BOC INTERNATIONAL

INDUSTRIALS — Power Equipment

Initiating Coverage

**20 July 2009**

# GCL-Poly Energy

## *Morphing into polysilicon leader*

**BUY**

**3800.HK – HK$2.61**

**Target Price: HK$3.31**

**GCL-Poly Energy recently announced its acquisition of Jiangsu Zhongneng, the firm with the lowest polysilicon costs in China. After the deal, the main business of GCL-Poly will shift from power generation to polysilicon, which accounted for more than 80% of pro-forma profit in 2008. The company is set to become the largest listed polysilicon maker in Asia. The gross profit of polysilicon and wafers may double in 2010 compared to 2008, based on our assumptions. We initiate coverage on GCL-Poly with a *BUY* rating and a target price of HK$3.31.**

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## Key Factors for Rating

- GCL-Poly is the largest polysilicon producer in China and will become the key listed player in Asia. It plans to construct over 1 GW of wafer manufacturing capacity in the next 12 months.
- Zhongneng has ramped up capacity substantially during industry down cycle, seizing a leading position ahead of the market normalisation. Production volume is expected to increase from 1,800 tonnes last year to 7,500 tonnes this year and 19,500 tonnes in 2011, implying a robust CAGR of 121%.
- Zhongneng's production costs are declining fast and we believe it has the biggest cost advantage over its peers in China. Its costs stood at US$36.1/kg in June 2009, compared with US$50-$100/kg for other domestic companies.
- Average selling price (ASP) of polysilicon has largely normalised, falling 70% from the irrational level seen last year. The decline of polysilicon prices will reduce costs and promote the healthy development of the PV industry.

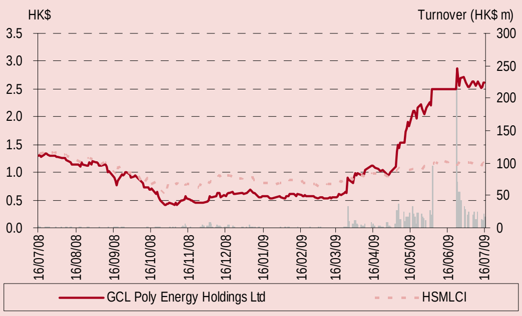
## Key Risks to Rating

- Continuous capital investments and lack of accessible credit for domestic solar companies.

## Valuation

- We expect the company's EPS to be Rmb0.17, Rmb0.31 and Rmb0.44, (for 2009, 2010 and 2011 respectively), and set a target price of HK$3.31, equal to 17x 2009E P/E.

### Share Price vs Index




*Sources: Bloomberg, BOCI Research*

### Share Price Performance

| | YTD | 1M | 3M | 12M |
|---|---|---|---|---|
| Absolute (%) | 328 | 4 | 137 | 101 |
| Relative to HSMLCI (%) | 295 | 3 | 118 | 111 |

*Sources: Bloomberg, BOCI Research*

### Key Data

| | |
|---|---|
| Total issued shares (m) | 1,023 |
| Free float (%) | 65.53 |
| Free float mkt. cap. (HK$ m) | 1,750 |
| 3M avg. daily turnover (HK$ m) | 19 |
| Net debt/equity (%) (2009 E) | Net cash |
| Major shareholder (%) | |
| Mr Zhu Gongshan | 34.47 |

*Sources: Company data, Bloomberg, BOCI Research*

**Figure 1. Investment Summary**

| Year ended 31 Dec | 2007 | 2008 | 2009E | 2010E | 2011E |
|---|---|---|---|---|---|
| Revenue (Rmb m) | 1,845 | 3,693 | 8,094 | 12,705 | 17,224 |
| *Change (%)* | *97.6* | *100.2* | *119.2* | *57.0* | *35.6* |
| Net profit (Rmb m) | (267) | 131 | 1,900 | 3,458 | 4,863 |
| Fully diluted EPS (Rmb) | (0.57) | 0.14 | 0.17 | 0.31 | 0.44 |
| *Change (%)* | *(471.4)* | *(123.7)* | *27.2* | *82.0* | *40.6* |
| Fully diluted P/E (x) | (4.03) | 17.04 | 13.40 | 7.36 | 5.23 |
| CFPS (Rmb) | 0.22 | 0.66 | 0.38 | 0.51 | 0.64 |
| P/CF (x) | 10.45 | 3.47 | 5.99 | 4.47 | 3.59 |
| EV/EBITDA (x) | 13.29 | 9.27 | 5.13 | 5.07 | 4.85 |
| DPS (Rmb) | 0.00 | 0.02 | 0.05 | 0.09 | 0.13 |
| Yield (%) | 0.00 | 0.88 | 2.25 | 4.09 | 5.76 |

*Sources: Company data, BOCI Research estimates*

* *LI Bo made major contributions to this report*

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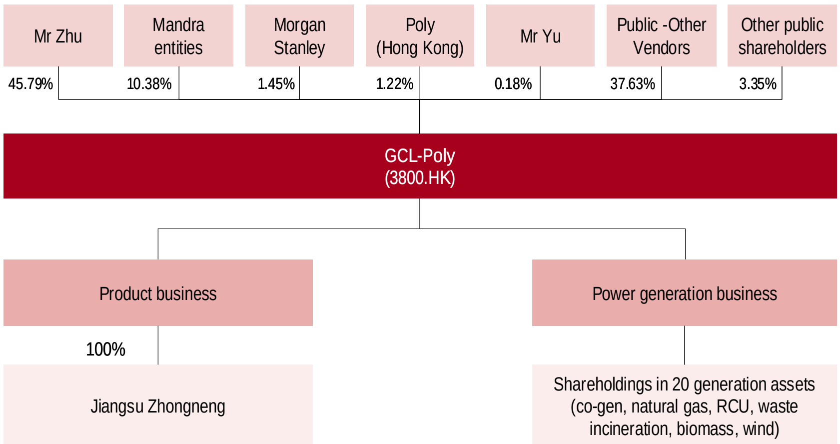
# JIANGSU ZHONGNENG ACQUISITION

On 3 June 2009, GCL-Poly Energy announced its plan to acquire 100% of Jiangsu Zhongneng Polysilicon Technology Development Co from the entities controlled by chairman Zhu and other shareholders for HK$26.35bn. This represents 10.4x FY08 P/E and a 25% discount to its global peers' historiced P/E of 14x. GCL-Poly acquired this asset by way of a 10.04bn new share issuance (90.7% of the enlarged share capital) at HK$2.20/share, as well as US$350m in 10% 18-month secured notes and US$200m in cash.

