

# HANERGY SOLAR GROUP (0566.HK)

NOT RATED

**Current Price** **HK\$1.30**

52-Week Range	HK\$0.25 – HK\$1.49
Avg Daily Turnover (3M)	HK\$362M
Shares Outstanding	27,927M
Free Float	37.2%
Market Cap.	HK\$36,304.9M

## Company Profile

Hanergy Solar Group, renamed from Apollo Solar Energy in 2013 is the world's no.1 thin-film solar turnkey line provider. It acquired Solibro (Germany), and MiaSolé (US), which are the world's leaders in CIGS thin-film technology. It started to expand into large-scale downstream solar power business globally since 2013. The parent company, Hanergy Holding, is the largest privately held renewable energy player in China, with operations in solar, hydro and wind power generation. Hanergy Solar is listed on the HK Stock Exchange through a backdoor listing in Oct 2009.

## YTD Price Performance vs. HSI



Source: Bloomberg

## Major Shareholders

Hanergy Holdings	62.8%
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# DESK NOTE

## “A Thin-film Advocate”

- Hanergy started to expand into the downstream solar segment, through acquisition of a solar farm in the U.S., launching of two solar projects in China, as well as developing new solar application markets;
- Solibro's CIGS technology has just achieved a 18.7% photovoltaic (PV) module efficiency in Sept this year, making the thin-film technology closer to being on par with traditional crystalline ones in terms of conversion efficiency;
- The stock is trading at 13x 2012 P/E and 2.0x PB in 1H13.

## Background

We revisited the company recently, as we saw that a growing number of solar players had started to expand into the downstream solar market by having a complete value-chain in order to stay competitive.

## Company Highlights

**What has Changed since our Last Visit?** Hanergy has built a more solid roadmap of its thin-film development, by establishing the Power Group for developing into the global solar power generation and development of new solar application markets. At the beginning, Hanergy Solar only provided turnkey thin-film solar module production lines to its parent company, “Hanergy Holdings”. The downstream expansion will now create demand for thin-film modules, which Hanergy targets to buy from its parent and on the other hand, the solar farm will generate tariff income for Hanergy.

**Proposed Launch of Solar Power Plants in Qinghai and Xinjiang** – Hanergy announced a 100MW ground-mounted power plant in Qinghai and a 20MW plant in Xinjinag in Sept, which are expected to be completed by 25 Dec 2013 with an on-grid electricity price of RMB1.0 per kwh and an annual electricity generation of ~155mn kwh and ~27mn kwh on average respectively. These projects will use the thin-film solar modules manufactured by its parent on completion.

**Valuation** – Hanergy currently trades at 13x 2012 P/E and 2.0x P/B currently, compared to 16.0x P/E and 2.0x P/B peers average of both upstream to downstream solar players (see Figure 1).

**Key risks** – Commercialization of the CIGS thin-film solar module is delayed by a slower than expected localization; slow development in solar projects to fill the demand for its equipment orders and failure to install 10GW solar capacity per annum from 2013-2015 in China.

## Key Financials – Fiscal Year End Dec

FYE Dec	Dec 10	Dec 11	Dec 12	1H12	1H13
<b>Total Revenue (HKD mn)</b>	<b>3,019</b>	<b>2,565</b>	<b>2,756</b>	<b>1,637</b>	<b>2,080</b>
Revenue Growth	320.8%	-15.1%	7.5%	101.3%	27.1%
<b>EBITDA (HKDmn)</b>	<b>1,768</b>	<b>1,334</b>	<b>1,827</b>	<b>1,034</b>	<b>1,626</b>
EBITDA Growth	749.8%	-24.6%	37.0%	412.3%	57.3%
<b>Net Profit (HKDmn)</b>	<b>1,185</b>	<b>719</b>	<b>1,316</b>	<b>771</b>	<b>1,432</b>
Net Profit Growth	N/A	-39.3%	83.0%	N/A	85.7%
<b>EPS (Basic) (HKD) -</b>	<b>0.250</b>	<b>0.060</b>	<b>0.100</b>	<b>0.050</b>	<b>0.060</b>
EPS (FD) (HKD) -	0.090	0.050	0.080	0.060	0.070
DPS (HKD)	-	-	-	-	-
P/E (x)	5.2	21.7	13.0	26.0	21.7
EV/EBITDA (x)	3.6	3.2	2.6	3.5	21.9

