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Ammonia and Urea Strategic Business Analysis

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Ammonia and Urea

Strategic Business Analysis

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SECTION 1.

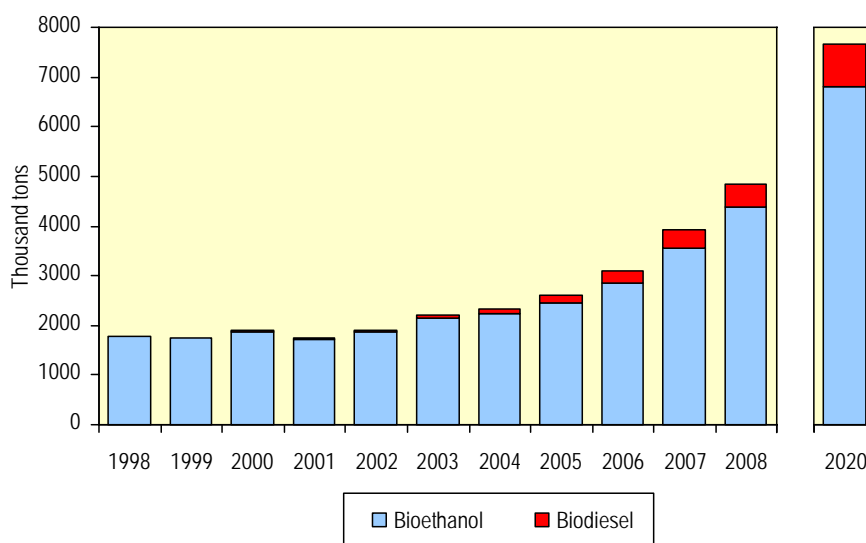


Business Need for the Program

The ammonia and urea industry is changing significantly as new markets for biofuels and NOx abatement emerge whilst some existing markets are challenged. Restructuring has resulted from feedstock cost rises in some parts of the world whilst substantial new investment has occurred in others. Capital and logistics cost rises have altered business decisions. Price volatility has rocked the industry but despite this upheaval and uncertainty, growth has continued apace.

A key driver of this frenetic activity has been the cost of feedstock. High gas costs in the traditional production centres of North America and Western Europe have put producers in these regions under severe pressure. In response, major developments in plant capacities are being made in the regions with access to low cost natural gas. These regions usually have relatively low local market demand for natural gas. Access to low cost gas and technology allow the construction of plants with large capacities and such large plants can take advantage of economies of scale and produce low cost ammonia and urea. The recent surge in capital costs, though, is impacting the industry significantly.

Urea Requirement for Biofuels Cultivation
(Historical and 2020 Forecast)



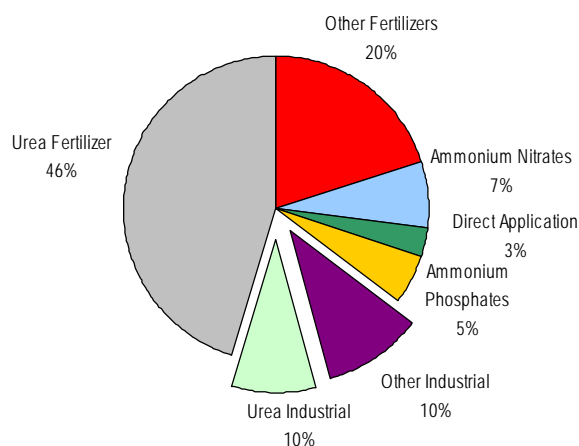
PP-00289 SBA/NH3 & Urea/2009/Section3

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.

Ammonia is the largest volume chemical produced from hydrocarbon feedstocks and is a key intermediate for fertilizers such as urea, ammonium nitrates, ammonium phosphates and compounds as well as a variety of industrial applications including synthetic resins (urea-based), synthetic fibres (acrylics and nylons), polyurethanes, explosives (ammonium nitrate-based) and refrigeration.

Population growth is a key driver for increased fertilizer consumption, with economic growth also contributing. Both have resulted in increased protein (meat) uptake and higher consumption of fruit and vegetables in countries such as China and other rapidly developing nations. Greater demand for meat results in higher grain consumption as feed, which in turn boosts fertilizer use in agricultural production. The increased demand for vegetables and fruit has been met by using more fertilizer per hectare, so boosting production. Biofuels (e.g. ethanol derived from corn) are also gaining importance due to high fossil fuel prices and environmental legislation. Growing crops for biofuels is contributing to nitrogen fertilizer consumption.

