

## Monthly wind power output

### Solid April output bodes well for the coming quarter

|                           | Ticker  | Rec | Mkt cap  |     | Price | PT   | Up/<br>dn (%) | EPS growth (%) |       | PER (x) |       | PBR (x) |       |
|---------------------------|---------|-----|----------|-----|-------|------|---------------|----------------|-------|---------|-------|---------|-------|
|                           |         |     | (USD mn) | Ccy |       |      |               | 2017E          | 2018E | 2017E   | 2018E | 2017E   | 2018E |
| <b>Longyuan Power</b>     | 916 HK  | BUY | 6,212    | HKD | 6.09  | 7.51 | +23%          | 15.1           | 14.6  | 11.0    | 9.6   | 1.0     | 0.9   |
| <b>Huaneng Renewables</b> | 958 HK  | BUY | 3,298    | HKD | 2.67  | 3.22 | +20%          | 6.1            | 17.9  | 8.1     | 6.9   | 1.0     | 0.9   |
| <b>Datang Renewables</b>  | 1798 HK | NR  | 728      | HKD | 0.79  | -    | -             | 173.6          | 33.3  | 9.1     | 6.8   | 0.4     | 0.4   |

Source: Company data, CSC Research estimates; prices as of 16 May 2017

- **Longyuan Power (LYP) and Huaneng Renewables (HNR) reported their Apr-2017 domestic wind power output increased by 20.2% and 7.7% YoY. We estimate their monthly utilizations have also increased by 10.6% and 2.1% YoY, respectively.**
- **The output growth was mainly driven by the traditionally heavily-curtailed provinces, namely Gansu, Ningxia, Xinjiang in Northwest, Jilin and Heilongjiang in Northeast, and Inner Mongolia in Northern China, which recorded good wind conditions in April as well as eased curtailments. On the flip side, Yunnan was the main drag due to repair and maintenance works on local grids and Shaanxi has incurred persistent curtailments since 4Q16.**
- **Reiterate BUY on LYP and HNR, on the back of their healthy growth outlook and given that their current valuations are well below historical averages.**

**April wind power outputs kicked off to a good start in 2Q17.** LYP announced Apr-17 power generation of 4,212GWh (up 19.7% YoY), which was mainly driven by the 20.2% YoY growth in domestic wind power generation (accounting for 79% of total output) and also helped by the 21.0% YoY growth in coal power. Meanwhile, HNR reported total power generation of 2,105GWh (up 8.3% YoY), attributable to the 7.7% YoY growth in wind power (95% of total output) and 21.7% YoY growth in solar power.

**Output growth primarily driven by recovery among traditionally heavily-curtailed provinces.** Applausively, the traditionally heavily-curtailed provinces (*highlighted in red in figures 1 and 2*) all posted higher utilizations and have been the primary contributor to the operators' output growth, with LYP and HNR registering 22%/17%/10% and 39%/28%/27% increments in power output in Heilongjiang/ Xinjiang/ Ningxia and Inner Mongolia/ Jilin/ Shaanxi, respectively. LYP indicated that for April, its curtailment rate has reduced by 7ppts to 11% (vs. 18% in Apr-16), and specifically, curtailment in Ningxia has been reduced to single-digits since 4Q16, while Heilongjiang and Jilin registered notable YTD improvements, and Xinjiang and Gansu have maintained relatively stable curtailment rates as compared with 1Q17 (that would be c.7-9ppts YoY improvements, according to industry data).

**Temporary drag in Yunnan but persistent curtailments in Shaanxi.** Yunnan was the main drag due to repair and maintenance works on local grids, which are scheduled to restore operations this month. Meanwhile, Shaanxi has been subject to substantial curtailments since 4Q16 despite utilization reductions have been offset by the increased capacity among the operators.

**Reiterate BUY on LYP and HNR, valuation at historical trough.** LYP is currently trading at a forward PER and PBR of 10.4x and 1.0x respectively, both of which are 1SD below the historical average (12.5x/1.1x). Meanwhile, HNR is currently trading at a forward PER and PBR of 7.6x and 1.0x respectively, both of which are below the historical average of 13.1x/1.1x (1SD below average are 7.9x/0.8x).

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**Figure 1: Monthly wind power generation – Longyuan Power (916 HK)**

