



Fertilizer Industry Report

OPPORTUNITIES IN DIFFICULTIES

Domestic fertilizer market saturation with fierce competition, stable demand as well as continuously declining fertilizer price trend at least until 2018 are characterizing current Vietnam fertilizer market. This period has been proving competitive advantages of domestic fertilizer manufacturers.



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GLOBAL MARKET
VIETNAM MARKET
COMPANY

HIGHLIGHTS

Global Market

- According to IFA, worldwide fertilizer demand in the 2013-2014 cropping season increased by 3.1% compared with 2012-2013 period to approximately 184 bn tons.
- The demand structure for nitrogen, phosphate and potassium fertilizer remained stable at 60%, 23% and 16%, respectively.
- China, India and the US are the major fertilizer consumers occupying for 28%, 14% and 11% respectively of total worldwide demand.
- According to IFA, the global fertilizer production reached 243 bn tons in 2014, showed a 2.6% increase yoy, at 80% of total global production capacity.
- 200 development and expansion projects are expected to be implemented in the next 5 years.
- Considering urea supply, China is the largest supplier taking up to 29% of worldwide supply, followed by Russia with 6% and India with 8% (Fertecon, 2013).
- Phosphoric fertilizer and potassium fertilizer supply are condensed when 10 largest producers of these fertilizer types take up to 86% and 97%, respectively.
- In the 2014-2015 cropping season, total fertilizer demand is forecast to grow by 2.1%, reach 187.9 mn tons and total supply is forecast to grow by 4.9% CARG, reach 212.7 mn tons.

Vietnam Market

- In the period 2009 - 2013, fertilizer production has increased by more than 1 mn tons, CARG of 8.6%.
- According to the Statistical Yearbook (2013), Vietnam has total natural land area of 33.1 mn hectares in which agricultural area is 10.2 mn hectares, mainly concentrates in the Mekong Delta with 25% (2.6 mn hectares), the Central Highland with 20% (2 mn hectares), the Southeast Vietnam with 14% (1.4 mn hectares).
- Annually, Vietnamese farmers spend about VND110.000 bn (about USD5 bn) on fertilizers.
- Rice, corn, rubber require the largest amount of fertilizer, account for 65%, 9%, 8% of Vietnam fertilizer demand, respectively.
- According to FAO (2012), Vietnam fertilizer use density is very high, 297 kg fertilizer per hectare compared with peer countries' average level of 156 kg per ha. This explains Vietnam high crop yield of 55 quintal per hectare compared with others' average of 38 quintal per ha.
- Concerning about environmental pollution caused by fertilizer overuse, density of fertilizer use has been falling in recent years.
- In 2014, Vietnam consumed about 10.8 mn tons of fertilizer, grew by 4% while demand for NPK fertilizers is the largest share and accounts for 37% of total demand.
- According to GDVC, Vietnam fertilizer import in 2014 reached 3.79 mn tons, valued at USD1.237bn, decreased by 17.85% in quantity and 26.38% in value yoy.
- Vietnam fertilizer exports in 2014 reached about 1.078 mn tons, valued at USD383.7mn, showed a slight increase of 0.51% in volume but decreased by 8.06% in value yoy.
- According to Agromonitor, in 2015 Vietnam will need about 10.83 mn tons of total fertilizer, stay unchanged compared with 2014.
- Smuggled fertilizer phenomenon has been a major concern for Vietnam fertilizer industry.

Recommendation

Petrovietnam Fertilizer And Chemicals Corporation (HOSE: DPM)

- Current price: VND29,400/share
- 3-month average volume: 387,430 share/day
- Target price: **VND33,900/share**

In 2015, we forecast that DPM will reach VND1,268 bn of NPAT, equivalent to EPS of VND2,900/share. By DCF valuation method, DPM target price is VND33,900/share, upside 15.3%. Therefore, we recommend an ADD. In 2015, DPM as well as peer companies will suffer from new VAT tax law and benefit from lower oil price as market-based gas price policy. New projects will contribute to DPM's profit from 2016 onwards (UFC85/formaldehyde project) and 2017 (Ammonia/chemical NPK compound project). DPM has relatively stable operating cash flow, with planned dividend ratio of 25%, or dividend yield of 8.3%, which is attractive compared with current interest rate. ([details](#))

PetroVietnam Ca Mau Fertilizer Joint Stock Company (HOSE: DCM)

- Current price: VND13,200/share
- 1-month average volume: 860,430 share/day (listed on Mar 31st, 2015)
- Target price: **VND14,300/share**

Unlike DPM, DCM has been receiving support from PVN to ensure an average ROE of 12% which will reduce negative effects from exchange rate volatility, new VAT tax law and continuously declining urea price. However, a positive prospective for DCM is granular fertilizer characteristics, its plant has been in operation in three years but now is at maximum capacity and earns favour from neighbouring importers such as: India, Thailand. We project that in 2015, DCM will reach VND5.790 bn in net sales and VND852 bn in NPAT, corresponding to EPS of VND1,600/share, by DCF model, we recommend an ADD with target price VND14,100/share. ([details](#))

The Southern Fertilizer Joint Stock Company (HOSE: SFG)

- Current price: VND15,100/share
- 3-month average volume: 19,998 share/day
- Target price: **VND15,800/share**

SFG has two main products: superphosphate fertilizer and NPK fertilizers but main revenue contribution is from NPK products. NPK market under our projection will not change significantly in 2015 as stable domestic demand and pressure from fierce competition. In near future, there will be more NPK projects implementing and operating. NPK technologies of SFG is steam granulization and blending technology with low barriers to entry (60-70% of domestic NPK producers use). In 2015, we forecast that SFG will achieve VND107 bn in NPAT, corresponding to EPS of VND2,300/share. Given current PE of 7.5 for fertilizer sector, target price of SFG is VND15,800/share, so we recommend a **NEUTRAL**. ([details](#))

Lam Thao Fertilizers And Chemicals Joint Stock Company (HNX: LAS)

- Current price: VND27,700/share
- 3-month average volume: 83,554 share/day
- Target price: **VND28,500/share**

Similar to SFG, but LAS targets Northern Vietnam Market, we project that 2015 NPAT is VND330 bn, equivalent to EPS of VND3,800/share. With target PE of 7.5, target price of LAS is **VND28,500/share**, we recommend a **NEUTRAL**. ([details](#))

Acronym list

CAN	: Calcium ammonium nitrate
CIS	: Commonwealth of Independent States includes: Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan
DAP	: Diammonium Phosphate
DSP	: Double Superphosphate
FAO	: Food And Agriculture Organization
FAV	: The Fertilizer Association of Vietnam
GDVC	: General Department of Vietnam Customs
IFA	: International Fertilizer Association
MAP	: Monoammonium Phosphate
PVN	: PetroVietnam
SA	: Sunfat Ammonium
TE	: Trace Elements
UAN	: Urea Ammonium Nitrate Solution
USGS	: United States Geological Survey
Vinacomin	: Vietnam National Coal - Mineral Industries Group
Vinachem	: Vietnam National Chemical Group

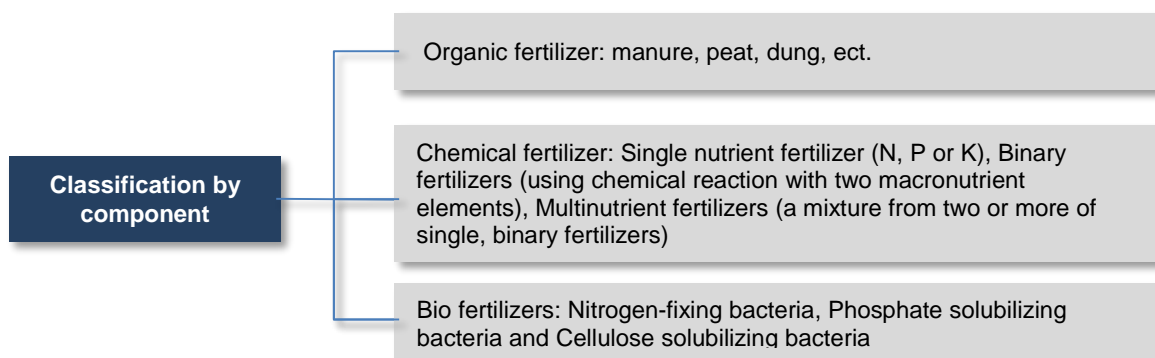
A. FERTILIZER INDUSTRY OVERVIEW

I. Global Fertilizer Industry

1. Overview

Fertilizers provide extra nutrients for plants for faster growth. There are 8 to 9 groups of fertilizer but it all consists of 13 basic nutrient types (6 macronutrient types N, P, K, Ca, Mg and 7 micronutrient types Fe, Mn, Cu, Mo, B, Co). There are also some essential elements such as: Na, Si, and Cl. Three elements that soil often lacks and must be primarily provided by fertilizer application are nitrogen, phosphorus, potash. The most common nitrogen (N) fertilizer types are ammonia nitrogen (ammonium sulfate, ammonium carbonate, ammonium chloride) and nitrate (ammonium nitrate, sodium nitrate and potassium nitrate). Phosphate (P) fertilizers are mostly made from phosphate rock while potassium (K) fertilizer is the product of potassium phosphate and potassium chloride.

