Rising incomes, vehicle ownership fuel gains in developing economies

In developing economies, rising per capita incomes and increasing rates of vehicle ownership have resulted in large gains in demand for motor vehicle fuels. The growth of manufacturing and the related need to transport goods have also supported growth in demand for vehicle fuels. As a result, refined products output is expected to expand throughout the forecast period, supporting overall healthy gains in demand for refining catalysts.

Environmental regulations will also have a strong impact on the refining catalyst market. The implementation of fuel sulfur regulations to address air pollution will drive demand for hydrotreating catalysts, while reforming catalysts will benefit from the increasing production of higher-octane gasoline for use in more fuel-efficient engines.

Refining catalyst producers face strong competition

The refining catalyst markets in developed countries are mature, with strong competition among catalyst manufacturers. To maintain and expand market share in these countries, manufacturers invest significant time and resources into the development of better catalysts with performance at higher temperatures and pressures, lower costs via increased crude oil feed rate or longer catalyst life, and higher quality end products. This continued introduction of new catalysts will sustain minor growth in the mature markets of North America, Western Europe, and Japan.

Challenges to growth

The established nature of fuel sulfur regulations in developed countries, declining gasoline consumption, and decreasing refined products output will restrain stronger gains. In addition, the changing nature of the global crude oil supply, particularly the increased availability of tight oil crudes that are lower in sulfur content, may restrain growth in hydrotreating catalyst consumption in more developed markets. Opportunities will exist, though, for catalysts that allow refiners flexibility in responding to the changing nature of the crude oil supply.

Study coverage

This study analyzes the global refining market industry. It presents historical data (2005, 2010, 2015) plus forecasts (2020, 2025) for supply and demand by application (fluid catalytic cracking, hydroprocessing, alkylation, reforming, other) and material (metal, acid, zeolites) in six regions and 21 countries. The study also examines key market environment factors, assesses the industry structure and evaluates company market share.
CONTENTS SUMMARY

Executive Summary

Market Environment

Overview

Applications

Hydroprocessing Catalysts

Hydrotreating

Hydrocracking

Fluid Catalytic Cracking (FCC) Catalysts

Alkylation Catalysts

Sulfuric Acid

Hydrofluoric Acid

Reforming Catalysts

Other Petroleum Refining Catalysts

Materials

Metal Catalysts

Base Metal Catalysts

Precious Metal Catalysts

Acid Catalysts

Zeolites

Regional Overview

Demand

Production & Trade

North America

Economic Overview

Demand by Application

Demand by Material

United States

Canada

Mexico

Western Europe

Economic Overview

Demand by Application

Demand by Material

Germany

United Kingdom

Italy

France

Spain

Netherlands

Belgium

Other Western Europe

Asia/Pacific

Economic Overview

Demand by Application

Demand by Material

China

Japan

South Korea

India

Taiwan

Thailand

Singapore

Australia

Other Asia/Pacific

Other Regions

Central & South America

Economic Overview

Demand by Application

Demand by Material

Brazil

Other Central & South America

Eastern Europe

Economic Overview

Demand by Application

Demand by Material

Russia

Other Eastern Europe

Africa/Mideast

Economic Overview

Demand by Application

Demand by Material

Saudi Arabia

Other Africa/Mideast

Industry Structure

Market Share

Industry Restructuring

Cooperative Agreements

Research & Development

Marketing & Distribution

Competitive Strategies

Participating Companies

TABLES & CHARTS

Executive Summary

1 Summary Table

Overview

1 World Refining Catalyst Demand by Application

Cht World Refining Catalyst Demand by Application, 2015

2 World Hydroprocessing Catalyst Demand by Type & Region

3 World Hydrotreating Catalyst Demand by Region

4 World Hydrocracking Catalyst Demand by Region

5 World Fluid Catalytic Cracking Catalyst Demand by Region

6 World Alkylation Catalyst Demand by Type & Region

7 World Reforming Catalyst Demand by Type & Region

8 World Other Petroleum Refining Catalyst Demand by Region

9 World Refining Catalyst Demand by Material

Cht World Refining Catalyst Demand by Material, 2015

10 World Metal Catalyst Demand by Type & Region

11 World Base Metal Catalyst Demand by Region

12 World Precious Metal Catalyst Demand by Region

13 World Acid Catalyst Demand by Type & Region

14 World Zeolite Catalyst Demand by Type & Region

15 World Refining Catalyst Demand by Region

Cht World Refining Catalyst Demand by Region, 2015

Tables for each region/country:

Refining Catalyst Market Indicators

Refining Catalyst Demand by Application

Refining Catalyst Demand by Material

Charts:

North America: Refinery Catalyst Demand by Country, 2015

Western Europe: Refinery Catalyst Demand by Country, 2015

Asia/Pacific: Refinery Catalyst Demand by Country, 2005-2025

Industry Structure

1 Refining Catalyst Sales by Company, 2015

Cht World Refining Catalyst Market Share, 2015

2 Selected Acquisitions & Divestitures

3 Selected Cooperative Agreements
**OVERVIEW**

Zeolites

Demand for zeolite catalysts will increase 4.9 percent annually through 2020, reaching $2.4 billion. In volume terms, demand will grow 1.4 percent per year to 723,700 metric tons in the same year. Zeolites are used primarily as catalytic cracking catalysts, though their use is growing in hydrocracking and other more niche applications. The outlook will be dependent on regions with growing consumption of gasoline and other refined products, such as the Asia/Pacific and Africa/Mideast regions, which are major consumers of motor fuels. Zeolites used for fluid catalytic cracking experienced significant price growth in 2011 due to the rapid increase in rare earth prices. Following that peak, zeolite catalyst prices declined through 2015 as additional rare earth supply was added globally. Going forward, continuing investment by zeolite catalyst manufacturers into research and development will support healthy growth in zeolite catalyst prices.