Global Ammonia Consumption by Application
(2008 Total = 153 million tons ammonia)



Urea has gained market share over other nitrogen fertilizers, mainly due to the fact that the higher nitrogen content of urea results in a lower freight cost per ton of nutrient than ammonium nitrate and other fertilisers. Another important factor is the rate of growth for urea's industrial end use segments such as amino resins, which are projected to grow at around the same rate as global average GDP to 2015. While combined industrial applications are the second largest end use segment in overall urea consumption, direct application fertilizer use dwarfs all other applications and accounts for 84 percent of total urea demand.

SECTION 1.

Business Need for the Program

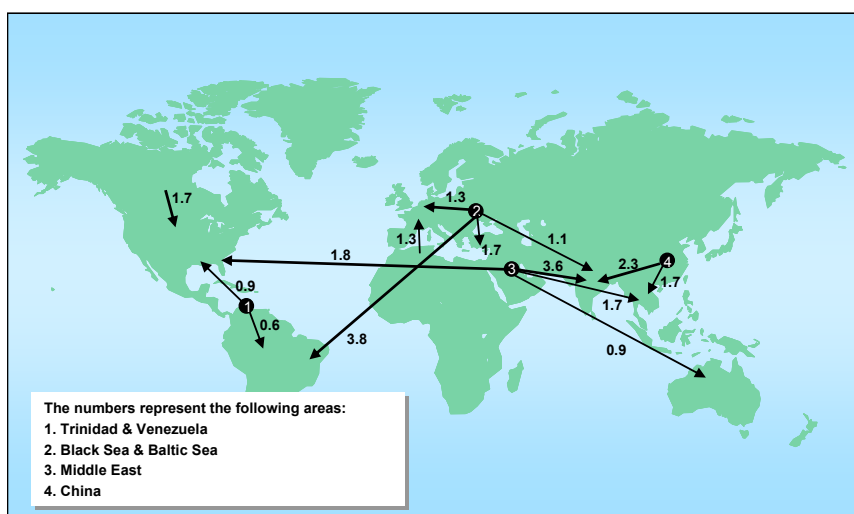
With this upward pressure on gas prices, producers have been looking with renewed interest in alternative feedstocks to natural gas, which is typically steam reformed to provide syngas which is then converted to ammonia.

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.

Ammonia demand is primarily driven by urea consumption, which is mainly a function of fertilizer demand. Therefore, the highest rates of urea consumption growth is in regions where agriculture remains a major sector in national economies such as South America, Central and Eastern Europe and Asia. However, the absolute size of markets in the industrialised regions remains significant, and imports into these locations are expected to increase.

Urea Trade Flow Pattern, 2008



Western Europe is a good example. Over the last few years urea consumption has slightly decreased in this region, the main reason being new European Union policies to reduce food over-supply via set-aside and to combat water eutrophication that occurred due to over-application of fertilizers. As a result net consumption of fertilizer decreased in recent years. However, urea consumption is expected to revive due to growing demand for first generation biofuels (bio-ethanol and bio-diesel), driven by the EU Renewable Fuels Directive which

sets a target of 10 percent usage by 2020. Nexant is very active in the biofuel sector, and has a good understanding of existing first generation biofuels and also of the second generation biofuels poised to emerge. Another developing application for urea is in AdBlue, a urea solution which is used to catalytically reduce diesel emissions and so enable the automotive sector to achieve NOx emission reductions. This is being driven by the need to comply with increasingly stringent environmental legislation.

These are dynamic and exciting times for the ammonia and urea industry that bring with them a wealth of opportunities for existing and prospective players in the market. To succeed in capitalizing on these opportunities, it is crucial to understand the drivers and mechanisms that are shaping the changes in this industry.

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

Nexant's Unique Blend of Capabilities

| STRATEGY CONSULTING | UPSTREAM OIL & GAS PRACTICE |
|---|---|
| <ul style="list-style-type: none"> ▪ Distilling key trends to understand businesses ▪ Portfolio appraisal and positioning ▪ Merger & acquisition support ▪ Customer segmentation ▪ Manufacturing Strategy ▪ Value chain positioning ▪ Growth Strategy ▪ Industry structure analyses | <ul style="list-style-type: none"> ▪ Global gas availability and pricing ▪ Strong experience of alternative gas monetization options including LNG, GTL, methanol and power ▪ National and regional energy planning ▪ Oil & gas development projects ▪ Upstream oil & gas asset management ▪ Gas value chain analyses |
| CHEMICALS PRACTICE | DOWNSTREAM OIL & BIOFUELS PRACTICE |
| <ul style="list-style-type: none"> ▪ Strong understanding of ammonia and urea markets, technology and economics ▪ Strong experience in derivative chemicals and related fertilizer markets ▪ Market dynamics research and analysis and forecasts ▪ Pricing and profitability scenarios ▪ Performance benchmarking ▪ Cost curve assessments ▪ Techno-economic feasibility studies | <ul style="list-style-type: none"> ▪ Biofuel market and technology development ▪ Projected market demand for differing crops to produce first and second generation biofuels ▪ Petroleum value chain analysis including ports & terminals, refining, storage & distribution, terminals & depots, fuel wholesaling and retailing |

SECTION 2.



