

## Solar Sector 3Q14 Updates

**We prefer polysilicon sector in industry chain:** 1) Excluding power generation segment, upstream has the highest margins in industry chain- we estimate both GCL Poly and Daqo New Energy's polysilicon GPM are over 30% now. 2) Highest capacity concentration in industry chain. We expect the concentration in this sector will be lifted further after new FBR capacity launch in future. 3) Relative more production cost reduction potentials through FBR technology adoption. **We like GCL Poly(3800 HK).**

**We are optimistic on long term fundamentals of solar farm operators.** We like United PV(0686 HK) based on: 1) attractive valuation. Compared to its 8.1 x FY15F PER. We estimate that other solar farm operators are trading at ~20x FY15F PER. 2) Reorganization potentials.

**3Q14 operation updates.** We expect China tier 1 polysilicon producers, GCL Poly and Daqo New Energy continued fully production and sales condition in 3Q14. However, they should record slightly lower polysilicon and wafer ASPs in 3Q14. Regarding the polysilicon production costs, both GCL and Daqo's reduction should be limited before technology breakthrough and other milestones.

We estimate that SF-PV and United PV's 3Q14 electricity generation 3Q14 figures implied annualized utilization hours of 800 and 1,250 hours, respectively. The FY15's utilization hours guidance of SF-PV and United PV are >1,000 and ~1,500.

**Generally stable price in 4Q14.** Based on the lagging effect and our channel checks, polysilicon price seems have bottomed out in this September and we expect it will be generally stable at currently ~US\$22.5 level in 4Q14. Till now, module price hike in traditional peak seasons are disappointing. We expect generally stable module price continued in 4Q14 and the price in 2015 will face downside risks from weaker than expected global demand.

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### Top pick: we like GCL Poly(3800 HK) and United PV(0686 HK)

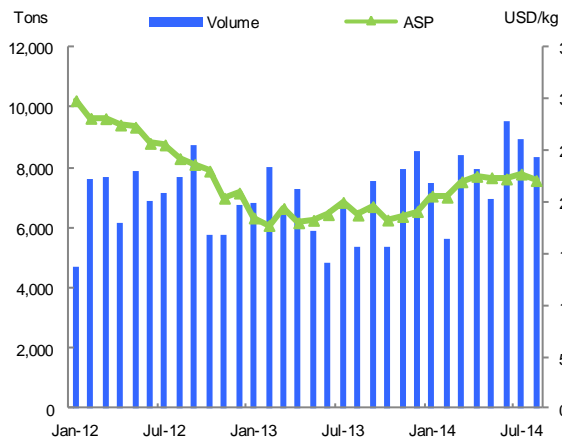
Stock prices of solar industry chain dropped 20% and 30% from recent high levels in this September. We believe the main reasons are: 1) Steep decline in oil prices: Brent spot price has plummeted 26% since this June. 2) Smaller than expect photovoltaic(PV) price hike in 4Q14 so far. 3) Negative news reporting regarding connection problem and FIT downsides in Japan PV market. The FIT adjustment of Japan may exceed previous expected 10% and Japan may control the future installation volume in April 2015.

We prefer polysilicon sector in industry chain: 1) Excluding power generation segment, upstream has the highest margins in industry chain. We estimate both GCL Poly and Daqo New Energy's polysilicon GPM are over 30% now. 2) Highest capacity concentration in industry chain. Top five producers - GCL, Wacker, Hemlock, OCI and REC – comprised 81% of global supply volume in 2013. Top four producers - GCL, Wacker, Hemlock and OCI represented 74% of global supply volume in 2013. We expect concentration in this sector will be lifted further after new FBR capacity launch in future. 3) Relative more production cost reduction potentials through FBR technology improvement. For example, GCL targets to lower its full productions cost from US\$ 15.5(hydrochlorination) to ~US\$ 10 through FBR technology.