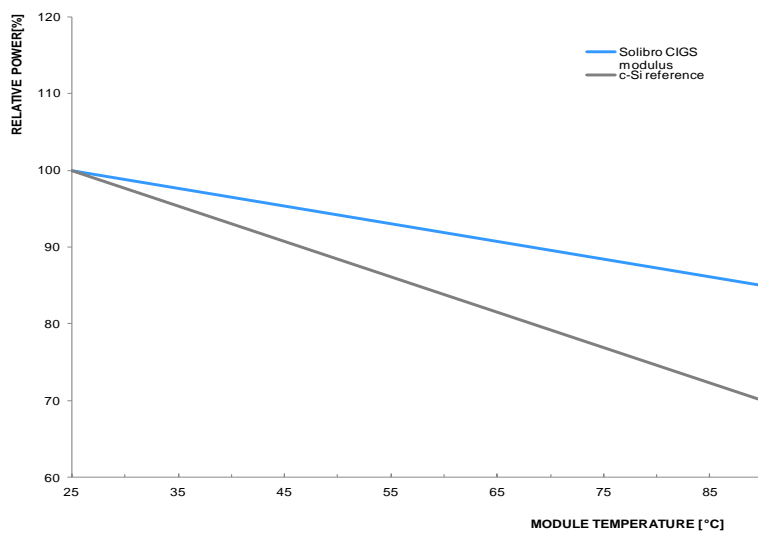
Source: Company Data, Bloomberg

**18.7% PV module efficiency making it almost in par with traditional crystalline module**

**Solibro's CIGS Thin Film Technology Breakthrough** – Solibro has made a major breakthrough by achieving 18.7% PV module efficiency (aperture area efficiency) in Sept 2013, which is one of the highest efficiency rates for CIGS thin-film sub-modules in the world and making it almost on par with traditional crystalline module efficiency of 12-19%. This, together with an expected production cost drop to USD0.35/watt on production localization and scale expansion from the current level of USD0.81/watt in 1-2 years time, suggest that the share of total solar module demand accounted for by thin film will rise. However, as the module was manufactured using laboratory tools, its full commercialization is yet to be seen. (see Figure 3, for comparison between CIGS and Crystalline technology)

**Temperature coefficient for Solibro modules is -0.36%/K (P<sub>MPP</sub>), compared with crystalline standard of -0.45 to -0.49%/K (P<sub>MPP</sub>), suggests lower power loss for Solibro's modules at high temperature**

**Figure 1: Performance of Solibro's CIGS Modles Vs c-Si**



Source: Company

**Successful application of CIGS thin-film modules by Manz in China gives Hanergy a confidence boost**

**Application of Manz (M5Z GR)'s CIGS thin-film Modules in China** – In Mar 2013, the Shilin Town Solar Park in China's south western province Yunnan has incorporated 1MW of CIGS thin-film modules supplied by Manz, a German solar manufacturer. Both crystalline solar modules and CIGS thin-film modules were installed in the solar park, and it came as a surprise that the CIGS solar modules yielded up to 10% more than crystalline solar modules because CIGS has a more favorable temperature coefficient in the subtropical climate of Yunnan.

**Favorable government policy**

**Government Policy in Favor of Solar Power** – The NDRC issued a notice on the effect of price leveraging to promote the healthy development of the PV (photovoltaic) industry in Aug 2013, that to increase the current renewable energy surcharges imposed on all non-renewable energy users from RMB0.008 per kwh to RMB0.015 per kwh. Under the 12<sup>th</sup> Five-Year Plan, the State Council targets solar power installed capacity of 10 GW (giga-watt) per annum between 2013 and 2015, bringing the total solar installed capacity to 35 GW by 2015.

## Financials & Valuations

**Sales & Subscription Contracts with Hanergy Holding** – Hanergy entered into two master sales contracts with its parent company (Hanergy Holding) for the sale of equipment and turnkey production lines for the manufacture of thin-film solar PV modules to its parent in both 2010 and 2011. The total contracted sales capacity amounted to 10GW, with a total contract sum of HKD66.2bn for these two sales contracts. In return, the parent company would subscribe to 29bn new shares of Hanergy Solar. As of today, there are still 12bn outstanding shares under the share subscription contracts, representing ~43% of total existing shares issued.

**Convertible Bonds (CB) Expiry Extended to 31 Dec 2014** – As of 4 Oct 2013, GL Wind Farm and China Genco are holders of existing outstanding 3.4bn CB. The two companies are wholly-owned subsidiaries of Hanergy Investment. Upon full conversion of the outstanding CBs, together with the above sales and share subscription contracts, total shareholdings held by its parent in Hanergy will eventually reach ~70% from the current level of 62.8%.

**Earnings Rebounded in 1H13** – 1H13 net profit surged 87% YoY, due to an increase in the recognition of sales revenue from the sales & subscription contracts for equipment and turnkey production line sales to Hanergy Holdings, as well as a sharp improvement in gross margin by 13.4ppts to 80.5%. Hanergy booked in a contract revenue of HK\$2,756mn for FY2012 and HK\$2,080mn for 1H13.