Zeolites are aluminosilicates, that is, porous, crystalline substances composed of silicon and aluminum, and frequently also contain sodium, calcium, rare earths, or other elements chosen to enhance their catalytic performance. The value of zeolites as catalysts lies in their cage-like structure consisting of exterior pores and interior channels. By manipulating the geometry of these pores, different molecules can be allowed inside or kept outside of the zeolite. In this way, a zeolite can restrict the types of chemical reactions taking place, preventing the formation of unwanted byproducts.

Fluid catalytic cracking applications account for the majority of catalytic zeolite uses. Zeolites are also frequently used in combination with other catalytic substances, such as platinum, with which the zeolite functions as both a catalyst and a catalyst support. In addition, zeolites are also used in the production of alkylated products, such as motor gasoline.

### TABLE III-6

WORLD ALKYLATION CATALYST DEMAND BY TYPE & REGION (million dollars)

<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>Refined Products Prdn (mil metric tons)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m ton catalyst/000 m ton refined prdts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alkylation Catalysts (000 metric tons)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$/metric ton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alkylation Catalyst Demand By Material:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfuric Acid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrofluoric Acid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alkylation Catalyst Demand By Region:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Europe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia/Pacific</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central &amp; South America</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Europe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Africa/Mideast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% alkylation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refining Catalyst Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The Freedonia Group

### TABLE VI-8

JAPAN: REFINING CATALYST DEMAND BY APPLICATION (million dollars)

<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>Refined Products Prdn (mil metric tons)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m ton catalyst/mil m ton refined prdts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refining Catalyst Demand (000 m ton)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$/metric ton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refining Catalyst Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydroprocessing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluid Catalytic Cracking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alkylation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reforming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Japan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia/Pacific Catalyst Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The Freedonia Group

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](http://www.freedoniagroup.com)
Related Studies

Solvents
US demand for solvents is forecast to rise just over one percent per year through 2020 to 9.6 billion pounds. Environmental regulations will continue to drive a shift toward less hazardous solvents. Public perception and consumer preference will also favor green products derived from renewable sources such as soy methyl ester and terpenes. This study offers historical demand data as well as forecasts for 2020 and 2025 by product and market. The study also considers market environment factors, details company market share and profiles US industry competitors.

#3429.............. July 2016 ............... $5300

Lubricants
US demand for lubricants will rise slightly to 2.4 billion gallons in 2020, with a value of $23.5 billion. As most products move toward higher-quality lubricants, transmission fluids, gear oils, and engine oils will be affected by the lengthening drain intervals associated with improvement in fluid technology. This study presents historical demand data (2005, 2010 and 2015) plus forecasts (2020 and 2025) by basestock, formulation, product and market. The study also considers key market environment factors, evaluates company market share and profiles US industry competitors.

#3394.............. April 2016 ............... $5400

World Lubricants
World demand for lubricants will rise 2.0 percent annually to 45.4 million metric tons in 2019. Growth will be supported by increasing demand for engine oils in new motor vehicles, but will be tempered by longer drain intervals that slow the engine oil aftermarket. The Asia/Pacific market will grow the fastest. This study analyzes the 41.1 million metric ton world lubricant industry, with forecasts for 2019 and 2024 by formulation, product and market for six world regions and 23 major countries. The study also evaluates company market share and profiles industry players.

#3364.............. December 2015 ............. $6500

World Catalysts
World demand for catalysts will grow 4.8 percent per year to $20.6 billion in 2018. Growth will be led by a rebound in the chemical and polymer industries, most notably in developed economies hit hard by the recession. The fastest advances, however, will occur in developing areas such as the Asia/Pacific and Africa/Middle East regions. This study analyzes the $16.3 billion world catalyst industry, with forecasts for 2018 and 2023 by material, type, market, world region, and for 18 countries. The study also evaluates company market share and profiles industry players.

#3217.............. December 2014 ............. $6500

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

About The Freedonia Group

The Freedonia Group is a leading international industry market research company that provides its clients with information and analysis needed to make informed strategic decisions for their businesses. Studies help clients identify business opportunities, develop strategies, make investment decisions and evaluate opportunities and threats. Freedonia research is designed to deliver unbiased views and reliable outlooks to assist clients in making the right decisions. Freedonia capitalizes on the resources of its proprietary in-house research team of experienced economists, professional analysts, industry researchers and editorial groups. Freedonia covers a diverse group of industries throughout the United States and other world markets. Industries analyzed by Freedonia include:

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

The Freedonia Group is a division of MarketResearch.com

About MarketResearch.com

With offices in London, New York City, and Washington D.C., MarketResearch.com is the leading provider of global market intelligence products and services. With research reports from more than 720 top consulting and advisory firms, MarketResearch.com offers instant online access to the world’s most extensive database of expert insights on industries, companies, products, and trends.