Although nutrition components are similar, fertilizer is divided into 3 main groups: organic fertilizers, chemical fertilizers and microbial fertilizers depending on material to produce fertilizer. Also, fertilizer is classified as straight fertilizer, buck blending fertilizer, bio-organic fertilizer, microbial fertilizer, trace element fertilizer. ([details](#))

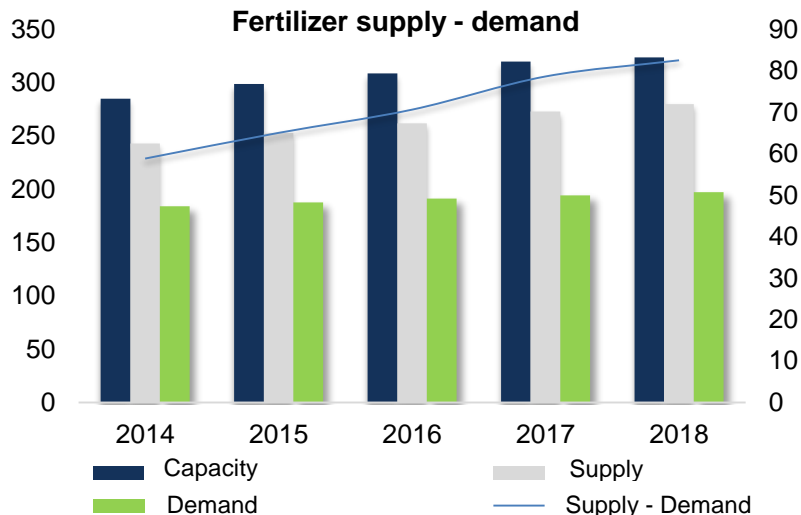
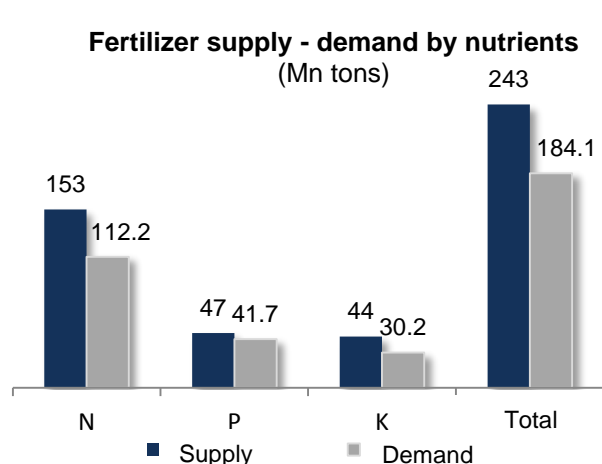


Source: FPTS Research, 2014

For a long time, organic and inorganic fertilizers have been utilized in the form of manure, dung, peat and ect. However, synthetic fertilizers have been only widely utilized after the industrial revolution. Development and use of these types of fertilizer is a remark of the British Agricultural Revolution and the Green revolution in the 20th century.

Synthetic fertilizers mainly aim to provide 3 nutrient types: N, P and K. These macronutrients can come included in various fertilizers or provided by specialized products. From these 3 element, various types of fertilizer are also created by restructuring level of each component by using chemical method or just simply mixing. Because all Vietnam listed firms are synthetic fertilizer manufacturers, this report scope just maily covers on this segment.

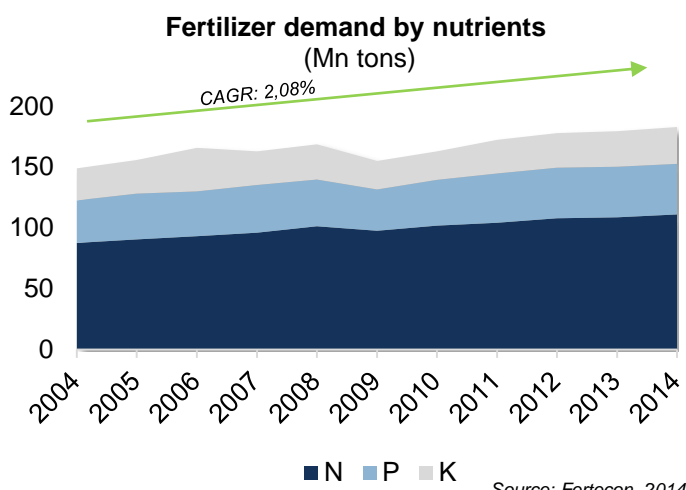
According to IFA, fertilizer demand in 2013-2014 cropping season increased by 3.1% and reached 184 bn tons. An increase in quantity of transactions and consumption pushed up productivity of factories around the world. IFA also stated that fertilizer production in 2014 was 243 mn tons (+2.6% yoy) and at 85% of worldwide production capacity. Therefore, there are 59 mn ton of excess fertilizer, globally. This trend is expected to continue to 2018 when total supply and fertilizer demand are 197 and 280 bn tons, respectively, (+82 mn tons and 40% compared with 2014).



Source: IFA, 2014

Fertilizer Demand

In the period 2004-2014, fertilizer demand consistently grew with CAGR of 2.08%. Fertilizer demand is also strongly segmented in terms of geography and fertilizer types.



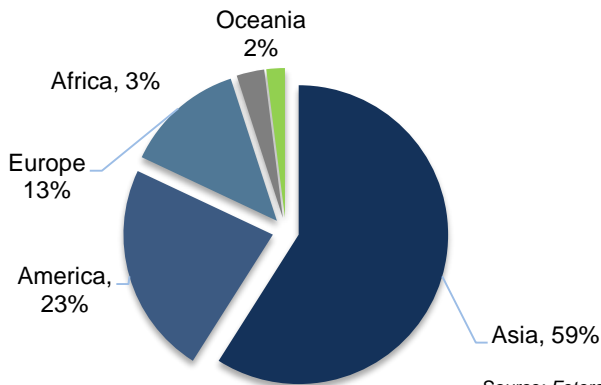
	2012	2013	2014
Weight			
N fertilizer	61.0%	60.7%	60.3%
P fertilizer	23.1%	23.3%	23.2%
K fertilizer	15.9%	16.0%	16.5%
Growth			
N fertilizer	1.6%	1.5%	1.3%
P fertilizer	2.4%	2.9%	1.8%
K fertilizer	2.0%	3%	4.7%

The fertilizer demand structure remained unchanged in 2014 with 60% of N fertilizer, 23% of P fertilizer and 16% K fertilizer. In 2014, demand for each type grew by 1.3%, 1.8%, 4.7%, respectively. Compared with 2012, N fertilizer demand is slightly decrease while the other two increase.

Considering demand structure by region, in 2014, Asia fertilizer demand was still at first place with 59% of total world demand. Ranking the second and third positions were Americas and Europe, with 23% and 13%, respectively or total global demand. Africa and Oceania accounted for the lowest proportion of demand with a total of 5% of world demand. Fertilizer demand in 2013 2014 cropping season increased in most regions with the highest growth rate at 5% in Oceania, Western Asia, Latin America and Africa. Asia increased slightly but is still the largest consumers worldwide.

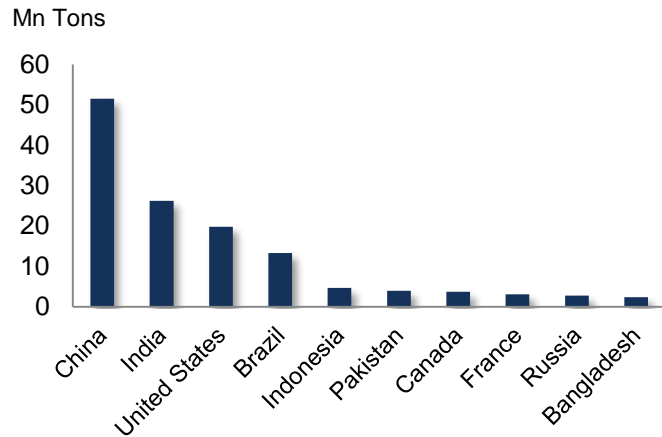
Considering demand structure by country, China, India and the US are the 3 largest fertilizer consumers with 28%, 14%, and 11%. Similar to the worldwide trend, straight nutrient consumption of N, P, K fertilizer are the majority of total demand.

