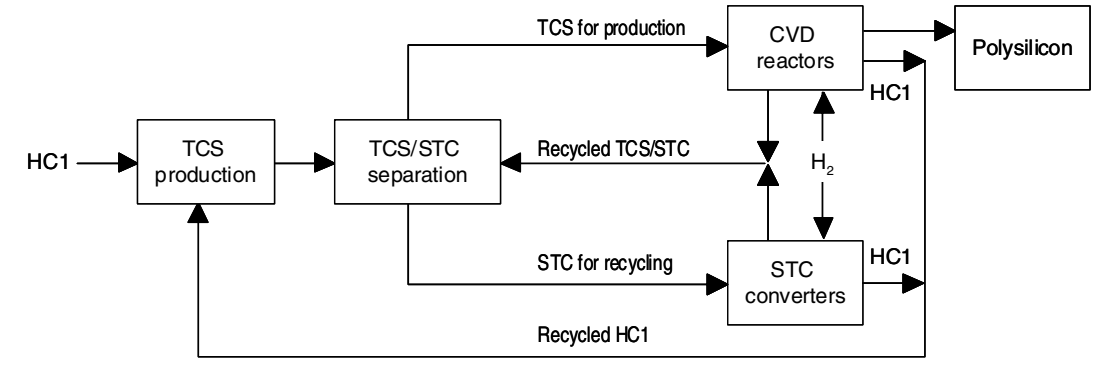
The oldest method, the "Siemens" process, was the only commercial route to polysilicon prior to 1980. It remains the dominant technology used in the production of prime quality polysilicon chunks. This processes is carried out by depositing silicon onto the surface of electrically heated high-temperature silicon core rods from silicon element-containing gas such as trichlorosilane (SiHCl.sub.3, referred to as TCS hereafter), dichlorosilane (SiH.sub.2 Cl.sub.2) or monosilane (SiH.sub.4) in a bell-jar type reactor. It is conceivable to heat a silicon core rod with a high-temperature radiation as well as with an electromagnetic wave including high-frequency wave on behalf of the electrical resistance heating via electrode. Therefore, polysilicon can be prepared regardless of the shape of the reactor if the silicon core rod is heated. In the Siemens process, high-purity silicon rods are exposed to trichlorosilane at 1,150°C. The trichlorosilane gas decomposes and deposits additional silicon onto the rods, enlarging them according to chemical reactions such as

$$2\ HSiCl3 \rightarrow Si + 2\ HCl + SiCl4$$

But when the diameter of the silicon rod reaches a maximum of 10-15cm, the reaction should be terminated, the reactor is dismantled and the rod-type polysilicon products are separated from the electrodes. Finally, the rods will be broken into chunks, impurities will be segregated and the ultra pure polysilicon chunks will then be used for wafer production.

Thus, continuous preparation of polysilicon is impossible by using a bell-jar type reactor. Therefore, for reducing the specific electric power consumption and preparation cost, it is essential to maintain the surface temperature of the silicon rod in the limited reactor space as high as possible and

LDK's planned polysilicon production process:



Source: Company report

to enhance thereby the silicon deposition as much as possible although the yield may be less than that achievable at a thermodynamic equilibrium.

Metallurgical purification process

The direct metallurgical route produces silicon from ultra-high purity raw materials. Silicon is commercially prepared by the reaction of high-purity silica with wood, charcoal, and coal, in an electric arc furnace using carbon electrodes. At temperatures over 1900 ˚C, the carbon reduces the silica to silicon according to the chemical equation

$$SiO2 + C \rightarrow Si + CO2$$

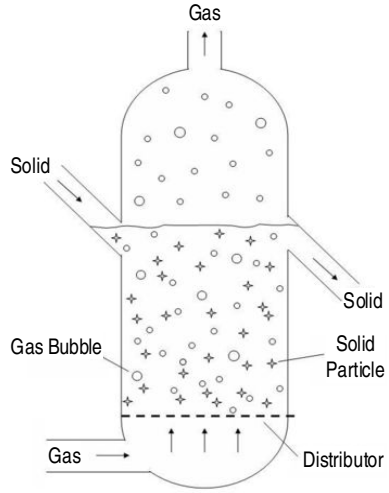
Liquid silicon collects in the bottom of the furnace, and is then drained and cooled. The silicon produced via this process is called metallurgical grade silicon and is at least 98% pure. But the use of silicon in semiconductor devices demands a much greater purity than afforded by metallurgical grade silicon.

PV-grade silicon needs to possess a purity of more than 99.999999999%, while silicon for semiconductor applications needs to be even purer, at 99.9999999999%.