We acknowledge that new FBR capacity expansion and weaker than expected global demand growth in 2015 may bring oversupply risk so we prefer technology and cost leader. We like GCL Poly because: 1) its ~30% polysilicon and wafer global market shares in 1Q-3Q14, lifted from 23% in FY13. 2) More cost reduction potentials. We expect the launch of GCL's captive power plant in Jiangsu province will narrow or clear its costs disadvantages with the domestic competitors in Xinjiang province. GCL is also one of the only three polysilicon producers(Other two are REC and Sunedison) who are adopting/developing FBR technology.

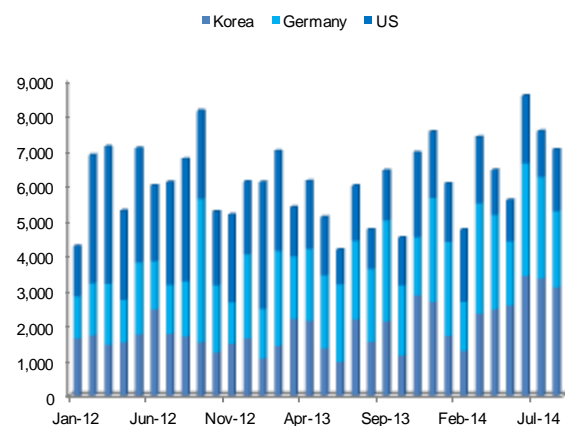
We are optimistic on long term fundamentals of solar farm operators. We like United PV based on:1) attractive valuation. Compared to its 8.1 x FY15F PER. We estimate that other solar farm operators are trading at ~20x FY15F PER. 2) Reorganization potentials.

**Figure 1: China Monthly Imported Polysilicon Volume and ASP Changes**



Source: China Custom, CSCI

**Figure 2: China Monthly Imported Polysilicon Volume Breakdown Changes**



Source: China Custom, CSCI

## Company Updates.

### Polysilicon segment

We expect China tier 1 polysilicon producers, GCL Poly and Daqo New Energy continued fully production and sales condition in 3Q14. However, they should record slightly lower polysilicon and wafer ASPs in 3Q14. Different from the condition in 1H14, GCL's higher weights of high-efficiency wafer (5%-15% price premium to traditional P-type wafer) in wafer sales mix may not able to offset the wafer price downtrend in 3Q14. Regarding the polysilicon production costs, both GCL and Daqo's reduction should be limited before technology breakthrough and other milestones.

**Table 1: Polysilicon Producers**

	GCL Poly (3800HK)	Daqo New Energy (DQ US)
<b>Polysilicon annual capacity(tons)</b>		
Capacity by 1H14	65,000	6,150
Capacity by FY14F	70,000	6,150
Capacity by 1H15F	80,000	12,150
<b>Polysilicon ASP(US\$/kg)</b>		
1H14	22.1	21.8
FY14F	22.3	22.1
FY15F	19.0	19.0
<b>Polysilicon production cost(US\$/kg)</b>		
Full production cost in 1H14	15.7	14.3
Full production cost in FY14F	15.6	13.8
Full production cost in FY15F	13.0	11.9
Existing cash cost	~13	~11
<b>Polysilicon GPM(%)</b>		
1H14	29.0%	34.5%
FY14F	30.0%	37.6%
FY15F	31.6%	37.4%
<b>Technology breakthrough</b>	FBR production line launch in 4Q14	Hydrochlorination production line launch in 2Q15
<b>Other milestone</b>	Captive power plant launch in 4Q14	Xinjiang factory capacity doubled in 2Q15

Source: the Company, CSCI

### Module segment

After a strong 2Q14, China tier 1 module producers, Canadian Solar and Jinko Solar both guided historical high module shipment range for 3Q14. However, we expect their GPM may slightly drop in 3Q14 due to: 1) flat or weaker module ASP in 3Q14. 2) Limited cost reduction progress. But driven by total solutions segment,

we expect CSIQ's 3Q14 results would be strong and continue to beat consensus.

