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China Solar

2017 Top Runner Draft Released, Mono Still Likely in Advantage

Stock implications – over-reaction on Longi; we remain OW: We believe the key reason for the Longi stock price reaction is that the efficiency gap on the mono module is 1% higher than the multi module in this 2017 new draft standard (0.5% in 2016 standard), so the multi module benefits more (vs. in 2016 standard), at first glance. However, we believe Longi is still in an advantageous position from this new standard (draft) due to the following two key reasons, and the recent price correction provides an entry opportunity. Meanwhile, we stay UW on GCL Poly.

- 1. Module conversion efficiency won't be a major barrier; cost is key:** 17% and 18% conversion efficiency for multi and mono c-Si modules, representing 275W and 295W output for a 60-piece multi and mono panel, respectively, compared with current mainstream 270W multi and 285W mono. By end-2017, we believe both multi and mono mainstream panels will reach the 2017 standard. Therefore, cost is key in project bidding, where we believe the mono module still has advantages. As shown in Exhibit 1, although the mono wafer is ~4% higher than the black silicon multi wafer, the mono PERC module cost is likely to be lower than the multi PERC module, thanks to the PERC technology (discussed in point 2).
- 2. Cell conversion efficiency standards require PERC technology on both multi and mono, where mono has the advantage:** The requirement on cell efficiency is new in the 2017 standard (no cell efficiency hurdle in the 2016 standard). Currently, the median conversion efficiency for the multi and mono cell is ~18.7% and ~20.0%, and can be enhanced to ~19.3% to 21.0% with PERC technology, respectively. Therefore nowadays, the multi PERC is close to, and the mono PERC has already reached, the top runner standards. As we expect this batch of top runner project construction will be mainly in 2018, most of the multi and mono PERC can meet the requirements. So, we highlight here that PERC will be a must-have technology for top runner projects, which still benefits mono products, in our view, as the PERC is more effective on mono products (PERC can increase 1% conversion efficiency on mono cell, while just 0.5-0.6% on a multi cell, at the same cost). Longi's conversion efficiency is 20.8% without PERC and 21.6% with PERC now, and will reach 100% PERC-equipped at end-2017. This efficiency premium will support Longi to be more competitive in the bidding, according to the scoring system. There's a debate whether this cell efficiency requirement will be included in the final version of the 2017 top runner standard, but if this is included, as we analyze above, it will benefit mono products.

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Our Thoughts and Key Highlights of the 2017 Top Runner Program

Our thoughts

We think this 2017 top runner draft standard shows that the government is more focused on solar cost reduction, and in the meantime will provide a better operational environment for solar power projects. We note several changes in this new standard: **1) Technology barrier is acceptable, cost is key:** in the new scoring system for project bidding, technology advantage; **2) Target to improve solar project operation:** by eliminating land cost, and enhancing solar power consumption; **3) Top runner program size is smaller:** 8-10GW total project size in 2017 top runner program for the next three years, vs. 13GW+ in 2016 program for the next 2-3 years (5.5GW as the first batch in the first year, others will be applied the new 2017 scoring standard), showing top runner program is a guidance on technology, while not a major support on solar installation demand.

Key Highlights

Project size: 8GW-10GW project base with single project not smaller than 0.5GW and not bigger than 1GW. Every province could apply for three project bases with maximum accumulated size of 2GW. Provinces that did not achieve the minimum solar generation in 2016 cannot apply and count towards existing construction in progress, or finished construction for inspection cannot apply.

Technology standard: Multi cell and module with conversion above 19.5% and 17% (vs. 16.5% in 2016 standard), respectively. Mono cell and module with conversion above 21% and 18% (vs. 17% in 2016 standard), respectively.

Requirements on construction progress: For a project size of 0.5GW, construction must be completed within 2-3 years with first year completion of no less than 10% and no more than 30% of total construction.

Application standards: Preference is given to companies with industry leading technology and commitment to not transfer the project base to another company, and it will not change fundamental technology and product offering without obtaining prior permission.