Fluidised-bed reactor (FBR)

This is the method currently used by MEMC and REC Silicon in its new capacity. According to this process, a fluidised bed of moving silicon particles is formed by the reaction gas supplied from the lower part of the reactor toward its upper part. Elementary silicon is continuously deposited on the hot surfaces of the fluidising silicon particles, which grow into polysilicon product granules. Being enlarged from the smaller seed crystals due to the repeated silicon deposition, the larger particles tend to lose mobility and to settle downward. Here, the seed crystals can be supplied continuously or periodically into the fluidized bed, and the enlarged particles can be withdrawn continuously or periodically from the lower part of the reactor.

Fluidised-bed reactor (FBR)



Source: Scientific Electronic Library online

MG-Si is reacted with HCl to form trichlorosilane (TCS) in a fluidised-bed reactor (at 300oC) according to the chemical reaction Si + 3HCl --> SiHCl3 + H2. TCS is an intermediate compound for polysilicon manufacturing. In the course of converting MG-Si to TCS, impurities such as Fe, Al and B are removed. This ultra-pure TCS is subsequently vaporized (distilling the TCS achieves an even higher level of purity), diluted with H2, and flowed into a deposition reactor where it is retransformed into elemental silicon. This polysilicon has typical contamination levels of less than .001 ppb.

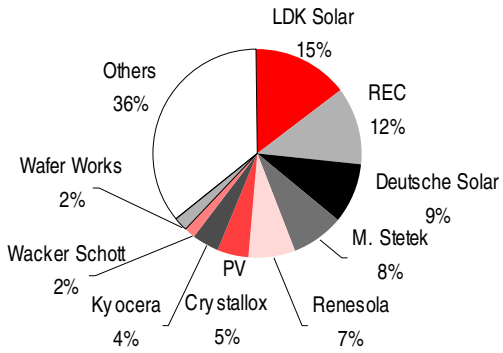
A method of producing polysilicon using a conventional bell-jar type reactor cannot produce the polysilicon continuously; power consumption is large; and post-treatment is required before use. A fluidised-bed reactor to some extent can solve those problems of the bell-jar type reactor. However, continuous operation of the fluidised-bed reactor is impossible unless the accumulation of silicon deposit on the surfaces of the reaction gas supplying means is prevented.

Appendix III: Ingot/wafer manufacturing process

Wafer market share

LDK enjoyed 15% market share in the solar wafer segment in 2007. Other big players include REC, Deutsche Solar, M.Setek, and Renesola.

Solar wafer market share (2007)



Source: Company data, Photon International, Solar Buzz, HSBC Research

Wafer production process

Production of solar wafers can be divided into two main steps: ingot production and wafering. LDK uses manufacturing equipment and related technologies purchased from some solar equipment vendors, including GT Solar, HCT Shaping and Meyer Burger. It also uses other equipment manufactured domestically or imported from overseas.

Production of Polysilicon Ingot

LDK prepares its polysilicon feedstock with de-ionized water in etching stations. The prepared polysilicon feedstock is then placed in crucibles and each crucible is loaded into the DSS furnaces for melting and crystallization. Polysilicon ingots formed during the crystallization process are then cut into smaller blocks with a squarer, a process known as squaring. The polysilicon ingots are currently 270 kilograms in weight and 690mm by 690mm in width and 216 or 243 mm in height. LDK is engaged in research and development efforts in collaboration with GT Solar to increase the number of wafers that can be produced per standard ingot of 270 kilograms by 15%.

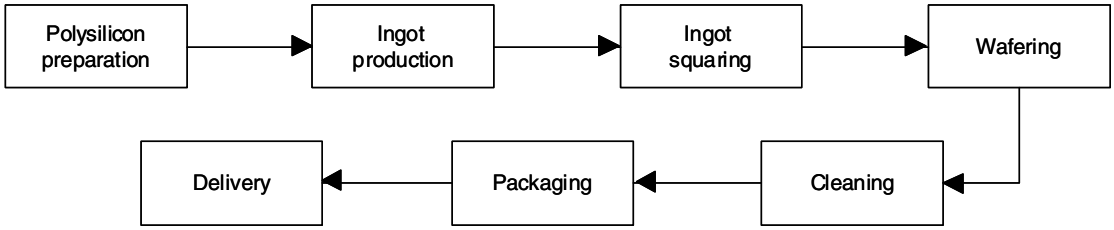
Wafering

After passing inspection, the polysilicon blocks are cropped and prepared for slicing. The prepared polysilicon blocks are sliced into wafers by wire saws. The company then washes and dries the wafers at its wafer cleaning stations before the final inspection and packaging for delivery.