|                                      |        | Curtailments |            | Grid-connected capacity (GW) |              |              | Power generation (GWh) |              |              | Utilization hour |            |              |
|--------------------------------------|--------|--------------|------------|------------------------------|--------------|--------------|------------------------|--------------|--------------|------------------|------------|--------------|
|                                      |        | 2015         | 2016       | 2015                         | 2016         | %            | Apr-16                 | Apr-17       | YoY%         | Apr-16           | Apr-17     | YoY%         |
| <b>Eastern China Power Network</b>   |        |              |            |                              |              |              |                        |              |              |                  |            |              |
| Shanghai                             | IV     |              |            | 0.05                         | 0.05         | 0.3%         | 10.1                   | 11.0         | 9.0%         | 213              | 232        | 9.0%         |
| Jiangsu                              | IV     |              |            | 1.68                         | 1.73         | 10.0%        | 199.4                  | 325.9        | 63.5%        | 119              | 189        | 58.7%        |
| Zhejiang                             | IV     |              |            | 0.23                         | 0.23         | 1.3%         | 36.3                   | 33.1         | -8.8%        | 159              | 145        | -8.8%        |
| Anhui                                | IV     |              |            | 0.59                         | 0.73         | 4.2%         | 146.4                  | 146.8        | 0.3%         | 230              | 200        | -12.9%       |
| Fujian                               | IV     |              |            | 0.52                         | 0.67         | 3.9%         | 75.5                   | 105.6        | 39.8%        | 145              | 159        | 9.8%         |
| <b>Sub-total</b>                     |        |              |            | <b>3.06</b>                  | <b>3.40</b>  | <b>19.7%</b> | <b>467.7</b>           | <b>622.5</b> | <b>33.1%</b> |                  |            |              |
| <b>Central China Power Network</b>   |        |              |            |                              |              |              |                        |              |              |                  |            |              |
| Jiangxi                              | IV     |              |            | -                            | 0.04         | 0.2%         | -                      | 6.0          | -            | -                | 151        | -            |
| Henan                                | IV     |              |            |                              |              | 0.0%         |                        |              |              |                  |            |              |
| Hubei                                | IV     |              |            |                              |              | 0.0%         |                        |              |              |                  |            |              |
| Hunan                                | IV     |              |            | -                            | 0.05         | 0.3%         | 11.1                   | 16.6         | 50.2%        | 230              | 346        | -            |
| Chongqin                             | IV     |              |            | 0.15                         | 0.15         | 0.9%         | 29.8                   | 33.3         | 11.7%        | 199              | 223        | 11.7%        |
| Sichuan                              | IV     |              |            |                              |              | 0.0%         |                        |              |              |                  |            |              |
| Tibet                                | IV     |              |            | 0.01                         | 0.01         | 0.0%         | 1.9                    | 1.0          | -47.6%       | 253              | 133        | -47.6%       |
| <b>Sub-total</b>                     |        |              |            | <b>0.16</b>                  | <b>0.25</b>  | <b>1.4%</b>  | <b>42.8</b>            | <b>57.0</b>  | <b>33.1%</b> |                  |            |              |
| <b>Southern China Power Network</b>  |        |              |            |                              |              |              |                        |              |              |                  |            |              |
| Guangdong                            | IV     |              |            | 0.03                         | 0.08         | 0.4%         | 2.3                    | 8.6          | 278.2%       | 89               | 114        | 28.5%        |
| Guangxi                              | IV     |              |            | -                            | 0.10         | 0.6%         | 17.1                   | 21.4         | 24.6%        | 357              | 224        | -            |
| Hainan                               | IV     |              |            | 0.10                         | 0.10         | 0.6%         | 3.9                    | 9.2          | 136.3%       | 39               | 93         | 136.3%       |
| Guizhou                              | IV     |              |            | 0.54                         | 0.64         | 3.7%         | 118.3                  | 135.0        | 14.2%        | 200              | 211        | 5.3%         |
| Yunnan                               | IV     | 3%           | 4%         | 0.62                         | 0.77         | 4.5%         | 196.3                  | 166.6        | -15.2%       | 317              | 216        | -31.7%       |
| <b>Sub-total</b>                     |        |              |            | <b>1.28</b>                  | <b>1.68</b>  | <b>9.7%</b>  | <b>338.0</b>           | <b>340.8</b> | <b>0.8%</b>  |                  |            |              |
| <b>Northern China Power Network</b>  |        |              |            |                              |              |              |                        |              |              |                  |            |              |
| Beijing                              | IV     |              |            |                              |              | 0.0%         |                        |              |              |                  |            |              |
| Tianjin                              | IV     |              |            | 0.13                         | 0.13         | 0.8%         | 31.8                   | 28.4         | -10.9%       | 241              | 215        | -10.9%       |
| Hebei                                | II/IV  | 10%          | 9%         | 1.17                         | 1.17         | 6.8%         | 277.0                  | 269.4        | -2.7%        | 237              | 230        | -2.7%        |
| Shanxi                               | IV     | 3%           | 9%         | 0.65                         | 0.83         | 4.8%         | 134.6                  | 129.2        | -4.0%        | 208              | 156        | -25.2%       |
| Shandong                             | IV     |              |            | 0.34                         | 0.39         | 2.3%         | 72.5                   | 80.2         | 10.6%        | 214              | 204        | -4.8%        |
| Inner Mongolia                       | I/II   | 18%          | 21%        | 2.59                         | 2.64         | 15.3%        | 442.6                  | 484.5        | 9.5%         | 171              | 184        | 7.4%         |
| <b>Sub-total</b>                     |        |              |            | <b>4.87</b>                  | <b>5.16</b>  | <b>29.9%</b> | <b>958.5</b>           | <b>991.6</b> | <b>3.5%</b>  |                  |            |              |
| <b>Northeast China Power Network</b> |        |              |            |                              |              |              |                        |              |              |                  |            |              |
| Liaoning                             | IV     | 10%          | 13%        | 1.00                         | 1.00         | 5.8%         | 262.0                  | 254.7        | -2.8%        | 261              | 254        | -2.8%        |
| Jilin                                | III/IV | 31%          | 30%        | 0.45                         | 0.55         | 3.2%         | 71.6                   | 100.2        | 39.9%        | 160              | 183        | 14.4%        |
| Heilongjiang                         | III/IV | 21%          | 19%        | 1.23                         | 1.23         | 7.1%         | 175.9                  | 300.5        | 70.8%        | 142              | 243        | 70.8%        |
| <b>Sub-total</b>                     |        |              |            | <b>2.69</b>                  | <b>2.79</b>  | <b>16.1%</b> | <b>509.5</b>           | <b>655.4</b> | <b>28.6%</b> |                  |            |              |
| <b>Northwest China Power Network</b> |        |              |            |                              |              |              |                        |              |              |                  |            |              |
| Shaanxi                              | IV     |              | 7%         | 0.20                         | 0.44         | 2.5%         | 47.3                   | 59.6         | 26.1%        | 239              | 136        | -43.1%       |
| Gansu                                | II/III | 39%          | 43%        | 1.29                         | 1.29         | 7.5%         | 135.2                  | 177.7        | 31.4%        | 105              | 138        | 31.4%        |
| Qinghai                              | IV     |              |            |                              |              | 0.0%         |                        |              |              |                  |            |              |
| Ningxia                              | III    | 13%          | 13%        | 0.72                         | 0.72         | 4.2%         | 76.5                   | 135.0        | 76.5%        | 106              | 186        | 76.5%        |
| Xinjiang                             | I/III  | 32%          | 38%        | 1.39                         | 1.54         | 8.9%         | 189.1                  | 283.1        | 49.7%        | 136              | 184        | 35.1%        |
| <b>Sub-total</b>                     |        |              |            | <b>3.60</b>                  | <b>4.00</b>  | <b>23.1%</b> | <b>448.1</b>           | <b>655.4</b> | <b>46.3%</b> |                  |            |              |
| <b>National total</b>                |        | <b>15%</b>   | <b>17%</b> | <b>15.67</b>                 | <b>17.27</b> |              | <b>2,765</b>           | <b>3,323</b> | <b>20.2%</b> | <b>174</b>       | <b>193</b> | <b>10.6%</b> |

