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ifa INTERNATIONAL FERTILIZER ASSOCIATION

Impact of Low Oil Prices on the Nitrogen Fertilizer Industry

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Nexant   Rungtawan Tangphongprasit   October 2016

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Nexant is a leading advisor to the fuels and chemicals industry

Through Nexant's global footprint we will provide you with valuable market insight

- Nexant has offices in the major fuels and chemicals producing and consuming regions of the world.
- Our international presence allows us to provide insight through our consultants' local market knowledge and our vast network of sector specialists.

Our history

- Nexant has been advising clients in the chemicals industry for over 40 years.
- The company has completed over 3000 client assignments in more than 100 countries.

Our people

- Over 150 consultants in Consulting Division worldwide.
- Our consultants blend strategic consulting, operational and technical expertise with deep chemicals sector knowledge.
- Nexant's consultants are typically Chemical Engineers, Economists and MBA graduates.
- Many of our consultants have also spent several years working in industry for energy & chemicals producers.

Our proposition

- Nexant provides corporate and private equity clients with advice in the following areas:
  - Strategic Planning
  - Commercial analysis
  - Transaction support: Due Diligence
  - Technology assessment
  - Independent expert
- In addition, Nexant has proprietary technology and commercial analysis (NexantThinking™) which includes market dynamics and pricing forecasts, capacity developments and production cost economics

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Agenda

- Nitrogen fertilizer value chain
- Feedstock overview
- Demand and supply overview
- Impact of low oil environment

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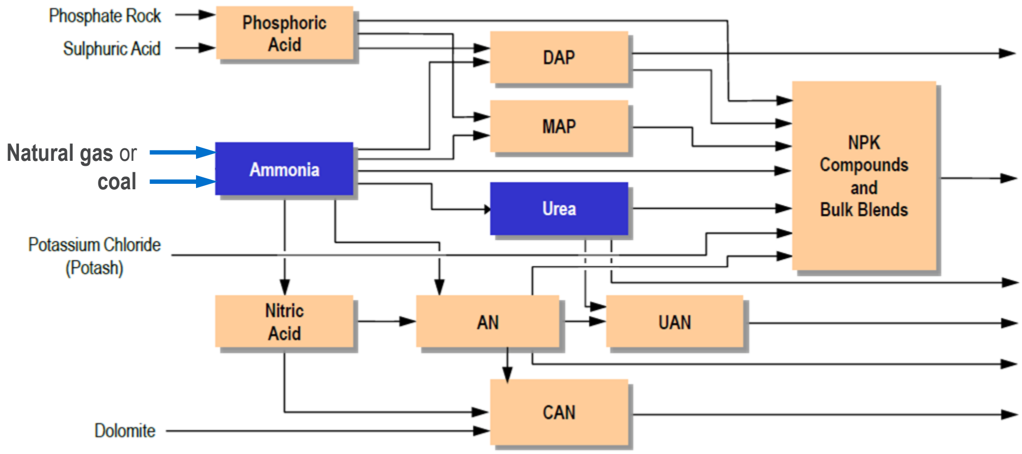
Ammonia and urea are the major component for various fertilisers

Value Chain of Main Ammonia and Urea Derived Fertilizers



Note :
AN = Ammonium Nitrate, UAN = Urea Ammonium Nitrate, CAN = Calcium Ammonium Nitrate
DAP = Diammonium phosphate, MAP = Mono-Ammonium Phosphate (MAP)

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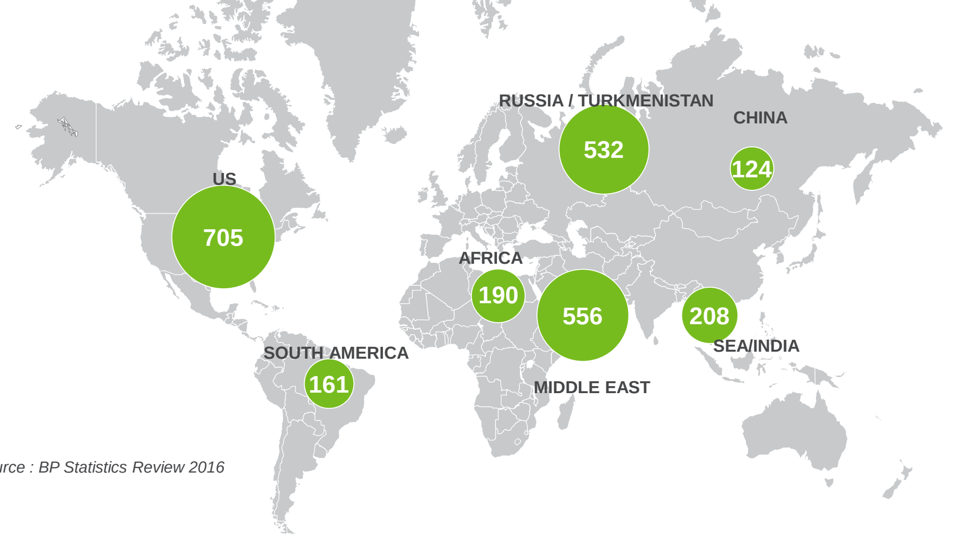
Gas Production (million tons oil equivalent)