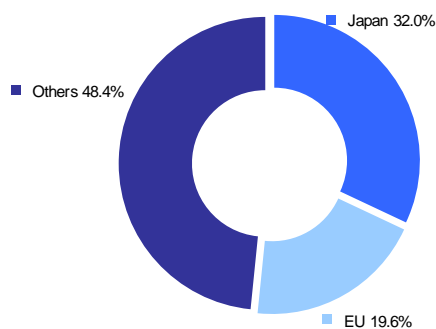
Different from the condition in 2013, module producers faced lower than expected price hike in this traditional Chinese peak season. We expect module sector will continue experiencing lower than expected Chinese demand risk and US trade wars headwind in 4Q14.

**Table 2: Module Producers**

	Canadian Solar (CSIQ US)	Jinko Solar (JKS US)
<b>Module capacity and shipment(MW)</b>		
Capacity by 1H14	3,000	2,100
Shipment in 1H14	1,027	1,026
Shipment in FY14F	2,756	2,326
<b>Module ASP(US\$/w)</b>		
1H14	0.66	0.63
FY14F	0.65	0.63
<b>Module production cost(US\$/w)</b>		
1H14	0.54	0.47
FY14F	0.54	0.46
<b>Module business GPM(%)</b>		
1H14	16.4%	25.9%
FY14F	16.3%	26.0%
<b>Other business</b>	40%+ FY14F gross profit from total solution business(EPC and solar farm)	~9% of FY14F gross profit from solar farm generation

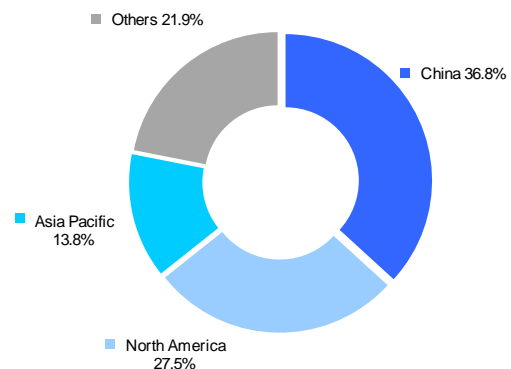
Source: the Company, CSCI

**Figure 3: Canadian Solar 2Q14 Shipment Breakdown**



Source: the Company, CSCI

**Figure 4: Jinko 2Q14 Module Shipment Breakdown**



Source: the Company, CSCI

### Solar farm segment

Solar farm operators, SF-PV and United PV disclosed their 3Q14 electricity generation data recently. We estimate that their 3Q14 figures implied annualized utilization hours of 800 and 1,250 hours, respectively. The normal countrywide annual utilization hours should be 1,500-1,700 hours. We understood that only part of SF-PV's 890MW connected solar farms were under operation and both the two firms faced power generation limitation and other problems from grid. United PV's solar farm in Gansu province recorded relative low annulation utilization hours in 3Q14 due to power generation limitation. We estimate that its Gansu farm's annualized utilization hours was 950 in 3Q14, compared to over 1,350 hours in Qinghai and Inner Mongolia. The FY15's utilization hours guidance of SF-PV and United PV are >1,000 and ~1,500.

**Table 3: Solar Farm Operators**

	SF-PV (1165HK)	GCL New Energy (0451 HK)	United PV (0688 HK)	Singyes Solar(0750 HK)
<b>Attributable solar farm installation capacity(MW)</b>				
Capacity by FY13	890	0	133	180
Capacity by 1H14F	890	0	443	180
Capacity by FY14F	2,000	600	600	200
<b>Cumulative Electricity Generation (MWH)</b>				
Electricity generation in 1-3Q14	385,268	NA	433,939	NA
<b>Solar farm under construction/acquisition(MW)</b>				
Capacity by 1H14	876	0	65	60

Source: the Company, CSCI

### Photovoltaic Prices Updates.

#### Polysilicon and wafer:

- Solarzoom and Pvinfosights show polysilicon price dropped 0.6% and 3.6% QoQ in 3Q14, respectively. From monthly perspectives, polysilicon price dropped 1%-2% MoM in this August.
- Solarzoom and Pvinfosights show multi-wafer price dropped 5.7% QoQ in 3Q14, and show mono-wafer price dropped 4.5-4.6% and 0.7-1.9% QoQ in 3Q14, respectively.
- In October, average polysilicon price in the two sources were up 1.0% and 0.8% MoM, respectively.