Value of the Program

The Program provides a valuable aid for strategic planning purposes, at a time of both opportunity and challenge for players and prospective entrants into the nitrogenous fertilizer business. It combines a review of the fundamental business drivers and their dynamics, as well as analysis of the wider trends in ammonia and urea to understand what these entail for the short, medium and long-term outlook for the business. Key issues that are addressed include:

Business Fundamentals:

- **Supply:** what ammonia and urea projects are currently under development and in planning? What are the primary motivators behind these capacity developments?
- **Demand:** what is the expected demand outlook segmented by geography and application? Which segments are driving growth?
- **Profitability:** how have the changes in capacity distribution and feedstock price impacted profitability of existing producers?
- **Pricing:** what are the implications of the scale, feedstock and capital costs and location of new projects for future product pricing?
- **Technology:** who are the major process licensors, what are the latest developments and how do their different technologies compare?
- **Competitiveness:** how do the various producers compare in terms of delivered cost competitiveness to the major international markets?

Strategic Trends and Challenges:

Coverage strongly influenced by current activity and pertinent trends in the nitrogenous fertilizer business. Examples of issues to be addressed include:

- **Raw materials:** How sustainable is the stranded gas advantage in the longer term? How does ammonia compare in terms of value addition to other gas-based derivatives such as LNG, GTL, methanol and power? How competitive will coal-based ammonia be in China and elsewhere? What are the integration possibilities for coal gasification?
- **Food versus Fuel:** How will governments balance their desire to promote biofuels with the need to feed their populations? What is the impact on fertilizer usage as crops for biofuels are grown? How will second generation biofuels impact fertilizer demand?
- **Government Intervention:** To what extent are production or consumption subsidies desirable, affordable and sustainable? What is the outlook for subsidies and anti-dumping duties on fertilizers? How will this impact pricing?
- **Capacity development:** How will political considerations and environmental legislation affect future development? Is sufficient flexibility available in the shipping market and terminalling infrastructure to accommodate the expected increase in inter-regional trade?

SECTION 2.

Value of the Program

- **Logistics:** What are the future requirements for ammonia and urea shipping? What is the impact on new ship builds and freight rates?
- **Engineering Contractor markets:** has the contracting boom led to an investor bust? What is the outlook for capital costs?

The Program analyses and comments on these developments and is an essential source of analysis for companies active in the industry. Our Program is backed up by access to experienced Nexant consultants who are able to discuss and comment on the latest developments and their implications. We believe our offering is unique in terms of breadth and depth of insight and coverage.

SECTION 3.



Scope of the Program

Your annual subscription to the **Ammonia and Urea Strategic Business Analysis** includes:

- Two hard copies of the full 347 page annual report and unlimited downloads of softcopies from the ChemSystems web site
- Access to the data and analysis through the ChemSystems website at www.chemsystems.com and via electronic reports (Adobe .pdf file)
- Quarterly updates on capacity, project status and pricing developments
- Copies of ammonia and urea conference papers presented by our consultants
- Access to desk-based support from our consulting staff

Strategic Trends and Challenges

This analysis is predominantly qualitative, building upon the trends identified in the market and economic analysis sections. Hypotheses are developed and investigated in order to provide answers to the questions posed above under *Value of the Program*. Nexant's unique access to the wider value chain including developments in the upstream oil & gas industry and downstream energy, fuels (including biofuels) and chemicals markets are leveraged in this analysis. Combined with our extensive experience as advisors to leading fertilizer producers, this knowledge allows us to provide subscribers with in-depth, original insight at the leading edge of ammonia and urea strategic business analysis.

Market Dynamics

The Program delivers an analysis of the supply, demand and net trade outlook for ammonia and urea on a global basis covering historic and projected trends for the period 1995 to 2025. A capacity listing of existing producers and firm projects is also be provided. The geographic coverage of the market analysis includes:

- North America
- South America, including Trinidad
- Western Europe
- Central and Eastern Europe
- Asia Pacific, including individual profiles of key countries:
 - China
 - India
- Middle East
- Africa

SECTION 3.