3 200 million tons oil equivalent in 2015



Source : BP Statistics Review 2016

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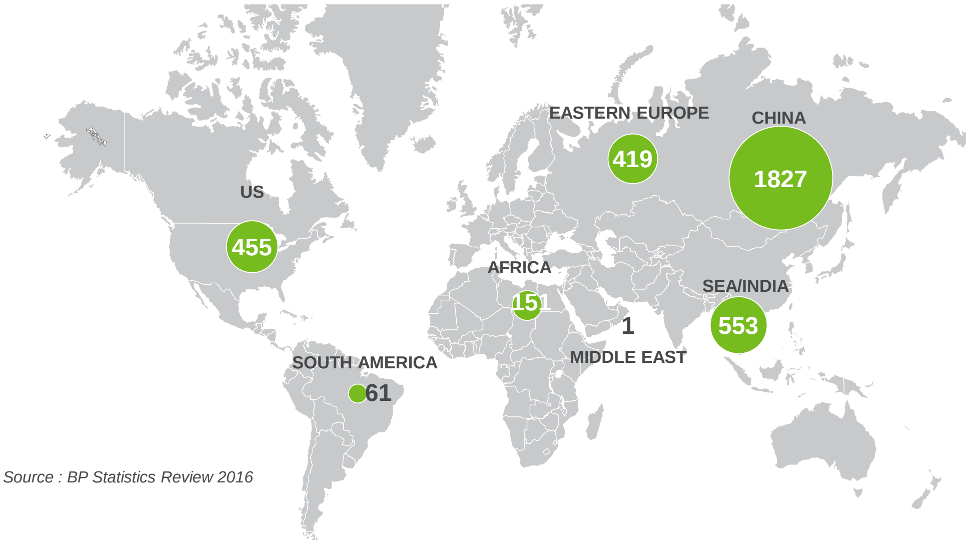
Coal Production (million tons)

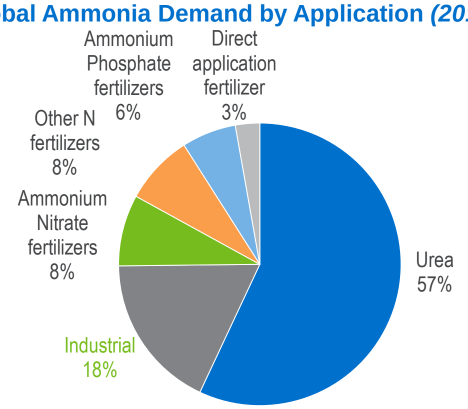
3 830 million ton in 2015



Source : BP Statistics Review 2016

Ammonia / Urea market is mainly driven by fertilizer industry

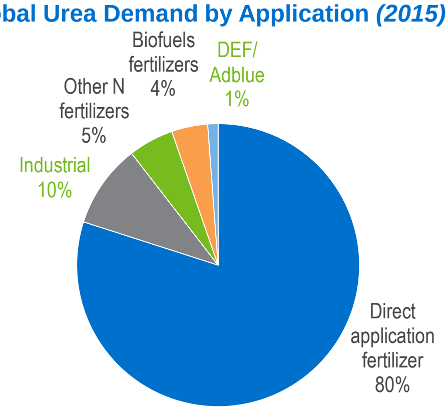
Global Ammonia Demand by Application *(2015)*