Source: CEC, Company, CSCI Research estimates

**Figure 2: Monthly wind power generation – Huaneng Renewables (958 HK)**

|                                      |        | Curtailments |            | Grid-connected capacity (GW) |              |              | Power generation (GWh) |              |              | Utilization hour |            |             |
|--------------------------------------|--------|--------------|------------|------------------------------|--------------|--------------|------------------------|--------------|--------------|------------------|------------|-------------|
|                                      |        | 2015         | 2016       | 2015                         | 2016         | %            | Apr-16                 | Apr-17       | YoY%         | Apr-16           | Apr-17     | YoY%        |
| <b>Eastern China Power Network</b>   |        |              |            |                              |              |              |                        |              |              |                  |            |             |
| Shanghai                             | IV     |              |            | 0.11                         | 0.11         | 1.1%         | 16.2                   | 18.8         | 15.9%        | 150              | 174        | 15.9%       |
| Jiangsu                              | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Zhejiang                             | IV     |              |            | 0.03                         | 0.07         | 0.7%         | 6.7                    | 11.4         | 70.8%        | 194              | 153        | -20.9%      |
| Anhui                                | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Fujian                               | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| <b>Sub-total</b>                     |        |              |            | <b>0.14</b>                  | <b>0.18</b>  | <b>1.8%</b>  | <b>22.9</b>            | <b>30.2</b>  | <b>31.9%</b> |                  |            |             |
| <b>Central China Power Network</b>   |        |              |            |                              |              |              |                        |              |              |                  |            |             |
| Jiangxi                              | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Henan                                | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Hubei                                | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Hunan                                | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Chongqin                             | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Sichuan                              | IV     |              |            | 0.49                         | 0.49         | 4.8%         | 102.4                  | 122.7        | 19.8%        | 207              | 249        | 19.8%       |
| Tibet                                | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| <b>Sub-total</b>                     |        |              |            | <b>0.49</b>                  | <b>0.49</b>  | <b>4.8%</b>  | <b>102.4</b>           | <b>122.7</b> | <b>19.8%</b> |                  |            |             |
| <b>Southern China Power Network</b>  |        |              |            |                              |              |              |                        |              |              |                  |            |             |
| Guangdong                            | IV     |              |            | 0.50                         | 0.50         | 4.9%         | 74.2                   | 77.9         | 5.1%         | 148              | 155        | 5.1%        |
| Guangxi                              | IV     |              |            | -                            | 0.05         | 0.5%         | -                      | 14.1         | -            | -                | 284        | -           |
| Hainan                               | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Guizhou                              | IV     |              |            | 0.73                         | 0.73         | 7.1%         | 117.7                  | 123.2        | 4.7%         | 161              | 169        | 4.7%        |
| Yunnan                               | IV     | 3%           | 4%         | 1.12                         | 1.12         | 10.9%        | 318.5                  | 286.8        | -10.0%       | 285              | 257        | -10.0%      |
| <b>Sub-total</b>                     |        |              |            | <b>2.35</b>                  | <b>2.40</b>  | <b>23.4%</b> | <b>510.4</b>           | <b>502.0</b> | <b>-1.7%</b> |                  |            |             |
| <b>Northern China Power Network</b>  |        |              |            |                              |              |              |                        |              |              |                  |            |             |
| Beijing                              | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Tianjin                              | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Hebei                                | II/IV  | 10%          | 9%         | 0.36                         | 0.36         | 3.5%         | 86.7                   | 75.6         | -12.9%       | 240              | 209        | -12.9%      |
| Shanxi                               | IV     | 3%           | 9%         | 0.69                         | 0.74         | 7.3%         | 136.9                  | 146.0        | 6.6%         | 197              | 196        | -0.5%       |
| Shandong                             | IV     |              |            | 0.95                         | 1.00         | 9.8%         | 188.8                  | 181.3        | -4.0%        | 198              | 181        | -8.7%       |
| Inner Mongolia                       | I/II   | 18%          | 21%        | 2.47                         | 2.47         | 24.1%        | 414.0                  | 472.4        | 14.1%        | 168              | 191        | 14.1%       |
| <b>Sub-total</b>                     |        |              |            | <b>4.48</b>                  | <b>4.57</b>  | <b>44.6%</b> | <b>826.4</b>           | <b>875.2</b> | <b>5.9%</b>  |                  |            |             |
| <b>Northeast China Power Network</b> |        |              |            |                              |              |              |                        |              |              |                  |            |             |
| Liaoning                             | IV     | 10%          | 13%        | 1.36                         | 1.40         | 13.7%        | 331.4                  | 328.6        | -0.8%        | 244              | 234        | -3.9%       |
| Jilin                                | III/IV | 31%          | 30%        | 0.40                         | 0.40         | 3.9%         | 50.3                   | 92.6         | 83.9%        | 127              | 234        | 83.9%       |
| Heilongjiang                         | III/IV | 21%          | 19%        |                              |              |              |                        |              |              |                  |            |             |
| <b>Sub-total</b>                     |        |              |            | <b>1.76</b>                  | <b>1.80</b>  | <b>17.5%</b> | <b>381.7</b>           | <b>421.2</b> | <b>10.3%</b> |                  |            |             |
| <b>Northwest China Power Network</b> |        |              |            |                              |              |              |                        |              |              |                  |            |             |
| Shaanxi                              | IV     |              | 7%         | 0.06                         | 0.36         | 3.5%         | 11.4                   | 52.3         | 358.2%       | 195              | 146        | -25.2%      |
| Gansu                                | II/III | 39%          | 43%        |                              |              |              |                        |              |              |                  |            |             |
| Qinghai                              | IV     |              |            |                              |              |              |                        |              |              |                  |            |             |
| Ningxia                              | III    | 13%          | 13%        |                              |              |              |                        |              |              |                  |            |             |
| Xinjiang                             | I/III  | 32%          | 38%        | 0.45                         | 0.45         | 4.4%         | 98.5                   | 101.0        | 2.5%         | 220              | 226        | 2.5%        |
| <b>Sub-total</b>                     |        |              |            | <b>0.51</b>                  | <b>0.81</b>  | <b>7.9%</b>  | <b>109.9</b>           | <b>153.4</b> | <b>39.5%</b> |                  |            |             |
| <b>National total</b>                |        | <b>15%</b>   | <b>17%</b> | <b>9.72</b>                  | <b>10.25</b> |              | <b>1,954</b>           | <b>2,105</b> | <b>7.7%</b>  | <b>201</b>       | <b>205</b> | <b>2.1%</b> |