Fertilizer demand by area



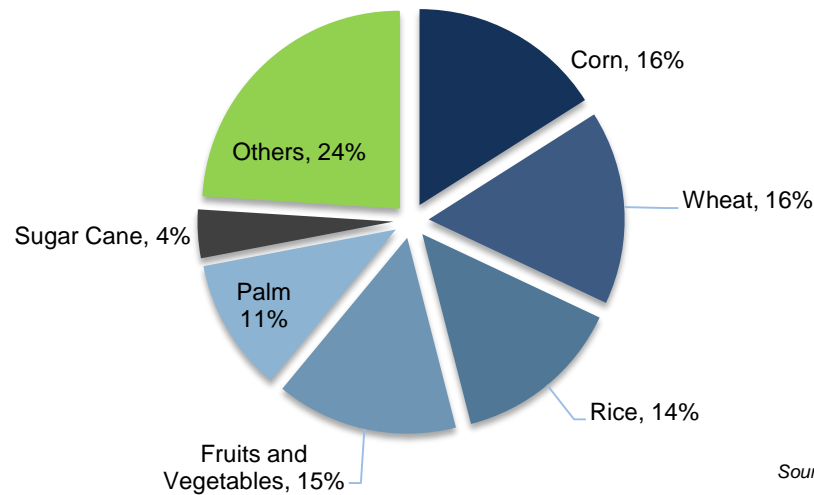
Source: Fetercon, 2013

Top 10 fertilizer-consuming country (by nutrient)



Source: Agrium, 2014

Fertilizer demand by crops



Source: IFA, 2012

Fertilizer supply

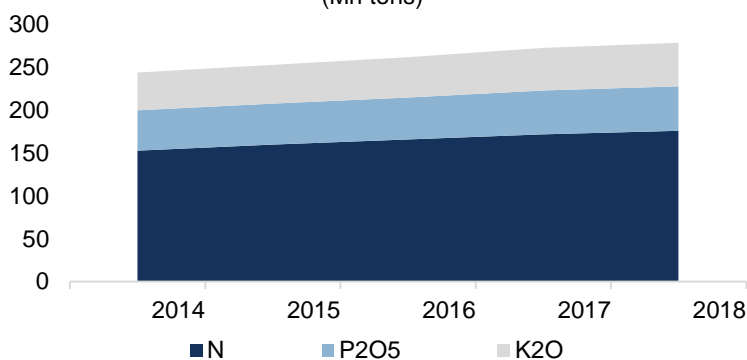
In the most recent decade, population growth, economy, commerce and resources have been the main drivers for fertilizer production development. Thus, surplus is an inevitable situation and can be considered as a necessary inflation in the economy. Overall, the worldwide fertilizer demand in recent years and the upcoming 5 years is expected to fluctuate around 85% of total fertilizer production capacity. This is a stable equilibrium which is crucial for consumer, manufacturer as well as entire industry.

Similar to demand, fertilizer supply mainly focuses on urea. In 2014, total urea production took up to 63.5% of total fertilizer production, followed by phosphoric (19%) and potassium fertilizer (17.5%) production. The fertilizer supply structure varies by countries.

Considering urea supply, according to Fetercon 2013, China contributed 29% of global urea supply, followed by Russia with 6% and India with 8%. However, urea supply concentration is not as phosphorus and potassium fertilizer while top 10 phosphoric and potassium fertilizer supplying countries account for up to 86% and 97% of worldwide supply.

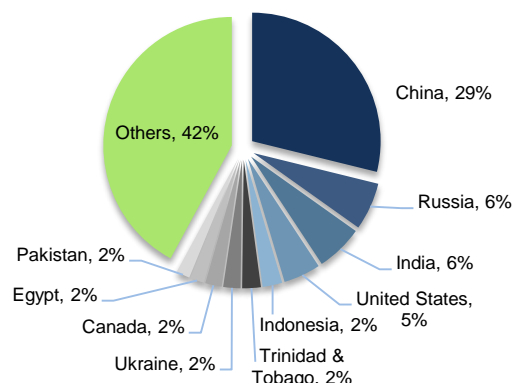
The dominant role of China is also confirmed when it contributed 35% of total phosphorus fertilizer supply, followed by America (18%) and Morocco (9%). In potash market, Canada, Russia and Belarus are the top 3 countries with total production accounting for over 50% of the supply, they are 34%, 17% and 13%, respectively.

Fertilizers supply by components
(Mn tons)



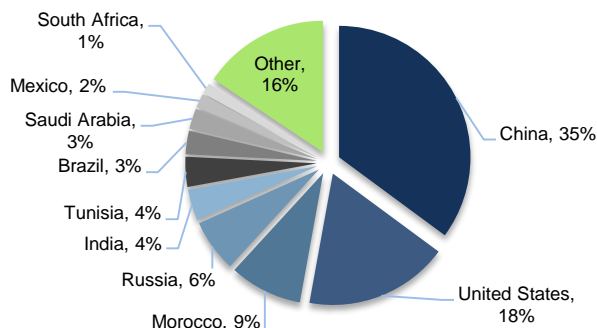
Source: IFA, 2014

Urea supply by country



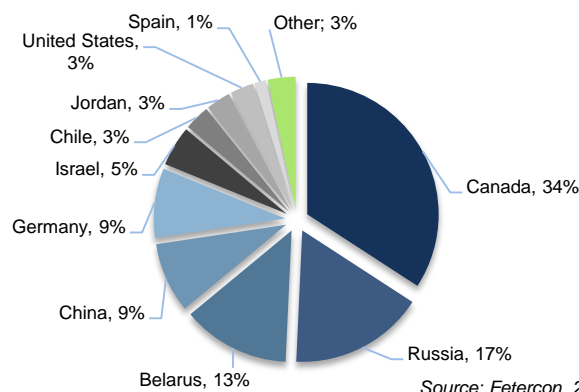
Source: Fetercon, 2013

Phosphorus fertilizer supply by country



Source: Fetercon, 2013

Potassium fertilizer supply by country



Source: Fetercon, 2013

2014 is considered to be a favorable year for fertilizer industry as a result of economic factors, seasonality, volatility of oil prices and commodity prices. With demand recovery in 2014, global fertilizer trade has begun to warm up with higher supply. The increased volume of trade and consumption have stimulated production of fertilizer to satisfy newly arisen demand.

Fertilizer price movement

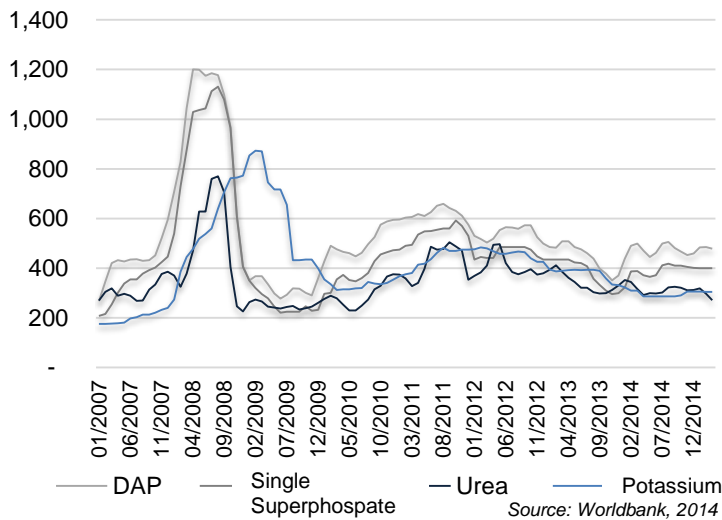
Profitability of fertilizer companies is jointly determined by fertilizer prices, crop prices, fertilizer demand, political and economic activity, exchange rates, prices of input raw materials, industry structure etc.

Considering fertilizer prices, in recent years it can be observed that there are strong linkages between fertilizer prices and: **(1)**. Gas prices (as this directly affects production cost); **(2)**. Crop price (as this determines budget which farmers invest in fertilizers); **(3)**. Global economic development (as this determines overall demand for agriculture products).

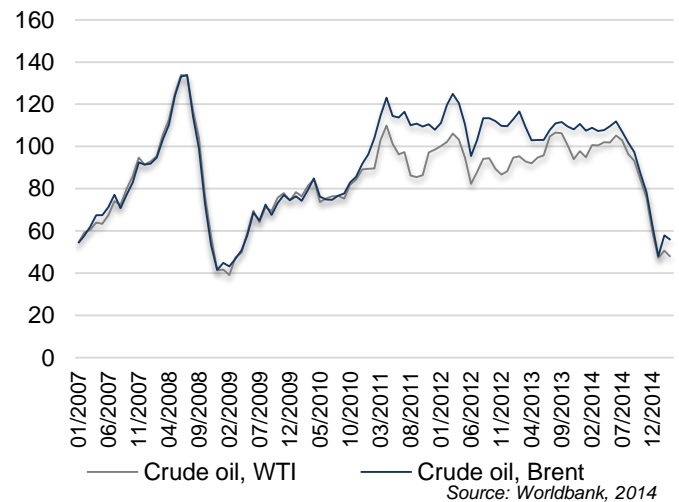
According to WB, since 2009, with Financial Crisis impact, consumption is sharply decrease, which leads to a plunge in the Food and Cereal Price Index, then indirectly pressures fertilizer

price as agriculture activities frozen. After a time of agriculture shortage, price of food and cereal rose in 2011, which boosted fertilizer price. In the same year, fertilizer peaked with DAP price at USD619/ton, DSP price at USD538/ton, urea price at USD420/ton and K fertilizer price at USD435/ton. Later, fertilizer price fell in 3 consecutive years. In 2013, average fertilizer price fell by 17.1% yoy, was only at an average of USD286.6/ton. 2014 prices continued to fall, yet slower at a rate of 4.7%, to USD273.1/ton.