Total Demand = 172 Million tons

Source : Nexant

Global Urea Demand by Application *(2015)*



Total Demand = 171 Million tons

Source : Nexant

- Urea production is currently the largest ammonia application, and this trend is set to continue
- Ammonia as direct ammonia fertilizer is a minor end-use due to its gaseous phase at ambient temperature and its odor during application.
- Urea is used in may areas of the world as the primary sources of nitrogen for crop nutrition

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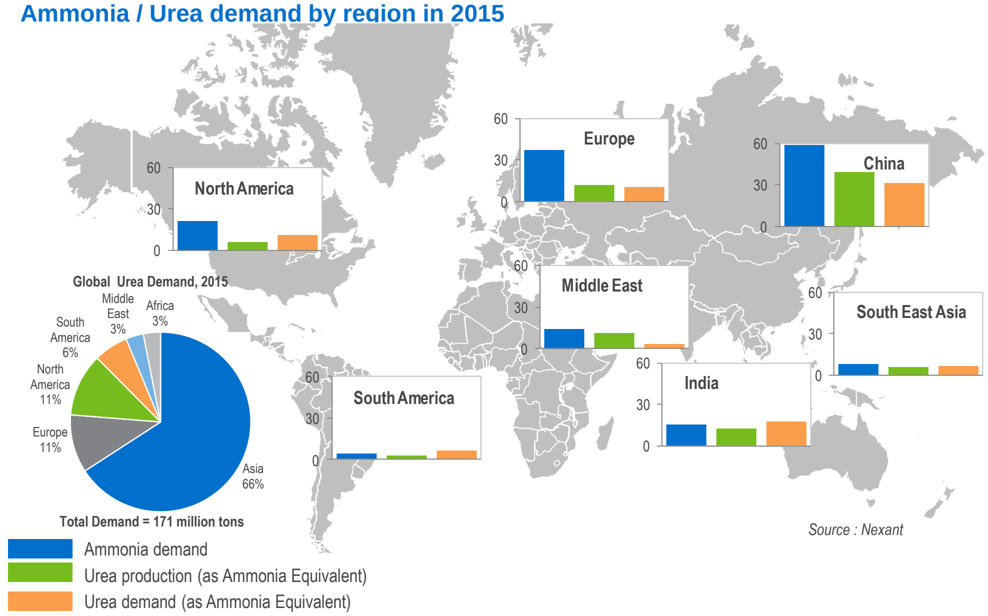
The largest consuming region is Asia, led by China and India, followed by Europe and North America

Ammonia / Urea demand by region in 2015



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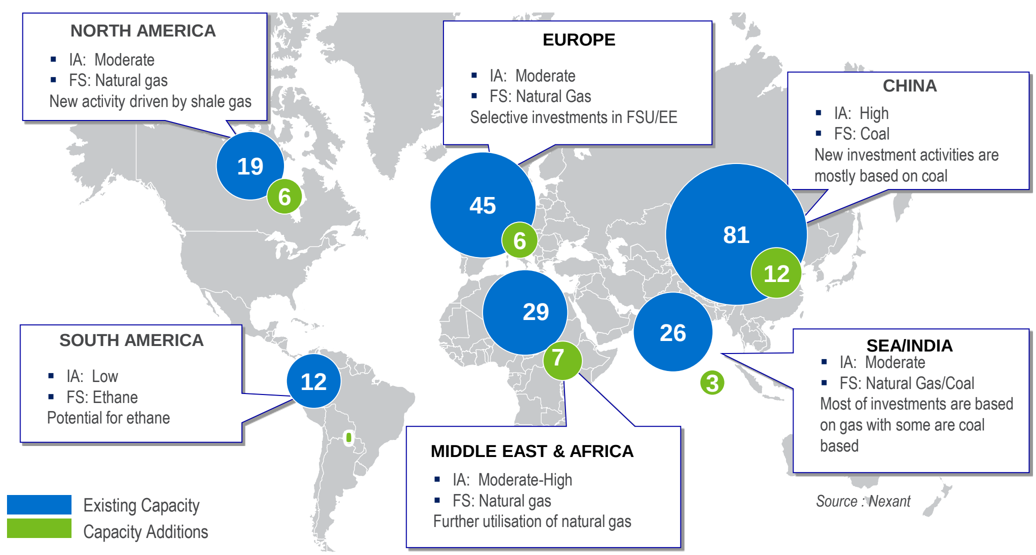
Capacity investment is led by China, North America, Eastern Europe and Middle East, driven by its own feedstock position