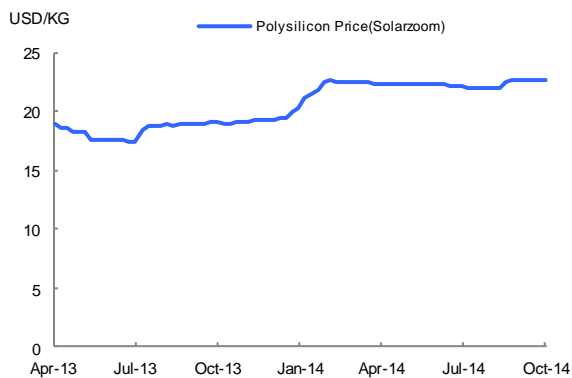
Based on the lagging effect and our channel checks, polysilicon price seems have bottomed out in this September and we expect it will be generally stable at currently ~US\$22.5 level in 4Q14, the reasons are: 1) Positive demand outlook during traditional peak season in China. 2) Inventory level of domestic polysilicon producers have dropped significantly QoQ in 3Q14. 3) No new capacity addition before Daqo's 6,000 tons new production line launch in 1H15. 4) Prohibition of processing based imported polysilicon since this September. In 1Q-3Q14, imported polysilicon accounted for around 40% of domestic consumption volume in China.

Cell and module:

- Solarzoom and PVinsights show cell price dropped 10%-11.7% and 13.7% QoQ in 3Q14, respectively.
- Solarzoom and PVinsights show module price dropped 5%-7.4% and 5.5% QoQ in 3Q14, respectively.
- In October, average cell price in the two sources were up 0.3%-1.5% and 2.1% MoM, respectively. Average module price in the two sources rebounded 5.8% and 0.7%, respectively.

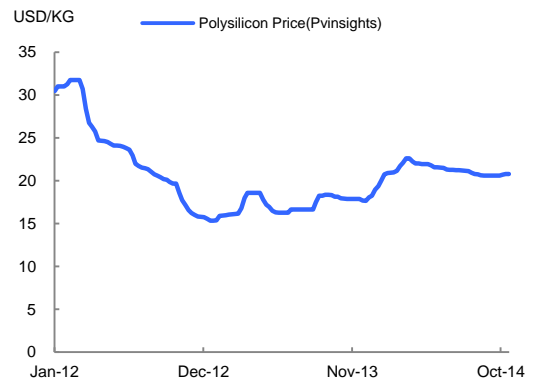
Till now, module price hike in traditional peak seasons seems disappointing. We expect generally stable module price in 4Q14 and the price in 2015 will face downside risks from weaker than expected global demand.