**Figure 2. Post-acquisition Structure**




*Sources: Company data, BOCI Research*

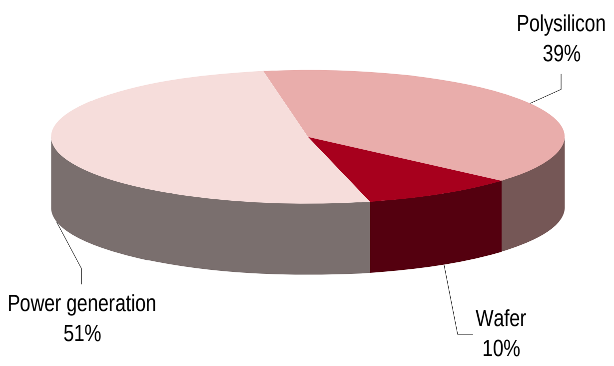
# Company Background

GCL-Poly Energy is one of the country's largest foreign-owned independent cogeneration plant operators, and has primarily been engaged in the development, investment, management and operation of cogeneration and power plants, and trading of coal in China.

The target Group, Xuzhou Zhongneng is one of the leading suppliers of polysilicon and wafers to companies operating in the solar industry. Zhongneng manufactures polysilicon at its production facilities, which are located in Xuzhou, Jiangsu province.

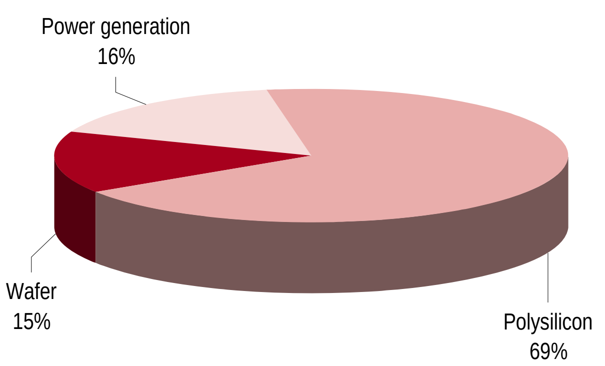
After the deal, GCL-Poly will be grouped into three business segments: polysilicon, wafer and power generation. The polysilicon and wafer business came from the group. Figures 3-4 show GCL-Poly's revenue and operating profit breakdown by segment.

**Figure 3. Pro-forma Revenue Breakdown (2008)**




*Sources: Company data, BOCI Research*

**Figure 4. Pro-forma Operating Profit Breakdown (2008)**



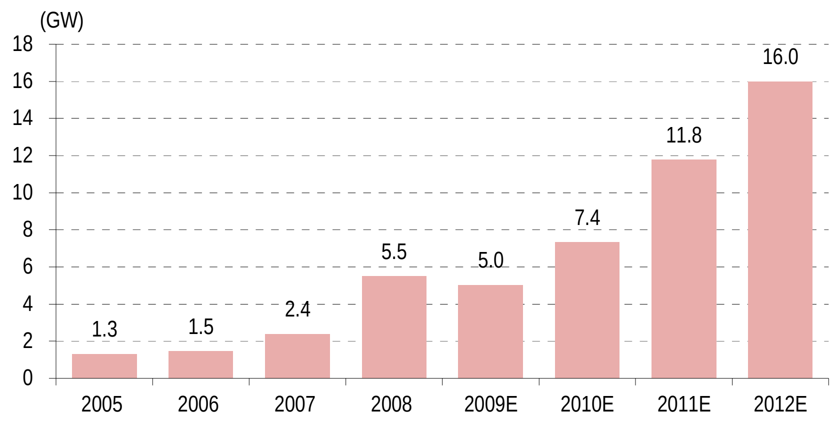

*Sources: Company data, BOCI Research*

# PV DEMAND TO RECOVER IN 2010

## Sharp growth in global PV market

With the backdrop of global warming issues and the depletion of traditional fossil fuels, the worldwide PV industry has entered into an era of rapid development in recent years. According to the European Photovoltaic Industry Association (EPIA), the number of PV power plants increased seven-fold during 2001-08, with a compound annual growth rate (CAGR) as high as 35%.

**Figure 5. Global Newly Installed PV Capacity Estimates (GW)**




*Sources: EPIA, BOCI Research estimates*

Globally, although the growth of newly installed PV capacity will decrease this year due to the financial crisis, next year's installed capacity is expected to rebound substantially on the back of new stimulus policies on renewable energy in the US, China and Japan, as well as loosening credit markets. According to our forecasts, newly installed PV capacity should reach 5.03GW, 7.35GW and 11.8GW, respectively, during 2009-11.

**Figure 6. PV Policy Changes in Major Countries**

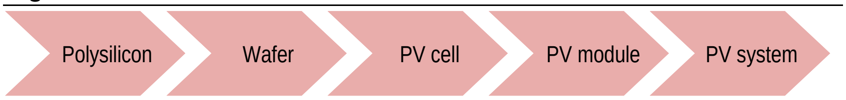
| Country | Old policy | New policy |
|---|---|---|
| Japan | Carried out “70,000 Roofs Program” in 1997, offering a subsidy of up to 50% for the cost of PV equipment installation. This policy boosted the development of Japan’s PV industry. The subsidy was gradually reduced before being eliminated in 2006. Since then, no similar subsidy has been offered. | The government has restarted PV project investments in its recent economic stimulus program and invested US$20bn to promote the use of solar energy batteries. Assuming the cost is similar to the current level of US$4.4/W, this program will result in about 4.5GW of capacity. This policy will significantly enhance confidence in the country’s PV market. |
| Germany | The “Renewable Energy Power Law” required 2,000 prescribed power producers to adopt PV power. The law was revised in 2004, and the average tariff was set a 50 euro cents/kWh. After another revision in 2008, the tariff was reduced to 40 eurocents/kWh. | Revised down the tariff on solar energy, and reduced FIT of solar energy roofs. The decrease was 5% in 2008 and will be gradually raised to 8%, 8% and 9% in 2009, 2010 and 2011, respectively. Ground- mounted system FIT were reduced 6.5% in 2008 and reduced a further 10% in each of 2009 and 2010. |
| USA | “Net Metering” was passed in 30 states. The declining price policy in California gave direct subsidy in the form of the reduced price of solar battery power generation systems. The subsidy was US$4/W. | The Obama administration has actively promoted new energy policies and will invest US$150bn to promote private investments in clean energy over the next 10 years. This February, the American Recovery and Reinvestment Act was passed, which includes direct subsidies, supportive credit policies and tax reductions for the solar energy industry. |
| China | | On 25 March, the Ministry of Finance and Construction published *Subsidies on China's Solar Energy Projects*, outlining plans for alternative energy development and the subsidies offered by provinces, China’s new PV capacity will be 150MW, 500MW and 1,000MW in the next three years. |