Scope of the Program

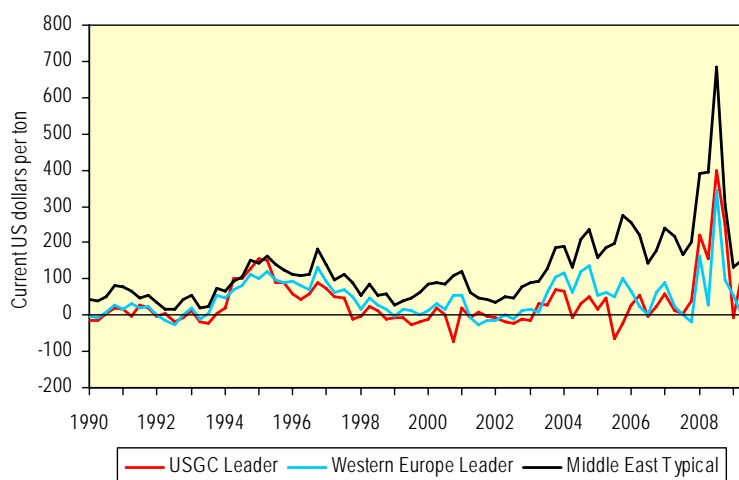
As well as quantitative projections of capacity, consumption, operating rates and net trade volumes, in-depth analysis of the major factors influencing consumption and capacity growth are included. An explanation of the expected developments in demand by end use sector is presented. Segmentation by end use covers:

| Ammonia | Urea |
|---------------------|---------------------------|
| Urea | Fertilizer (for food) |
| Ammonium Nitrates | Fertilizer (for biofuels) |
| Ammonium Phosphates | Other N Fertilizers |
| Other N Fertilizers | DEF/Ad Blue |
| Direct Application | Industrial |
| Industrial | |

Industry Profitability and Pricing

- Historic profitability of archetypal ammonia and urea producers in the traditional producing centres of the United States and Western Europe, as well as in the Middle East for the period 1995 to present.
- Profitability projections with estimates of simple returns on investment (ROI) for the United States, Western Europe and the Middle East.

Ammonia Historic Profitability
(Cash Cost Margins)



XL: CSOL 00235.20.M.S.M.M.ProspectusSBA2009

Profitability is the key consideration for future project developers, and the Program provides:

- Historic and projected future prices for the period 1995 to 2025.
- Prices for the following reference regions of the United States, Western Europe, Black Sea, Arab Gulf and East Asia.
- Nexant's Oil Scenario methodology (see Methodology section below) is used to assess the impact of volatility in energy costs on product prices.
- Commentary is given on the key drivers and price setting mechanisms, and the outlook for these going forward.

Technology

- An overview of the major licensor offerings is provided, together with a discussion of new developments.
- Cost of production tables are included for ammonia and urea with a breakdown of the key components of the variable, fixed and capital costs.

Delivered Cost Competitiveness

- 2008 delivered cost to market will be assessed and competitiveness presented.
- In order to accurately evaluate the transportation costs associated with delivering ammonia and urea to the major markets, Nexant has developed shipping models that analyse factors such as the parcel size and capital cost of typical ammonia and urea carriers, variable and fixed operating costs associated with shipping, terminalling fees, canal dues etc.
- For each major market, the delivered cost for domestic ammonia and urea producers will be compared to the delivered costs of major competing producers selling into that market, as shown below:

Major Producers

United States of America
Trinidad
Russia
Western Europe
Egypt
Middle East
China
South-East Asia

Target Markets

United States of America
Western Europe
India
East Asia

Appendix C shows an illustrative Table of Contents.

SECTION 4.



Methodology

Our Program is produced by a global organisation of Nexant researchers, analysts and recognised experts in the fertilizer industry. All our analysis is underpinned by Nexant's considerable experience of single client work in the ammonia and urea sectors, as well as the unique ChemSystems Simulator.

Consulting Support

Our consultants are available to subscribers to provide further discussion and clarification of any areas of the industry covered by the subscription. Any travel or out-of-pocket expenses associated with such consulting support is not covered by the subscription and will be invoiced separately at cost.

Strategic Analysis

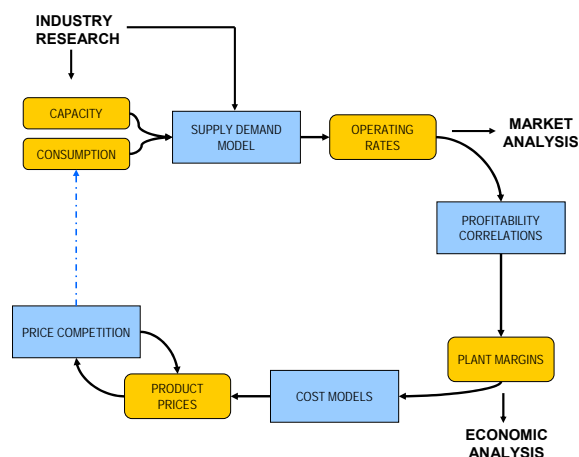
In addition to the technical and data-driven analysis that underlines the review of the business fundamentals as outlined below, Nexant also brings the benefit of its extensive experience of single-client engagements to the Strategic Trends and Challenges analysis. We have acted in a wide variety of capacities spanning the areas of technical due diligence, feasibility analysis, market entry, competitiveness assessments and strategic planning for many prominent players in the ammonia and urea industries. Combined with our wealth of wider single-client experience in the upstream gas, downstream oil (including biofuels) and ammonia and urea derivatives markets, we are able to deliver unparalleled insights into emerging trends both within the ammonia and urea businesses and across the wider value chain. Selected engagements are presented in Appendix D.

