Is this coal downturn cyclical or structural?”

Tim Buckley, Director of Energy Finance Studies, Australasia Institute for Energy Economics and Financial Analysis
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Agenda

• State of Play in Global Coal Markets
• IEA New Policies Scenario
• Technology Improvements
• Regulatory Change
• Case Study – China
• Case Study - Japan
Section 1 – Current state of the Coal Market
Australian Thermal Coal Price
US$/t, Newcastle benchmark, 6,000kca l NAR fob, 14% ash.

Australian Thermal Cost Curve (US$/t)

Source: Wood MacKenzie
US Coal Companies (2011-2014)

Peabody Energy Corp. (BTU) - NYSE
15.93 0.00(0.00%) 12 Jul

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Section 2 – IEA New Policies

• The IEA’s central estimate
Global Power Capacity Investment (2000-2012)

Renewable Energy Installs Globally (GW)

Source: IEEFA Estimates

Section 3 – Technology Improvements
Solar System – Conversion Efficiency (RHS)

Source: First Solar Estimates, April 2014

LHS – Average Production Line Run Rate (output)
RHS – Conversion Efficiency (%)
CpW – manufactured Cost per Watt
Solar– Total Utility Scale installed cost: 2013 vs 2018

Source: First Solar Estimates, April 2014
Section 4 – Regulatory Change
Section 4 – Global Regulatory Change

• There is serious national climate policy
  – China’s President Xi Jingping calls for an energy revolution; 7 ETS schemes progressing
    • War on air polution
  – US President Obama has launched his “Clean Power Plan”
    • EPA forecasts 90GW of coal plant closures (-180Mtpa)
  – South Korea launches US$16-18/t coal tax July 2014 and its national ETS in Jan 2015
Section 5 – China as a Case Study
China Coal Consumption Growth (% pa)

Source: BP statistical review, Chinese preliminary data, Platts
## China’s Electricity System

<table>
<thead>
<tr>
<th>GW Installed</th>
<th>Jun'2013</th>
<th>Jun'2014</th>
<th>Percent of total Installed</th>
<th>Change yoy</th>
<th>GW</th>
<th>Percent of new installs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal</td>
<td>793.6</td>
<td>829.1</td>
<td>66.3%</td>
<td>4.5%</td>
<td>35.5</td>
<td>33%</td>
</tr>
<tr>
<td>Gas</td>
<td>40.2</td>
<td>49.7</td>
<td>4.0%</td>
<td>23.8%</td>
<td>9.6</td>
<td>9%</td>
</tr>
<tr>
<td>Hydro</td>
<td>221.8</td>
<td>253.7</td>
<td>20.3%</td>
<td>14.4%</td>
<td>31.9</td>
<td>30%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>14.6</td>
<td>17.8</td>
<td>1.4%</td>
<td>21.7%</td>
<td>3.2</td>
<td>3%</td>
</tr>
<tr>
<td>Wind</td>
<td>67.5</td>
<td>82.8</td>
<td>6.6%</td>
<td>22.6%</td>
<td>15.3</td>
<td>14%</td>
</tr>
<tr>
<td>Other (Solar, EfW, CHP)</td>
<td>6.0</td>
<td>18.1</td>
<td>1.4%</td>
<td>202.3%</td>
<td>12.1</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,143.7</strong></td>
<td><strong>1,251.2</strong></td>
<td><strong>9.4%</strong></td>
<td><strong>107.5</strong></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: National Energy Agency, July 2014, IEEFA calculations
Section 6 – Japan as a Case Study
Section 6 – Japan as a Case Study

• Fukushima provoked a massive, urgent energy strategy rethink.

• Nuclear was 30% of supply, but 49GW was closed.

• Over CY2010-2013, GDP growth was +1% pa, but electricity demand was -12% or -4% pa. Energy efficiency cut 110TWh of the 2010 929TWh total.

• Japan is installing 8GW pa of solar. Over 8 years at this rate to 2020, this adds 80TWh of new electricity.

• Japan’s population and electricity demand is still falling, so this solar will replace fossil fuel imports.

• If nuclear restarts, that will replace more coal imports.
Appendix
# Grid Privatisation

<table>
<thead>
<tr>
<th></th>
<th>2012/13 Base year</th>
<th>2013/14 Current year</th>
<th>2014/15</th>
<th>2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental policies</td>
<td>4.56</td>
<td>4.49</td>
<td>4.48</td>
<td>2.91</td>
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<tr>
<td>Carbon</td>
<td>2.44</td>
<td>2.53</td>
<td>2.60</td>
<td>0.65</td>
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<tr>
<td>LRET</td>
<td>0.57</td>
<td>0.58</td>
<td>0.56</td>
<td>0.65</td>
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<tr>
<td>SRES</td>
<td>0.81</td>
<td>0.54</td>
<td>0.34</td>
<td>0.24</td>
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<tr>
<td>FIT Schemes</td>
<td>0.57</td>
<td>0.67</td>
<td>0.81</td>
<td>1.20</td>
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<tr>
<td>Other state schemes</td>
<td>0.17</td>
<td>0.17</td>
<td>0.17</td>
<td>0.17</td>
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<tr>
<td>Regulated networks</td>
<td>13.58</td>
<td>14.40</td>
<td>15.11</td>
<td>15.53</td>
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<tr>
<td>Transmission</td>
<td>2.41</td>
<td>2.54</td>
<td>2.63</td>
<td>2.71</td>
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<tr>
<td>Distribution</td>
<td>11.17</td>
<td>11.85</td>
<td>12.48</td>
<td>12.82</td>
</tr>
<tr>
<td>Competitive market</td>
<td>8.96</td>
<td>9.06</td>
<td>9.30</td>
<td>9.60</td>
</tr>
<tr>
<td>Wholesale</td>
<td>5.29</td>
<td>5.26</td>
<td>5.38</td>
<td>5.56</td>
</tr>
<tr>
<td>Retail</td>
<td>3.68</td>
<td>3.80</td>
<td>3.92</td>
<td>4.04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27.11</strong></td>
<td><strong>27.95</strong></td>
<td><strong>28.89</strong></td>
<td><strong>28.04</strong></td>
</tr>
</tbody>
</table>

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