Source: CEC, Company, CSCI Research estimates

## Valuation at historical trough

**Figure 3: LYP (916 HK) historical PER band**


Source: Bloomberg, CSCI Research

**Figure 4: LYP (916 HK) historical PBR band**


Source: Bloomberg, CSCI Research

**Figure 5: HNR (958 HK) historical PER band**


Source: Bloomberg, CSCI Research

**Figure 6: HNR (958 HK) historical PBR band**


Source: Bloomberg, CSCI Research

**Figure 7: Peer valuation**

| Company                 | Ticker  | Close (Local\$) | Mkt cap (USD mn) | EPS Growth (%) |            | PER (x)     |             | PBR (x)    |            | ROE (%)    |            | Yield (%)   |             | Net Gear (%) |             |
|-------------------------|---------|-----------------|------------------|----------------|------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|--------------|-------------|
|                         |         |                 |                  | FY17E          | FY18E      | FY17E       | FY18E       | FY17E      | FY18E      | FY17E      | FY18E      | FY17E       | FY18E       | FY17E        | FY18E       |
| <b>Wind Power</b>       |         |                 |                  |                |            |             |             |            |            |            |            |             |             |              |             |
| Longyuan                | 916 HK  | 6.1             | 6,212            | 15%            | 15%        | 11.0        | 9.6         | 1.0        | 1.0        | 10%        | 10%        | 1.8%        | 2.1%        | 176%         | 166%        |
| Goldwind                | 2208 HK | 11.9            | 5,537            | 4%             | 8%         | 9.0         | 8.4         | 1.3        | 1.2        | 15%        | 15%        | 2.8%        | 3.5%        | 78%          | 86%         |
| HN Renew                | 958 HK  | 2.7             | 3,298            | 6%             | 18%        | 8.1         | 6.9         | 1.0        | 0.9        | 12%        | 13%        | 1.9%        | 2.2%        | 202%         | 189%        |
| Datang Renew            | 1798 HK | 0.8             | 728              | 174%           | 33%        | 9.1         | 6.8         | 0.4        | 0.4        | 5%         | 6%         | 2.7%        | 3.7%        | -            | -           |
| <b>Average</b>          |         |                 |                  | <b>50%</b>     | <b>18%</b> | <b>9.3</b>  | <b>7.9</b>  | <b>1.0</b> | <b>0.9</b> | <b>11%</b> | <b>11%</b> | <b>2.3%</b> | <b>2.9%</b> | <b>152%</b>  | <b>147%</b> |
| <b>Thermal Power</b>    |         |                 |                  |                |            |             |             |            |            |            |            |             |             |              |             |
| Huaneng Power           | 902 HK  | 5.9             | 15,747           | -50%           | 50%        | 18.0        | 12.1        | 1.0        | 0.9        | 5%         | 9%         | 2.9%        | 4.4%        | 245%         | 222%        |
| CR Power                | 836 HK  | 15.4            | 9,450            | -19%           | 18%        | 11.7        | 9.9         | 1.0        | 1.0        | 9%         | 11%        | 5.4%        | 5.5%        | 125%         | 120%        |
| Datang Power            | 991 HK  | 2.9             | 8,859            | -28%           | 34%        | 13.9        | 10.4        | 0.8        | 0.7        | 6%         | 8%         | 1.1%        | 4.3%        | 215%         | 204%        |
| Huadian Power           | 1071 HK | 3.7             | 6,662            | -35%           | 54%        | 15.4        | 10.0        | 0.7        | 0.7        | 6%         | 8%         | 2.3%        | 3.8%        | 202%         | 191%        |
| China Power             | 2380 HK | 2.9             | 2,805            | -23%           | 22%        | 10.2        | 8.4         | 0.7        | 0.6        | 7%         | 8%         | 4.4%        | 5.5%        | 167%         | 162%        |
| <b>Average</b>          |         |                 |                  | <b>-31%</b>    | <b>36%</b> | <b>13.9</b> | <b>10.1</b> | <b>0.8</b> | <b>0.8</b> | <b>6%</b>  | <b>9%</b>  | <b>3.2%</b> | <b>4.7%</b> | <b>191%</b>  | <b>180%</b> |
| <b>Renewable Energy</b> |         |                 |                  |                |            |             |             |            |            |            |            |             |             |              |             |
| Jingneng CE             | 579 HK  | 2.3             | 2,047            | 15%            | 8%         | 6.1         | 5.6         | 0.8        | 0.7        | 13%        | 13%        | 3.9%        | 7.1%        | 125%         | 105%        |
| Huadian Fuxin           | 816 HK  | 1.9             | 1,986            | 8%             | 17%        | 6.4         | 5.5         | 0.6        | 0.6        | 10%        | 11%        | 3.2%        | 3.9%        | 292%         | 277%        |
| Suntien                 | 956 HK  | 1.5             | 725              | 16%            | 15%        | 7.8         | 6.8         | 0.6        | 0.6        | 7%         | 8%         | 4.9%        | 5.6%        | 187%         | 204%        |
| CGN New Energy          | 1811 HK | 1.2             | 634              | 9%             | 8%         | 7.4         | 6.9         | 0.8        | 0.7        | 10%        | 10%        | 1.4%        | 2.3%        | 230%         | 198%        |
| Concord                 | 182 HK  | 0.4             | 386              | 48%            | 19%        | 4.4         | 3.7         | 0.5        | 0.5        | 11%        | 12%        | 4.0%        | 4.0%        | 115%         | 124%        |
| <b>Average</b>          |         |                 |                  | <b>19%</b>     | <b>14%</b> | <b>6.4</b>  | <b>5.7</b>  | <b>0.7</b> | <b>0.6</b> | <b>10%</b> | <b>11%</b> | <b>3.5%</b> | <b>4.6%</b> | <b>190%</b>  | <b>182%</b> |
| <b>Nuclear</b>          |         |                 |                  |                |            |             |             |            |            |            |            |             |             |              |             |
| CGN Power               | 1816 HK | 2.4             | 13,714           | 9%             | 11%        | 11.7        | 10.6        | 1.5        | 1.3        | 13%        | 14%        | 2.6%        | 2.9%        | 211%         | 197%        |