**Figure 5: Polysilicon Price Changes- Solarzoom**



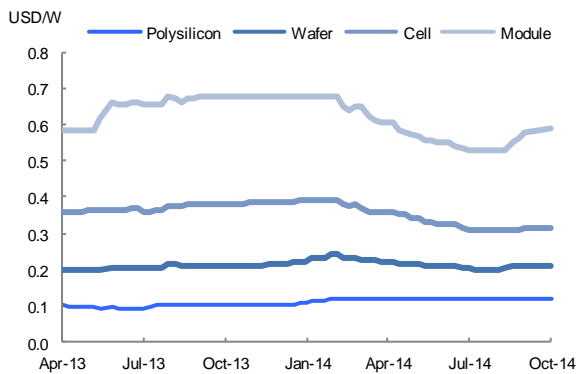
Source: Solarzoom, CSCI

**Figure 6: Polysilicon Price Changes-PVinsights**



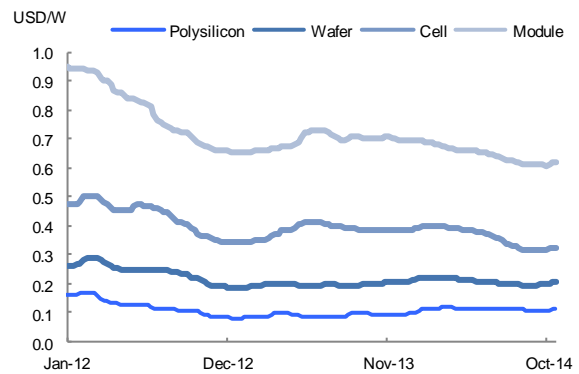
Source: PVinsights, CSCI

**Figure 7: Photovoltaic Products Prices Changes- Solarzoom**

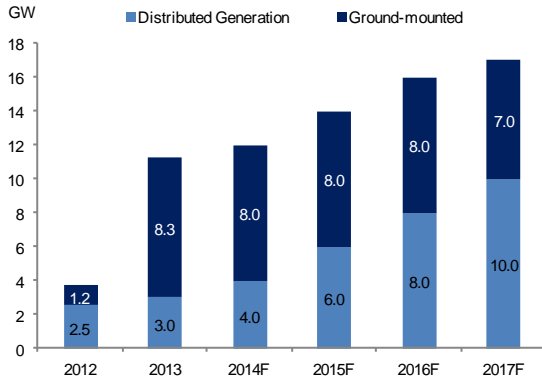


Source: Solarzoom, CSCI

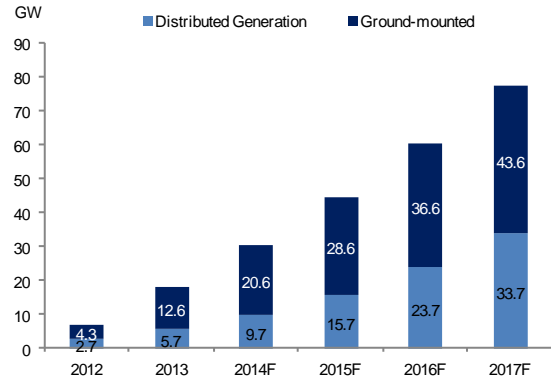
**Figure 8: Photovoltaic Products Prices Changes- PVinsights**