**Figure 2: Valuations and Comparables**

Name	Ticker	Mkt Cap (bn HK\$)	Currency	Last Price	2012 P/E (x)	Current P/B (x)	Sales growth (%)	Op Profit Margin (%)	Cap Ex/ Sales (%)	ROIC (%)	ROA (%)	Dvd Yield (%)	EV/ EBITDA (X)
<b>Upstream</b>													
Hanergy Solar	566 HK	36.30	HKD	1.3	13.0	2.0	7.5	62.9	1.3	14.4	13.3	0.0	14.8
Tera Semicon	123100 KS	0.86	KRW	87.2	11.4	1.9	-45.1	13.2	2.3	14.5	10.0	0.0	43.8
Jusung Engineering	036930 KS	1.42	KRW	34.5	N/A	1.4	-74.8	-105.7	42.7	N/A	-24.8	0.0	N/A
<b>Average</b>		<b>12.9</b>			<b>11.8</b>	<b>1.8</b>	<b>-37.5</b>	<b>-9.9</b>	<b>15.4</b>	<b>14.4</b>	<b>-0.5</b>	<b>0.0</b>	<b>29.3</b>
<b>Mid-Downstream Players</b>													
MANZ AG	M5Z GR	2.93	EUR	655.0	N/A	1.8	-23.5	-17.6	21.5	N/A	-9.3	N/A	N/A
Solarworld	SWV GR	0.88	EUR	7.9	N/A	2.2	-42.0	-81.2	8.7	N/A	-26.6	N/A	N/A
Green Energy	3519 TT	2.17	TWD	6.3	N/A	0.8	-47.2	-34.7	4.8	N/A	-13.3	N/A	N/A
First Solar	FSLR US	46.57	USD	468.4	11.4	1.4	21.8	12.8	11.3	12.9	6.9	0.0	5.9
Applied Materials	AMAT US	156.83	USD	130.4	29.0	2.9	-13.9	10.3	2.5	N/A	2.1	2.3	17.1
Yingli Green Energy	YGE US	7.01	USD	42.1	N/A	4.4	-21.6	-20.4	17.1	N/A	-8.6	0.0	N/A
Trina Solar	TSL US	9.33	USD	118.2	N/A	1.3	-36.7	-20.4	10.9	N/A	-9.3	0.0	N/A
<b>Average</b>		<b>32.2</b>			<b>20.2</b>	<b>2.1</b>	<b>-23.3</b>	<b>-21.6</b>	<b>11.0</b>	<b>12.9</b>	<b>-8.3</b>	<b>0.6</b>	<b>11.5</b>
Average of all		26.4			16.0	2.0	-27.5	-18.1	12.3	13.9	-6.0	0.3	20.4

Source: Bloomberg

**Figure 3: Comparison of Thin-film Technology with Crystalline**

		Crystalline ("c-Si")		Thin-film ("TF")		
		Mono-crystalline	Poly-crystalline	Amorphous Silicon ("a-Si") and nano-crystalline Silicon ("nc-Si")	Cadmium Telluride ("CdTe")	Copper Indium Gallium Selenide ("CIGS")
<b>Environmentally friendly</b>	Energy payback time <sup>(1)</sup>	1-2 years		1-1.5 year		
	Impact from side product/ toxicity	Acid		None	Cadmium	None
	Key raw material	Mono-silicon	Poly-silicon	Silicon	Tellurium	Indium
<b>Performance</b>	Record cell efficiency (laboratory)	27.6%	20.4%	13.4%	18.7%	20.4%
	Module efficiency (fabrication)	13- 19%	12- 16%	9- 12% <sup>(2)</sup>	10- 13%	12- 15% <sup>(3)</sup>
	Energy Yield	Medium to High		High		
	Negative impact of heat on efficiency	High		Low	Medium	Low- Medium
	Tolerance to partial shadowing	Low		Medium	Medium	High
	Ability to use flexible substrate	Limited		High		
	Ability to be made transparent	Limited		High		
<b>Commercialization</b>	Production Cost	High	Low to Medium	Low		
	Maturity of technology	>30 years		>10 years	>8 years	>5 years

Source: Hanergy Solar, International Energy Agency ("IRENA"), National Renewable Energy Laboratory ("NREL"), Company Data Note

(1) Energy payback time relates to the time necessary for a PV module to generate the energy equivalent to that used to produce it.

(2) Efficiency reached in a a-Si/Si-Ge/nc-Si and a-Si/nc-Si/nc-Si triple tandem

(3) Efficiency of 15.6% reached for Solibro's 1m<sup>2</sup> champion module and 15.5% reached for Miasole's FLEX 01 module

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