Prospects, challenges and trends in the global ammonia market

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As of 1 July 2019, Agribusiness Intelligence joined IHS Markit in its Energy & Natural Resources division

“The Informa Agribusiness Intelligence portfolio is a clear extension of our Chemical and Downstream businesses and builds our existing data, pricing, insights, forecasting and news services within our Resources segment. Agriculture is the largest end chemical market in the world and this transaction expands our capabilities into fertilizers and chemical crop protection, while substantively expanding our capabilities in biofuels.”

Lance Uggla, CEO of IHS Markit
Agenda

• Key market developments: 2018-2019
• Key drivers for ammonia demand
• Ammonia cost curve and competitiveness
• Global ammonia trade and trade flows
• Capacity growth in 2014 – 2019 and Outlook to 2025
• New capacity changes trade flows:
  • USA
  • Russia
  • Indonesia
• Overview of industrial demand segment
• Overview of phosphate segment
• Risks and outlook for ammonia trade
Ammonia prices have recently fallen below the prices of other commodities.

Ammonia prices continuously decrease from Sep. 2018.

Unlike urea prices, ammonia prices did not recover in spring 2019.
Urea breaks away from ammonia

- Ammonia - urea price difference reaches record high
- The urea production margin (how much producer earns more if convert ammonia in 1 t of urea) has been positive since the end of 2017 (no market self-regulation)
- The urea production margin has reached the highest level since 2012
- Why integrated producers do not swing to urea?

Note: Urea production (upgrade) margin is calculated at 0.58 t of ammonia per 1 t of urea and after deduction of processing costs per t of urea. Source: Fertecon cost model.
Key drivers of ammonia demand

- Global ammonia demand is dominated by urea production – 54%
- Not all integrated ammonia/urea producers are flexible to swing from merchant ammonia to urea or vice versa
- Some older technology integrated plant always produce merchant ammonia along with urea (CO₂ balance)
- Ammonia merchant market is dominated by industrial applications and Phosphates/NPK.

Ammonia demand by end use, 2018

100% = 179 million tonnes

Ammonia export by end use, 2018

100% = 19.0 million tonnes

Source: Fertecon

Note: D.A. = direct application
Feedstock prices

Energy Prices

- Natural gas prices are still at low levels
- Recently, soft winter and LNG inflow have pushed the European spot gas prices down
- Contract gas prices in Europe (LT contracts from Russia and other sources) are following the track of spot prices

Sources: Fertecon, Gazprom, IHS Markit, EIA
Lower gas prices round the world since 2014 have reduced ammonia costs.

The global cost curve became lower and flatter.

This change has not affected low-cost producers (Middle East, North Africa, Russia, North America).

However, high-cost producers have become more competitive.

High-cost (marginal) producers can afford producing at lower ammonia prices.
Costs: cfr Europe

Source: Fertecon
Trade flows

- Global Ammonia Trade ~ 19 million tonnes, Sea Trade – 16.6 million tonnes
- Market “West of Suez” accounts for almost 2/3 of global market
- Market “East of Suez” is fast growing
- West has traditional surplus and East has traditional shortage, West – East net transfer is ~1.2 million tonnes
- Trade flows are stable with special infrastructure in place and long-term contracts
Ammonia Demand: East and West

Source: Fertecon

Transformation: A New Era for the Agri-nutrients Industry
Capacity additions peak in 2016-2019

- Prices at >$500 in 2011-2014
- Wave of investments in 2011-2015
- Commissioning peak in 2015-2018
- Capacity ramping up in 2017-2019
- Most of new capacity additions in 2016-2019 – outside China
- Over 7 million tons of merchant ammonia new capacity in 2016-2019
- Not many new projects in 2020–2024 (but long list of “possible” projects
- Only one merchant ammonia unit expected in 2020–2021 in Oman.