Project base selection criteria:

- Good solar energy resources
- Land permitted for solar power construction with clear ownership and low land transfer costs (or government owned)
- Provincial power grid companies committed to invest in construction of 220V collecting station and power transmission line
- The electricity market demand guarantee: relevant provincial offices to guarantee

preferential usage in the market

Exhibit 1: Mono PERC will maintain an advantage over Multi products, in terms of both cost and efficiency (end-2017)

	Multi c-Si			P type Mono c-Si	
	Standard	Black Silicon	Black Silicon PERC	Longi P type Mono	Longi Perc P type Mono
Polysilicon price (\$/kg)	13	13	13	13	13
Polysilicon usage (gram/W)	4.5	4.3	4.3	4.0	4.0
Polysilicon cost (\$/W)	0.059	0.056	0.056	0.052	0.052
Wafer processing cost (\$/W)	0.042	0.035	0.035	0.043	0.043
Wafer cost (\$/W)	0.101	0.091	0.091	0.095	0.095
Cell process material cost (\$/W)	0.033	0.033	0.038	0.036	0.041
Cell processing cost (\$/W)	0.027	0.030	0.044	0.040	0.042
Cell efficiency (%)	18.5	19.0	19.8	20.5	21.5
Cell cost (\$/W)	0.161	0.154	0.173	0.171	0.178
Module material cost (\$/W)	0.100	0.097	0.093	0.090	0.086
Module processing cost (\$/W)	0.020	0.020	0.020	0.019	0.019
Module cost (\$/W)	0.281	0.271	0.286	0.280	0.283
Module assembly loss (%)	0.5	0.5	1.0	3.0	4.0
60-cell Module power Output (W)	269	276	286	290	301

Source: Morgan Stanley Research

Valuation Methodology and Risks

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Our price target of Rmb22.9 implies 2017 and 2018 P/Es of 23x and 19x and P/B ratios of 3.9x and 3.3x. Longi's 2017 P/E multiple is at the mid point of A-share peers' 15-32x. Although the P/B multiples look a bit high vs. peers 2-3x, we think they are reasonable given ~20% ROE in 2017 and the shares' historical forward year +1SD P/B multiple of 4x.

Solar companies are normally highly leveraged, and earnings are very volatile, so we believe EV/EBITDA better captures the total entity value and eliminates bias at the debt level. DCF is not workable for solar companies at the current stage, since they are still in relatively long periods of investment. We cross-check our valuation with P/E and P/B.

EV/EBITDA: We have changed our target EV/EBITDA multiple from 14x previously to 15x, as we now think Longi can achieve higher EBITDA growth in 2017 and 2018 of 28% and 30%, respectively, vs. our previous forecasts of 25% and 28%. In addition, we believe Longi deserves a premium multiple given its disruptive position in the solar product technology roadmap and tailwind from strong mono c-Si growth momentum.

Downside risks to our price target: 1) Solar installations below expectations if project returns decline, curbed by severe power oversupply and no priority dispatch for renewable energy; 2) Multi c-Si manufacturers compete at ultralow prices, either forcing down mono c-Si prices or causing a loss of market share; 3) Policy changes could lead to better support for multi c-Si products.

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We use P/B-based sum-of-the-parts valuation, focusing on the company's asset returns and asset value, as profits (EBITDA/net profit) are too volatile to assess the company's value.

Our HK\$0.68 price target is based on our one-year forward P/B valuation for the manufacturing business, and we apply the listed subsidiary's market value. Our price target implies 2017 and 2018 P/Es of 12x and 18x, respectively, and a P/B ratio of 0.6x for both years. Our price target is also our base-case scenario value.

Solar materials: We apply a forward P/B multiple of 0.4x, which is at the high end of the company's one-year forward P/B of 0.15-0.4x during the mid-2018 to mid-2019 downcycle, lower than its normal historical one-year forward P/B range of 0.8-2.6x.

Solar PV project business: The solar energy business is in a listed subsidiary company, GCL New Energy (0451.HK, NC, HK\$0.38 as of May 16 close). We use the market value of GCL Poly's 62.28% shareholding in the listed subsidiary company's to value the solar energy business.

Key upside risks: stronger policy support boosting demand, a greater preference for multi wafer, more anti-dumping tariffs on Korean polysilicon, and better-than-expected execution of the company's strategic initiatives.