ChemSystems Simulator

Our ChemSystems Simulator is the proprietary simulation model developed by Nexant and used to generate all the analysis and forecasts of the ChemSystems Online® and other offerings including the **Ammonia and Urea Strategic Business Analysis Program** (and our Methanol SBA and PolyOlefins Planning Service, POPS Program). Our ChemSystems Simulator is available to subscribing companies, for an additional subscription fee, to develop private forecasts of market dynamics, industry profitability, etc. Clients are currently using our simulator for corporate and business unit planning, investment decision making and competitive analysis.

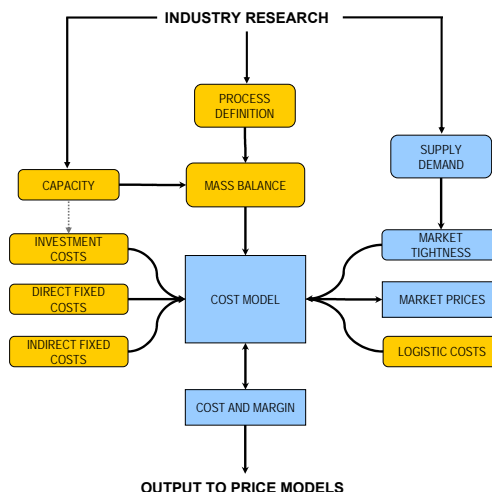
Our simulation model is a proprietary, experience-based database running commodity petrochemical business logic algorithms to produce multi-scenario simulations of the global industry.

ChemSystems Simulator Simplified Logic Diagram



It is integrated from end-use fertilizer and chemical markets back to feedstocks. It considers inter-material competition, inter-regional price relationships, chain margins, product substitution, logistic costs and trade drivers. Costs and prices are integrated from crude oil, natural gas and petrochemical feedstocks through ammonia, urea to derivative products. One of the functional blocks depicted in the graphic above is expanded below to illustrate the interconnectivity of these drivers and the complex relationships that are built into Simulator algorithms.

ChemSystems Simulator Functional Blocks



Our ChemSystems Simulator delivers step change improvements in market forecasting and business/corporate planning, while reducing the resources and time required to evaluate multiple hypotheses and scenarios.

SECTION 5.

Costs and Subscription



The subscription price for an annual company subscription to the **Ammonia and Urea Strategic Business Analysis** is £12 500 (twelve thousand five hundred pounds sterling). The annual subscription covers one year from the date of subscription. The standard subscription includes:

- Two hard copies of the Report and unlimited downloads of softcopies from the ChemSystems web site.
- Access to the data and analysis through the ChemSystems website at www.chemsystems.com and via electronic reports (Adobe pdf file)
- Quarterly updates on capacity, project status and pricing developments
- Copies of ammonia and urea conference papers presented by our consultants
- Access to desk-based support from our consulting staff

Nexant is pleased to offer a **10 percent discount** to Ammonia and Urea SBA subscribers who also subscribe to its Methanol SBA program/

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Ammonia and Urea Strategic Business Analysis .

GBP 12,500

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Credentials

Nexant ChemSystems

Nexant

Nexant, a leading, global provider of consulting services to the energy industry, was established on 1 January 2000. As an independent company with a number of shareholders, Nexant provides impartial advice to clients in the energy and chemicals sector.

Nexant's global headquarters are in San Francisco. The company provides a range of services to the energy industries, as detailed in our literature and on our website at www.nexant.com.

Nexant Oil & Gas and Chemicals Practices

The foundations of Nexant's Oil & Gas Practice are based on more than 25 years of experience in the oil and gas industries as part of Bechtel's consulting business and 40 years of experience of the downstream oil practice originating from Nexant's acquisition of Chem Systems in 2001. Our consolidated expertise and experience is unrivalled by any other specialist consulting firm in the industry.

Our Oil & Gas and Chemicals Practices serve the entire industry value chain, from oil and gas production through the downstream sub-sector to chemicals, including speciality chemicals. These services complement Nexant's other divisions, which provide a comprehensive range of consulting services and software to the electric power and advanced energy sectors.