Source: Fertecon

*Transformation: A New Era for the Agri-nutrients Industry*
New projects after 2018

- A list of probable projects in 2018-2024 includes 25 plants (excluding China)
- 10 plants from this list came on stream in 2018-2019
- The majority of projects are integrated with urea production
- Three merchant ammonia plants started in 2018-2019 and reshape the world trade flows:
  - Yara / BASF Freeport
  - PAU Sulawesi
  - Eurochem Kingisepp

Source: Fertecon
Focus on USA

US Ammonia Projects

- US capacity +4.7 mt 2015 to 2019
- Minor expansion by Mosaic expected 2023 (+0.1 mt)
- Many additional projects initiated, but none probable – high EPC costs constraining progress
- Potential for further capacity growth, but not expected before second half of decade
- Bad weather hampered direct application seasons in fall 2018 and spring 2019, reducing the demand
USA: import substitution

Source: IHS Markit, Fertecon
USA: from import to export

USA Ammonia Import

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Source: IHS Markit

USA Ammonia Export

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</table>

Source: IHS Markit

2018 USA Ammonia Production, Export, Import and Apparent Consumption, 2018, million t

- Capacity: 16.4
- Production: 16.0
- Import: 6.7
- Export: 18.7
- Apparent Consumption: 16.8

Source: IHS Markit, Fertecon

Transformation: A New Era for the Agri-nutrients Industry
Trinidad looks for new markets

New Markets for Trinidad ammonia

- Trinidad & Tobago (T&T) ammonia faces competition with new capacity in the US
- The share of USA in T&T export shrinks from >80% to <50%
- Competition with US supply in LA markets: Mexico and Chile
- Growing Morocco import absorbs a part of T&T export
- T&T expand to Europe (contract in Belgium, eventual sales to Finland, Turkey) and Asia
- Gas curtailment in Trinidad seem already overcome
Focus on Russia: Kingisepp

- Successful start up of a new plant in March 2019
- ~60,000 t per month of maritime exports, 8,000 t railway export to Lithuania (May 2019)
- Eurochem new plant mainly supplies ammonia to Eurochem’s fertilizer plants in Russia, Belgium and Lithuania, but replaces purchased merchant ammonia
- New contract supplier of ammonia to NW Europe

Eurochem becomes 3rd Russian contract supplier to NW Europe

Eurochem Kingisepp NH₃ capacity 0.89 mt

Russian Export to NW Europe (LT contracts Acron and Uralkem) 2018: 800 kt

Russian Railway Supply of Eurochem Phosphorite Kingisepp Plant 2018: ~130 kt

Russian Railway Export to Lithuania (to Eurochem Lifosa Phosphate plant) 2018: 160 kt

Eurochem Export to Belgium through Yuzhny, 2018: 383 kt

Eurochem Lifosa (NH₃ requirement ~0.2 mt)

115 kt in H1 2019

Russian Export to NW Europe (LT contracts Acron and Uralkem) 2018: 800 kt

Eurochem Antwerp (NH₃ requirement 0.2-0.3 mt)

300-500 kt in 2016-2018

Source: Fertecon

Export of Ammonia from Baltic Ports

- 2016: 758 kt
- 2017: 855 kt
- 2018: 840 kt
- 2019 8m: 867 kt

Source: Fertecon
New markets for Yuzhny suppliers

- Ukraine stops exports with high gas price/low availability of gas
- Ukraine imports more ammonia after the ban of fertilizers import from Russia
- Russian exporters supply to Ukraine by railway and pipeline
- OPZ may be back in operation after new gas supply agreement
- Turkey increases imports after ban for CAN was lifted
- Turkey increases production of phosphates and NPK
- Turkey exports AN to Ukraine
Focus on Asia: PAU

- Indonesia is a supply growth focus in Asia
- Indonesia traditionally supplies to the Far East
- Recently, the Indonesian export expands to China and India
- New 700 kt greenfield project Panca Amara Utama (PAU) started operations in Q2 2018
- PAU is stand alone merchant ammonia producer with no local downstream consumers
- PAU is located at Sulawesi island and has local dedicated source of natural gas (not from the gas grid on main islands).
- Export considerably increases since July 2018
Far East Markets: Industrial Segment

