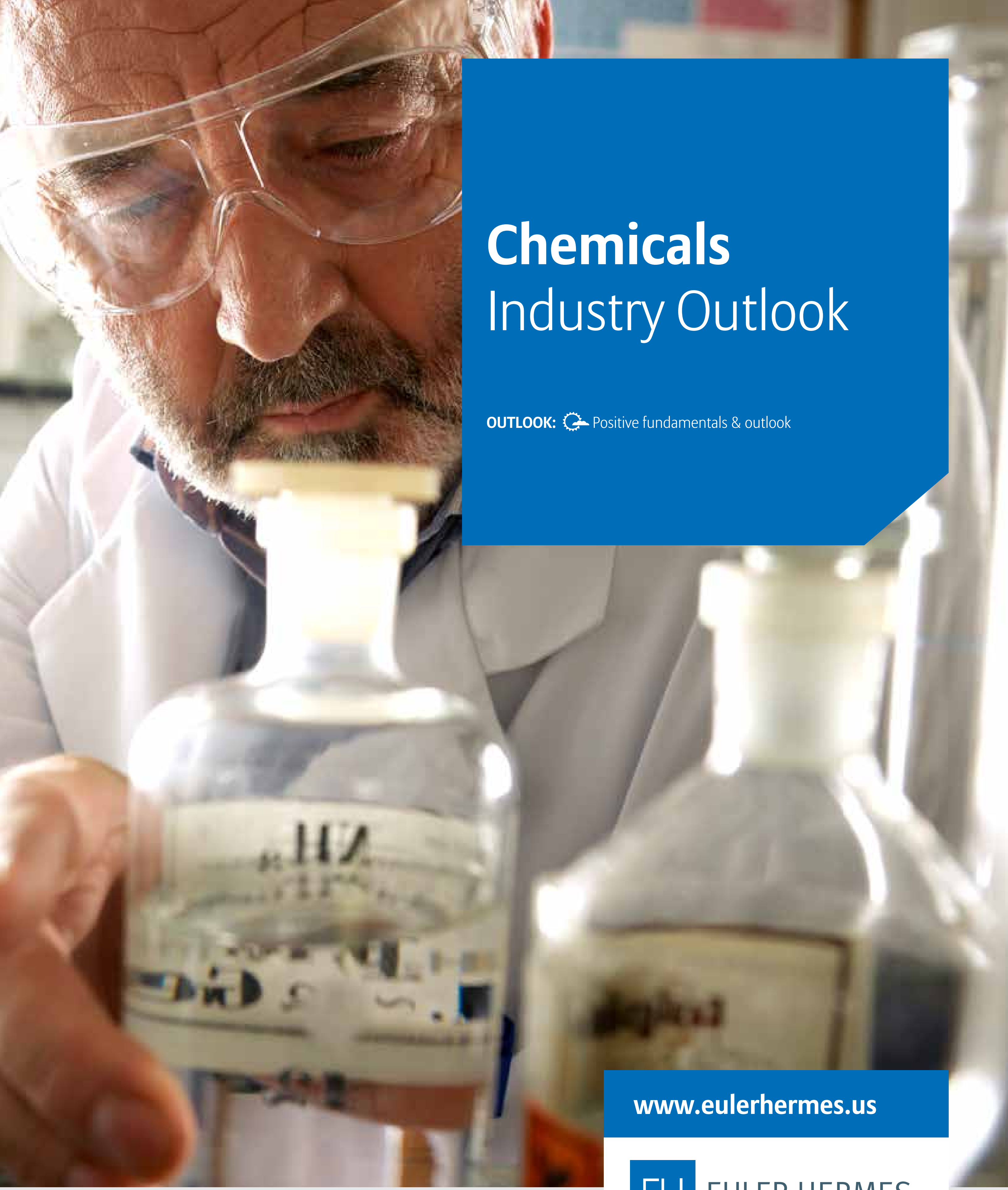

Chemicals
Industry Outlook

OUTLOOK: Positive fundamentals & outlook

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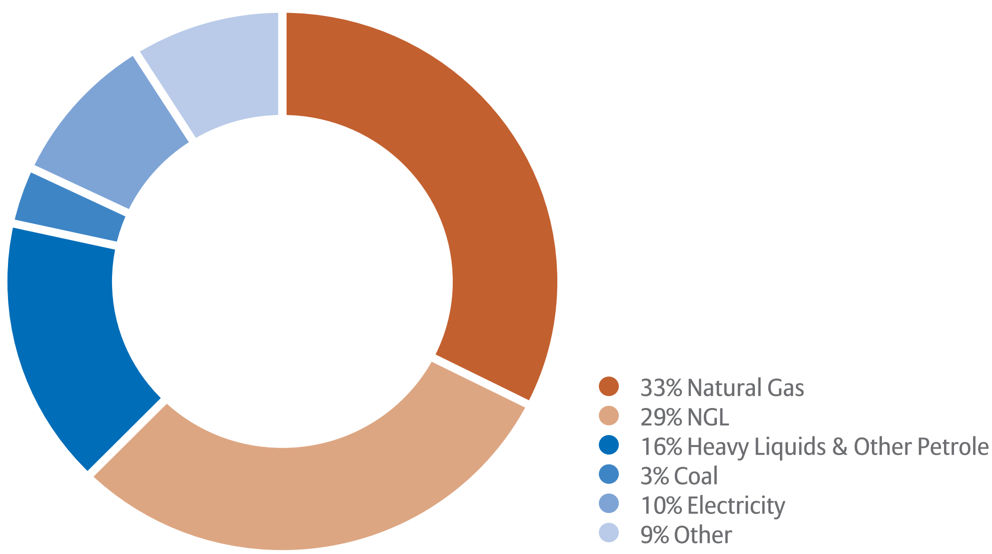
Key points

- The U.S. chemical manufacturing industry is fundamentally healthy. However, the industry's growth is impaired by the slow recovery of the national economy and weak performance of international markets.

- North American chemical manufacturers are benefiting from abundant and cheap natural gas thanks to the shale gas bonanza. This advantage is expected to continue in the foreseeable future despite growing worries about environmental risks.