*Sources: EPIA, BOCI Research*

## Polysilicon Demand Forecast

The upstream photovoltaic cell industrial chain involves silicon materials; the middle stream includes silicon wafers, cells and cell modules, and system integration in the downstream. Polysilicon material is at the very top end of the PV industry and has played an extremely important role in the entire chain over the past five years. The most profitable processes in the industrial chain lie in polysilicon, as well as system integration.

**Figure 7. Photovoltaic Industrial Chain**




*Sources: Company data, BOCI Research*

The main polysilicon demand is for semiconductor type and solar-grade type. The purity of semiconductor polysilicon is 9N, higher than the 7N for solar-grade polysilicon. We forecast the semiconductor market will remain in stable with a 5% annual growth rate in the next three years.

The demand for solar-grade polysilicon largely depends on two factors, the production of crystalline silicon cells and the corresponding silicon consumption per watt. With the development of diaphragm technology, the ratio of crystalline silicon cells has decreased in recent years. In addition, the advancement of silicon wafers' cutting technology also led to the decrease in corresponding silicon consumption per watt and we forecast the average industry consumption level to drop from the current 7.8g/W to 6.5g/W in 2011. Although we see two negative factors for polysilicon demand, we expect demand to rebound in 2010 due to the sharp growth in newly installed PV capacity. We project the annual demand for polysilicon rephrase during 2009-11 will increase -13.5%, 25.5%, 36.7%, respectively.

**Figure 8. Global Polysilicon Demand Forecast**

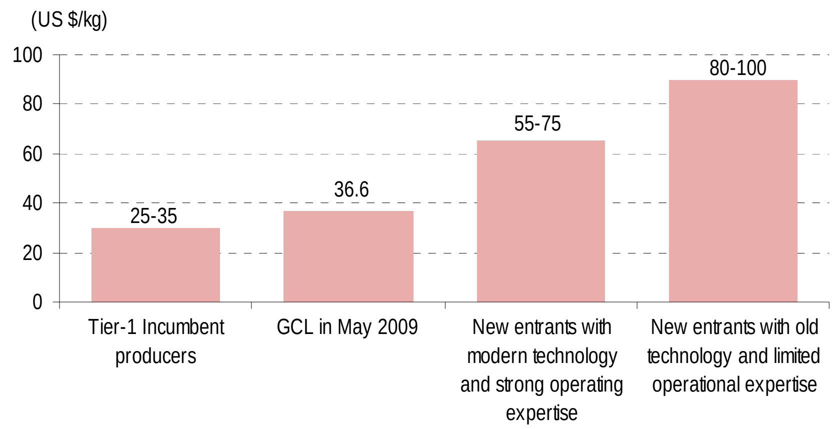
| | 2008 | 2009E | 2010E | 2011E |
|---|---|---|---|---|
| Newly installed PV capacity (GW) | 5.5 | 5.03 | 7.35 | 11.8 |
| Solar cells (GW) | 7.9 | 7.1 | 10.5 | 17 |
| Crystalline silicon cells ratio (%) | 86 | 81.2 | 81 | 80.4 |
| Polysilicon consumption (g/W) | 7.8 | 7.4 | 6.9 | 6.5 |
| Solar-grade polysilicon demand (tonne) | 54,352 | 42,662 | 58,685 | 88,842 |
| Semiconductor polysilicon demand (tonne) | 25,000 | 26,000 | 27,500 | 29,000 |
| Total polysilicon demand (tonnes) | 79,352 | 68,662 | 86,185 | 117,842 |
| Annual growth rate (%) | | (13.5) | 25.5 | 36.7 |

*Sources: EPIA; BOCI Research estimates*

## Polysilicon Supply Analysis

The wide gross margin of the purifying polysilicon industry attracted many new companies and triggered the capacity expansion plans of existing players.

**Figure 9. Comparison of Polysilicon Production Cost (2009)**



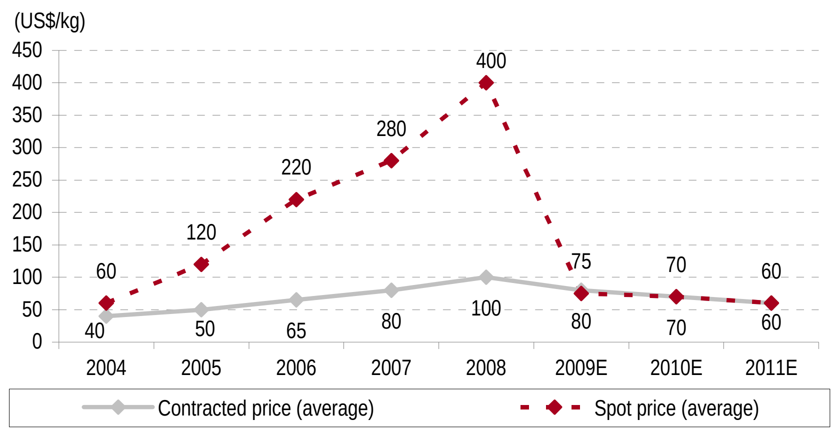

*Sources: Photon Consulting, BOCI Research*

Most of the new entrants in the sector have to bear polysilicon costs of above US$55/kg, some at even US$100/kg, according to Photon Consulting. When polysilicon prices are above US$100/kg, all companies, including new entrants, can make profits. Nevertheless, the spot price is only US$70/kg, and so some of the new entrants have discontinued production due to the high costs. We believe the ultimately successful players will be those with costs below US$40/kg.

## Polysilicon Prices Expected to Normalise at above US$60/kg

The polysilicon market contains spot market and long-term contract market. Spot prices indicate the near-term demand-supply situation, and those of the long term refer to the prices of long-term contracts, which last for five years or longer and are less affected by short-term supply and demand.