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TOTAL	3,253		703			1518	

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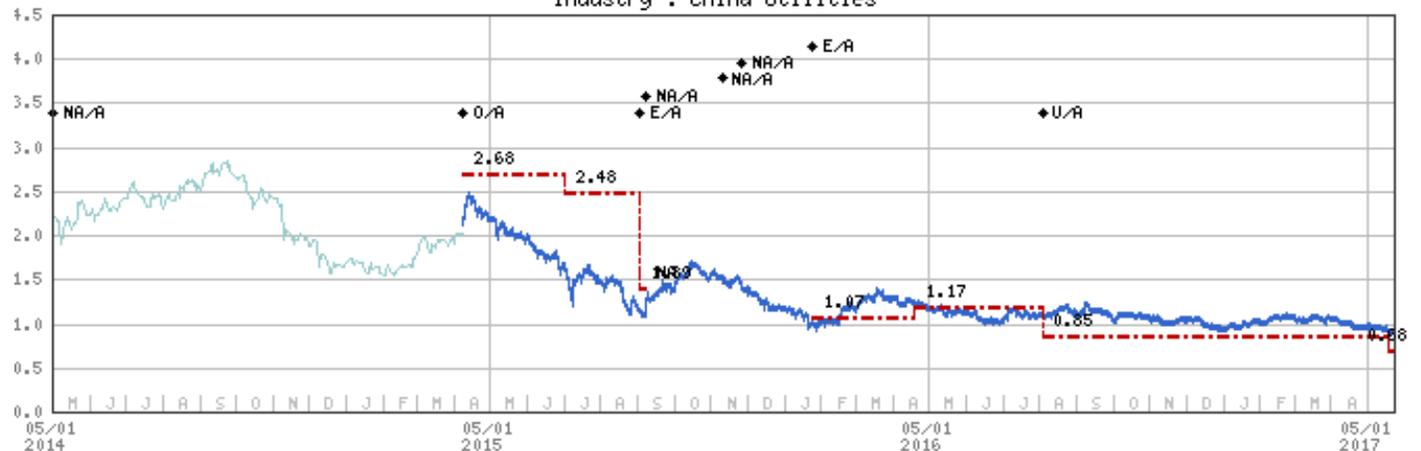
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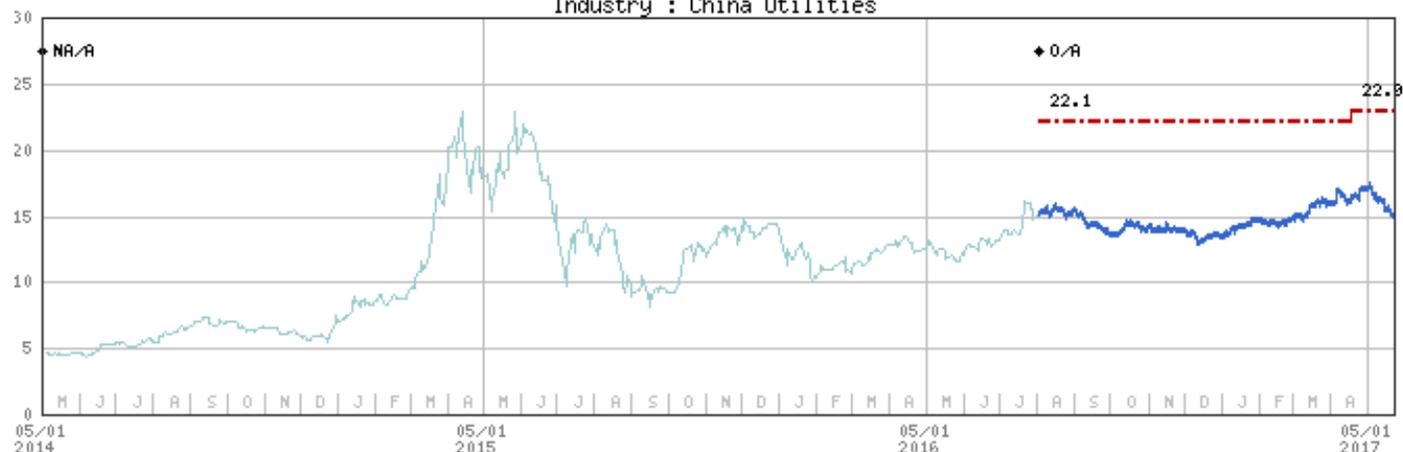
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 1/25/16 : E/A; 8/3/16 : U/A

Price Target History: 4/8/15 : 2.68; 7/2/15 : 2.48; 9/3/15 : 1.39; 9/7/15 : NA; 1/25/16 : 1.07; 4/18/16 : 1.17;
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Stock Rating History: 5/1/14 : NA/A; 8/3/16 : O/A

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INDUSTRY COVERAGE: CHINA UTILITIES