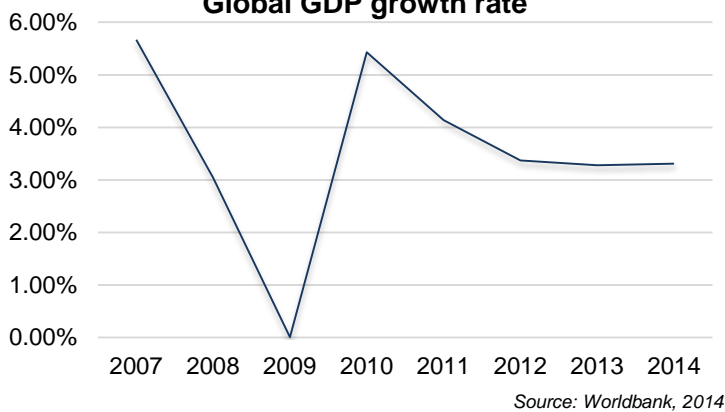
Fertilizers price (USD/Ton)



Crude oil price (USD/Barrel)



Global GDP growth rate

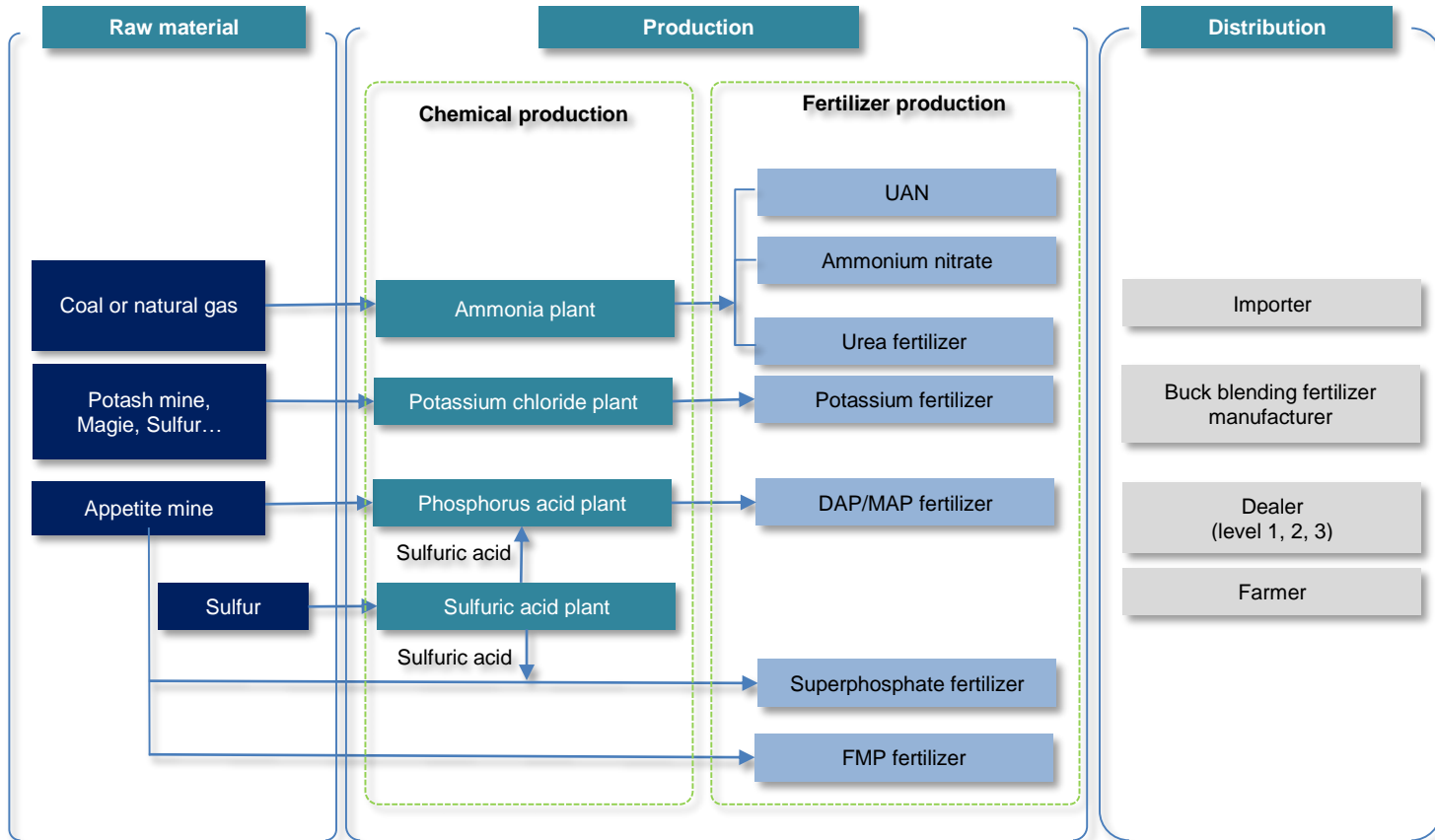


Crop price index



2. Global Value Chain

Synthetic fertilizer sector's value chain begins with acquiring of natural resources such as: natural gas, coal and sulphur etc; then production of needed chemical: ammonia, potassium chloride, phosphoric acid, sulfuric acid etc. Chemical and physical mechanisms are applied to create various types of fertilizer. Lastly, fertilizer will be distributed to the final consumer by importers and fertilizer dealers.

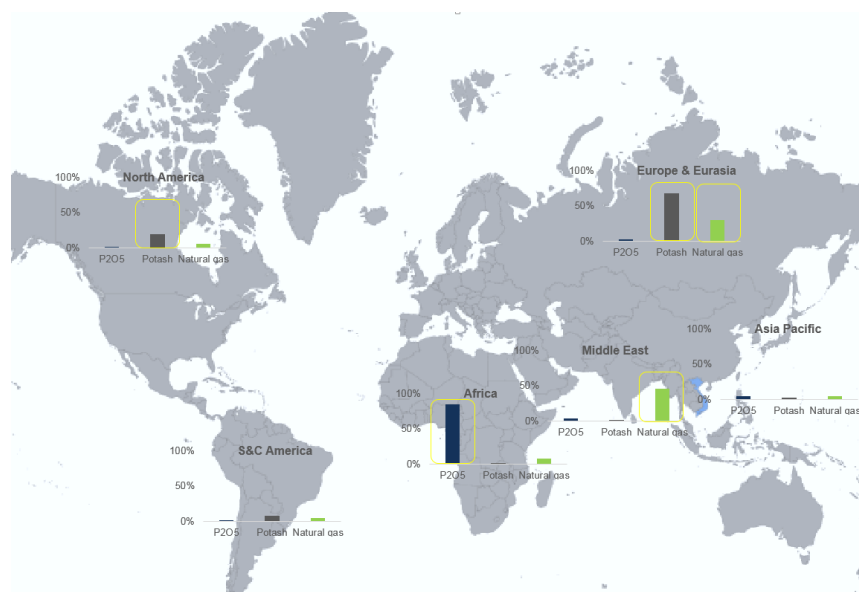


Source: FPTS Research, 2014

2.1. Raw material

Natural resources include in the fertilizer production are: coal, natural gas (N fertilizer), potash ore (K fertilizer), apatite (P fertilizer), etc.

Fertilizer raw material by region



Source: FPTS Research, 2014

Fertilizer sector significantly depends on natural resources as well as technological advancement, financial ability. Specifically:

- **Resources for N fertilizers:** Two third of the N fertilizers in the world are made from natural gas, the other one third are from coal in which 95% are made in China. The global reserve of natural gas in 2013 was 186 trillion m³, which mainly concentrated in the Middle-East, accounted for 43.2%. According to BP, the global coal reserve is 892 bn tons in 2013, in which the US, Russia and China possess the largest reserve with 27%, 17.6% and 13% of total global reserve respectively. ([details](#))
- **Resources for P fertilizers:** P fertilizers are mainly made from apatite and phosphate rock. In particular, production using phosphate is more popular. Apart from small number of underground mines, phosphate ores are mainly mined in open-pit mines in various sites worldwide. Global phosphate reserve is 63 bn tons, mainly located in Morocco (75% of global reserve), followed by the US (8%), Sahara (6%). However, according to data in 2011, China is the largest phosphate rock manufacturer (81 bn tons), followed by Morocco (28 mn tons) and Russia (11.2 mn tons). These nations take up to 75% of phosphate rocks production. ([details](#))
- **Resources for K fertilizers:** K fertilizers are produced from potash mines. Potash mines locate in vast quantity in only few countries, in which Canadian mines are among the highest quality and quantity worldwide. According to USGS, potash mines mainly locate in Canada and Russia, take up to 81% of the world potash reserve. Belarus holds the third place taking only 3% of total reserve and others countries such as China, Brazil and Chile only account for 1% to 3% of the reserve. The world reserve is currently at 210 bn tons of potash and is expected to meet demand of 288 production years (USGS, 2013). Saskatchewan in Canada has the largest reserve of 37% and has the best quality with 25-30% K₂O. ([details](#))

In recent years, material prices for fertilizer production fell significantly by 26% (material for P fertilizer), 21% (material for K fertilizer). Regarding natural gas prices, 2014 average price was approximately the same with that of 2013. However, due to effect of oil price plunge from 2Q2014, end-of-year natural gas price dropped by 25% compared with mid-year level; thus it has been creating input cost advantages for fertilizer production.