Prices as of 16 May 2017

Source: CSCI Research Estimates, Bloomberg

## Longyuan Power (916 HK)

### Income statement (Rmb mn)

| Year end: Dec               | 2015          | 2016          | 2017E         | 2018E         | 2019E         |
|-----------------------------|---------------|---------------|---------------|---------------|---------------|
| <b>Revenue</b>              | <b>19,683</b> | <b>22,304</b> | <b>23,639</b> | <b>25,345</b> | <b>27,214</b> |
| Other net income            | 450           | 647           | 589           | 656           | 729           |
| Material costs              | (3,851)       | (5,328)       | (4,979)       | (4,730)       | (4,659)       |
| Service concession          | (662)         | (541)         | (433)         | (390)         | (351)         |
| General and administrative  | (1,795)       | (2,032)       | (2,148)       | (2,322)       | (2,487)       |
| Repairs and maintenance     | (531)         | (642)         | (709)         | (813)         | (881)         |
| Other operating expenses    | (584)         | (518)         | (473)         | (762)         | (703)         |
| <b>EBITDA</b>               | <b>12,710</b> | <b>13,890</b> | <b>15,486</b> | <b>16,985</b> | <b>18,862</b> |
| Depreciation & Amortization | (5,578)       | (6,342)       | (6,929)       | (7,537)       | (8,144)       |
| <b>EBIT</b>                 | <b>7,132</b>  | <b>7,548</b>  | <b>8,557</b>  | <b>9,448</b>  | <b>10,718</b> |
| Net interest                | (3,039)       | (2,774)       | (2,978)       | (3,078)       | (3,116)       |
| JVs and associates          | 576           | 376           | 321           | 357           | 417           |
| <b>Pretax profit</b>        | <b>4,669</b>  | <b>5,150</b>  | <b>5,901</b>  | <b>6,727</b>  | <b>8,019</b>  |
| Taxation                    | (601)         | (660)         | (756)         | (862)         | (1,028)       |
| Minority & perpetual note   | 1,189         | 1,074         | 1,212         | 1,363         | 1,599         |
| <b>Net profit</b>           | <b>2,878</b>  | <b>3,415</b>  | <b>3,933</b>  | <b>4,502</b>  | <b>5,392</b>  |
| Net profit (adjusted)       | 2,704         | 3,258         | 3,933         | 4,502         | 5,392         |
| Basic EPS (Rmb)             | 0.36          | 0.42          | 0.49          | 0.56          | 0.67          |
| Diluted EPS (Rmb)           | 0.36          | 0.42          | 0.49          | 0.56          | 0.67          |
| DPS (Rmb)                   | 0.07          | 0.09          | 0.10          | 0.11          | 0.13          |

### Balance sheet (Rmb mn)

| Year end: Dec                      | 2015           | 2016           | 2017E          | 2018E          | 2019E          |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|
| Cash                               | 3,274          | 1,933          | 851            | 1,421          | 2,154          |
| Short term investments             | 866            | 635            | 635            | 635            | 635            |
| Accounts receivables               | 4,243          | 5,901          | 6,476          | 6,868          | 7,253          |
| Inventory                          | 1,081          | 1,040          | 862            | 819            | 807            |
| Other current assets               | 3,240          | 3,824          | 3,824          | 3,824          | 3,824          |
| <b>Total current assets</b>        | <b>12,704</b>  | <b>13,333</b>  | <b>12,647</b>  | <b>13,567</b>  | <b>14,672</b>  |
| PP&E                               | 98,997         | 105,598        | 112,488        | 118,804        | 124,541        |
| Intangible Assets                  | 10,702         | 10,997         | 11,081         | 11,100         | 11,058         |
| Associates and JVs                 | 4,822          | 4,483          | 4,804          | 5,161          | 5,578          |
| Other long term assets             | 6,643          | 4,250          | 4,250          | 4,250          | 4,250          |
| <b>Total long term assets</b>      | <b>121,164</b> | <b>125,328</b> | <b>132,624</b> | <b>139,315</b> | <b>145,427</b> |
| <b>TOTAL ASSETS</b>                | <b>133,867</b> | <b>138,661</b> | <b>145,271</b> | <b>152,882</b> | <b>160,099</b> |
| Short term debt                    | 44,977         | 44,511         | 44,511         | 40,064         | 36,061         |
| Accounts payables                  | 10,867         | 11,120         | 11,210         | 11,618         | 12,054         |
| Other current liabilities          | 156            | 176            | 176            | 176            | 176            |
| <b>Total current liabilities</b>   | <b>56,000</b>  | <b>55,807</b>  | <b>55,897</b>  | <b>51,858</b>  | <b>48,292</b>  |
| Long term debt                     | 29,970         | 31,788         | 33,981         | 40,685         | 45,512         |
| Deferred tax                       | 106            | 138            | 138            | 138            | 138            |
| Other long term liabilities        | 3,217          | 3,141          | 3,141          | 3,141          | 3,141          |
| <b>Total long term liabilities</b> | <b>33,293</b>  | <b>35,067</b>  | <b>37,260</b>  | <b>43,964</b>  | <b>48,791</b>  |
| <b>TOTAL LIABILITIES</b>           | <b>89,293</b>  | <b>90,874</b>  | <b>93,157</b>  | <b>95,822</b>  | <b>97,083</b>  |
| Shareholders' funds                | 35,145         | 37,899         | 41,148         | 44,864         | 49,356         |
| Perpetual medium-term note         | 2,991          | 2,991          | 2,991          | 2,991          | 2,991          |
| Minority Interests                 | 6,439          | 6,896          | 7,975          | 9,204          | 10,670         |
| <b>TOTAL LIAB AND EQUITY</b>       | <b>133,867</b> | <b>138,661</b> | <b>145,271</b> | <b>152,882</b> | <b>160,099</b> |
| Net cash / (debt)                  | (71,672)       | (74,366)       | (77,641)       | (79,327)       | (79,419)       |