Ammonia Capacity (2015) and Capacity Addition (2015-2020)



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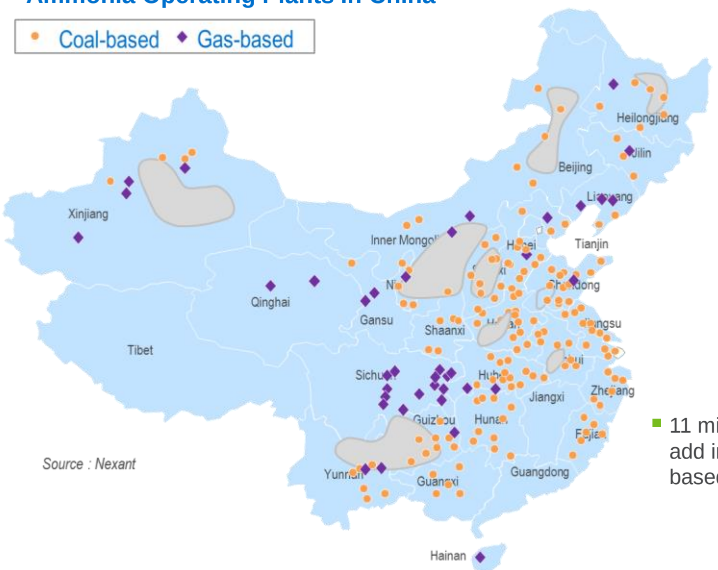
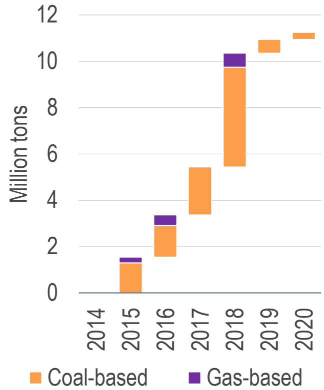
More than 300 ammonia plants in China of which 80 percent is coal based

Ammonia Operating Plants in China



Ammonia Capacity Addition



- 11 million tons of ammonia is planned to add in china with only 11 percent is gas based.

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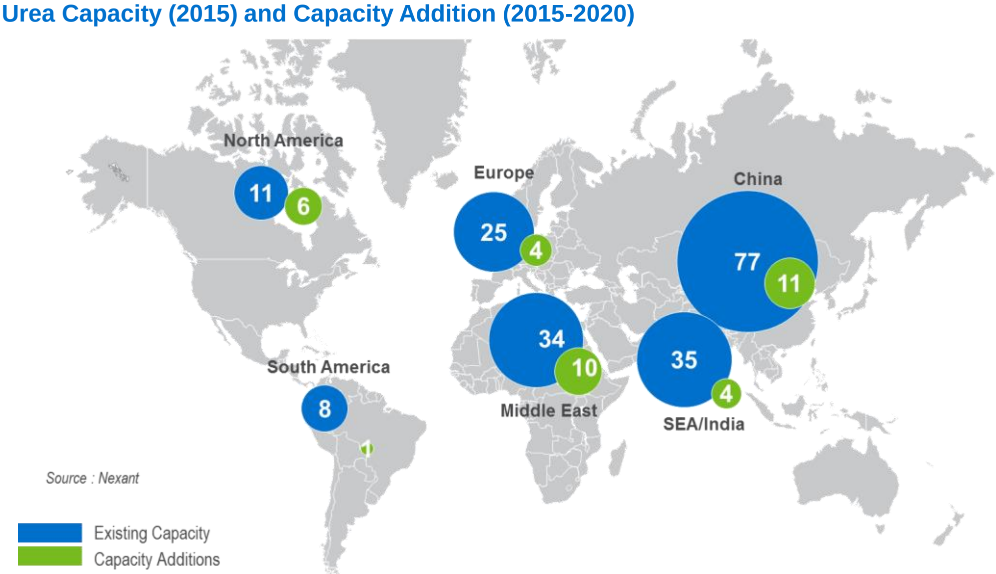
Most of urea capacity additions are integrated with ammonia plants.

