

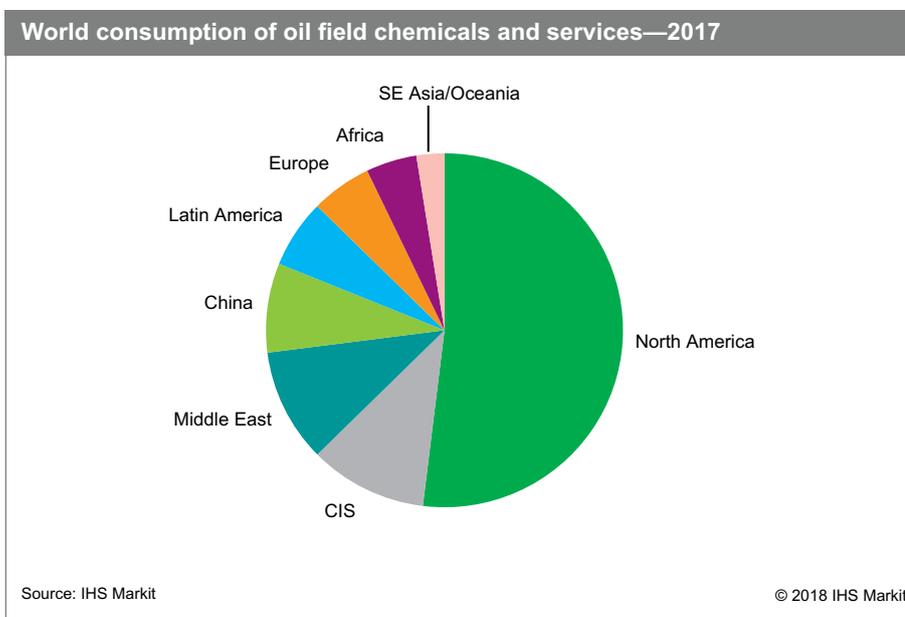
Oil Field Chemicals

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Abstract

The market for oil field chemicals that enable the production of oil and gas or make it more efficient is in many ways complex. Different chemicals are used at different stages of the process, starting from the drilling of the borehole, to production and stimulation, and finally to the closing of the borehole. Organic as well as inorganic base chemicals are used, for example, as a matrix fluid of drilling fluid or as weighting agents to increase the specific weight of a drilling fluid. These base chemicals, despite being used in large volumes, are not within the focus of this report, which is on specialty chemicals that provide distinct and sophisticated functionalities. To name only a few of these functionalities, these specialty chemicals help avoid penetration and loss of drilling fluid in different geological formations, provide protection from corrosion in hot and chemically aggressive environments, and ensure that drilling fluids remain fluid and easily pumpable under a wide range of temperature conditions and solids loadings.

The following pie chart shows world consumption of oil field chemicals and services:



The market is served by oil field service companies and also by chemical companies. Oil field service companies have a background in the oil industry and provide services around oil and gas exploration, production, and pipeline infrastructure. They purchase most of the chemicals from chemical companies and provide services around the chemicals, including storage, transportation, mixing with other chemicals, diluting, and, most importantly, knowledge as to what products to use for which functionality and geological and geographic environment. Oil field service companies produce some of the commodity chemicals that are used in larger volumes. Chemical companies have a background in the chemical industry, and usually produce a number of chemicals that are used in the oil field, and that usually have a range

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of other uses outside the oil field area. They sell some of their products through oil field service companies, but also sell directly to oil field operators. This requires technical expertise as well as laboratory and service capabilities in proximity to the oil field.

The most significant changes in the oil field chemicals market over the past decade have been the rapid exploitation of shale gas and oil reserves in North America, and the vacillation in the oil price. Advances in both horizontal drilling and hydraulic fracturing resulted in the rapid exploitation of reserves that were previously uneconomic to develop. A number of factors came together to ensure that this was the case. Rig and equipment availability and better access to the high volumes of water required for fracking is not as big an issue in the United States and Canada as in some countries.

Lower oil prices after 2014 had no major impact on the oil production segment's sales of chemicals, but had a significant impact on drilling, stimulation, and completion activities. Hydraulic fracturing continues globally, but primarily in North America, which represents over 84% of the global fracturing chemicals market.

The increases in well stimulation have been significantly impacted by the growth in shale oil and gas development in North America. The increase in shale gas and oil activity has also resulted in higher volumes of drilling and cementing chemical sales. For production chemicals, the impact of high oil prices on the volume of chemicals used is less than for the other sectors. The usage of most production chemicals is directly related to the volume of associated water produced, and is thus linked to the age of the field. Although the oil price does not have the same direct impact on production chemical usage, it can have a secondary effect. If an oil company is confident about future oil prices, there is likely to be a greater focus on extending field life and therefore on extending the operating lifetime of process equipment. This greater focus on asset integrity will increase the use of products such as corrosion inhibitors and biocides.

Rapid growth in unconventional oil and gas activity in North America has resulted in increases in the volume of chemicals used. Based on the projected growth in this area, the volumes consumed in the future will represent a significant portion of the market. Growth in Latin America, particularly in Brazil and Argentina, has been significant. Political instability has resulted in limited activity in Venezuela.

Demand for water management services in the United States is robust, driven in 2017 by the rise in drilling and completion activity. Well completion designs continue to evolve, requiring more water use for horizontal wells. And with the sharp rise in water consumed per well in fracking operations, water management costs as a percentage of total well costs continue to rise. Water is complex and requires operators to develop management strategies tailored to specific regions. There is strong competition in a highly fragmented market, combined with continuing service capacity additions to meet growing demand. Logistics (hauling, transfer, and storage) and disposal remain the largest segment, combining for approximately 85–90% of total spending annually.

The world market for oil field chemicals is projected to grow at an average annual rate of about 4% during 2017–22.

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