Source: Bloomberg, Company, CSCI Research estimates

### Cash flow statement (Rmb mn)

| Year end: Dec                    | 2015            | 2016            | 2017E           | 2018E           | 2019E           |
|----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Pretax profit</b>             | <b>4,669</b>    | <b>5,150</b>    | <b>5,901</b>    | <b>6,727</b>    | <b>8,019</b>    |
| Depreciation & amortisation      | 5,578           | 6,342           | 6,929           | 7,537           | 8,144           |
| Net interest                     | 2,685           | 2,602           | 3,016           | 3,117           | 3,154           |
| Taxes paid                       | (526)           | (634)           | (756)           | (862)           | (1,028)         |
| Changes in working capital       | 4,128           | 483             | (307)           | 59              | 63              |
| Others                           | (227)           | (411)           | (359)           | (396)           | (455)           |
| <b>Cash flow from operations</b> | <b>16,307</b>   | <b>13,533</b>   | <b>14,422</b>   | <b>16,182</b>   | <b>17,897</b>   |
| Capex                            | (15,264)        | (13,990)        | (13,904)        | (13,871)        | (13,839)        |
| Acquisitions                     | (877)           | (68)            | (0)             | (0)             | (0)             |
| Disposals                        | 3               | 220             | -               | -               | -               |
| Others                           | (182)           | 2,630           | 111             | 98              | 132             |
| <b>Cash flow from investing</b>  | <b>(16,319)</b> | <b>(11,209)</b> | <b>(13,792)</b> | <b>(13,773)</b> | <b>(13,707)</b> |
| Dividends                        | (1,174)         | (1,306)         | (683)           | (787)           | (900)           |
| Issue of shares                  | 412             | 147             | -               | -               | -               |
| Change in debt                   | 4,870           | 1,322           | 2,193           | 2,257           | 824             |
| Others                           | (3,582)         | (3,447)         | (3,222)         | (3,309)         | (3,381)         |
| <b>Cash flow from financing</b>  | <b>525</b>      | <b>(3,284)</b>  | <b>(1,712)</b>  | <b>(1,839)</b>  | <b>(3,457)</b>  |
| <b>Change in cash</b>            | <b>513</b>      | <b>(961)</b>    | <b>(1,082)</b>  | <b>570</b>      | <b>733</b>      |
| Free cash flow                   | 1,043           | (458)           | 519             | 2,312           | 4,058           |

### Key ratios

| Year end: Dec            | 2015  | 2016  | 2017E | 2018E | 2019E |
|--------------------------|-------|-------|-------|-------|-------|
| <b>Operating ratios</b>  |       |       |       |       |       |
| EBIT margin (%)          | 36.2  | 33.8  | 36.2  | 37.3  | 39.4  |
| EBITDA margin (%)        | 64.6  | 62.3  | 65.5  | 67.0  | 69.3  |
| Effective tax rate (%)   | 12.9  | 12.8  | 12.8  | 12.8  | 12.8  |
| Revenue growth (%)       | 8.0   | 13.3  | 6.0   | 7.2   | 7.4   |
| Net income growth (%)    | 12.7  | 18.7  | 15.1  | 14.5  | 19.8  |
| EPS growth adj (%)       | 12.7  | 18.7  | 15.1  | 14.5  | 19.8  |
| DPS growth (%)           | 20.1  | 18.5  | 15.1  | 14.5  | 19.8  |
| <b>Efficiency ratios</b> |       |       |       |       |       |
| ROE (%)                  | 8.2   | 9.0   | 9.6   | 10.0  | 10.9  |
| ROCE (%)                 | 9.2   | 9.1   | 9.6   | 9.4   | 9.6   |
| Asset turnover (x)       | 0.1   | 0.2   | 0.2   | 0.2   | 0.2   |
| Op cash / EBIT (x)       | 2.3   | 1.8   | 1.7   | 1.7   | 1.7   |
| Depreciation / CAPEX (x) | (0.4) | (0.5) | (0.5) | (0.5) | (0.6) |
| Accounts receivable days | 98.8  | 83.0  | 95.6  | 96.1  | 94.7  |
| <b>Leverage ratios</b>   |       |       |       |       |       |
| Net debt / assets (%)    | 53.5  | 53.6  | 53.4  | 51.9  | 49.6  |
| Net gearing (%)          | 187.9 | 181.9 | 175.9 | 165.8 | 151.7 |
| Net debt / EBITDA (x)    | 5.6   | 5.4   | 5.0   | 4.7   | 4.2   |
| Interest cover (x)       | 2.7   | 2.9   | 2.8   | 3.0   | 3.4   |
| Current ratio (x)        | 0.2   | 0.2   | 0.2   | 0.3   | 0.3   |
| <b>Valuation</b>         |       |       |       |       |       |
| PER (x)                  | 15.0  | 12.6  | 11.0  | 9.6   | 8.0   |
| EV/EBITDA (x)            | 9.8   | 9.6   | 8.8   | 8.2   | 7.6   |
| PBR (x)                  | 1.2   | 1.1   | 1.0   | 1.0   | 0.9   |
| Dividend yield (x)       | 1.3   | 1.6   | 1.8   | 2.1   | 2.5   |