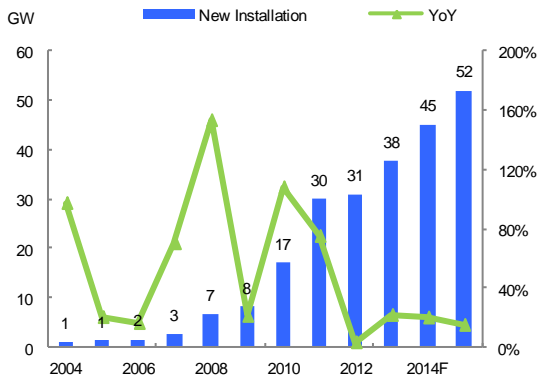
Source: PVinsights, CSCI

**Figure 9: China DG and Ground-mounted PV New Installation Changes**


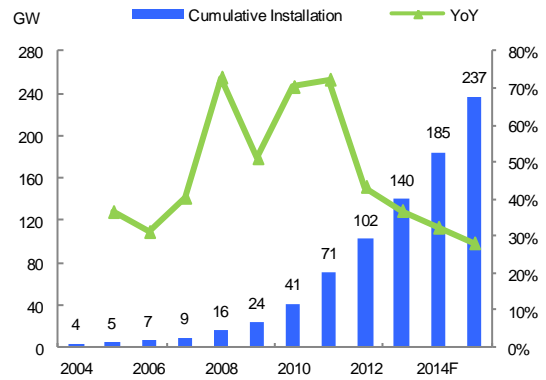
Source: NDRC, CSCI

**Figure 10: China DG and Ground-mounted PV Cumulative Installation Changes**


Source: NDRC, CSCI

**Figure 11: Global PV New Installation Changes**


Source: BP, CSCI

**Figure 12: Global PV Cumulative Installation Changes**


Source: BP, CSCI

**Table 4: Peers Comparison**

Company	Stock Code	Currency	Last price	PE				PB				ROE(%)	D/Y(%)	Market Cap
				13A	14F	15F	16F	13A	14F	15F	16F	14F	14F	HKD
<b>EPC</b>														
China Singyes Solar Tech	750 HK	HKD	14.06	8.1	11.0	8.7	7.9	1.6	2.4	1.9	1.5	22.9	0.9	9,777.3
Shanghai Aerospace Automob-A	600151 CH	CNY	9.72	71.3	29.5	20.9	15.3	2.8	3.0	2.7	2.3	7.5	0.2	15,414.0
Power Construction Corp Of-A	601669 CH	CNY	3.6	6.5	6.9	6.3	5.4	0.9	0.9	0.8	0.7	12.6	4.5	43,594.5
Zhejiang Chint Electrics-A	601877 CH	CNY	22.67	16.3	12.3	10.3	8.7	4.8	3.7	3.0	2.4	31.6	4.7	28,993.4
Zhongli Science And Tech-A	002309 CH	CNY	18.17	46.4	16.6	12.1	11.1	3.0	2.7	2.3	2.0	16.5	n.a.	13,098.0
Xinyi Solar Holdings Ltd	968 HK	HKD	2.65	21.8	30.1	16.6	13.3	3.9	4.7	3.9	3.0	17.7	1.1	16,112.0
Simple Average				28.41	17.72	12.48	10.27	2.84	2.90	2.43	2.00	18.14	2.28	21,164.87
Mkt-cap Weighted Avg.				22.79	15.12	11.07	9.13	2.67	2.59	2.17	1.79	18.17	2.85	27,604.24
<b>Polysilicon/wafer</b>														
Gcl-Poly Energy Holdings Ltd	3800 HK	HKD	2.55	n.a.	17.6	12.3	10.0	2.3	2.1	1.9	1.6	12.4	0.5	39,497.2
Oci Co Ltd	010060 KS	KRW	89,300.00	n.a.	89.9	15.3	10.2	1.6	0.8	0.7	0.7	0.8	0.4	15,699.6
Wacker Chemie Ag	WCH GR	EUR	90.57	1,607.6	29.7	29.2	19.2	1.8	2.0	1.9	1.7	6.2	0.8	46,517.4
Sunedison Inc	SUNE US	USD	18.87	n.a.	n.a.	n.a.	n.a.	15.0	943.5	n.a.	n.a.	(267.6)	0.0	39,357.5
Rec Silicon Asa	REC NO	NOK	2.60	n.a.	n.a.	98.7	20.8	1.0	1.0	1.0	0.9	(1.8)	0.0	7,089.5
Tbea Co Ltd-A	600089 CH	CNY	9.34	21.4	15.3	11.2	9.7	1.9	1.5	1.4	1.2	10.5	1.6	38,387.3
Daqo New Energy Corp-Adr	DQ US	USD	39.15	7.8	12.3	6.1	4.2	1.8	1.6	1.3	1.0	10.4	n.a.	2,714.0
Au Optronics Corp	2409 TT	TWD	12.90	21.2	11.5	12.4	12.5	0.6	0.7	0.7	0.6	5.9	1.6	31,685.2
Tianjin Zhonghuan Semicond-A	002129 CH	CNY	22.06	232.3	91.9	50.1	n.a.	4.7	n.a.	n.a.	n.a.	n.a.	n.a.	29,206.6
Xian Longji Silicon Materia-A	601012 CH	CNY	19.27	118.5	35.6	21.5	15.5	2.8	3.2	2.7	2.3	8.8	0.2	13,163.3
Comtec Solar Systems Group	712 HK	HKD	1.27	58.9	24.4	16.1	26.3	1.0	0.8	0.8	0.9	3.8	0.5	1,767.6