**Figure 10. Polysilicon Contract and Spot Price**




*Sources: Photon Consulting, BOCI Research*

Solid demand for solar cells in the past two years, the booming semi-conductor industry and substantial increase in polysilicon demand had led to a big supply shortage. Spot prices rose to a new high at US$450/kg in 3Q08. Due to the current financial crisis, demand in the solar energy and semiconductor markets has declined since 4Q08, accompanied by a drop in polysilicon prices. The spot price, now at US$70/kg, should remain in the range of US$60-90/kg in 2010.

# COST ADVANTAGE IN POLYSILICON

## Tremendous Cost Advantage from Hydrochlorination Technology

The global polysilicon industry has a history of more than 30 years. Silicon fume is added in the course of hydrocortisone under 500 degrees and 25-30 kg pressure.

Producing trichlorosilane (TCS) through the hydrochlorination technology not only reduces capital investment by 10-15%, but also lowers annual operating costs by about 15%. This substantial cost-savings is the result of removing electricity-intensive silicon tetrachloride (STC) converters from the process, in both equipment and operations.

Due to high environmental requirements in Europe and the US, the thermal hydrogenation method had been terminated, but this remains the major technology in China. Domestic Siemens-adapted thermal hydrogenation technology is no longer in use in Europe and the US since 15 years ago.

Xuzhou Zhongneng is the only company that uses the hydrochlorination method in China. Its production cost was only Rmb246.8/kg (US$36.1) as of June 2009, versus more than US$50/kg for all of its domestic peers since they were still adopting the hydrorination process that consumed much more electricity.

Zhongneng's production costs are fast declining and we believe it has the biggest cost advantage over its peers. For the year ended 31 December 2008, the three months ended 31 March 2009 and the month ended 30 June 2009, its production costs were at US$67.1, US$48.5 and US$36.1 per kilogram, respectively. By end-2009, the cost is expected to fall to US$32.2/kg nearly 12% lower, as a result of lower electricity tariffs, declining TCS costs and economies of scale.

**Figure 11. Polysilicon Costs Per Kilogram of Zhongneng**

| | 2008 | 1Q09 | May09 | Jun09 | Dec09 |
|---|---|---|---|---|---|
| Cost (Rmb) | 458.6 | 331 | 249.5 | 246.8 | 220 |
| Cost (US$) | 67.1 | 48.5 | 36.5 | 36.1 | 32.2 |
| *YoY %* | | *(27.8)* | *(24.6)* | *(1.1)* | *(11.8)* |

*Source: BOCI Research estimates*

## Penitential Tariff Decrease from Direct Power Supply

Electricity tariffs account for the main portion of polysilicon production costs. The current tariff is at Rmb0.63/kWh, and the electricity cost to polysilicon is at US$11/kg, accounting for one-third of the total costs. We expect the tariffs to dip further before end-2009. The government announced the Improvement on Direct Transactions between the Electricity Users and Power Generation policy on 1 July. According to the new policy, the client can sign contracts directly with the power factory. As a power supplier, GCL-Poly has eight power factories in Xuzhou and more than 20 power plants in Jiangsu Province, with its largest power plant at 2,940,000kWh. If Zhongneng can use the electricity from power plant directly, the electricity tariff could fall to Rmb0.43/kWh. Based on our assumption, the total cost would fall US$3.6/kg if the electricity tariff is Rmb0.43/kWh, accounting for 10% of the total cost.

**Figure 12. Sensitivity Analysis of Electricity Costs**

| | Base case | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|---|---|---|---|---|---|
| Electricity tariff (Rmb/kWh) | 0.63 | 0.58 | 0.53 | 0.48 | 0.43 |
| Electricity cost(US$/kg) | 11.1 | 10.2 | 9.4 | 8.5 | 7.6 |
| *Change (%)* | *30.3* | *28.6* | *26.8* | *24.9* | *22.9* |
| Other costs (US$/kg) | 25.6 | 25.6 | 25.6 | 25.6 | 25.6 |
| *Change (%)* | *69.7* | *71.4* | *73.2* | *75.1* | *77.1* |
| Total costs (US$/kg) | 36.7 | 35.8 | 34.9 | 34.0 | 33.2 |
| Percentage of cost reduction (%) | | (2.4) | (4.8) | (7.2) | (9.6) |
| Price (US$/kg) | 70 | 70 | 70 | 70 | 70 |
| Gross margin (%) | 47.6 | 48.8 | 50.1 | 51.4 | 52.6 |

*Source: BOCI Research estimates*

## Hydrochlorination Process to Reduce TCS Consumption

TCS is one of the major and most costly production inputs used in the polysilicon production process and, Zhongneng used to rely on third-party suppliers for most of its TCS requirements, which requires relatively higher costs. Recently, Zhongneng incorporated the hydrochlorination process into its own TCS production process. The hydrochlorination process recycles STC, a by-product of polysilicon production, into TCS, and this process is critical in enabling the firm to reduce its production costs. Zhongneng owns Taixing, a TCS production facility with an annual capacity of 20,000m tonnes located in Taizhou, Jiangsu Province, which commenced commercial production in September 2008. Zhongneng has successfully used the TCS produced by Taixing in its own polysilicon production process. For the year ended 31 December 2008, the three months ended 31 March 2009 and the month ended 30 June 2009, about 20.9%, 37.3% and 80% of the company's TCS consumption were produced in-house. We expect the company to be self-sufficient for TCS by the end of this year.

The company will only enjoy a cost advantage if its production scale reaches at least 3,000-5,000 tonnes. Production has gradually moved toward the scale efficiency level as production at Xuzhou Phase III has been ramped up.

## SMART CAPACITY EXPANSION

Zhongneng has implemented proven technology in its polysilicon production facilities. It utilises a modified Siemens process to produce polysilicon and, from its Xuzhou Phase II onwards, its production facilities have been designed to produce both solar and electronic grade polysilicon. Figure 13 sets out the details of Zhongneng's production facilities, dates of commercial operations startups and fully ramped production capacity for each phase.