Chemical Industry Energy Consumption by Product

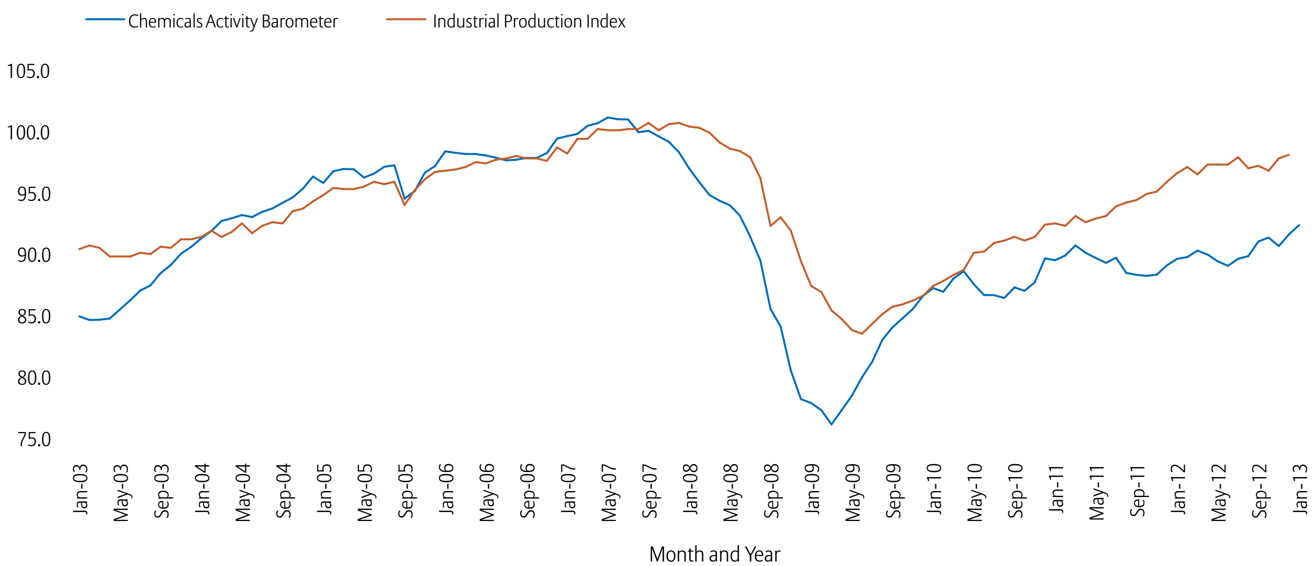


Source: American Chemistry Council

Overview

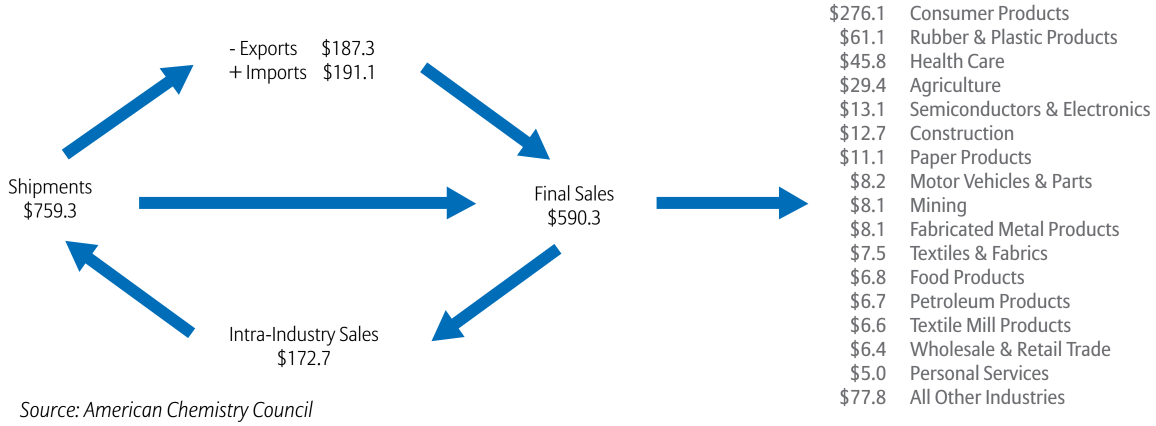
The chemical industry performance is largely tied to the strength of the national and global economy. After the strong post-recession recovery in 2010 and 2011 the industry production growth has slowed to 1.6% in 2012 due to the weakened manufacturing recovery in the U.S., the financial crisis in Europe, and a slowdown in China. U.S. chemical output further declined at the end of 2012 due to the deadlock in Congress over an agreement on tax increases and spending cuts. Nonetheless, the U.S. chemicals industry remains a healthy $760 billion enterprise, with more than 96% of all manufactured goods in some way touched by chemistry products. The American Chemistry Council expects growth in the industry to accelerate in the coming years, due to improving demand from key end-markets, driven by expected higher consumer consumption and an increase in exports, with up to 2.9% increase in chemical production in 2013 and 5.4% in 2014, before reaching its peak in 2015.

Chemical Activity Barometer vs. Industrial Production Index



Source: American Chemistry Council & Federal Reserve Board

U.S. Chemical Sales Flow Chart (billions of $)



Source: American Chemistry Council

Current Situation

Chemicals are consumed in a number of cyclical and non-cyclical markets. Relatively stable important markets for chemicals include agriculture, healthcare, consumer staples, and food as well as packaging for products across these non-cyclical markets. Critical cyclical markets for the chemical industry include electronics, construction, automotives, as well as other manufacturing sectors. End-user markets for chemicals have recovered in the U.S, especially car makers, which have rebounded strongly after the recession. They also posted a healthy 3.4% revenue increase in 2012 and are expected to continue to grow in 2013. Nonetheless, growth in most chemical end-markets continues to be sluggish. The industry also consumes close to 25% of all chemical production for other chemical products. As many of these chemical products are consumed at an early phase of the production supply chain, the chemicals industry is often considered an early indicator for the economic cycle.