Nexant's Chemicals Practice offers its clients ***Insight and Understanding*** – Our sharp focus on the petroleum and chemical industry gives us an unrivalled ***insight*** into the current issues and opportunities; the shifting landscape and changing fortunes that affect the sector. We ***understand*** our clients businesses - the challenges they face and the competitive pressures which shape their thinking.

This can only be achieved through an unrivalled combination of:

- **Industry knowledge** - we consult on the petroleum and chemical industry; our consultants are all experts in the industry, who work fulltime on the challenges facing the industry.
- **In-house data** - we have an unrivalled database on the industry and its markets, and employ teams of researchers to continually update this resource. Our ChemSystems Online product, which can be accessed by subscribers, contains the core of this knowledge base covering the commodity chemicals and polymers.
- **Proven and tested methodologies** - we have developed a range of methodologies to cover different types of assignments, such as feasibility studies, project finance support, privatisations, due diligence studies for acquisitions and financings, market and technology review, and selection studies. All of these have been tailored and continuously improved to suit the needs of the industry.

- **Technical competence** - we constantly track the technical improvements in the industry and frequently review new process improvements for clients. Our ChemSystems Process Evaluation/Research Planning (PERP) Program encapsulates some of this work and is available to subscribers.
- **Global** - our permanent offices in London, New York (White Plains), Houston, Tokyo, and Bangkok provide comprehensive coverage. In addition, we have long-term relationships with representatives or registered branch offices in most major locations, including Beijing, Singapore, Seoul, New Delhi, Moscow, Abu Dhabi, Amman, Rio de Janeiro, Caracas, and Paris. Nexant professionals have extensive experience in emerging markets such as the former Soviet Union and China, and our team of industry experts can work fluently in over ten languages.
- **Strategic consulting** - we have been on the leading edge of many of the strategic initiatives in the industry, including consolidations, restructuring, and privatisations. We pride ourselves on our thought leadership in strategy consulting in the sector.
- **Breadth** across all relevant sectors. Our team can provide clients with a complete and holistic view of the sector and its place in the overall economy covering the entire value chain.

Nexant has unrivalled experience:

- Each year Nexant advises on tens of billions of dollars of petroleum and chemicals projects, in most of the major global supply and demand centres, covering the full hydrocarbon production, processing and transportation supply chain.
- Our team routinely works for almost every major multinational corporation in the petroleum and chemical business and for many national companies, governments, and international organisations. Nexant's view is often quoted by major corporations as an authoritative view on the industry.

We are recognised for our quality and industry thought leadership:

- Nexant is often quoted in the petroleum and chemical press on its views on markets and developments.
- Our team members are called on to give expert papers at major conferences.
- Our team of experienced vice presidents is responsible for the quality of our work in their individual areas of expertise. They are expected to provide inputs to and supervise every assignment we undertake.
- Our UK-based group has twice been honoured with the "Consultant of the Year" by The Times newspaper/BCCB. The first time in 2000 for work on the cost implications of the European Commission's Programme of automotive fuel specification improvements and again in 2002 for the innovative ¹ChemSystems Online® product.

¹ Nexant®, ChemSystems® and ChemSystems Online® are registered trademark of Nexant, Inc.

We have extensive resources to fulfil any assignment in the industry:

- Nexant Oil & Gas and Chemicals Practices employ over one hundred staff, making us the largest specialist consultant in the sector. We are the only industry specialist consultant to offer a fully comprehensive in-house service from well-to-wire and to downstream chemical.
- All staff are experienced in the industry and have typically worked previously for a multi-national industry company or a major contractor/technology company. More than half of our staff have worked for Nexant and the predecessor organisations for more than ten years.
- Staff qualifications include chemists and engineers as well as economists and legal specialists. A very high proportion of staff has advanced degrees - PhD or MBA.
- We can staff projects anywhere in the world from our global network of offices.
- Our data resources are the best in the industry and are continually updated.

Selected Single-Client Ammonia and Urea Experience

The ammonia and urea industry is an area of particular specialisation for Nexant, having performed well over a hundred engagements for most of the significant global and regional players and numerous new or would-be new operators, as well as financial or governmental organisations. The following notes describe a **few selected** recent engagements. Details of the many other engagements are available on request. In many cases, the nature of Nexant work is confidential, and we are not free to identify the client with the project. For this reason, some of the typical projects listed below do not identify the client.

■ Feasibility Study – Ammonia/Urea, Uzbekistan

This engagement evaluated the attractiveness of a large-scale ammonia plant to replace older units at an existing complex plus a new urea unit to supply local and international markets. It reviewed local markets and logistics, global market dynamics, pricing outlook, delivered cost competitiveness to various markets, technology evaluation, project definition, contracting strategy and financial attractiveness.

