

Nitrogen Solutions

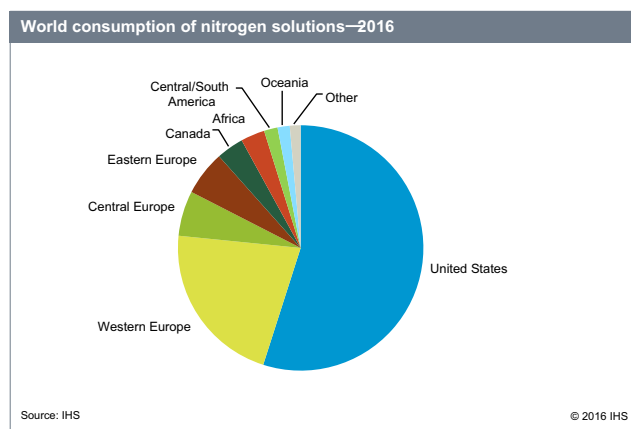
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Abstract

Urea-ammonium nitrate (UAN) solutions, containing 28–32% nitrogen, account for the bulk of the solutions market. A small but growing amount of ammonium nitrate and calcium ammonium nitrate solution is also consumed. Fertilizer applications account for the vast majority of consumption. World supply/demand for nitrogen solutions is forecast to grow at an average rate of 3.9% annually during 2016–21. Nitrogen solutions account for 5.0% of the world nitrogen fertilizer market in 2016, but account for approximately 27% of the market in the United States.

The following pie chart shows world consumption of nitrogen solutions:



Nitrogen solutions have been used almost exclusively as nitrogen fertilizer materials. Nitrogen solutions fertilizer use is largely confined to countries that have highly developed agricultural economies; very little consumption occurs in the developing regions of the world. Apparent world consumption of nitrogen solutions has been fluctuating around an upward trend and increased at an average rate of 2.3% annually during 2000–16. The United States is by far the largest consumer of nitrogen solutions, accounting for an estimated 56% of the world total in 2016. Western Europe, Central Europe and Eastern Europe account for the major portion of the remaining consumption.

World consumption recovered from a downward cycle in the early 2000s, and began to grow at a significant rate after 2003. After 11 September 2001, consumption of dry ammonium nitrate began to decline dramatically, spurring consumption of nitrogen solutions. Consumption of nitrogen solutions grew at an average annual rate of 9.4% from 2003 to 2007 prior to declining during late 2008 and 2009. Volumes have increased moderately since then. The volume of material entering international trade has increased more than fivefold since the late 1990s and additional increases are expected, although much of the trade is limited to adjoining regions.

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World production of nitrogen solutions is heavily concentrated in the United States and Eastern Europe. Western Europe, Central Europe, and Central and South America are also large producers. In 2016, these five regions account for an estimated 90% of capacity, 92% of production, 96% of consumption, 99% of imports, and 87% of exports. The United States accounts for much of the production; Eastern Europe accounts for much of the production increase since 1994. A significant increase in capacity and production occurred in 2010 in the Central and South American country of Trinidad and Tobago.

The United States is by far the largest consumer of nitrogen solutions in the world, accounting for an estimated 56% of the world total in 2016. The largest producer in the world is CF Industries, Inc. in the United States. The United States has been enjoying the benefits associated with increasing production of unconventional natural gas production from shale-based resources since 2010. This, coupled with the declining price of crude oil, has resulted in dramatic increases in infrastructure investment to take advantage of reduced raw material costs, especially within the nitrogenous fertilizer industry. Among the various products set to increase in capacity is urea–ammonium nitrate. Though not all announced projects are expected to come to fruition, capacity is poised to increase by at least 14% during the next five years. As domestic production increases to satisfy local demand, it is anticipated that imports will fall dramatically and the existing supply regions, such as Trinidad and Eastern Europe, will have to look for consumers outside North America.

China started industrial production of nitrogen solutions in 2013. During the past three years, some producers that have both urea and ammonium nitrate plants have started to produce nitrogen solutions. Nitrogen solutions produced in China were used primarily for export in the past three years, which accounted for over 80% of the total domestic production. Domestically, nitrogen solutions are applied as fertilizer in field trials. It is expected that Chinese production, exports, and consumption will grow at fairly strong rates through the forecast period. Fairly high annual growth rates of 32% are projected for the Chinese nitrogen solutions market through 2021.

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