US demand for activated carbon, including virgin and reactivated products sold by activated carbon suppliers, is expected to rise 3.5 percent per year through 2020. Forecast growth is expected to be considerably slower than the gains seen in the 2010-2015 period, when the market for activated carbon significantly expanded in response to two key environmental regulations:

- Disinfection Byproducts (DBP) Rule, which required that municipal water treatment facilities meet disinfection byproduct removal standards by 2015
- Mercury and Air Toxics Standards (MATS), which set limits on mercury emissions from coal-fired power plants (CFPPs), clinker cement plants, and other facilities, by early 2016

**Coal-generated electricity requires air purification**

In industrial air purification -- the largest application for activated carbon -- demand is projected to increase at an above-average pace. The US' continued reliance on coal-generated electricity will necessitate continued use of powdered activated carbon for air purification. In addition, powdered activated carbon generally is not reactivated, so these products must be fully replaced when spent. The number of activated carbon injection (ACI) systems is also expected to increase, as some CFPPs are expected to install additional ACI systems to either replace temporary mercury removal systems or to supplement existing equipment.

**Water treatment applications exhibit slow growth**

In water treatment -- the second largest application for activated carbon -- gains are expected to be slower than the overall average. In municipal drinking water, granular activated carbon is favored for the removal of DBPs. Because granular activated carbon is used in large volumes in these applications, many users have invested in on-site reactivation equipment or have contracted with outside companies for reactivation services. This will limit demand for virgin or regenerated carbon sold by suppliers.

**Study coverage**

This study analyzes the US activated carbon market. It presents historical demand data (2005, 2010 and 2015) plus forecasts (2020 and 2025) by type (powdered, granular), application (liquid phase, gas phase) and US region. The study also considers key market environment factors, assesses the industry structure and evaluates company market share.

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GAS PHASE APPLICATIONS

Industrial Air Purification

In 2015, industrial air purification uses accounted for 78 percent of all activated carbon used in gas phase applications, and 39 percent of total US activated carbon demand. This represents significant growth from 2005, when industrial air purification applications represented less than half of total gas phase activated carbon demand. Gains resulted from the phase-in of the EPA’s Mercury & Air Toxics Standards (MATS), which had a final implementation deadline in 2016. During the phase-in period, the number of activated carbon injection (ACI) systems for mercury control in the US increased significantly. Going forward, gains in the industrial air purification market will slow as the mercury removal market matures.

Demand for activated carbon in industrial air purification applications is expected to advance 4.9 percent per year to 400 million pounds in 2020.

The industrial air purification market includes the use of activated carbon for mercury control emissions technology; for removing other pollutants such as nitric oxide or nitrogen dioxide from industrial flue gas streams; in industrial heating, ventilating, and air conditioning (HVAC) equipment; and in a number of smaller-volume industrial air filtration applications such as specialized air purifiers (e.g., gas phase radon filters).

Regulations monitoring outdoor and indoor air quality overseen by government agencies such as the US Environmental Protection Agency and the Occupational Safety and Health Administration (OSHA) have a strong influence on activated carbon demand in this market. As the use of industrial air purification equipment is also directly tied to the number and type of manufacturing facilities in the US, the overall state of the economy and the health of the country’s manufacturing sector are also key indicators of demand.

Powdered activated carbon is currently the largest product type in industrial air purification applications, as it is the preferred product type.

This study can help you:

• Determine your market & sales potential
• Learn more about industry competitors
• Assess new products & technologies
• Identify firms to merge with or acquire
• Complement your research & planning
• Gather data for presentations
• Confirm your own internal data
• Make better business decisions

For complete details on any study visit www.freedoniagroup.com

TABLE V-3
ACTIVATED CARBON DEMAND IN WATER TREATMENT BY TYPE & APPLICATION
(million pounds)

<table>
<thead>
<tr>
<th>Item</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Use (trillion gallons)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lbs activated carbon/mil gallons water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Treatment AC Demand</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>By Application:</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking Water</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Wastewater &amp; Sewage</td>
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<td></td>
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<tr>
<td>Groundwater &amp; Other</td>
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<td></td>
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<tr>
<td>By Type:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Powdered</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Granular</td>
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<td></td>
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<tr>
<td>% water treatment</td>
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</tr>
</tbody>
</table>

Liquid Phase Activated Carbon Demand

Source: The Freedonia Group

TABLE III-7
ACTIVATED CARBON SUPPLY & DEMAND
(million pounds)

<table>
<thead>
<tr>
<th>Item</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Domestic Product (bil 2009$)</td>
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</tr>
<tr>
<td>lbs activated carbon/mil $ GDP</td>
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<tr>
<td>Activated Carbon Demand</td>
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<tr>
<td>net exports</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Activated Carbon Shipments</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Powdered</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granular:</td>
<td></td>
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<td></td>
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<tr>
<td>Virgin GAC</td>
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</tr>
<tr>
<td>Regenerated GAC</td>
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<tr>
<td>Other</td>
<td></td>
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</tr>
</tbody>
</table>

Source: The Freedonia Group
Freedonia’s methods

- Establishing consistent economic & market forecasts
- Using input/output ratios, flow charts & other economic methods to quantify data
- Employing in-house analysts who meet stringent quality standards
- Interviewing key industry participants, experts & end users
- Researching a proprietary database that includes trade publications, government reports & corporate literature

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- Automotive & Transport
- Chemicals
- Construction & Building Products
- Consumer Goods
- Energy & Petroleum
- Industrial Components
- Healthcare & Life Sciences
- Machinery & Equipment
- Metals, Minerals & Glass
- Packaging
- Plastics & Other Polymers
- Security
- Services
- Textiles & Nonwovens
- Water Treatment

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