## Huaneng Renewables (958 HK)

### Income statement (Rmb mn)

| Year end: Dec               | 2015         | 2016         | 2017E         | 2018E         | 2019E         |
|-----------------------------|--------------|--------------|---------------|---------------|---------------|
| <b>Revenue</b>              | <b>7,357</b> | <b>9,239</b> | <b>10,507</b> | <b>11,661</b> | <b>12,905</b> |
| Other net income            | 435          | 322          | 289           | 320           | 354           |
| Material costs              | -            | -            | -             | -             | -             |
| Service concession          | -            | -            | -             | -             | -             |
| General and administrative  | (559)        | (626)        | (755)         | (863)         | (955)         |
| Repairs and maintenance     | (109)        | (189)        | (246)         | (273)         | (299)         |
| Other operating expenses    | (272)        | (375)        | (414)         | (459)         | (508)         |
| <b>EBITDA</b>               | <b>6,851</b> | <b>8,370</b> | <b>9,380</b>  | <b>10,386</b> | <b>11,496</b> |
| Depreciation & Amortization | (2,735)      | (3,462)      | (3,578)       | (3,935)       | (4,289)       |
| <b>EBIT</b>                 | <b>4,116</b> | <b>4,908</b> | <b>5,802</b>  | <b>6,451</b>  | <b>7,207</b>  |
| Net interest                | (2,073)      | (1,995)      | (2,447)       | (2,499)       | (2,560)       |
| JVs and associates          | (3)          | (3)          | (2)           | (3)           | (2)           |
| <b>Pretax profit</b>        | <b>2,041</b> | <b>2,910</b> | <b>3,353</b>  | <b>3,949</b>  | <b>4,645</b>  |
| Taxation                    | (141)        | (202)        | (232)         | (274)         | (322)         |
| Minority                    | 40           | 49           | 57            | 67            | 78            |
| <b>Net profit</b>           | <b>1,860</b> | <b>2,659</b> | <b>3,064</b>  | <b>3,609</b>  | <b>4,245</b>  |
| Net profit (adjusted)       | 1,616        | 2,614        | 3,064         | 3,609         | 4,245         |
| Basic EPS (Rmb)             | 0.19         | 0.27         | 0.29          | 0.34          | 0.40          |
| Diluted EPS (Rmb)           | 0.19         | 0.27         | 0.29          | 0.34          | 0.40          |
| DPS (Rmb)                   | 0.03         | 0.04         | 0.04          | 0.05          | 0.06          |

### Balance sheet (Rmb mn)

| Year end: Dec                      | 2015          | 2016          | 2017E         | 2018E         | 2019E          |
|------------------------------------|---------------|---------------|---------------|---------------|----------------|
| Cash                               | 4,504         | 2,570         | 3,537         | 1,984         | 1,525          |
| Short term investments             | -             | -             | -             | -             | -              |
| Accounts receivables               | 2,900         | 4,635         | 5,253         | 5,247         | 5,162          |
| Inventory                          | 43            | 33            | 33            | 33            | 33             |
| Other current assets               | 205           | 1,457         | 1,457         | 1,457         | 1,457          |
| <b>Total current assets</b>        | <b>7,652</b>  | <b>8,696</b>  | <b>10,281</b> | <b>8,722</b>  | <b>8,177</b>   |
| PP&E                               | 68,658        | 72,107        | 76,471        | 82,324        | 87,753         |
| Intangible Assets                  | 682           | 654           | 620           | 587           | 553            |
| Associates and JVs                 | 109           | 106           | 104           | 102           | 99             |
| Other long term assets             | 5,452         | 3,883         | 3,913         | 3,951         | 3,987          |
| <b>Total long term assets</b>      | <b>74,901</b> | <b>76,749</b> | <b>81,108</b> | <b>86,963</b> | <b>92,392</b>  |
| <b>TOTAL ASSETS</b>                | <b>82,553</b> | <b>85,445</b> | <b>91,389</b> | <b>95,685</b> | <b>100,569</b> |
| Short term debt                    | 19,223        | 22,998        | 23,458        | 23,927        | 24,405         |
| Accounts payables                  | 9,250         | 7,440         | 7,440         | 7,440         | 7,440          |
| Other current liabilities          | 60            | 80            | 80            | 80            | 80             |
| <b>Total current liabilities</b>   | <b>28,533</b> | <b>30,517</b> | <b>30,977</b> | <b>31,446</b> | <b>31,925</b>  |
| Long term debt                     | 32,695        | 29,955        | 30,554        | 31,165        | 31,789         |
| Deferred tax                       | 20            | 3,743         | 3,743         | 3,743         | 3,743          |
| Other long term liabilities        | 2,680         | 235           | 235           | 235           | 235            |
| <b>Total long term liabilities</b> | <b>35,395</b> | <b>33,933</b> | <b>34,533</b> | <b>35,144</b> | <b>35,767</b>  |
| <b>TOTAL LIABILITIES</b>           | <b>63,928</b> | <b>64,451</b> | <b>65,510</b> | <b>66,590</b> | <b>67,692</b>  |
| Shareholders' funds                | 17,798        | 20,137        | 24,966        | 28,115        | 31,819         |
| Perpetual medium-term note         | -             | -             | -             | -             | -              |
| Minority Interests                 | 827           | 857           | 913           | 980           | 1,059          |
| <b>TOTAL LIAB AND EQUITY</b>       | <b>82,553</b> | <b>85,445</b> | <b>91,389</b> | <b>95,685</b> | <b>100,569</b> |
| Net cash / (debt)                  | (47,414)      | (50,383)      | (50,475)      | (53,108)      | (54,669)       |

