

# Catalysts, Emission Control

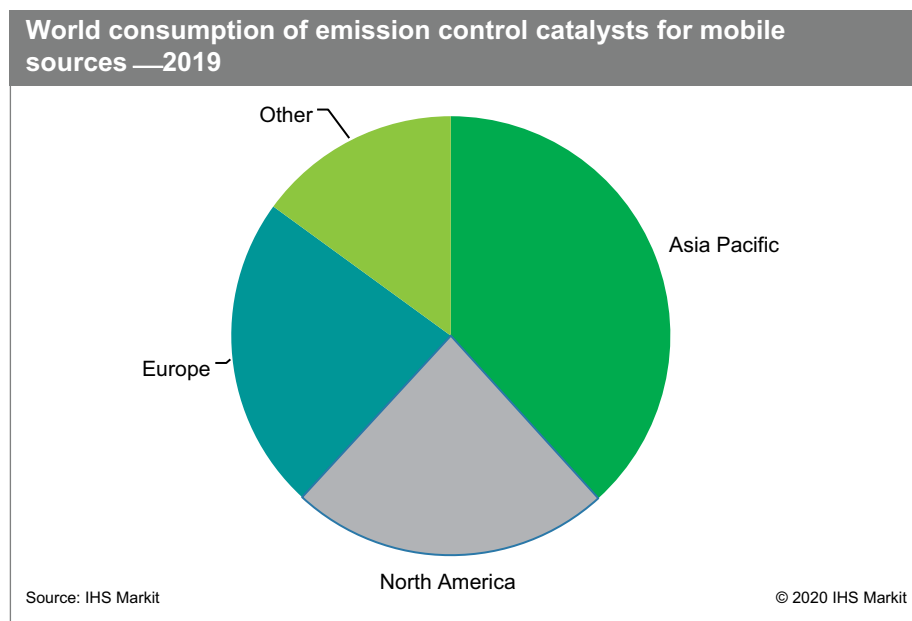
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## Abstract

The importance of emission control catalysts has been increasing as environmental concerns and measures to fight pollution have become more important globally. China has become the largest market for vehicle emission control catalysts. Europe is the second-largest market, followed by North America. Catalyst consumption in China will continue to grow along with increasing vehicle production and with increasingly stringent emission control regulations. The fastest developing regions are Southeast Asia and India.

The main processes used in stationary emission control catalysts are selective catalytic reduction (SCR), catalytic oxidation, catalyzed traps/filters for particulate matter, and catalytic incineration of VOC emissions. The SCR catalyst market in North America, Europe, and Japan is mainly a reload market, while the main new market for coal-fired power plants/SCR catalysts is in China and India.

The following pie chart shows world consumption of catalysts for emission control catalysts for mobile sources on a value basis:



Two factors are driving the growth of the mobile emission catalyst markets: further tightening of regulations in the United States, the European Union, and Japan, and the introduction or further tightening of emission standards in China, India, Other Asian countries, Russia, and Latin America in the forecast period. Emissions from mobile and stationary sources have increased in recent years.

## Contacts

**Koon-Ling Ring** • [Koon-Ling.ring@ihsmarkit.com](mailto:Koon-Ling.ring@ihsmarkit.com)  
**Maria deGuzman** • [Maria.deguzman@ihsmarkit.com](mailto:Maria.deguzman@ihsmarkit.com)

Catalysts for environmental protection are becoming more widespread for applications such as off-gas cleaning, including

- NO<sub>x</sub> from electrical power plants, refineries and chemical plants, and furnaces, boilers, and incinerators.
- VOC emission treatment from chemical plants, surface coating facilities, and so on.
- Regenerative thermal oxidizers and converters for exhaust streams in chemical plants.
- Dioxin reduction from waste incinerators.
- Catalytic converters in two-stroke stationary engines. Biofuels such as palm oil can be used in combined heat and power plants in a low-speed two-stroke engine. This combination represents a special challenge to NO<sub>x</sub> reduction technology to fulfill air emissions legislation. The chemistry of biofuels differs from fossil fuels in that the exhaust gas includes phosphorus, which needs to be taken into consideration in order to avoid catalyst deactivation. Two-stroke diesel engines, on the other hand, result in very low exhaust temperatures, demanding a particular design for reliable operation of NO<sub>x</sub> reduction.

Recently, apparent manipulations in automotive software resulted in emission values under test conditions that did not reflect real emissions under normal use conditions. It appears that some automotive producers tried to avoid the use of selective catalytic reduction (SCR) catalysts in smaller diesel vehicles. These catalysts require additional space under the hood, which is already tight, as well as an additional tank for the reducing agent, which in turn is inconvenient for the consumer as it needs to be refilled. As it turns out, the use of only oxidation catalysts does not seem to allow for the simultaneous achievement of target values for diesel consumption, motor power, and emission values under normal driving conditions; accordingly, SCR catalysts will become the norm in these types of diesel vehicles in the coming years.

Trends that are expected to affect the global emission control catalyst business from 2019 to 2024 include the following:

- Increasing automobile production, especially in developing countries.
- More-stringent legislation on automobile emissions in both developed and developing countries.
- More-stringent emission standards for off-road diesel engines (e.g., industrial drilling rigs, compressors, construction wheel loaders, bulldozers, nonroad trucks, highway excavators, forklift trucks, road maintenance equipment, snowplows, ground support equipment in airports, aerial lifts and mobile cranes, agricultural and forestry tractors) and for ships and vessels and railway locomotives and railcars.
- More-stringent legislation on emissions from stationary sources.

**For more detailed information, see the table of contents, shown below.**

**IHS Markit's Specialty Chemicals Update Program – *Catalysts, Emission Control*** is the comprehensive and trusted guide for anyone seeking information on this industry. This latest report details global and regional information, including



Industry structure,  
operating characteristics  
and regulatory  
environment



Products, functions  
and markets



Cost structure/  
profitability



Technology changes  
and emerging  
substitution practices



Quantitative market  
analysis and forecasts

## Key benefits

**IHS Markit's Specialty Chemicals Update Program – *Catalysts, Emission Control*** has been compiled using primary interviews with key suppliers and organizations, and leading representatives from the industry in combination with IHS Markit's unparalleled access to upstream and downstream market intelligence and expert insights into industry dynamics, trade, and economics.

This report can help you

- Identify the competitive environment and key players
- Assess key issues facing both suppliers and their end-use customers
- Understand industry integration strategies
- Keep abreast of industry structure changes, regulatory requirements, and other factors affecting profitability
- Identify new business opportunities and threats
- Follow important commercial developments
- Recognize trends and driving forces influencing specialty chemical markets

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## IHS Markit Customer Care

CustomerCare@ihsmarkit.com

Americas: +1 800 IHS CARE (+1 800 447 2273)

Europe, Middle East, and Africa: +44 (0) 1344 328 300

Asia and the Pacific Rim: +604 291 3600

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