**Figure 13. Production Facilities of Jiangsu Zhongneng**

| Production facility | Investment (Rmb m) | Planned annual production capacity (TONNES) | Commencement of planning/ construction | Commencement of commercial production | Achievement of fully ramped production capacity |
|---|---|---|---|---|---|
| Xuzhou Phase I | 1,100 | 1,500 | July 2006 | October 2007 | March 2008 |
| Xuzhou Phase II | 850 | 1,500 | August 2007 | July 2008 | December 2008 |
| Xuzhou Phase III | 6,600 | 15,000 | December 2007 | December 2008 | December 2009 |

*Sources: Company data, BOCI Research*

Only a small number of incumbent producers in the world with decades of experience are capable of achieving this level of production scale within such a short period of time. Even compared with the seven traditional plants, Zhongneng is highly competitive both in the length of construction period and initial investments.

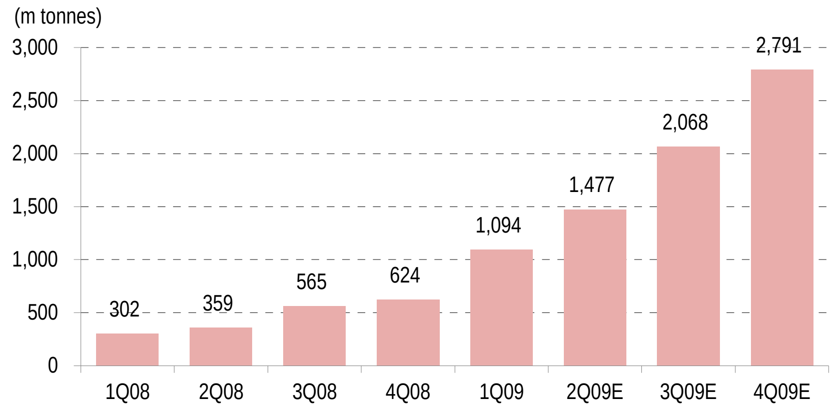
**Figure 14. Comparison of Polysilicon Project Construction**

| | Investment (Rmb m) | Annual production capacity (TONNES) | From construction to commercial production (month) | From commercial production to fully ramped production (month) |
|---|---|---|---|---|
| Xuzhou Phase I | 1,100 | 1,500 | 16 | 5 |
| Xuzhou Phase II | 850 | 1,500 | 11 | 5 |
| Peer plants of same scale | 1,000 | 1,500 | 20 | 9 |
| | | | | |
| Xuzhou Phase III | 6,600 | 15,000 | 12 | 12 |
| Peer plants of same scale | 9,000-9,500 | 15,000 | 36-48 | 18 |

*Source: BOCI Research*

For the three months ended 31 March 2008, 30 June 2008, 30 September 2008 and 31 December 2008, Zhongneng produced 302 tonnes, 359 tonnes, 565 tonnes and 624 tonnes of polysilicon, respectively. In the first three months of 2009, the firm produced 1,094 tonnes of polysilicon. It is one of the few polysilicon manufacturers in China that has attained commercial production of approximately 400 tonnes per month.

**Figure 15. GCL-Poly's Polysilicon Output**




*Sources: Company data, BOCI Research estimates*

By the end of this year, Zhongneng's total annual polysilicon production capacity should reach 18,000 tonnes. With further technical improvements, we anticipate its total annual polysilicon production capacity will reach 21,000 tonnes by December 2010, making it one of the world's largest polysilicon manufacturers in terms of production capacity. It will rank No. 1 in Asia and No. 3 globally by volume.

# SOARING POLYSILICON PROFITS

## Contracted Long-term Customers

The company has entered into polysilicon and wafer supply agreements with some cell and module manufacturers, requiring its customers to pay in advance. The contracted price tends to be lower for contracted covering longer periods. However, greater supply tends to be required every year. Due to the substantial price drop for polysilicon this year, the contracts signed last year were adjusted, with total payments unchanged and quantities increased. The contract periods were also extended from eight to 15 years. Its main customers include LDK, JA Solar, Solarfun, TrinaSolar, Canadian Solar, Solargiga Energy, Aidesolar (Taiwan), among others. Furthermore, an increasing number of foreign firms are moving their production centers to China.

At present, 70% of Zhongneng's revenue comes from long-term contracts. In view of the future expansion of production, long-term contracts will continue to generate more than 65% of revenue. The signed contracts provide for aggregate sales of approximately 15.4GW of wafers and about 33,311 tonnes of polysilicon. Every 1W wafer requires the use of 6.5g of polysilicon, and so we believe the total amount of polysilicon needed for wafer production would amount to 100,000 tonnes.

## Expanding Towards Downstream

The company is expanding rapidly towards downstream. Its silicon wafers plant with a 1GW capacity is likely to be built up within one year. The final capacity will reach 4GW, and is targeting to become the biggest silicon water plant in the world. Technology is key for silicon wafer plants. Albeit a late start, the company can lower its costs through advanced technology. The cutting saw from Switzerland can cut four slices at one time as compared with one slice by using the traditional technology. Besides, it could also save costs from omitting certain procedures such as pickling and packaging.

**Figure 16. Comparison of Wafer Production**

| | GCL-Poly | Peers | (%) |
|---|---|---|---|
| Electricity consumption (kWh/kg) | 8 | 27 | (70) |
| Staff (1.2GW capacity) | 800 | 6000 | (87) |
| Furnace (kg per unit) | 850 | 350 | 143 |

*Source: BOCI Research*

GCL-Poly's wafer cost is at least 13% lower than the industry average. We forecast its revenue structure will change tremendously from 2011, with 40% from polysilicon and the rest from wafer.

## Profit Projection for Polysilicon and Wafer

Even at an ASP of US$74/kg, a decrease of more than 70% from the 2008 levels, this year's profit should only be slightly lower than that of last year due to volume increase and cost reduction. Based on our assumptions, the gross profit of GCL-Poly's polysilicon and wafer will double in 2011 compared with 2008.