The shale gas revolution is considered to be one of the most significant developments in domestic energy and manufacturing sectors in recent years. Thanks to shale gas development, the United States has quickly become a low-cost natural gas producer and net exporter of chemicals. A broad range of U.S. based chemical companies benefit from lower costs for natural gas-based feedstock ranging from methanol and ethylene producers, to manufacturers that are fueled by the lower cost inputs such as plastics, coatings, adhesives and fertilizers. In 2012, the pricing ratio between crude oil and natural gas reached all-time highs. Natural gas prices are not expected to remain at these levels; however, favorable natural gas prices and abundant feedstock supply will continue to support the industry. According to American Chemistry Council, U.S. shale deposits contain up to 100 years of natural gas supply, which clearly presents long-term opportunities for North American chemical manufacturers. At the same time, shale gas exploration could have significant environmental impacts, including air and water pollution as well as health risks, such as increase in cancer and other illnesses. The full scope of the problem is not clear yet and EPA is currently conducting a study to better understand any potential impacts of fracking on the environment.

Petrochemicals

Low domestic feedstock costs have reduced the cost position of North American petrochemical producers and, suddenly, the North American manufacturers have become very competitive on the global market. Low feedstock costs prevent imports of oil-based petrochemical products from Europe and Middle East to North America and position U.S. petrochemicals companies as net exporters. In order to take advantage of the low natural gas prices, North American petrochemical manufacturers have switched to light feedstock with close to 85% of U.S. cracker capacity currently using ethane as feedstock. This number is expected to increase up to 90% by 2017, as producers continue to convert existing heavy feedstock capacity or bring on line new light feedstock capacity. Over the next five years, IBISWorld expects industry revenue to grow at an average annual rate of 4.5%.

