World Kaolin

Industry Study with Forecasts for 2017 & 2022

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World demand to rise 3.3% annually through 2017

Global demand for kaolin is forecast to rise 3.3 percent per year to 28.7 million metric tons in 2017, valued at $4.4 billion. Growth in kaolin sales will accelerate as economic conditions improve worldwide, especially in recession-impacted North America and Western Europe. Advances in manufacturing activity are expected to spur demand for kaolin in all key markets. However, gains will continue to be constrained by a relatively poor performance in the leading paper market, where kaolin usage is being affected by expanding competition from calcium carbonates.

Asia/Pacific region to remain largest, fastest growing market

The Asia/Pacific region held the largest share of demand for kaolin in 2012 and is projected to be the fastest growing through 2017. The world’s top four countries in projected growth rate for kaolin consumption -- China, India, Malaysia, and Thailand -- are all located in the Asia/Pacific region. China will continue to be the largest market for kaolin in the region, accounting for one-half of regional demand in 2017. China also recently became the largest national consumer of kaolin in the world, overtaking the US in 2012. Demand for kaolin in Japan is forecast to be flat, as modest increases in manufacturing will be counteracted by a declining market share for kaolin in paper production.

Demand in Western regions to see improved demand

Western Europe and North America -- the second and third largest regional markets for kaolin, respectively -- will both post improved demand through 2017, although gains will trail the global average in both regions due to slower growth in manufacturing output in kaolin-consuming industries. The US, which accounted for nearly 80 percent of North American kaolin consumption in 2012, will rebound from the decline it saw over the 2007-2012 period and remain the second largest national market for kaolin worldwide. Demand for kaolin in Western Europe is less concentrated, with Germany, Italy, and Finland representing the largest kaolin consumers in the region. All of these countries saw their kaolin markets contract between 2007 and 2012. Finland, whose importance in the global kaolin industry is almost entirely due to high domestic paper production, posted an especially poor performance, suffering the most severe contraction in demand of any major kaolin-consuming country worldwide. Demand for kaolin in Western Europe will return to growth through 2017 as paper production increases and a healthier economic climate supports improved demand in all major markets.
China: Demand by Market

Demand for kaolin in China is forecast to grow 7.4 percent per annum through 2017 to 5.8 million metric tons, valued at $890 million. China will continue to post faster growth in kaolin consumption than any other country in the world. The ceramics market holds the largest share of kaolin demand in the country, reflecting high levels of manufacturing of products such as sanitaryware and ceramic tableware. Rising manufacturing levels will contribute to increased demand for kaolin in ceramics, and this market will increase to 35 percent of total domestic kaolin demand in 2017.

Paper is the second largest market for kaolin in China. Although China is the world’s largest paper producer, corresponding demand for kaolin is relatively low, as the country produces an especially high share of uncoated paper products, which use kaolin less extensively. Although production of coated paper products has grown in recent years, competition from alternative materials has mitigated the impact of these advances on kaolin consumption. Both of these factors are expected to remain relevant for the immediate future, and overall usage of kaolin relative to paper production in China is projected to remain steady through 2017.

The refractories market is expected to post below average growth, as gains in clay refractory shipments will trail average gains in manufacturing. Among major kaolin consuming industries, both paint and rubber are expected to post above average gains. A significant amount of kaolin consumption in China also occurs in a variety of smaller markets. In the aggregate, these will show strong growth through 2017, with favorable prospects expected for applications associated with building construction, such as cement and fiberglass.

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### TABLE V-3

<table>
<thead>
<tr>
<th>Item</th>
<th>2002</th>
<th>2007</th>
<th>2012</th>
<th>2017</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (mil persons)</td>
<td>82.5</td>
<td>82.3</td>
<td>81.6</td>
<td>80.7</td>
<td>80.1</td>
</tr>
<tr>
<td>$ GDP/capita</td>
<td>34,350</td>
<td>37,440</td>
<td>39,120</td>
<td>42,260</td>
<td>45,570</td>
</tr>
<tr>
<td>GDP (bil 2011$)</td>
<td>2,834</td>
<td>3,081</td>
<td>3,192</td>
<td>3,410</td>
<td>3,650</td>
</tr>
<tr>
<td>Manufacturing Value Added (bil 2011$)</td>
<td>591</td>
<td>731</td>
<td>709</td>
<td>759</td>
<td>820</td>
</tr>
<tr>
<td>Paper &amp; Paperboard Prdn (mil metric tons)</td>
<td>18.5</td>
<td>23.3</td>
<td>22.7</td>
<td>24.5</td>
<td>26.4</td>
</tr>
<tr>
<td>m tons kaolin/mil $ GDP</td>
<td>0.44</td>
<td>0.49</td>
<td>0.42</td>
<td>0.42</td>
<td>0.41</td>
</tr>
<tr>
<td>m tons kaolin/mil $ MVA</td>
<td>2.12</td>
<td>2.05</td>
<td>1.90</td>
<td>1.87</td>
<td>1.83</td>
</tr>
<tr>
<td>Kaolin Demand</td>
<td>1,250</td>
<td>1,500</td>
<td>1,350</td>
<td>1,420</td>
<td>1,500</td>
</tr>
<tr>
<td>net exports</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaolin Shipments</td>
<td>1,000</td>
<td>1,150</td>
<td>1,060</td>
<td>1,160</td>
<td>1,250</td>
</tr>
</tbody>
</table>
EICL Limited, which changed its name from English Indian Clays in June 2012, is a manufacturer and supplier of kaolin and starch products primarily in India. EICL operates in three segments: Clay Products, Starch and Allied Products, and By-Products and Others.