**Figure 17. Polysilicon Sales of GCL-Poly**

| | 2008 | 2009E | 2010E | 2011E |
|---|---|---|---|---|
| Polysilicon (tonne) | 1,530 | 7,191 | 11,146 | 11,146 |
| Wafer (MW) | 39 | 43 | 474 | 1,281 |
| Unit amount (g/W) | 8 | 7.4 | 6.9 | 6.5 |
| Polysilicon used by wafer (tonne) | 314 | 319 | 3,273 | 8,324 |
| Total polysilicon (tonne) | 1,844 | 7,510 | 14,419 | 19,470 |
| *YoY (%)* | | *307* | *92* | *35* |

*Source: BOCI Research estimates*

**Figure 18. Profit Projections for Polysilicon and Wafer Businesses**

| | 2007 | 2008 | 2009E | 2010E | 2011E |
|---|---|---|---|---|---|
| Polysilicon | | | | | |
| Capacity (tonne) | 0 | 3,000 | 18,000 | 21,000 | 21,000 |
| Sales (tonne) | 153 | 1,530 | 7,191 | 11,146 | 11,146 |
| Price (US$/kg) | 263 | 256 | 74 | 70 | 65 |
| Cost (US$/kg) | 71 | 65 | 35 | 32 | 31 |
| Revenue (Rmb m) | 302 | 2,820 | 3,577 | 5,211 | 4,847 |
| Gross profit margin (%) | 73 | 74 | 53 | 54 | 52 |
| Gross profit (Rmb m) | 221 | 2,100 | 1,902 | 2,797 | 2,505 |
| | | | | | |
| Wafers | | | | | |
| Capacity (MW) | | 0 | 0 | 1,000 | 2,000 |
| Sales (MW) | | 39 | 43 | 474 | 1,281 |
| Price (US$/W) | | 2.63 | 0.92 | 0.87 | 0.83 |
| Cost (US$/W) | | 0.92 | 0.55 | 0.48 | 0.44 |
| Revenue (Rmb m) | | 701 | 270 | 2,822 | 7,239 |
| Gross profit margin (%) | | 65 | 40 | 46 | 47 |
| Gross profit (Rmb m) | | 455 | 107 | 1,284 | 3,418 |

*Source: BOCI Research estimates*

# LEAP IN POWER GENERATION PROFITS

As of 31 December 2008, the company had 19 operational subsidiary and associated power plants with an aggregate installed capacity of 1,050MW and attributable installed capacity totalling 698MW. These power plants are mainly located in Jiangsu and Zhejiang provinces, which see robust economic growth and strong demand for electricity and steam. In addition, GCL-Poly also owns a 100% stake in Huitengliang Wind Power Plant. With a designed installed capacity of 49.5MW, the plant is still under construction and is expected to commence operation this year.

**Figure 19. Existing GCL-Poly Power Plants in China**

| Name | Fuel | Current stake (%) | 2007 MW | 2008 MW | 2009E MW |
|---|---|---|---|---|---|
| Kunshan Cogeneration | Coal | 51.00 | 48 | 48 | 48 |
| Haimen Cogeneration | Coal | 51.00 | 30 | 30 | 30 |
| Rudong Cogeneration | Coal | 100.00 | 30 | 30 | 30 |
| Huzhou Cogeneration | Coal | 94.80 | 30 | 30 | 30 |
| Taicang Poly Cogeneration | Coal | 100.00 | 45 | 45 | 45 |
| Jiaxing Cogeneration | Coal | 95.00 | 36 | 36 | 36 |
| Xinneng Cogeneration | Coal/Sludge | 100.00 | 6 | 21 | 21 |
| Fengxian Cogeneration | Coal/Sludge | 51.00 | 30 | 30 | 30 |
| Yangzhou Cogeneration | Coal/Sludge | 51.00 | 48 | 48 | 48 |
| Dongtai Cogeneration | Coal/Sludge | 100.00 | 30 | 30 | 30 |
| Peixian Cogeneration | Coal/Sludge | 100.00 | 30 | 30 | 30 |
| Xuzhou Cogeneration | Coal/Sludge | 75.00 | 30 | 30 | 30 |
| Puyuan Cogeneration | Coal | 100.00 | 21 | 21 | 21 |
| Funing Cogeneration | Coal/Sludge | 60.00 | 30 | 30 | 30 |
| Suzhou Cogeneration | Natural gas | 51.00 | | 360 | 360 |
| China Resources Beijing Cogeneration | Natural gas | 49.00 | | 150 | 150 |
| Baoying Cogeneration | Coal/Biomass | 100.00 | | 30 | 30 |
| Lianyungang Xiexin Cogeneration | Coal/Biomass | 100.00 | | 45 | 45 |
| Taicang Incineration | Incineration | 100.00 | | 6 | 12 |
| Huitengliang | Wind power | 100.00 | | 0 | 49.5 |
| Total attributable installed capacity: | | | 594.3 | 697.8 | 753.3 |

*Sources: Company data, BOCI Research estimates*

## Still Possesses Capacity Growth Potential

We believe capacity growth through asset injection from the controlling shareholder will be the most powerful driver for GCL-Poly. Chairman Zhu still holds a number of large combined heat and power (CHP) and renewable-energy projects and had granted GCL-Poly the options to acquire the Nanjing cogeneration plant, Taicang Harbour, Longgu and Yonghe power plants, among others, before the company's listing. GCL-Poly also has the right of first refusal for any potential opportunities that may compete with the firm. The option agreement will become void if Mr Zhu and his associates jointly own less than 30% of voting rights in GCL-Poly.

**Figure 20. Potential Power Plant Acquisitions by GCL-Poly**

| Type | Name | Fuel | Location | Installed capacity *(MW)* | Interest to be acquired *(%)* | Attributable installed capacity *(MW)* | Current state of development |
|---|---|---|---|---|---|---|---|
| Operation plants to be acquired from controlling shareholder | Nanjing | Coal/Sludge | Jiangsu | 96.0 | 100 | 96.0 | Operating |
| | Longgu | Coal/Gangue | Jiangsu | 110.0 | 59 | 64.9 | Operating |
| | Taicang Harbour | Coal | Jiangsu | 2,170.0 | 37 | 802.9 | Operating |
| New projects to be acquired from controlling shareholder | Lanxi Xiexin | Coal | Zhejiang | 21.0 | 100 | 21.0 | Operating |
| | Baoxin | Biomass | Jiangsu | 30.0 | 100 | 30.0 | Operating |
| | Yonghe | Natural Gas | Guangdong | 180.0 | 100 | 180.0 | Expected by 2009 |
| | Xuzhou Cogeneration | Coal | Xuzhou | 600.0 | 100 | 600.0 | Expected by 2009 |
| | Xuzhou Incineration | Solid waste | Xuzhou | 24.0 | 100 | 24.0 | Expected by 2009 |
| Total | | | | | 3,231 | 1,819 | |

*Sources: Company data, BOCI Research*

# VALUATION

We are optimistic about GCL-Poly's future development after the Jiangsu Zhongneng acquisition. Its profit should increase sharply due to the volume growth in polysilicon after 2010 based on our estimates. We expect the company's EPS to be Rmb0.17, Rmb0.31 and Rmb0.44 for 2009, 2010 and 2011, respectively.