Far East merchant ammonia markets are dominated by industrial ammonia applications

Main markets: caprolactam and acrylonitrile, are affected by China – US trade dispute and general industrial slowdown in China

Industrial applications of urea (resins) and AN (mining) have also slowed down

Demand is supported by environmental segment (ammonia and urea for deNOx)

Source: IHS Markit
China increases import

- China reduces ammonia capacity in line with restructuring of the industry (closure of smaller and older plants), adjusting to slow demand growth (“0 growth” policy of fertilizer consumption).
- Import of ammonia has grown up in 2016-2018 with 3 main import terminals.
- Main consumers of import ammonia are the local JVs of international chemical companies.
- In 2019 import slows down with more merchant ammonia available in the country (due to weak domestic fertilizer markets).
- More than 50% of import comes from Middle East.
- Risks of US-China trade conflict.

Source: IHS Markit, Fertecon
Far East slows down

- South Korea, Taiwan and Japan have increased import in 2016-2018 by 7-10% pa.
- Like in China, main consumers of imported ammonia are in chemical industry.
- About half of imports come from Middle East, followed by Indonesia and Malaysia.
- Competition with ammonia from other regions (Trinidad, Indonesia, Yuzhny, USA) is strengthening.
Weakness in phosphate segment

Phosphate fertilizer industry has had smooth growth in 2016 – 2018 despite growing overcapacity.

Top producers managed to limit the excess supply by lower operating rates and closures of less efficient operations.

However, in 2019 the oversupply finally affected MAP/DAP/NPK markets.

The announced reduction of Chinese output could not yet stop the decrease of prices.

Morocco is the fast growing importer of ammonia for the expanding phosphate granulation capacity.

In 2019 Morocco slows down because of depressed MAP/DAP/NPK markets.
Focus on India

India uses imported ammonia for DAP/NP/NPK production.

Ammonia import grows since 2013.

Indian P nutrient requirements are covered by import of DAP/NP/NPK, or by producing phosphates from the imported Phosphatic acid, or from the imported Phosphorite Rock. Decision is made upon the prices for DAP/NP/NPK, PhosAcid, Ammonia, Potash, and Subsidy/Minimum Retail Price.

Import is dominated by Iran and other Middle East exporters. However, Iran’s share decreases in 2019 due to sanctions.

Source: IHS Markit, Fertecon
Focus on Middle East

- Middle East is one of the major export hubs.
- Saudi Arabia, Iran and Qatar are the main exporters.
- About half of export is directed to India.
- Export of ammonia from Iran is hampered in 2019 by sanctions.
- Risk of escalation of tensions between the USA and Iran in Arab Gulf and Hormuz strait. If traffic reduced this affects global supply/demand.
- More merchant ammonia from Oman in 2020/2021 (Salalah Methanol Company).

Middle East Ammonia Export Destinations

- India: 55.4%
- South Korea: 19.2%
- Taiwan: 10.4%
- China: 20.4%
- Australia: 0.3%
- Thailand: 19.2%
- Japan: 0.1%
- Turkey: 0.9%
- South Africa: 0.8%
- Other: 0.0%

Middle East Ammonia Export from Arab Gulf

- 2014: 3.59 Million tonnes
- 2015: 2.66 Million tonnes
- 2016: 3.31 Million tonnes
- 2017: 3.67 Million tonnes
- 2018: 3.20 Million tonnes

Source: IHS Markit, Fertecon
Outlook

- Regional ammonia net trade analysis shows a major shift in the Americas region and tighter market balance in Asia (east of Suez)
- Export from Eurasia will continue to grow
- Net export from the Americas will stay at 2.7 million tonnes
- Net import will remain stable in Europe and Africa, and east of Suez.