COMPANY (TICKER)	RATING (AS OF)	PRICE* (05/22/2017)
Eva Hou		
China Everbright International Limited (0257.HK)	O (10/25/2016)	HK\$9.95
China XD Electric (601179.SS)	E (11/01/2015)	Rmb5.40
Goldwind (002202.SZ)	E (05/14/2015)	Rmb14.58
Goldwind (2208.HK)	E (02/03/2017)	HK\$11.50
Henan Pinggao Electric (600312.SS)	E (01/28/2016)	Rmb13.86
NARI Technology (600406.SS)	O (11/01/2015)	Rmb16.63
Shanghai Electric (2727.HK)	E (03/29/2016)	HK\$3.40
Titan Wind Energy Suzhou Co Ltd (002531.SZ)	O (02/03/2017)	Rmb6.74
XJ Electric (000400.SZ)	O (11/01/2015)	Rmb16.51
Joseph Lam, CFA		
Beijing Capital Company Limited (600008.SS)	E (07/27/2016)	Rmb7.75
Beijing Enterprises Holdings (0392.HK)	E (02/10/2017)	HK\$36.95
Beijing Enterprises Water Group Limited (0371.HK)	O (07/27/2016)	HK\$6.09
Beijing Origin Water Technology (300070.SZ)	O (07/27/2016)	Rmb19.10
China Gas Holdings (0384.HK)	O (02/15/2016)	HK\$11.70
China Resources Gas Group Ltd (1193.HK)	O (08/15/2013)	HK\$24.25
Chongqing Gas Group Corporation (600917.SS)	U (02/15/2016)	Rmb10.25
ENN Energy Holdings Ltd (2688.HK)	O (04/07/2010)	HK\$40.90
Guangdong Investment (0270.HK)	O (07/27/2016)	HK\$11.18
Kunlun Energy (0135.HK)	E (11/25/2014)	HK\$7.10
Towngas China (1083.HK)	E (02/15/2016)	HK\$4.71
Qin Zhang		
Dongjiang Environment (002672.SZ)	U (11/16/2015)	Rmb16.90
Dongjiang Environment (0895.HK)	E (11/16/2015)	HK\$12.32
Tus-Sound Environmental Resources (000826.SZ)	E (01/12/2016)	Rmb32.77
Xingrong Environment (000598.SZ)	U (08/28/2015)	Rmb5.46
Sheng Zhong		
Canadian Solar (CSIQ.O)	U (08/02/2016)	US\$13.01
Daqo New Energy (DQ.N)	O (01/25/2016)	US\$23.30
GCL-Poly Energy (3800.HK)	U (08/03/2016)	HK\$0.89
Jinko Solar (JKS.N)	O (04/08/2015)	US\$19.00
TBEA (600089.SS)	U (11/10/2015)	Rmb9.65
Xian LONGi Silicon (601012.SS)	O (08/03/2016)	Rmb14.87
Simon H.Y. Lee, CFA		
CGN New Energy Holdings (1811.HK)	E (03/03/2016)	HK\$1.13
CGN Power Co., Ltd (1816.HK)	U (06/09/2016)	HK\$2.32
China Hengshi Foundation (1197.HK)	O (02/03/2017)	HK\$2.83
China High Speed Transmission (0658.HK)	E (01/05/2017)	HK\$8.01
China Longyuan Power Group (0916.HK)	E (02/14/2014)	HK\$5.90
China Resources Power (0836.HK)	E (07/24/2016)	HK\$15.40
China Suntain Green Energy Co., Ltd. (0956.HK)	O (08/18/2016)	HK\$1.52
China Yangtze Power Co. (600900.SS)	O (06/08/2016)	Rmb14.56
Datang Int'l Power (601991.SS)	U (01/16/2015)	Rmb5.14
Datang Int'l Power (0991.HK)	E (01/11/2016)	HK\$2.85
GD Power Development (600795.SS)	E (07/15/2016)	Rmb3.40
Huadian Power Int'l (1071.HK)	E (07/24/2016)	HK\$3.70
Huadian Power Int'l (600027.SS)	U (07/24/2016)	Rmb4.77
Huaneng Power (600011.SS)	U (07/24/2016)	Rmb7.80
Huaneng Power (0902.HK)	E (07/24/2016)	HK\$5.83
Huaneng Renewables (0958.HK)	E (03/15/2013)	HK\$2.62
SDIC Power Holdings (600886.SS)	E (02/05/2016)	Rmb7.59

Stock Ratings are subject to change. Please see latest research for each company.
* Historical prices are not split adjusted.