As showed in Figure 21, the average 2009E P/E of the listed polysilicon producers is distorted by the exceptionally high P/Es of MEMC and TWBB. If we strip them out, the average 2009E P/E for polysilicon listed companies will be 17.67x. As GCL-Poly has only entered into this industry for three years, we value the stock at 17x P/E, slightly lower than its comparables. We set our target price for the stock at HK$3.31 with a *BUY* rating.

**Figure 21. Valuation Comparison of Polysilicon Companies Worldwide**

| | Code | Ccy | Share price | EPS | | | P/E *(x)* | | | ROE *(%)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2008 | 2009E | 2010E | 2008 | 2009E | 2010E | 2009E | 2010E |
| OCI | 010060.KS | KRW | 1,263.07 | 86.76 | 135.37 | 224.76 | 14.56 | 9.33 | 5.62 | 36.1 | 41.5 |
| MEMC | WFR.US | US$ | 130.51 | 25.32 | 2.50 | 9.53 | 5.15 | 52.18 | 13.70 | 2.98 | 11.36 |
| Wacker | WCH.GR | Euro | 852.88 | 93.13 | 38.10 | 72.82 | 9.16 | 22.39 | 11.71 | 8.06 | 14.93 |
| REC | REC.NO | NOK | 53.02 | 4.31 | 2.51 | 5.28 | 12.29 | 21.09 | 10.05 | 6.95 | 12.98 |
| Tokuyama | 4030.JP | JPY | 52.08 | (1.64) | 2.91 | 4.11 | (31.78) | 17.88 | 12.68 | 4.94 | 5.50 |
| TWBB | 600550.SS | Rmb | 42.61 | 0.92 | 0.94 | 1.25 | 46.38 | 45.26 | 34.15 | 22.05 | 22.2 |
| Average | | | | | | | 17.51 | 28.02 | 14.65 | 13.51 | 18.08 |
| | | | | | | | | | | | |
| GCL-Poly | 3800.HK | HK$ | 2.60 | 0.17 | 0.31 | 0.44 | 17.04 | 13.40 | 7.36 | 12.0 | 17.5 |

*Sources: Bloomberg, BOCI Research estimates*

# RISKS

## Continuous Capital Investment

The business of the target group may require significant and continuous capital investments, which may exceed GCL-Poly's original budgets, and there is no guarantee in achieving the intended economic results or commercial viability. Actual capital expenditure for the business of the target group may be much higher than the group's budgets because of various factors that may go beyond control. This may in turn affect the group's financial condition.

## Credit Availability to Solar Companies in China

Driven by the country's economic stimulus, it has become relatively easy for Chinese solar companies to secure funds. While this may help these firms in the near term, we are concerned about a potential delay in capital expenditure discipline, and hence prolonged overcapacity. In addition, there is no assurance as to the sustainability of available domestic credits to Chinese solar companies. Any failure to obtain a sufficient level of credit facilities may impact the group's financial condition.

## Income Statement *(Rmb m)*

| Year ended 31 Dec | 2007 | 2008 | 2009E | 2010E | 2011E |
|---|---|---|---|---|---|
| Revenue | 1,845 | 3,693 | 8,094 | 12,705 | 17,224 |
| Cost of sales | (1,482) | (3,196) | (5,087) | (7,520) | (10,091) |
| Operating expenses (ex-D&A) | (125) | (124) | 754 | 508 | 276 |
| EBITDA | 237 | 373 | 3,761 | 5,693 | 7,410 |
| Depreciation & amortisation | (18) | (96) | (1,240) | (1,274) | (1,311) |
| Operating profit (EBIT) | 220 | 277 | 2,521 | 4,420 | 6,099 |
| Net interest income/(expenses) | (162) | (259) | (167) | (50) | 46 |
| Other gains/(losses) | (274) | 189 | 1 | 1 | 1 |
| Pre-tax profit | (216) | 207 | 2,355 | 4,370 | 6,146 |
| Tax on profit | 4 | (27) | (146) | (350) | (492) |
| Minority interests | (55) | (48) | (309) | (563) | (792) |
| Net profit | (267) | 131 | 1,900 | 3,458 | 4,863 |
| Core net profit | (267) | 131 | 1,900 | 3,458 | 4,863 |
| EPS (Rmb) | (0.570) | 0.140 | 0.170 | 0.310 | 0.440 |
| Core EPS (Rmb) | (0.570) | 0.140 | 0.170 | 0.310 | 0.440 |
| DPS (Rmb) | 0.000 | 0.020 | 0.050 | 0.090 | 0.130 |
| Revenue growth (%) | n.a. | 100 | 119 | 57 | 36 |
| EBIT growth (%) | n.a. | 26 | 811 | 75 | 38 |
| EBITDA growth (%) | n.a. | 57 | 908 | 51 | 30 |
| EPS growth (%) | n.a. | (149) | 1,347 | 82 | 41 |
| Core EPS growth (%) | n.a. | (149) | 1,347 | 82 | 41 |

*Sources: Company data, BOCI Research estimates*

## Cash-flow Statement *(Rmb m)*

| Year ended 31 Dec | 2007 | 2008 | 2009E | 2010E | 2011E |
|---|---|---|---|---|---|
| Pre-tax profit | (216) | 207 | 2,355 | 4,370 | 6,146 |
| Depreciation & amortisation | 18 | 96 | 1,240 | 1,274 | 1,311 |
| Net interest expenses | 17 | 20 | 166 | 49 | (47) |
| Change in working capital | (13) | (102) | 1,366 | 810 | 961 |
| Tax paid | 4 | (27) | (146) | (350) | (492) |
| Other operating cash flows | 404 | 450 | (752) | (486) | (816) |
| Cash flow from operations | 214 | 644 | 4,228 | 5,667 | 7,064 |
| Net purchase of fixed assets | (256) | (336) | (3,900) | (300) | (300) |
| Decrease/(increase) in invest. | 0 | 0 | 0 | 0 | 0 |
| Other investing cash flows | 132 | (154) | (6,750) | 0 | 0 |
| Cash flow from investing | (124) | (490) | (10,650) | (300) | (300) |
| Net increase in equity | 93 | 0 | 884 | 0 | 0 |
| Net increase in debt | 1,941 | (230) | 570 | (965) | (193) |
| Dividends paid | 0 | (20) | (570) | (1,037) | (1,459) |
| Other financing cash flows | (1,495) | (282) | 13,976 | (548) | 47 |
| Cash flow from financing | 538 | (532) | 14,860 | (2,551) | (1,604) |
| Change in cash | 628 | (378) | 8,438 | 2,817 | 5,160 |
| Cash at beginning of year | 188 | 804 | 414 | 8,850 | 11,666 |
| Free cash flow to firm | 105 | 174 | (6,378) | 5,516 | 6,973 |
| Free cash flow to equity | 1,869 | (335) | (6,024) | 4,347 | 6,613 |