Simple Average				295.39	36.46	27.29	14.27	3.14	95.71	1.35	1.21	(21.05)	0.64	
Mkt-cap Weighted Avg.				319.68	28.93	20.35	9.90	4.04	141.30	1.10	0.99	(33.99)	0.70	
<b>Cell/module</b>														
First Solar Inc	FSLR US	USD	56.44	12.7	21.6	12.2	13.9	1.2	1.2	1.1	1.0	5.6	0.0	43,864.5
Sunpower Corp	SPWR US	USD	31.26	56.3	24.8	18.6	14.1	3.1	3.2	2.9	2.5	13.0	0.0	31,797.0
Canadian Solar Inc	CSIQ US	USD	29.54	56.3	8.1	6.4	5.5	3.9	2.0	1.4	1.0	37.7	0.0	12,289.8
Trina Solar Ltd-Spon Adr	TSL US	USD	10.18	n.a.	11.5	8.0	8.0	1.2	0.8	0.7	0.7	8.9	0.0	7,272.9
Yingli Green Energy Hold-Adr	YGE US	USD	2.92	n.a.	n.a.	108.1	8.8	9.4	73.0	n.a.	n.a.	(25.6)	0.0	4,117.0
Jinkosolar Holding Co-Adr	JKS US	USD	23.23	205.5	9.1	6.2	4.4	2.4	1.2	0.9	0.7	21.8	n.a.	5,543.3
Ja Solar Holdings Co Ltd-Adr	JASO US	USD	8.26	n.a.	8.6	6.0	4.8	0.5	0.5	0.4	0.4	7.2	n.a.	2,771.4
Renesola Ltd-Adr	SOL US	USD	2.44	n.a.	n.a.	8.4	7.0	2.1	1.5	1.3	1.1	(0.3)	n.a.	1,923.8
Hanwha Solarone Co -Spon Adr	HSOL US	USD	1.99	n.a.	n.a.	n.a.	n.a.	0.8	n.a.	n.a.	n.a.	n.a.	n.a.	1,410.7
Simple Average				82.69	13.95	21.74	8.31	2.73	10.42	1.25	1.07	8.53	0.00	
Mkt-cap Weighted Avg.				37.64	17.97	16.00	11.44	2.42	4.49	1.54	1.35	11.00	0.00	
<b>Solar farm</b>														
Shunfeng Photovoltaic Intl	1165 HK	HKD	6.92	n.a.	n.a.	n.a.	n.a.	5.8	n.a.	n.a.	n.a.	n.a.	n.a.	16,555.4
United Photovoltaics Group L	686 HK	HKD	0.86	n.a.	30.7	22.1	8.6	11.8	1.2	1.0	0.9	(18.8)	n.a.	3,750.7
Gcl New Energy Holdings Ltd	451 HK	HKD	4.92	n.a.	n.a.	n.a.	n.a.	1.3	n.a.	n.a.	n.a.	n.a.	n.a.	17,062.3
Solarcity Corp	SCTY US	USD	54.25	n.a.	n.a.	n.a.	n.a.	8.4	9.7	11.4	16.0	(51.5)	n.a.	39,005.7
Jiangsu Akcome Science & T-A	002610 CH	CNY	18.85	320.7	48.6	21.6	13.0	2.3	3.3	2.7	2.2	8.6	1.1	8,667.6
Huabei Expressway Co Ltd-A	000916 CH	CNY	5.22	14.0	17.1	13.9	12.3	0.9	1.3	1.2	1.1	7.4	1.9	7,217.3
Simple Average				167.35	32.14	19.19	11.31	5.09	3.87	4.11	5.04	(13.58)	1.49	
Mkt-cap Weighted Avg.				31.22	7.15	4.01	2.54	5.59	4.54	5.23	7.07	(21.14)	0.25	

Source: Bloomberg, CSCI



## Company Rating Definition

The Benchmark: Hong Kong Hang Seng Index

Time Horizon: 12 months

<b>Buy</b>	Relative Performance >15%;
<b>Accumulate</b>	Relative Performance is 5% to 15%;
<b>Neutral</b>	Relative Performance is -5% to 5%;
<b>Reduce</b>	Relative Performance is -5% to -15%;
<b>Sell</b>	Relative Performance is <-15%;

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