Urea Capacity (2015) and Capacity Addition (2015-2020)



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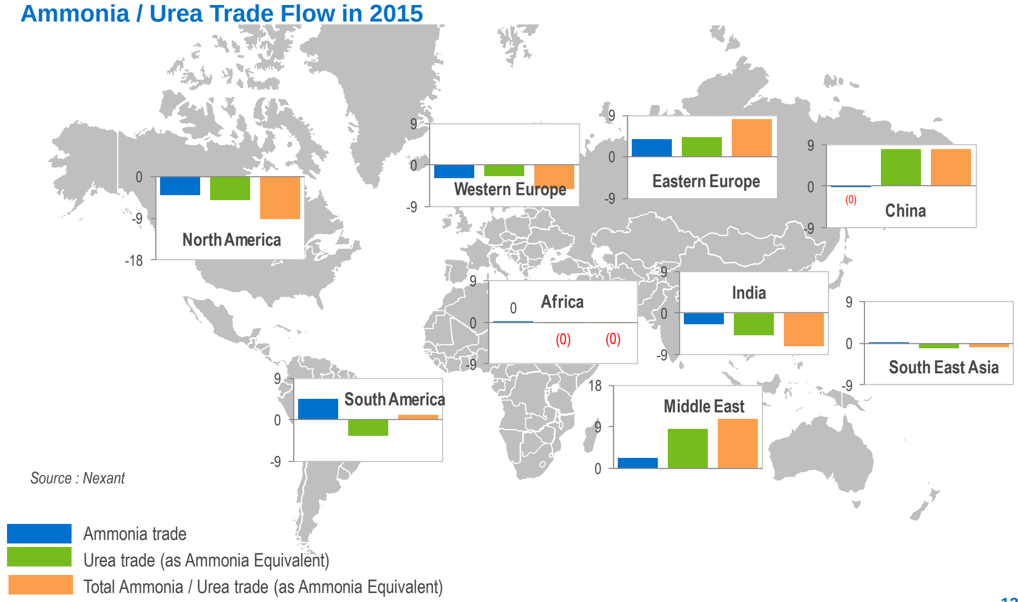
Urea trade is larger than ammonia trade

Ammonia / Urea Trade Flow in 2015



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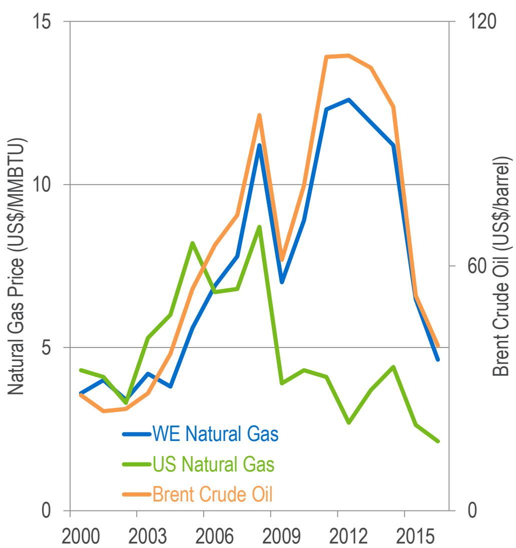
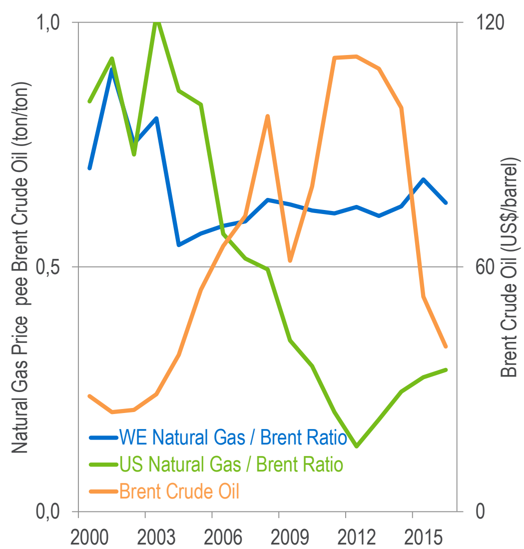
Natural gas in Western Europe trends have historically followed crude oil price while natural gas prices in the US have been low due to oversupply of shale gas