Specialty Chemicals

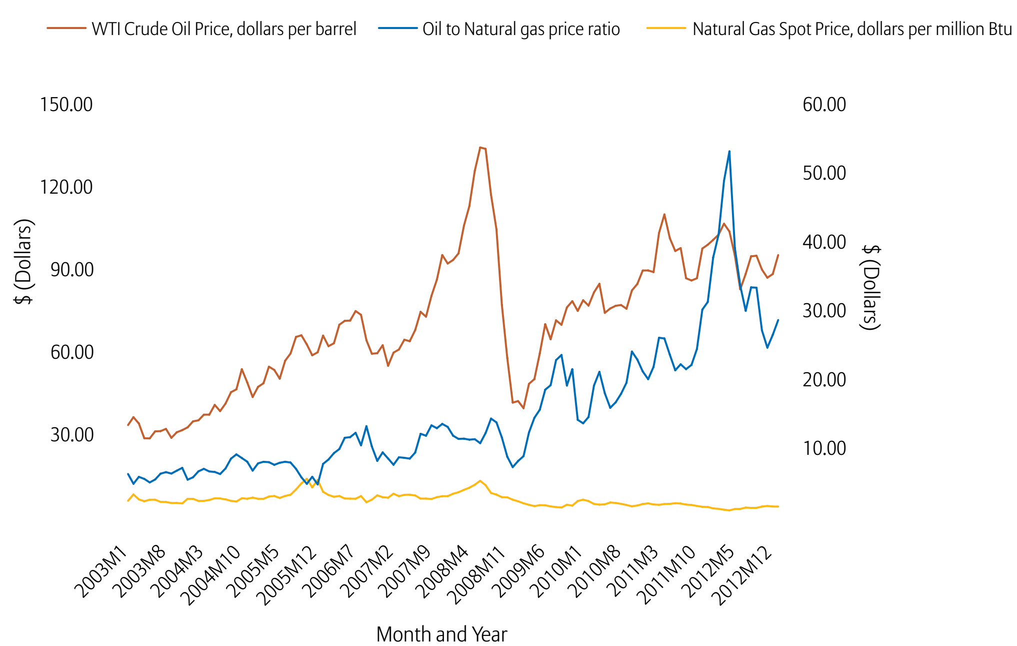
The specialty chemicals subsector remains broadly fragmented across products and markets. Overall, specialty chemical companies are demonstrating mixed results depending on the portfolio of assets and the end markets they serve. Companies without significant product differentiation focus their business models on low-cost manufacturing. These companies are affected by the cyclicality of the economy and are vulnerable to raw material price fluctuations and their impacts on revenue and profits. These companies have to improve their operational excellence and economies of scale, as well as try to manage the balance sheet carefully in the current complex operating environment.

In contrast, specialty chemicals manufacturers with an emphasis on product differentiation are less vulnerable to the market cyclicality. These companies invest constantly in developing and marketing new, more advanced products and applications in order to remain innovators and to ensure ongoing regeneration of their product portfolios. Some of the recent major mergers and acquisition transactions in the chemical industry are good examples of a company transformation to increase the share of differentiated specialty chemicals in the portfolio (e.g. E.I. du Pont de Nemours & Company's takeover of Danisco Co. and subsequent divestiture of the performance coating business to the Carlyle Group or Eastman Chemical Co.'s acquisition of Solutia Inc.).

Agrochemicals

According to a major industry player, Potash Corporation, crop prices are the most important variable affecting consumption of agricultural chemicals. Crop prices were elevated in 2012 and demand from crop growers is expected to remain strong during 2013, indicating a potential strong performance for the industry. In the short-term, unfavorable weather conditions and price volatility may represent substantial risks, which are natural to the agrochemical sector. In the long-term, the industry's performance is supported by rising demand driven by growing population and improving standards of living in emerged countries. At the same time, the global acreage available for crops does not increase. As a result, farmers increasingly demand fertilizers, pesticides, and biotechnology seeds to produce more crops on the same acreage. IBISWorld believes that the agricultural chemicals sector will grow at an average annual rate of 3.2% through 2017.

Crude Oil vs. Natural Gas



Source: EIA Weekly Petroleum Status Report and EIA Natural Gas Weekly

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KEYS TO SYMBOLS

Positive fundamentals & outlook

Structural weaknesses

Signs of weaknesses

Imminent or recognised crisis