*Sources: Company data, BOCI Research estimates*

## Balance Sheet *(Rmb m)*

| As at 31 Dec | 2007 | 2008 | 2009E | 2010E | 2011E |
|---|---|---|---|---|---|
| Cash & cash equivalents | 804 | 414 | 8,850 | 11,666 | 16,815 |
| Receivables | 566 | 494 | 776 | 1,218 | 1,652 |
| Inventories | 127 | 259 | 390 | 577 | 774 |
| Other current assets | 251 | 241 | 251 | 266 | 286 |
| Total current assets | 1,748 | 1,407 | 10,268 | 13,727 | 19,527 |
| Fixed assets | 4,658 | 4,979 | 13,147 | 13,113 | 12,521 |
| Intangible assets | 131 | 130 | 6,477 | 6,477 | 6,477 |
| Other long-term assets | 330 | 553 | 582 | 628 | 674 |
| Total long-term assets | 5,119 | 5,662 | 20,205 | 20,218 | 19,671 |
| Total assets | 6,867 | 7,070 | 30,473 | 33,945 | 39,198 |
| Creditors | 661 | 881 | 2,509 | 3,709 | 4,976 |
| Short-term debt | 1,492 | 1,652 | 1,542 | 1,377 | 1,184 |
| Other current liabilities | 5 | 8 | 170 | 424 | 769 |
| Total current liabilities | 2,157 | 2,542 | 4,221 | 5,510 | 6,929 |
| Long-term borrowings | 1,988 | 1,597 | 2,277 | 1,477 | 1,477 |
| Other long-term liabilities | 85 | 107 | 75 | 75 | 75 |
| Share capital | 93 | 93 | 976 | 976 | 976 |
| Reserves | 2,180 | 2,323 | 22,207 | 24,627 | 27,788 |
| Shareholders' equity | 2,273 | 2,416 | 23,183 | 25,603 | 28,764 |
| Minority interests | 364 | 408 | 717 | 1,280 | 1,953 |
| Total liabilities & equity | 6,867 | 7,070 | 30,473 | 33,945 | 39,198 |
| Book value/share (Rmb) | 2.34 | 2.48 | 2.11 | 2.32 | 2.61 |
| Tangible assets/share (Rmb) | 2.20 | 2.35 | 1.52 | 1.74 | 2.02 |
| Net debt/(cash)/share (Rmb) | 2.75 | 2.92 | (0.46) | (0.80) | (1.29) |

*Sources: Company data, BOCI Research estimates*

## Key Ratios

| Year ended 31 Dec | 2007 | 2008 | 2009E | 2010E | 2011E |
|---|---|---|---|---|---|
| Profitability (%) | | | | | |
| EBITDA margin | 12.9 | 10.1 | 46.5 | 44.8 | 43.0 |
| EBIT margin | 11.9 | 7.5 | 31.1 | 34.8 | 35.4 |
| Pre-tax margin | (11.7) | 5.6 | 29.1 | 34.4 | 35.7 |
| Net profit margin | (14.5) | 3.6 | 23.5 | 27.2 | 28.2 |
| Liquidity (x) | | | | | |
| Current ratio | 0.8 | 0.6 | 2.4 | 2.5 | 2.8 |
| Interest coverage | 1.2 | 1.0 | 11.7 | 21.6 | 36.4 |
| Net debt to equity (%) | 101.5 | 100.4 | Net cash | Net cash | Net cash |
| Quick ratio | 0.8 | 0.5 | 2.3 | 2.4 | 2.7 |
| Valuation (x) | | | | | |
| P/E | (4.0) | 17.0 | 13.4 | 7.4 | 5.2 |
| Core P/E | (4.0) | 17.0 | 13.4 | 7.4 | 5.2 |
| Core P/E @ target price | (5.1) | 21.6 | 17.0 | 9.3 | 6.6 |
| P/B | 1.0 | 0.9 | 1.1 | 1.0 | 0.9 |
| P/CF | 10.5 | 3.5 | 6.0 | 4.5 | 3.6 |
| EV/EBITDA | 13.3 | 9.3 | 5.13 | 5.07 | 4.85 |
| Activity ratios | | | | | |
| Inventory days | 31.0 | 29.6 | 28.0 | 28.0 | 28.0 |
| Accounts receivables days | 112.0 | 48.8 | 35.0 | 35.0 | 35.0 |
| Accounts payables days | 130.8 | 100.7 | 180.0 | 180.0 | 180.0 |
| Returns (%) | | | | | |
| Dividend payout ratio | 0.0 | 15.0 | 30.0 | 30.0 | 30.0 |
| Return on equity | (11.7) | 5.4 | 8.2 | 13.5 | 16.9 |
| Return on assets | 3.2 | 3.4 | 7.8 | 12.0 | 14.3 |
| Return on capital employed | 3.8 | 4.9 | 9.3 | 15.4 | 18.9 |

*Sources: Company data, BOCI Research estimates*

# LISTED COMPANIES IN THIS REPORT

OCI (010060.KS/KRW213500, NR)

MEMC (WFR.US/US$17.83, NR)

Wacker (WCH.GR/€82.89, NR)

REC (REC.NO/NOK46.03, NR)

Tokuyama (4030.JP/¥52.08, NR)

Tianwei Baobian (600550.SS/Rmb42.61, BUY)

GCL-Poly (3800.HK/HK$2.61, BUY)

*Prices as of 16 July 2008*
*All figures subject to rounding*
*NB: BUY = ≥+10% compared with the relevant benchmark index over a 6-month period; SELL = ≤-10% compared with the relevant benchmark index over a 6-month period; HOLD = ≤+10% and ≥-10% compared with the relevant benchmark index over a 6-month period; Not Rated (NR)*

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