

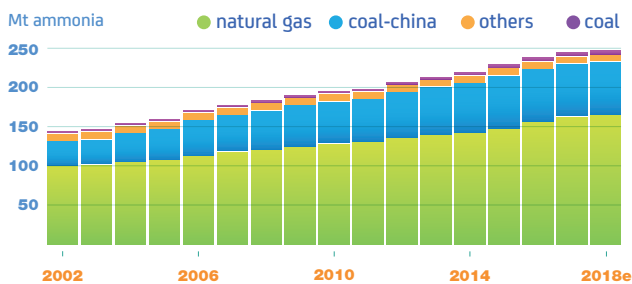
Fertilizer *facts*

Nitrogen production: why energy feedstock trends are important

What are recent developments?

Nitrogen is all around us. However, converting atmospheric nitrogen into ammonia to obtain a plant available nutrient requires energy. Access to an adequate, affordable supply of energy feedstock is of critical importance to ammonia producers.

Hydrocarbon feedstocks are the raw materials most commonly used in ammonia production. By 2018 natural gas will contribute 66% of global ammonia capacity and account for most of the incremental growth compared to 2013. Coal is projected to account for 30% of feedstock used in ammonia production by 2018. Shares of other feedstocks (e.g. naphtha, fuel oil, hydrogen, electricity) are projected to decline.

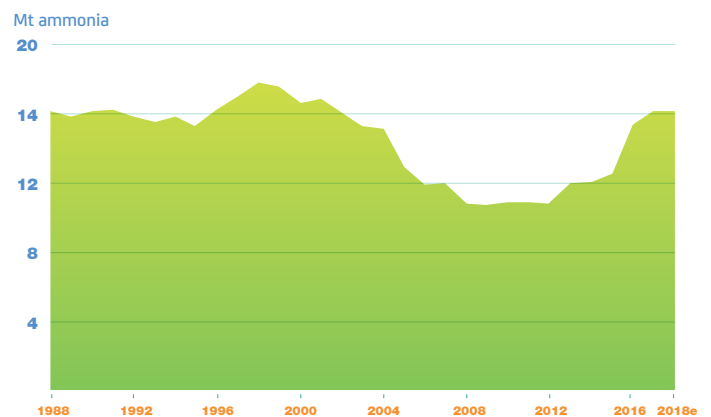


Ammonia Feedstock Evolution (2002-2018)

Significant new ammonia capacity in the United States due to shale gas development

Since 2012 there has been a surge of announcements of new capacity in the United States, spurred by shale gas development and thus relatively cheap feedstock.

US ammonia capacity is forecast to increase 25% by 2018. Of the more than 25 new nitrogen plants announced, though, only a handful are likely to be completed before that year.

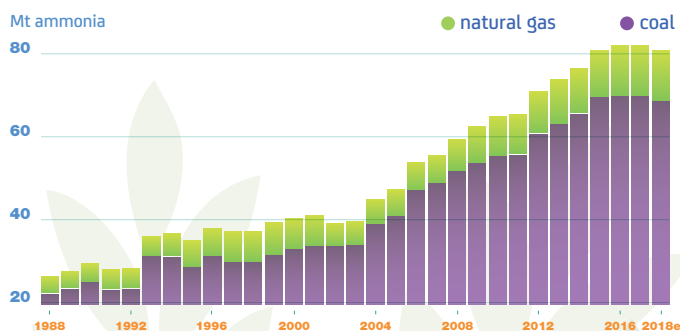


US Ammonia Capacity Evolution (1988-2018)

Coal – the basis of China’s expanding ammonia capacity

China currently accounts for 95% of global ammonia capacity based on coal feedstock. In view of China’s ample coal reserves, coal gasification technologies have been further developed and are now used extensively.

Coal-based ammonia capacity represents 86% of total Chinese ammonia capacity. It is forecast to increase by 5% between 2014 and 2016, but to decelerate thereafter.



China Ammonia Capacity Evolution (1988-2018)

What lies ahead?

Globally, ammonia capacity is forecast to continue to expand beyond 2018. Decoupling nitrogen production from hydrocarbons is not likely in the foreseeable future. In light of the nitrogen industry’s continued reliance on hydrocarbon feedstocks, the impressive energy savings that continue to be achieved in ammonia production are vitally important. (see *Fertilizer Facts*, July 2014).