2.2. Fertilizer Manufacturing

Overall, demand for three types of fertilizer tends to increase in 2014. As the result of falling oil price, there is an increasing number of fertilizer factories (especially N fertilizer) building to take advantage of a low cost of production. According to IFA, in 2013, the US built an urea factory in Dakota to expand production line of Solagan factory, which is expected to push total production of these two factories by 1.6 mn tons per year. In North Africa and Middle East, various urea factories are expanded and technologically improved. Thus total production is expected to reach approximately by 1.5-2 mn ton per year.

This section in the value chain produces the highest gross profit margin in value chain in 2013-2014 period, it is 42%. The following table describes some major companies in this sectors:

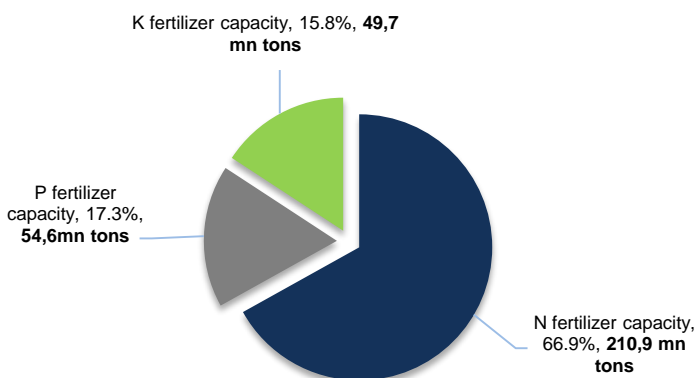
Company	Country	Main products	Gross profit margin 2013-2014	Revenues 2014 (mn USD)
SAUDI ARABIAN FERTILIZER CO	Saudi Arabia	N fertilizer	68%	1,170
SOC QUIMICA Y MINERA CHILE-B	Chile	K fertilizer	31%	1,985
URALKALI PJSC	Russia	K fertilizer	74%	3,507
CF INDUSTRIES HOLDINGS INC	United States	P, K fertilizer	42%	4,673
K+S AG-REG	Germany	K fertilizer	43%	5,002
ISRAEL CHEMICALS LTD	Israel	P, K fertilizer	37%	6,021
ISRAEL CORP LIMITED/THE	Israel	P fertilizer	37%	6,021
POTASH CORP OF SASKATCHEWAN	Canada	N, P, K fertilizer	41%	7,010
MOSAIC CO/THE	United States	P, K fertilizer	21%	8,923
AGRIUM INC	Canada	N, P, K fertilizer	23%	15,806
Avg.			42%	

Source: Bloomberg and FPTS Research, 2014

N, P and K fertilizers are formed by using ammoniac (NH₃), phosphoric acid (H₃PO₄) and potash ore. Production of these intermediate chemicals increase by 1.9% in ammoniac production, 3.3% in phosphoric acid production and 5.3% in potash ore. [\(details\)](#)

Global production of fertilizer as a whole in 2013 was 315 mn tons and top 5 countries accounted for 52% of total fertilizer production. China is largest manufacturer, reaches 84 mn tons (in 2013), takes up 27% of global supply. Considering production N and P fertilizer, China is still the world leader with 60.9 mn tons and 19.2 mn tons, respectively while worldwide production capacities are 211 mn tons and 55 mn tons, respectively. Regarding the production of K fertilizer, thanks to advantages in potash mine location, Canada is the largest producer, accounts for 34% of total global production with 17 mn tons.

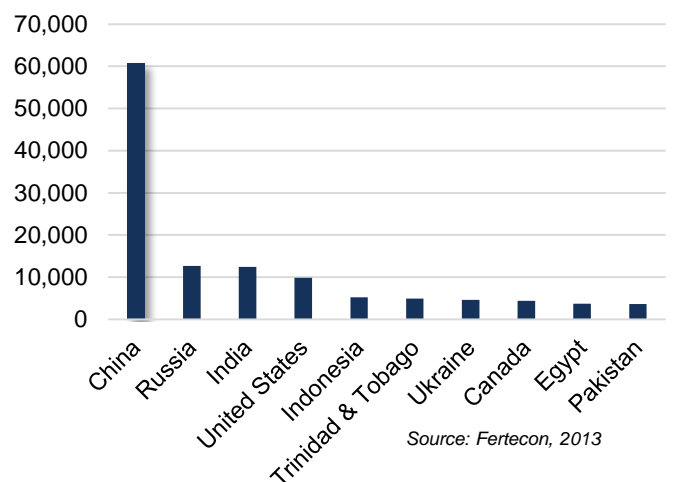
Worldwide fertilizer production capacity



Source: Fetercon, 2013

N Fertilizer Supply

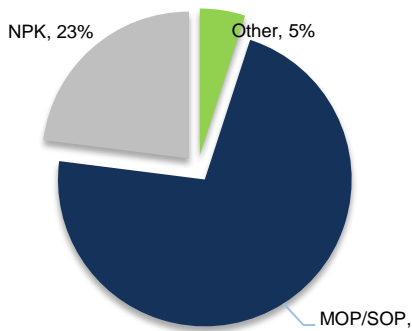
(thousand tons)



Source: Fertecon, 2013

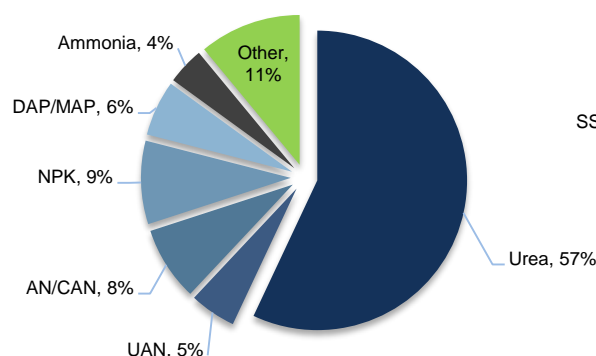
After N, K, P components are manufactured, other fertilizer types will be synthesized. With N fertilizer, urea is main product with over 50% of N fertilizer volume in the world, in addition to other fertilizers such as UAN, AN/CAN. Similarly, P fertilizer is used to produce DAP/MAP, NPK ect. K fertilizer mostly makes MOP/SOP with 72% of K fertilizer output and NPK with 23% of K fertilizer output. NPK fertilizers are produced from these 3 fertilizer types. [\(details\)](#)

K fertilizers



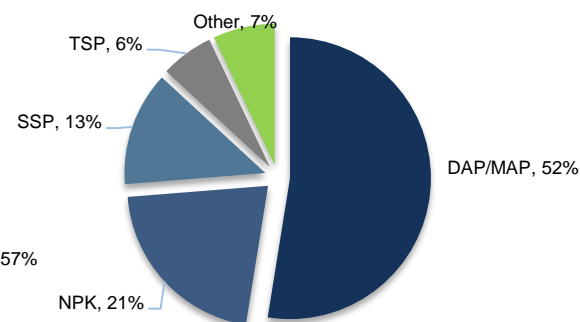
Source: IFA, 2011

N fertilizers



Source: IFA, 2011

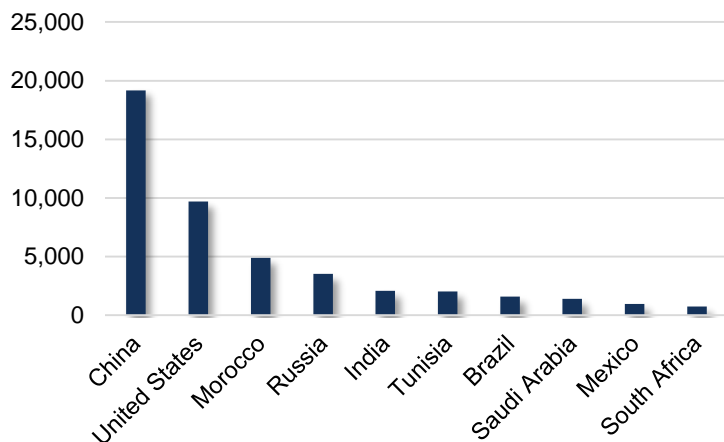
P fertilizers



Source: IFA, 2011

P fertilizer supply

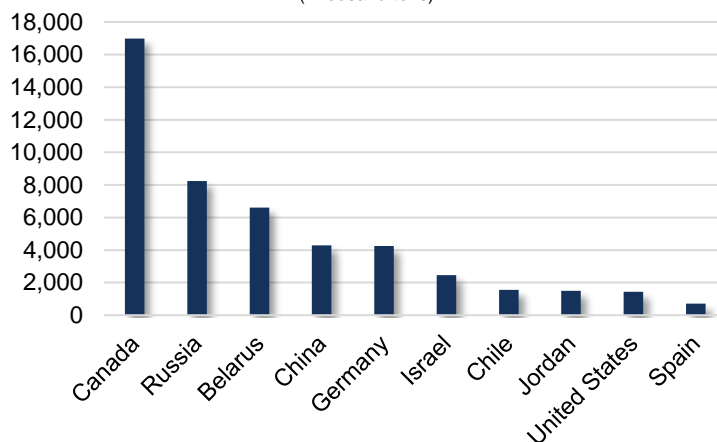
(Thousand tons)



Source: Fertecon, 2013

K fertilizer supply

(Thousand tons)



Source: Fertecon, 2013

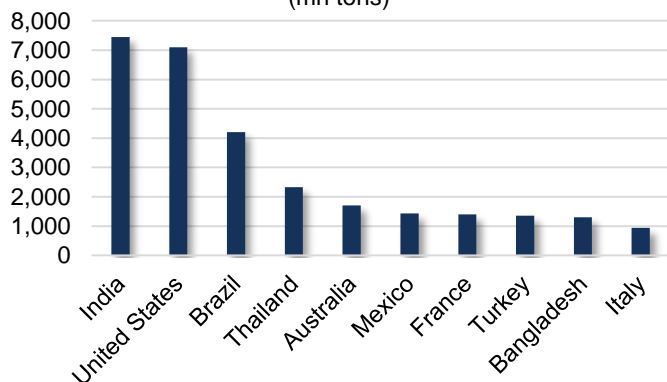
2.3. Fertilizer distribution

N distribution: in 2014, total fertilizer import was 46 mn tons (-0.4% yoy). Asian is the largest fertilizers importing continent in the world, imports one third of worldwide production. While, India, the US and Brazil are the top three countries, account for 17%, 16%, 12% of total global imports in 2014.