Historical Natural Gas Price in US, WE



Natural Gas Price per Brent Crude Oil Ratio



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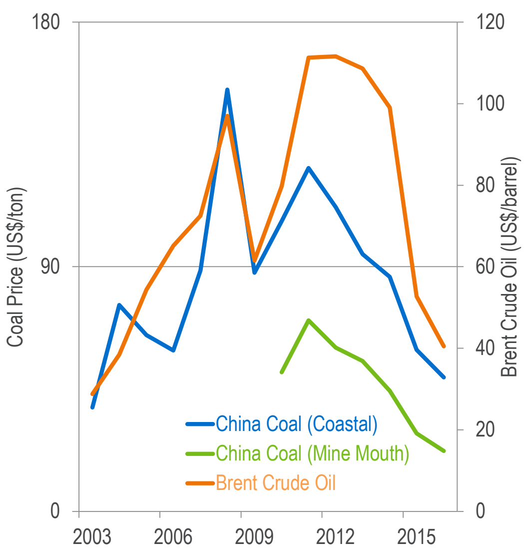
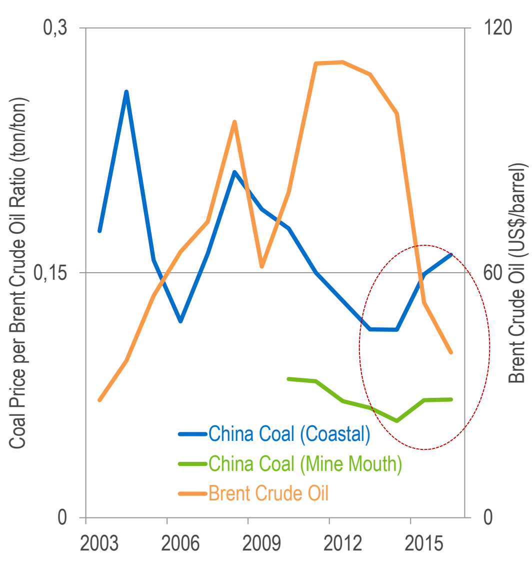
Coal prices in China are somewhat linked with oil price. Coal price is strengthened compared to oil price during low oil prices

Historical Coal Price in China



Coal Price in China per Brent Crude Oil Ratio



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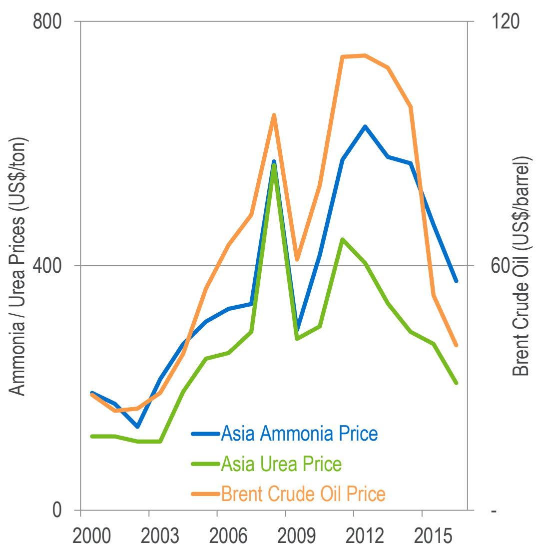
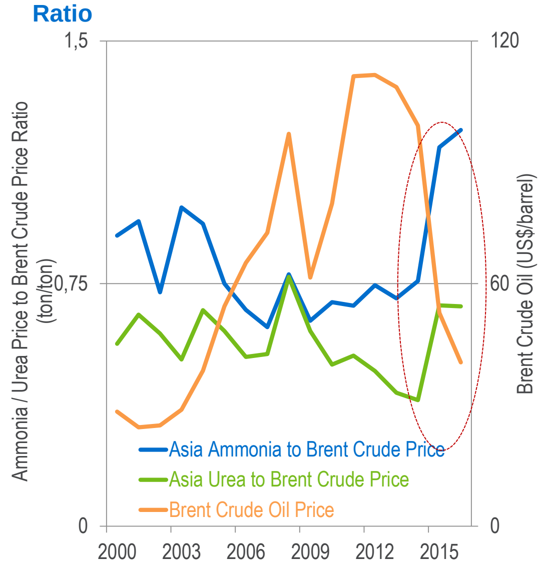
Ammonia / Urea prices in Asia are somewhat linked with the energy price. Strengthened prices are also seen during low oil price