Materials used in its wafer production

- ***Polysilicon Feedstock.*** The main raw material for multicrystalline wafer and ingot production is polysilicon feedstock. LDK uses a variety of polysilicon materials, including solar-grade virgin polysilicon that is at least 99.9999% pure, recyclable polysilicon scraps from third parties and silicon powder.
- ***Crucibles.*** A crucible is a ceramic container used to hold polysilicon feedstock for melting in the furnace and has to withstand extremely high temperatures. Crucibles are currently not reusable, as once the ingot is formed, the crucible holding the ingot will be broken and removed from the ingot.

LDK's ingot production and wafering process



Source: LDK

- ***Slurry and Wire.*** Slurry is used in the wire sawing process. It is a fluid composed of silicon carbide, or SiC, which functions as an abrasive, and polyethylene glycol, or PEG, which acts as a coolant. Wires are used in wire saws to carry the slurry in order to create an abrasive cutting tool.

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Disclosure appendix

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*A stock will be classified as volatile if its historical volatility has exceeded 40%, if the stock has been listed for less than 12 months (unless it is in an industry or sector where volatility is low) or if the analyst expects significant volatility. However,

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Prior to this, from 7 June 2005 HSBC applied a ratings structure which ranked the stocks according to their notional target price vs current market price and then categorised (approximately) the top 40% as Overweight, the next 40% as Neutral and the last 20% as Underweight. The performance horizon is 2 years. The notional target price was defined as the mid-point of the analysts' valuation for a stock.

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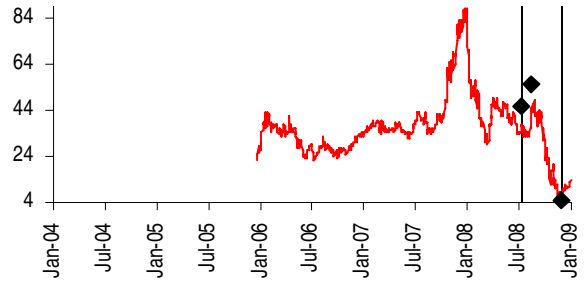
Overweight (Buy)	44%	(31% of these provided with Investment Banking Services)
Neutral (Hold)	37%	(33% of these provided with Investment Banking Services)
Underweight (Sell)	19%	(22% of these provided with Investment Banking Services)

Share price and rating changes for long-term investment opportunities

Suntech Power Holdings (STP.N) Share Price performance USD Vs HSBC rating history



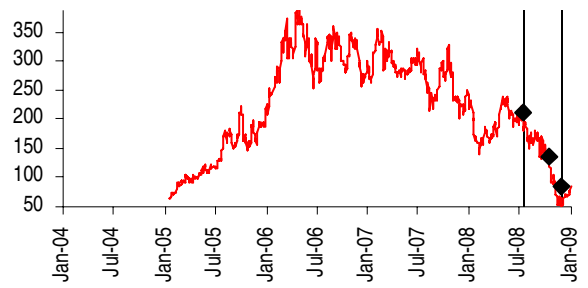
Source: HSBC

Recommendation & price target history

From	To	Date
N/A	Overweight (V)	16 July 2008
Overweight (V)	Underweight (V)	05 December 2008
Target Price	**Value**	**Date**
Price 1	46.00	16 July 2008
Price 2	55.00	21 August 2008
Price 3	4.50	05 December 2008

Source: HSBC

Motech Industries Inc (6244.TWO) Share Price performance TWD Vs HSBC rating history



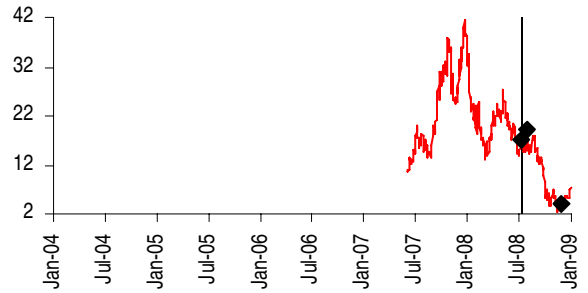
Source: HSBC

Recommendation & price target history

From	To	Date
N/A	Neutral (V)	16 July 2008
Neutral (V)	Overweight (V)	05 December 2008
Target Price	**Value**	**Date**
Price 1	212.57	16 July 2008
Price 2	135.00	22 October 2008
Price 3	85.00	05 December 2008

Source: HSBC

Yingli (YGE.N) Share Price performance USD Vs HSBC rating history



Source: HSBC

Recommendation & price target history

From	To	Date
N/A	Neutral (V)	16 July 2008
Target Price	**Value**	**Date**
Price 1	17.00	16 July 2008
Price 2	19.00	07 August 2008
Price 3	4.00	05 December 2008

Source: HSBC

HSBC & Analyst disclosures

Disclosure checklist

Company	Ticker	Recent price	Price Date	Disclosure
MOTECH INDUSTRIES INC	6244.TWO	82.80	05-Jan-2009	6, 7

Source: HSBC

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