In 2014, Middle East exported a volume of 15.8 mn tons of urea and is the world largest exporter occupying 34% of 46 mn tons in urea exported globally. On the other hand, China, Russia and China take up a total of 51.5% worldwide urea export. In which, China is the largest urea export country with 11.5 mn tons in 2014. Chinese export has been increasing consistently over the years, however, according to Fertecon, from 2015 onwards, Chinese fertilizer export will reduce by 26% from 2015 to 2018 when it will export is only 3.5 mn tons in 2015.

Top fertilizer importers

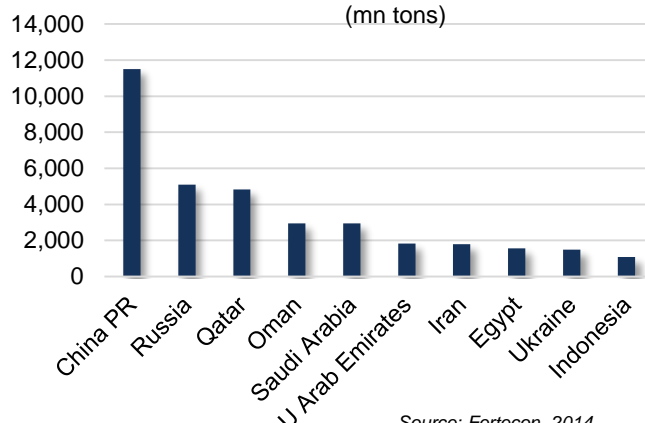
(mn tons)



Source: Fertecon, 2014

Top fertilizer exporters

(mn tons)

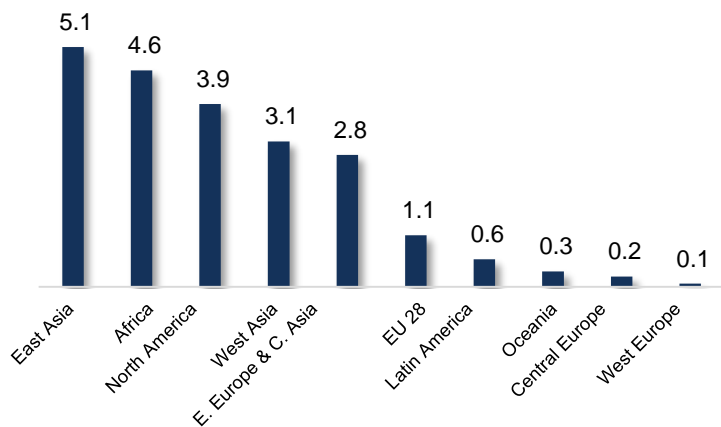


Source: Fertecon, 2014

P fertilizers distribution: Compared with the trade value of N fertilizer (46 mn tons) and K fertilizer (41.8 mn tons), the trade value of P fertilizer is considerably smaller, is only at 20.7 mn tons. In which, East Asia, North Asia and Africa have the largest export value (66% of 2013 total production). On the import side, South Asia and South America are the largest import areas with import volume are 5.5 mn tons and 3.2 mn tons respectively.

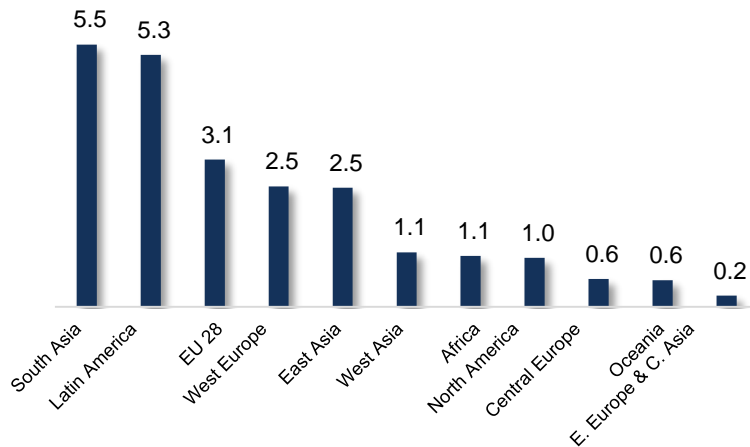
K fertilizers distribution. According to IFA, the total global K fertilizer import in 2013 was 41.8 mn tons (+9% yoy). North America, Eastern Europe and Central Asia region are 3 largest K fertilizer exporters accounting for 72% of export volume. In import side, East Asia and South America are the two largest importers with 32% and 23% of global trade, respectively.

P fertilizer export by region
(mn tons)



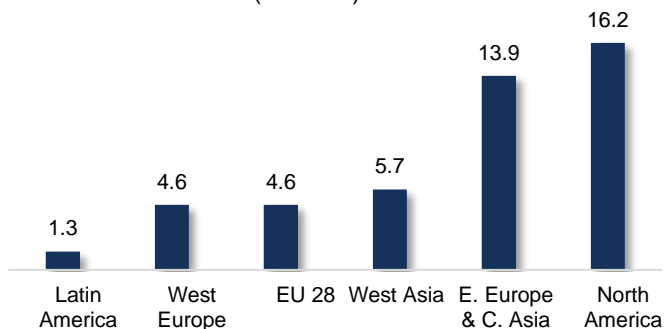
Source: IFA, 2013

P fertilizer import by region
(mn tons)



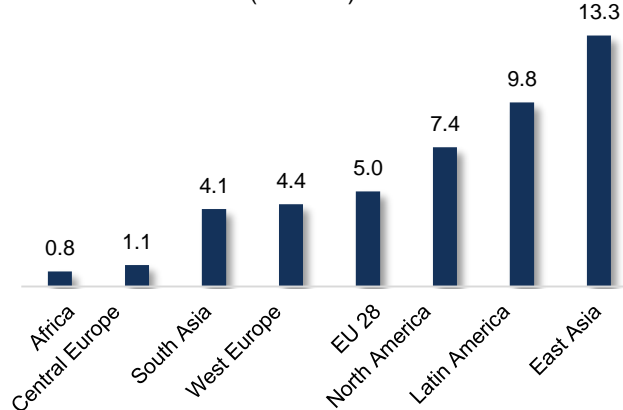
Source: IFA, 2013

K fertilizer export by region
(mn tons)



Source: IFA, 2013

K fertilizer import by region
(mn tons)



Source: IFA, 2013

II. Vietnam Fertilizer Industry

1. Overview

For long, Vietnamese farmers are familiar with organic fertilizers (manure, legumes, etc.) to nurture their crops. With the introduction of superphosphate technology, the chemical fertilizer industry started to overhaul agriculture industry which significantly improves crop yields. In 1960, Vietnamese farmers started to apply synthetic fertilizers (containing N, P, K) in conjunction with organic fertilizers to provide nutrients for plants. History of Vietnam fertilizer industry could be divided into three main periods:

- **Before 1972:** Mainly used N fertilizer, use of P and K fertilizer were limited.
- **From 1972 to 1992:** After N and P fertilizers, organic fertilizers were popularly used.
- **From 1992 to present:** N, P, K and organic fertilizer are used widely in Vietnam.

By shifting from traditional organic agriculture model to industrial model, productivity of Vietnam agriculture industry is significantly improving, especially from 1990 onwards. Agricultural productivity has achieved by contribution of NPK, NPKS fertilizers and 002E organic fertilizer.