The Company is active in the world kaolin industry via the Clay Products segment, which generated FY 2013 revenues of $43 million. Of the segment’s total FY 2013 sales, India accounted for 89 percent and other countries accounted for 11 percent. Through the Clay Products segment, EICL produces high-end calcined and hydrous kaolins for use in paint, printing ink, paper and board, plastic, rubber, cement and concrete, cable insulation, and other applications. The Company conducts kaolin mining and refining operations at three sites in Kerala, India.

For the paint market, EICL’s products comprise HIMAFIL, HIMAFINE, and HIMATEX calcined kaolins, which are made in standard, fine, and ultrafine grades; and BCK, CENTREX 60, DLC 90, HIBRITE, KCG, SUPERLUSTRE, and SUPERSHINE hydrous kaolins, which.

### Sample Profile, Table & Forecast

#### COMPANY PROFILES

**EICL Limited**

N-75, Connaught Circus  
New Delhi  110001  
India  
91-11-4760-9900  
http://www.eicl.in

Revenues:  $77 million (FY 2013)  
Employment:  300 (estimated)  
Key Products:  calcined and hydrous kaolins

EICL Limited, which changed its name from English Indian Clays in June 2012, is a manufacturer and supplier of kaolin and starch products primarily in India. EICL operates in three segments: Clay Products, Starch and Allied Products, and By-Products and Others.

<table>
<thead>
<tr>
<th>Item</th>
<th>2002</th>
<th>2007</th>
<th>2012</th>
<th>2017</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia/Pacific Kaolin Demand</td>
<td>5390</td>
<td>7410</td>
<td>9100</td>
<td>11700</td>
<td>14750</td>
</tr>
<tr>
<td>% China</td>
<td>27.8%</td>
<td>36.8%</td>
<td>44.8%</td>
<td>49.7%</td>
<td>53.7%</td>
</tr>
<tr>
<td>Kaolin Demand</td>
<td>1500</td>
<td>2730</td>
<td>4080</td>
<td>5820</td>
<td>7920</td>
</tr>
<tr>
<td>Ceramics</td>
<td>560</td>
<td>920</td>
<td>1350</td>
<td>2010</td>
<td>2870</td>
</tr>
<tr>
<td>Paper</td>
<td>510</td>
<td>940</td>
<td>1320</td>
<td>1740</td>
<td>2240</td>
</tr>
<tr>
<td>Refractories</td>
<td>112</td>
<td>214</td>
<td>281</td>
<td>328</td>
<td>406</td>
</tr>
<tr>
<td>Paint</td>
<td>68</td>
<td>147</td>
<td>271</td>
<td>404</td>
<td>561</td>
</tr>
<tr>
<td>Rubber</td>
<td>63</td>
<td>123</td>
<td>176</td>
<td>266</td>
<td>352</td>
</tr>
<tr>
<td>Other</td>
<td>187</td>
<td>386</td>
<td>682</td>
<td>1072</td>
<td>1491</td>
</tr>
<tr>
<td>S/metric ton</td>
<td>113</td>
<td>128</td>
<td>140</td>
<td>153</td>
<td>163</td>
</tr>
<tr>
<td>Kaolin Demand (mil $)</td>
<td>170</td>
<td>350</td>
<td>570</td>
<td>890</td>
<td>1290</td>
</tr>
</tbody>
</table>
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Other Studies

World Graphite (Natural, Synthetic & Carbon Fiber)

World demand for natural and synthetic graphite (including carbon fiber) is forecast to expand 5.8 percent annually to 4.2 million metric tons in 2018, valued at $30 billion. China will remain the largest and fastest growing market. Synthetic graphite will continue as the largest volume segment, while carbon fiber will grow the fastest. This study analyzes the 3.2 million metric ton world graphite industry, with forecasts for 2018 and 2023 by type, market, world region, and for 16 countries. The study also evaluates company market share and profiles industry players.

World Activated Carbon

World demand for activated carbon is projected to rise 8.1 percent per year to 2.1 million metric tons in 2018, driven by tightening pollution regulations and rising manufacturing activity. North America will remain the largest activated carbon market, while the Asia/Pacific region will slightly outpace and overtake North America by 2023. This study analyzes the global activated carbon industry, with forecasts for 2018 and 2023 by type, application, world region, and for 18 countries. The study also evaluates company market share and profiles industry participants.

Advanced Ceramics

Demand for advanced ceramics in the US is forecast to increase 5.1 percent annually to $13.6 billion in 2017. Medical products will be the fastest growing market, driven by applications such as dental implants and prosthetic components. Ceramic matrix composites will be the fastest growing class of products. This study analyzes the $10.6 billion US advanced ceramics industry, with forecasts for 2017 and 2022 by material, class, process and market. The study also evaluates company market share and profiles industry players.

World Aluminum

World demand for aluminum (primary and secondary/recycled) is projected to expand 5.8 percent per year through 2017 to 82.5 million metric tons. China will remain the largest and fastest growing market. Construction will remain the largest end use while the motor vehicle market grows the fastest. This study analyzes the 62 million metric ton world aluminum industry, with forecasts for 2017 and 2022 by market, world region, and for 20 countries. The study also evaluates company market share and profiles industry players.

Proppants in North America

North American proppant demand will grow 11.6 percent annually to over 100 billion pounds in 2017. Raw sand will remain the dominant type and will grow the fastest. Ceramic proppants will be limited to areas requiring high performance products. The US will continue as the dominant market while Canada will grow the fastest. This study analyzes the 59.1 billion pound proppant industry in the United States and Canada, with forecasts for 2017 and 2022 by type, region, state and province. The study also evaluates company market share and profiles proppant suppliers.