### Cash flow statement (Rmb mn)

| Year end: Dec                    | 2015            | 2016E          | 2017E          | 2018E          | 2019E          |
|----------------------------------|-----------------|----------------|----------------|----------------|----------------|
| <b>Pretax profit</b>             | <b>2,041</b>    | <b>2,910</b>   | <b>3,353</b>   | <b>3,949</b>   | <b>4,645</b>   |
| Depreciation & amortisation      | 2,735           | 3,462          | 3,578          | 3,935          | 4,289          |
| Net interest                     | 2,197           | 2,090          | 2,447          | 2,499          | 2,560          |
| Taxes paid                       | (126)           | (179)          | (232)          | (274)          | (322)          |
| Changes in working capital       | 967             | (844)          | (618)          | 6              | 85             |
| Others                           | (132)           | (101)          | 2              | 3              | 2              |
| <b>Cash flow from operations</b> | <b>7,682</b>    | <b>7,338</b>   | <b>8,530</b>   | <b>10,118</b>  | <b>11,260</b>  |
| Capex                            | (12,644)        | (7,877)        | (7,940)        | (9,793)        | (9,720)        |
| Acquisitions                     | (144)           | (16)           | 0              | 0              | -              |
| Disposals                        | (324)           | -              | -              | -              | -              |
| Others                           | 598             | 524            | 30             | 27             | 17             |
| <b>Cash flow from investing</b>  | <b>(12,514)</b> | <b>(7,370)</b> | <b>(7,910)</b> | <b>(9,766)</b> | <b>(9,703)</b> |
| Dividends                        | (214)           | (316)          | (399)          | (460)          | (541)          |
| Issue of shares                  | 39              | 35             | 2,163          | 0              | 0              |
| Change in debt                   | 4,396           | 632            | 1,059          | 1,080          | 1,102          |
| Others                           | (2,443)         | (2,209)        | (2,477)        | (2,526)        | (2,577)        |
| <b>Cash flow from financing</b>  | <b>1,778</b>    | <b>(1,858)</b> | <b>347</b>     | <b>(1,905)</b> | <b>(2,016)</b> |
| <b>Change in cash</b>            | <b>(3,054)</b>  | <b>(1,889)</b> | <b>967</b>     | <b>(1,553)</b> | <b>(459)</b>   |
| Free cash flow                   | (4,962)         | (538)          | 591            | 326            | 1,540          |

### Key ratios

| Year end: Dec            | 2015  | 2016  | 2017E | 2018E | 2019E |
|--------------------------|-------|-------|-------|-------|-------|
| <b>Operating ratios</b>  |       |       |       |       |       |
| EBIT margin (%)          | 56.0  | 53.1  | 55.2  | 55.3  | 55.9  |
| EBITDA margin (%)        | 93.1  | 90.6  | 89.3  | 89.1  | 89.1  |
| Effective tax rate (%)   | 6.9   | 6.9   | 6.9   | 6.9   | 6.9   |
| Revenue growth (%)       | 19.6  | 25.6  | 13.7  | 11.0  | 10.7  |
| Net income growth (%)    | 65.9  | 43.0  | 15.2  | 17.8  | 17.6  |
| EPS growth adj (%)       | 54.2  | 43.0  | 6.1   | 17.8  | 17.6  |
| DPS growth (%)           | 50.0  | 36.7  | 6.1   | 17.8  | 17.6  |
| <b>Efficiency ratios</b> |       |       |       |       |       |
| ROE (%)                  | 10.4  | 13.2  | 12.3  | 12.8  | 13.3  |
| ROCE (%)                 | 7.6   | 8.9   | 9.6   | 10.0  | 10.5  |
| Asset turnover (x)       | 0.1   | 0.1   | 0.1   | 0.1   | 0.1   |
| Op cash / EBIT (x)       | 1.9   | 1.5   | 1.5   | 1.6   | 1.6   |
| Depreciation / CAPEX (x) | (0.2) | (0.4) | (0.5) | (0.4) | (0.4) |
| Accounts receivable days | 143.9 | 183.1 | 182.5 | 164.3 | 146.0 |
| <b>Leverage ratios</b>   |       |       |       |       |       |
| Net debt / assets (%)    | 57.4  | 59.0  | 55.2  | 55.5  | 54.4  |
| Net gearing (%)          | 266.4 | 250.2 | 202.2 | 188.9 | 171.8 |
| Net debt / EBITDA (x)    | 6.9   | 6.0   | 5.4   | 5.1   | 4.8   |
| Interest cover (x)       | 1.9   | 2.3   | 2.4   | 2.6   | 2.8   |
| Current ratio (x)        | 0.3   | 0.3   | 0.3   | 0.3   | 0.3   |
| <b>Valuation</b>         |       |       |       |       |       |
| PER (x)                  | 12.3  | 8.6   | 8.1   | 6.9   | 5.8   |
| EV/EBITDA (x)            | 11.3  | 9.4   | 8.9   | 8.0   | 7.3   |
| PBR (x)                  | 1.3   | 1.1   | 1.0   | 0.9   | 0.8   |
| Dividend yield (%)       | 1.3   | 1.7   | 1.9   | 2.2   | 2.6   |

Source: Bloomberg, Company, CSCI Research estimates



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## Company Rating Definition

The Benchmark: Hong Kong Hang Seng Index; Time Horizon: 12 months

|             |  |
|-------------|--|
| <b>Buy</b>  | 12-month absolute total return: $\geq 10\%$            |
| <b>Hold</b> | 12-month absolute total return: $> -10\%$ but $< 10\%$ |
| <b>Sell</b> | 12-month absolute total return: $\leq -10\%$           |

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