Farming land: Agriculture is a key sector in Vietnam economy, more than 70% of Vietnam population are farmers. According to the Statistical Yearbook in 2013, total natural land is 33.1 mn ha, in which, agriculture land is 26.4 mn ha, non-agricultural land is 3.8 mn ha and unused land is 2.9 mn ha. In agricultural land, land for plantation takes up the largest share: 19.4% (approximately 6.4 mn ha), in which, rice area is 4.1 mn ha (12.4%) and others annual plant area is 2.3 mn ha (6.9%). Perennial crop area is 3.8 mn ha in which key commodity crops takes up 2.6 mn ha accounting for 69.1% including: 955.6 thousand ha of rubber area, 635 thousand ha of coffee area, 67.9 thousand ha of pepper area and 832 mn ha of other plants (cocoa, cashew, ect). ([details](#))

Region	Rice	Perennial plant	Forest land	Total area
Mekong Datal	1,902	569	305	3,399
Red River Delta	597	75	130	950
North Central Coast	401	224	3,160	4,068
Northeast	393	320	4,163	5,266
South Central Coast	286	329	2,341	3,393
Southeast	180	1,044	511	1,904
Northw est	169	84	1,934	2,523
Central Highlands	168	1,144	2,862	4,869

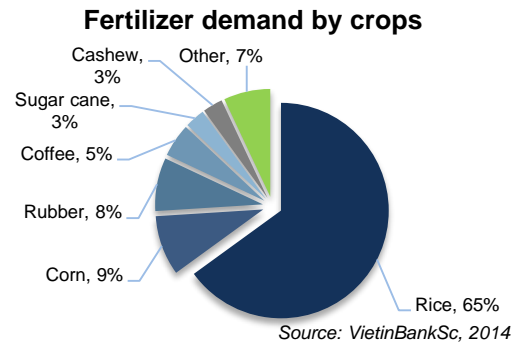
Crop	Fertilizer demand (ton)		
	N	P	K
Rice	1,485,864	1,598,105	219,739
Corn	342,255	160,702	55,241
Sugar cane	116,935	69,759	39,863
Coffee	260,461	400,000	170,000
Rubber	140,773	292,832	41,833
Cashew	51,647	233,898	97,458
Citrus tree	29,333	142,154	30,462
Longan, rambutan	50,704	30,000	20,000
Other fruit tree	43,902	40,000	20,000
Total	2,521,875	2,967,450	694,596

Source: Statistical Yearbook, 2013

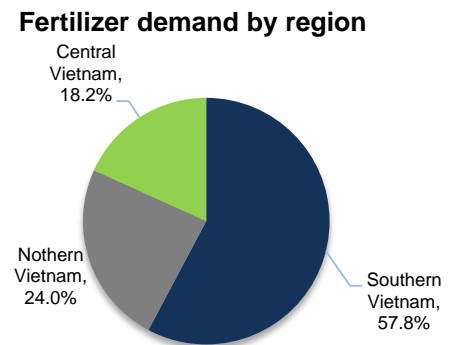
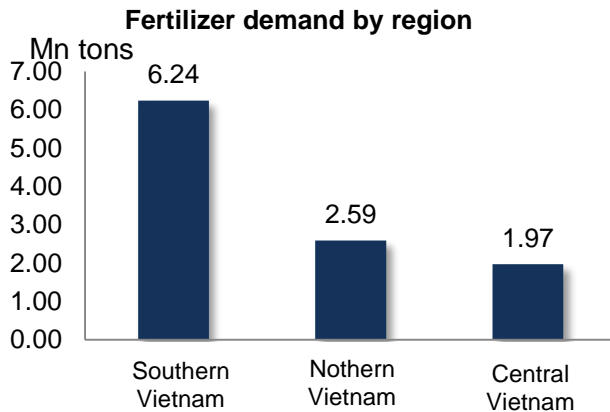
Fertilizer demand by crop: In general, crop requiring the most fertilizer application is rice, accounts for approximately 65% of total fertilizer demand, followed by corn crop with 9%. Short-term crop such as sugarcane, peanuts, soybeans, cotton, vegetables etc use 6% of fertilizer; the other plants including rubber, coffee, tea, pepper, cashew, fruit, etc account for 20%.

Crop	Fertilizer demand (ton)		
	N	P	K
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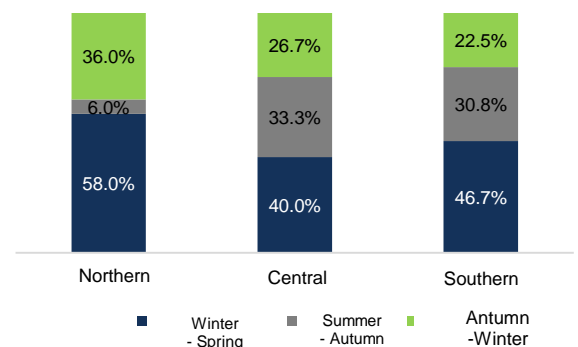
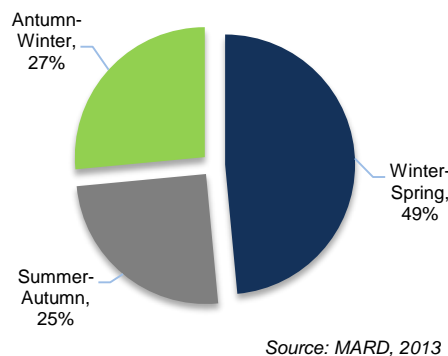
Source: MARD, 2013



Demand by region: Fertilizer demand mainly is concentrated in the Southern Vietnam with a volume of 6.2 mn tons, accounting for 58% of total Vietnam fertilizer consumption. Because this region mainly plants rice and industrial crops such as: coffee, rubber, pepper. Northern Vietnam and Central Vietnam consume 2.6 mn tons and 1.97 mn tons, respectively.



Demand by season: There are three main cropping seasons in Vietnam: Winter-Spring (late November to March of the following year), Summer-Autumn (April to August) and Autumn-Winter (late August to late November). Agricultural production mainly concentrates in the Winter-Spring season. According to MARD statistics, demand in Winter-Spring crop accounts for 49% of total fertilizer demand per year, the other two seasons have relatively equal demand of about 25% of total demand. Fertilizer demand in Northern Vietnam is clearly separated by different time of a year. While Summer - Autumn season only takes up 6% of total demand, that of Winter-Spring season is up to 58% of fertilizer demand. Central Vietnam and Southern Vietnam do not have that difference and fertilizer demand is relatively stable throughout the year. Briefly, Winter - Spring has seasonally highest fertilizer demand.



Fertilizer consumption: Annually, Vietnamese farmers spend about VND110.000 bn (about USD5 bn) on fertilizers. Compared with nearby countries, Vietnam fertilizer consumption is only lower than China in terms of fertilizer use density. Vietnam fertilizer application density is 297 kg/ha. As a result, Vietnam rice crop has the highest yield compared with neighbouring countries: 55 quintal/ha compared with average yield of 38 quintal/ha. But it is still lower than China's with 67 quintal/ha. This can be explained by intensive fertilizer consumption level of Vietnam and China. ([details](#))

Recently, Vietnam launches "Large Field Model" campaign to increase crop productivity and effectiveness of agriculture chemical use. Statistics show that degree of agricultural chemical use can be reduced by 15%. Therefore, in the long run, it is expected that fertilizer demand will drop as the model will gradually popularize. On the other hand, cooperation with other agricultural-related companies will ensure stable demand for fertilizer manufacturers. ([details](#))

1.1. Domestic fertilizer supply

From 2012, by building new plants and expanding production scale, Vietnam now has a surplus supply of NPK, phosphorus, urea fertilizers. DAP production also meets about 30-35% of domestic demand and supply capacity will expectedly increase when DAP Plant No.2 (in Lao Cai) is in operation with a capacity of 330,000 tons/year in 2015. Meanwhile, SA and Potassium fertilizers still depend on import source.

There are 15 large fertilizer manufacturers in Vietnam which take up 95% of total domestic production (in 2013). Vinachem has 9 manufacturers, PVN has two manufacturers. In 2009-2013 period, fertilizer production capacity increased by 1 mn tons, with CAGR of 8.6%. In 2014, Vietnam produced about 8 mn tons of chemical fertilizers, met 80% of demand. For details, 3.8 mn tons of NPK fertilizer, 2.4 mn tons of urea, 1.8 mn tons of phosphorus fertilizers, 330 thousand tons of DAP fertilizer were produced.

