

### CHEMSYSTEMS SBA PROGRAM

## **Report Abstract**

## Ammonia and Urea Strategic Business Analysis

December 2009

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## Ammonia and Urea Strategic Business Analysis

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Griffin House, 1st Floor South, 161 Hammersmith Road, London W6 8BS, UK Tel: +44 20 7950 1600 Fax: +44 20 7950 1550 The ammonia and urea industries have not escaped the turmoil seen in the world-wide chemical industry as a direct result of the worst global economic downturn since the Great Depression of the 1930s. Whilst urea, with its place as the most widely used fertilizer in the world, has fared better than petrochemicals and polymers (which have been particularly hard hit by the 'perfect storm' of a dramatic slump in consumer demand, coupled with considerable regional overcapacity), prices and margins for nitrogenous fertilizers have fallen steeply from the highs experienced during 2007 and early 2008.

Fertilizer market conditions deteriorated rapidly through the second half of 2008, as a slowdown in sales, amid rising inventories, saw farmers delaying purchases in the expectation of further price reductions, volatility in commodity markets, and tightening financial conditions. Lower natural gas costs in the U.S., which recently hit a seven year low of \$2.70/MMBtu, have combined with reducing crop prices to keep prices under pressure throughout 2009.

On a more positive note, non-traditional uses of urea are becoming increasingly important. It is clear that biofuels are becoming a significant and growing contributor to global fertilizer demand, with urea comprising a notable proportion of this. Global demand for ethanol and biodiesel has grown extremely quickly over the past decade. Nexant forecasts of the impact that this will have on urea demand is shown below.





This implies that almost five million tons of urea applied to crops in 2008 was for biofuel use, about 3.5 percent of overall global demand, up from 1.3 percent in 2000. This is forecast to increase to about four percent by 2020 - about 7.7 million tons, equivalent to six world-scale urea



units, so in Nexant's opinion, biofuels will continue to have a significant impact on global demand for urea into the next decade and beyond.

In feedstock terms, despite the recent recovery of energy prices after their sharp decline in the second half of 2008, natural gas prices in the U.S. are not expected to reach 2008 levels. Indeed, in the short term, they will be much lower due to additional gas supply. Alaskan natural gas will be made available in most of the U.S. LNG imports will become the swing supply with plenty of regasification capacity available. High U.S. gas prices would attract LNG supply and lower prices will mean that cargoes will go elsewhere, having an influence in natural gas prices in other regions. Lower natural gas prices in the U.S. could position the ammonia industry in a better competitive position relative to LNG in gas rich regions such as Trinidad and Venezuela.

There is clear upward pressure on natural gas prices around the world even in locations where prices have historically been "fixed" as the high crude oil environment generates much higher returns to such gas-based projects. It therefore seems likely that no (or very few) new projects will enjoy the low gas prices currently enjoyed by existing projects. Consequently, when new projects are benchmarked against existing competitors, the customary "lower quartile" cost position expected by investors and lenders is unlikely to be achieved.

With this upward pressure on gas prices, producers have been looking with renewed interest in alternative feedstocks to natural gas, which is typically steam reformed to provide syngas which is then converted to ammonia.

However, syngas may be produced from any carbon containing feedstock, including coal and oil products. China, which is a major producer of ammonia and urea, mainly uses coal as feedstock due to the abundance of this fossil fuel in the country compared to other sources.

Further, coal gasifiers can be readily modified to accept alternative feedstocks such as refinery sidestreams such vacuum residue oil and even biomass. Even outside of China there is increased interest in coal-based projects in coal rich countries such as Indonesia and Australia.

Despite the disadvantages of using alternative feedstocks other than natural gas, currently there are numerous facilities using coal; of approximately 73 million tons per year of ammonia capacity in China, approximately 56 million tons per year, or almost three-quarters, is based on coal gasification. Global increases in gas pricing raise the production cost base and make ammonia production from other feedstocks more attractive.





Figure 1.2 Ammonia and Urea Industry Dynamics

Nexant's wealth of experience in the fertilizer sector, combined with our wider global presence in the upstream oil and gas, refined products, biofuel and petrochemical industries, provides us with a unique overview of all factors influencing the development of the ammonia and urea business worldwide. This program distils the core issues and insights from our accumulated expertise to providing subscribers with a good understanding of not only the fundamental drivers but also likely future strategic direction of the ammonia and urea industry. We believe this is an invaluable source of insight and strategic business analysis for executives and managers at all levels of the organisation.

Figure 1.3	Nexant's Unique Blend of Capabilities
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STRATEGY CONSULTING	UPSTREAM OIL & GAS PRACTICE
<ul> <li>Distilling key trends to understand businesses</li> <li>Portfolio appraisal and positioning</li> <li>Merger &amp; acquisition support</li> <li>Customer segmentation</li> <li>Manufacturing Strategy</li> <li>Value chain positioning</li> <li>Growth Strategy</li> <li>Industry structure analyses</li> </ul>	<ul> <li>Global gas availability and pricing</li> <li>Strong experience of alternative gas monetization options including LNG, GTL, methanol and power</li> <li>National and regional energy planning</li> <li>Oil &amp; gas development projects</li> <li>Upstream oil &amp; gas asset management</li> <li>Gas value chain analyses</li> </ul>
CHEMICALS PRACTICE	DOWNSTREAM OIL & BIOFUELS PRACTICE
<ul> <li>Strong understanding of ammonia and urea markets, technology and economics</li> <li>Strong experience in derivative chemicals and related fertilizer markets</li> <li>Market dynamics research and analysis and forecasts</li> <li>Pricing and profitability scenarios</li> <li>Performance benchmarking</li> <li>Cost curve assessments</li> <li>Techno-economic feasibility studies</li> </ul>	<ul> <li>Biofuel market and technology development</li> <li>Projected market demand for differing crops to produce first and second generation biofuels</li> <li>Petroleum value chain analysis including ports &amp; terminals, refining, storage &amp; distribution, terminals &amp; depots, fuel wholesaling and retailing</li> </ul>

See Nexant's Methanol SBA Program for similar coverage for this sector.



#### Nexant, Inc.

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