Historical Ammonia and Urea Price



Ammonia / Urea Price per Brent Crude Oil Ratio



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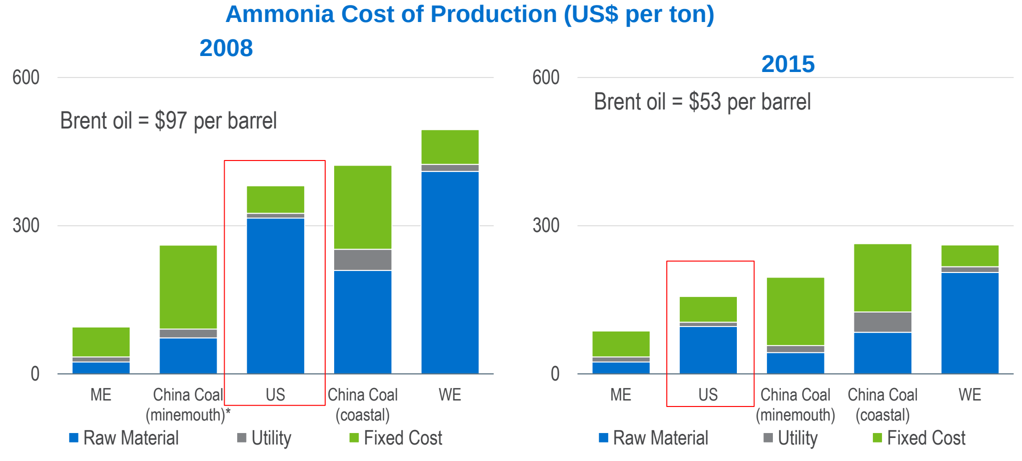
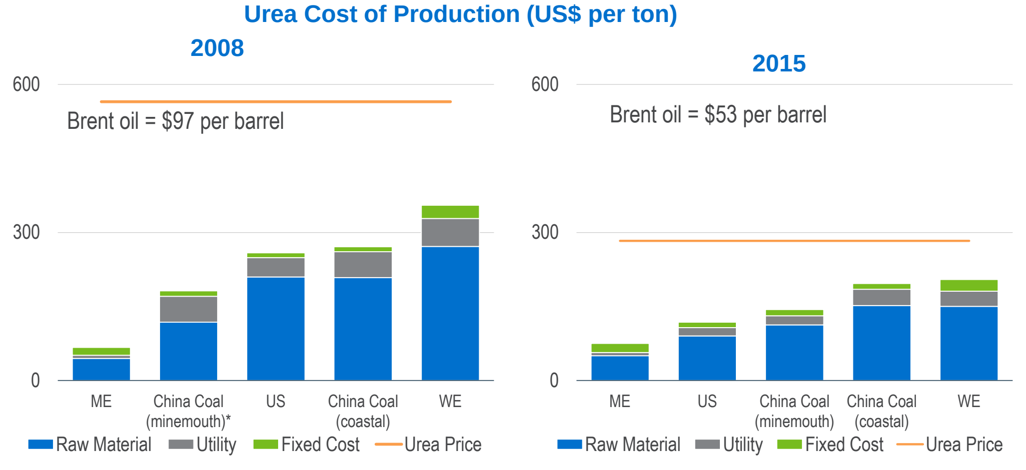
US producer becomes more competitive in recent years



- Recently, the US plant becomes more competitive due to the availability of cheap shale gas. This results in capacity additions in the US for around 7 million tons per year during 2013-2020 after the period of stable capacity since 2005

During low oil environment, the gap of competitiveness has narrowed down. WE producer maintains its high cost position during low oil while China becomes the same position as WE.



- China become less competitive compared to other producers during low oil environment

In Summary …

- Although demand growth levels are below GDP, long term demand growth trends are sustainable. The sector is mature however developing regions continue to provide the main growth drivers.
  - US/WE – low population growth, mature agricultural sector, efficient usage of fertiliser products taking place.
  - Emerging markets – good levels of growth, supported by high population/population growth, rising living standards, and improvements in agricultural techniques (growing recognition of benefits of using fertilisers)
- Low oil prices reduced production cost for WE producer which influenced the global pricing as it is considered as the high cost producer and, then, global price setter. Position of coal based China producer pushed back to the higher cost position.
- Capacity additions are expected in the region which has access to competitive feedstock e.g., shale gas in the US, natural gas in the Middle East/Eastern Europe and coal in China. However, low oil environment impacts economic development and projects might be postponed under sustained low oil environment.

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