■ Lenders Market Consultant/Lenders Technical Consultant

Nexant is the Independent Technical and Market consultant for a coal-based ammonia and urea project in South West Australia. The technical consultant role include reviews of facility design, site assessment, permits and licenses, environmental, health and safety performance, project execution and plan, capital cost estimate, operating and maintenance costs, project performance, contracting process and contracts, economic analysis, project risk analysis as well as ad-hoc technical advisory services and certifications.

The Market consultant role includes preparing historic and projected ammonia and urea market dynamics, price and profitability, delivered cost competitiveness and marketing strategy were reviewed for the project as well as ongoing ad-hoc market advisory services.

- **Strategic Plan Development - Ammonia/Nitric Acid/AN/Urea/UAN Solution, FSU**

Nexant developed a 10-year strategic plan for margin enhancement for a major Russian fertilizer company based on technology and manufacturing assessments of its sites, market characterisation and a profitability assessment of each business versus the wider global industry. Businesses and projects were identified within the substantial portfolio for expansion/investment and others for exit.

- **Conceptual Business Outlook Study – Ammonia/Urea, Arab Gulf**

Nexant developed a strategic plan for Fertil in Abu Dhabi which reviewed Fertil's existing operations and identified an economically viable "road map" to optimise the company's business potential for the next 20 years. The study included analyses of the global market for ammonia and urea, the feasibility of expansion/debottlenecking and the potential for new products including methanol, melamine, UF resins, sulphur-coated urea and hydrogen.

- **Business Valuation - Ammonia/Nitric Acid/AN/Urea/DAP/Potash, United States**

Nexant prepared a valuation of a major U.S. fertilizer supplier to support refinancing. The scope of the project included demand and supply forecasts, price forecasts, and valuations under alternative scenarios of each segment of the fertilizer business.

- **Feasibility Study – Ammonia/Urea, Turkmenistan**

Nexant performed this assessment of market dynamics, pricing outlook, delivered competitiveness to various markets, technology evaluation, project definition, contracting strategy and financial attractiveness of a large scale ammonia/urea project.

- **Lenders' Independent Market Consultant, Algeria**

Nexant is the independent market consultant for an ammonia and urea project. Historic and projected ammonia and urea market dynamics, price and profitability, delivered cost competitiveness and marketing strategy were reviewed for the project as well as ongoing ad hoc market advisory services.

- **Lenders' Independent Technical Consultant, Algeria**

Nexant is the independent technical consultant for an ammonia and urea project. Activities performed include reviews of facility design, site assessment, permits and licenses, environmental, health and safety performance, project execution and plan, capital cost estimate, operating and maintenance costs, project performance, contracting process and contracts, economic analysis, project risk analysis as well as ad hoc technical advisory services and certifications.

- **Environmental Audit – Ammonia/Urea, Russia**

The EBRD engaged Nexant to perform an assessment of environmental, health and safety (including major accident risks) performance at Togliattiazot, the largest ammonia producer in the world.

■ Feasibility Study – Ammonia/Urea, Latin America

For an international sponsorship partnership, Nexant teamed with a major engineering organisation to provide a full-scope feasibility study for a proposed grassroots world-scale ammonia/urea complex. The study included technology selection, market feasibility, transportation cost modelling, preliminary engineering, capital cost estimates and economic performance modelling.

■ Market Consultant – Ammonia/Urea, Oman

Nexant was retained as the Lenders' Independent Market Consultant for the OMIFCO project. It developed Global and Indian market dynamics and price projections. It also performed a comprehensive delivered cost competitiveness analysis and reviewed the shipping plan and marketing strategy.

■ Export-Orientated Urea Producer Strategic Plan

Nexant performed this major strategic planning study for an export-orientated petrochemical producer. The product range of the producer included ammonia and urea. The study screened potential global market opportunities in petrochemicals, projected target markets, pricing and profitability of new projects, and ranked the attractiveness of ammonia/urea among the petrochemical opportunities available.

■ Industry Restructuring Study

Regional fertilizer producers required Nexant to appraise the producers' competitiveness and potential restructuring options. The options were evaluated against Nexant's forecasts of global and regional markets and prices, and producers' volumes.

The study included manufacturing, organisational and distribution issues, and covered the following:

- ammonia
- urea
- nitrates
- NPKs.

■ Feasibility Study – Ammonia/Urea, QATAR

Nexant was appointed sponsor's market consultant to provide the initial assessment of the feasibility of the proposed QAFCO IV expansion. The study focused on markets, pricing and competitiveness.

■ Business Assessment – Ammonia/Urea, Ukraine

EBRD required a study of the Ukrainian ammonia, urea, ammonium nitrates, polystyrene and pharmaceutical operations of Stirol. Assessment of its technologies, and alternative technical improvement options, was undertaken by Nexant. Financial projections and a business plan were developed to support the Bank's assessment of Stirol's corporate loan application.

Fertilizer Multi-Client Experience

Regular Programmes

■ Process Evaluation/Research Planning (PERP)

The PERP programme provides valuable insights and information to research planning and marketing personnel. It examines existing, developing and embryonic technologies, aiming to provide early identification of commercially significant technical developments. Ten or more reports per year are on petrochemicals; additional reports cover polymers, fine and performance chemicals, and other topics.

Recent PERP topics relating specifically to nitrogenous fertilizers have included:

■ Developments in Syngas Production

A techno-economic review of the state-of-the-art of syngas production including natural gas reforming, syngas from coal, etc, and an evaluation of developing technologies.

■ Ammonia

This reviewed commercially available processes including those of Haldor Topsoe, KBR, Linde, Lurgi and Uhde, providing capital costs, operating costs and descriptions of all the processes. In addition, it provided an analysis of likely process development trends, the costs of production and a market overview.

■ Sulphuric Acid

A PERP report providing the background of sulphuric acid manufacture, an overview of the lead chamber process, and a detailed discussion of the contact process (focussing on the double absorption process). A cost of production estimate is presented along with sensitivities to sulphur price, plant investment and capacity. Sulphuric acid pricing trends are discussed and a commercial analysis discussed end uses and supply/demand/trade data for the United State, Western Europe and East Asia, including a global summary.

■ Phosphoric Acid

This PERP, providing the background of phosphoric acid manufacture, with detailed overviews of individual process technologies, phosphoric acid end uses and costs of production, is currently in preparation.

■ Developments in Syngas Production

A techno-economic review of the state-of-the-art of syngas production including natural gas reforming, syngas from coal, etc, and an evaluation of developing technologies.

■ Coal Gasification Technologies

A study covering in detail the chemistry, technology, economics, environmental issues and market analysis of coal gasification technologies.

■ Coal to Olefins (CTO)

A study discussing the technology, market analysis and economics behind coal to olefins

■ Urea

This volume is complementary to the ammonia PERP and examines the processes offered by Stamicarbon, Snamprogetti and Toyo. It further reviews the Uhde urea revamping and granulation offerings. It also provides an analysis of likely process development trends, the costs of production and a market overview.

Specific Studies

■ Adding Value to Methane: Strategic Opportunities for the Middle East

This major study reviews (by each Middle Eastern State) methane availability and pricing issues, methane derivative market dynamics and impact on global trade, technology options, impact of these developments on competitiveness, extending the methane value chain, other strategic issues. The fertilizer products included are ammonia, urea, ammonium nitrates, ammonium phosphates and NPK fertilizers. Also included are methanol and its derivatives, GTL, LNG and pipelines.

■ Stranded Gas Utilization: Steps to Commercialization

This study provides an in-depth quantitative and qualitative analysis of the various end-uses and production processes for converting large, remote natural gas reserves to viable commodity products. The fertilizer products included are ammonia and urea.

■ Stranded Gas Utilization: Methane Refineries of the Future

This study provides an in-depth analysis of the manufacturing processes, and economics for converting large, remote natural gas reserves to viable products. The fertilizer products included are ammonia and urea.

■ Fertilizer Business Analysis

In this major study Nexant reviewed the profitability of the major global nitrogen and phosphate fertilizer markets of the United States and Western Europe. International Nitrogen and Phosphate Markets and Delivered Cost Competitiveness were reviewed. The following products were included:

- Ammonia
- Urea
- Ammonium Nitrate
- Calcium Ammonium Nitrate
- Urea Ammonium Nitrate
- Phosphoric Acid
- Diammonium Phosphate
- Triple Superphosphate
- NPK (15:15:15)

CHEMSYSTEMS

ChemSystems Programs

ChemSystems Online

Providing online databases and tools for analysis and forecasts of the markets and economics of the petroleum and petrochemical industry.

Petroleum & Petrochemical Economics (PPE)

Providing regular analysis and forecast reports on the profitability, competitive position, and supply/demand trends of the global industry.

ChemSystems Simulator

Providing a state-of-the-art simulation model for the entire global petroleum and petrochemical market – including technology, costs, supply/demand, and profitability.

Process Evaluation/ Research Planning (PERP)

Providing analysis and economic models of the existing and developing process technology used by the industry.

ChemSystems Training

Providing in-house and public training courses on the industry, its chemistry and on the planning and analysis methodologies.

PolyOlefins Planning Service (POPS)

Providing detailed market and technology evaluation of the global polyolefin industry.

Special Reports

Providing reports on topical issues and aspects of the industry.

Strategic Business Analysis (SBA)

Providing regular reports on the strategic trends that will shape the industry, including reviews of markets, pricing, technology and delivered cost competitiveness

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