Vietnam major fertilizer manufacturers

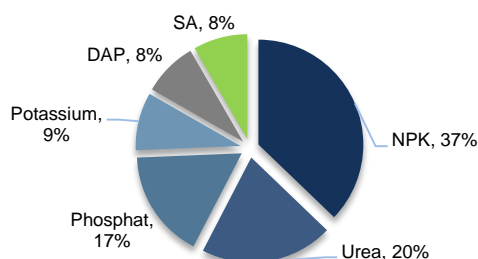
Group	Company	Product/Capacity (thousand ton/year)				
		FMP	NPK	Superphosphate	Urea	DAP
Vinachem	Ninh Binh Phosphate Fertilizer JSC	300	150			
	The Southern Fertilizer JSC		300	200		
	Lam Thao Fertilizers And Chemicals JSC	140	700	750		
	Van Dien FMP Fertilizer JSC	270	150			
	Binh Dien Fertilizer JSC		500			
	Can Tho Fertilizer and Chemical JSC		200			
	Habac Nitrogenous Fertilizer & Chemicals Company Limited				195	
	Ninh Binh Nitrogenous Fertilizer Ltd. Company				560	
	DAP No.1 – Dinh Vu					330
	DAP No.2 – Lao Cai					330
PVN	Petrovietnam Fertilizer & Chemicals Corporation				800	
	Petrovietnam Fertilizer & Chemicals Corporation				800	
Other	Five Star International Group		300			
	Baconco Group		200			
	General Materials Biochemistry Fertilizer JSC		360			
	Japan Vietnam Fertilizer Company		350			

Source: Vinachem, 2014

1.2. Domestic fertilizer demand

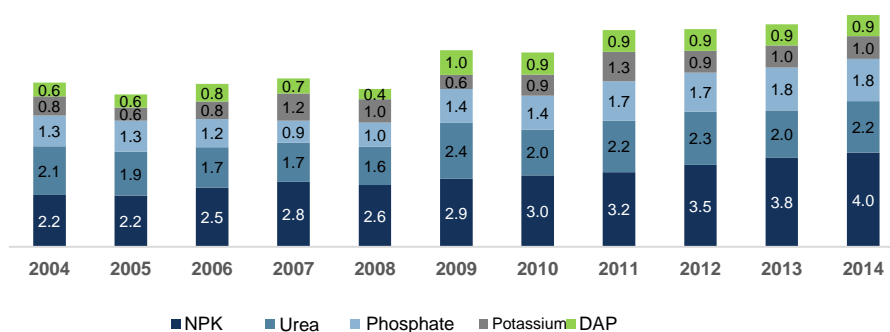
In Vietnam, commonly used fertilizer types are: urea, SA, DAP, phosphorus, potassium and NPK fertilizer. While demand for urea, potassium, phosphorus fertilizers remains unchanged or falls slightly, demand for compound fertilizers such as NPK, DAP increases slightly. According to FAV, Vietnam fertilizer demand in 2014 is about 11 mn tons (+4% yoy) of chemical fertilizer and 400-500 thousand tons of microbial fertilizer and foliar fertilizer. In particular, Vietnam farmers use 2.2 mn tons of urea fertilizer, 900 thousand tons of DAP, 900 thousand tons of SA, 960 thousand tons of K fertilizer, 1.8 mn tons of P fertilizer and 4 mn tons of NPK. This reflects changing cultivation practices of farmers toward compound fertilizers use.

Fertilizer demand by type



Source: MARD, 2014

Vietnam fertilizer demand by year (Mn tons)

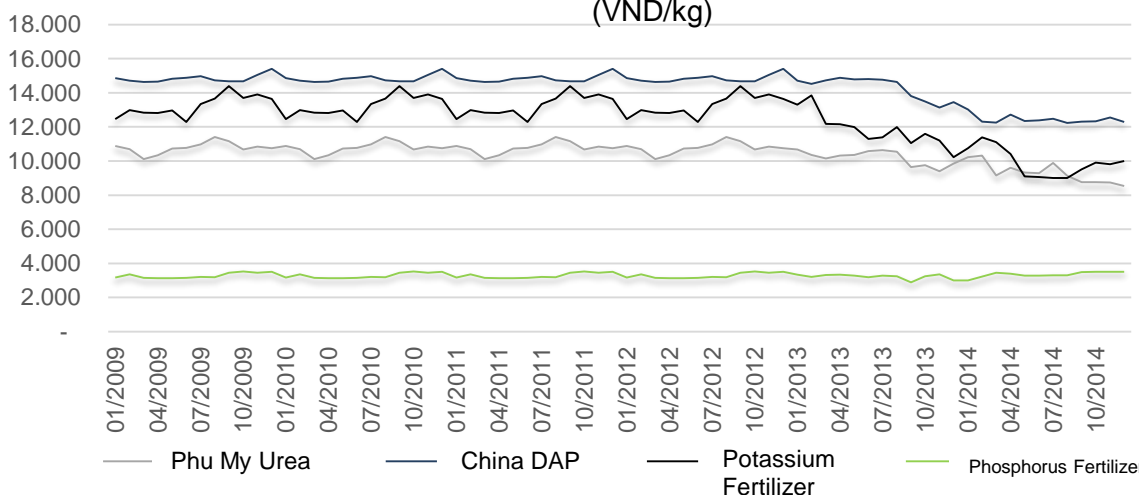


Source: MARD, 2014

1.3. Vietnam Fertilizer Price Trend

Similar to global market, it depends on various key factors such as: changing structure of the food crops, government policy, seasonal demand, speculation, commodity prices, global fertilizer prices, and international trade policies (especially from China), etc. These factors go along with incompetent government controlling (smuggling, inferior distribution channels and low-quality fertilizers) which causes Vietnam fertilizer price to be very difficult to predict.

Vietnam major fertilizer price (VND/kg)



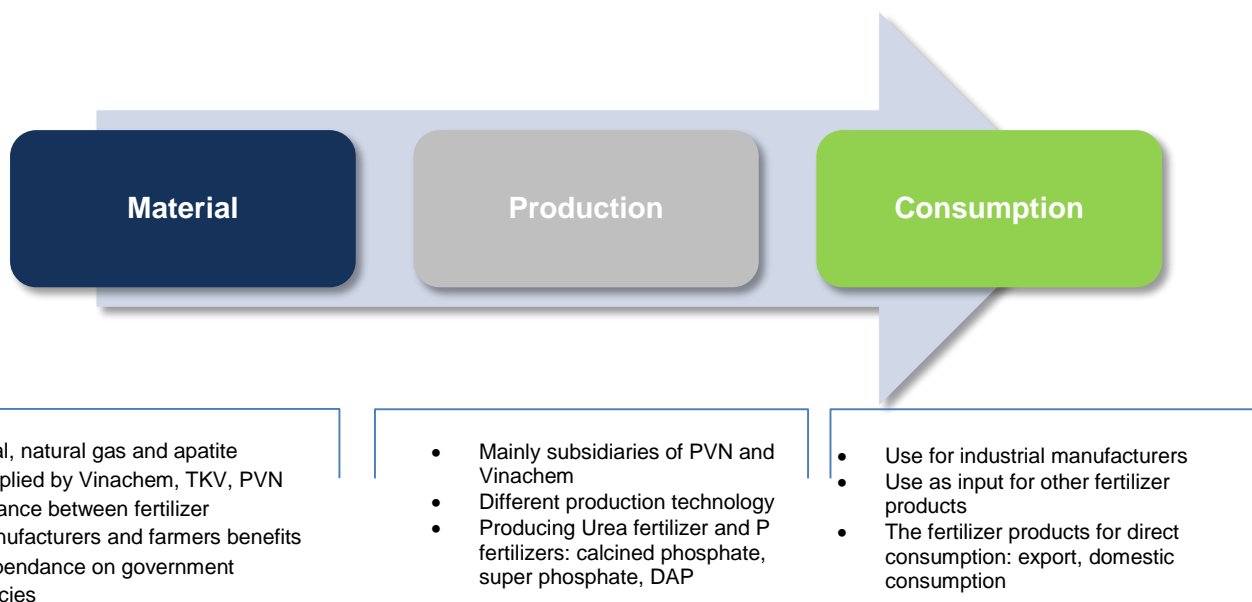
Source: AGRODATA, 2014

Overall, fertilizer retail prices in 2014 fell compared with 2013. In details, Phu My Urea fertilizer was sold at average price of VND9,300/kg (-8.6% yoy); DAP fertilizer (China) at VND12,400/kg (-13.1% yoy); K fertilizer at VND9,900/kg (-16.3% yoy); P fertilizer at VND3,350/kg (+4.1% yoy). At the beginning of 2014, despite of high demand in Winter-Spring season, price still dropped. This is the result of a stable demand in Southern Vietnam and abundant supply due to high inventory

level. Urea fertilizer and NPK with large demand have reached saturated demand-supply level. Besides, domestic fertilizer producers must lower their prices to compete with inferior products and China fertilizers. In 2H2014, fertilizer demand rose thanks to Summer-Fall, Winter-Spring crop seasons, and fertilizer market stabilized to the end of 2014.

2. Vietnam Fertilizer Value Chain

In general, Vietnam has a similar value chain to that of global market. However, Vietnam does not have material for K fertilizer production, so K fertilizer must be 100% imported.



Source: FPTS Research, 2014

2.1. Raw material resource

Materials for fertilizer production in Vietnam is geographically concentrated: gas source in southern continental shelf, apatite in Lao Cai and coal in Northern Vietnam (Northeastern Vietnam and Red River Delta). Fertilizer material resource is controlled and allocated by the Government. Thus, material prices sold to manufacturer fluctuate in accordance with government policies. The average gross margin of PVGAS and Vinacomin in the period 2013-2014 was 20.5%, similar to fertilizer producers.



Natural gas resource: According to BP, in 2013, Vietnam total reserve of natural gas was 21,800 bn m³, at current consumption rate, this reserves will last 63.3 years from 2013. The natural gas exploration and production sector is developing with attractive incentives for foreign investment. Therefore, it contains great potential with participation of many countries in form of joint-venture such as: Cuba, Indonesia, Iran, Tunisia, Burma, Laos, Cambodia, Congo, Madagascar, Russia, Venezuela, Algeria and Malaysia.

Gas selling prices are not consistent among fertilizer manufacturers. While DPM buys at market price from 2Q2014, DCM is subsidized by PVN to maintain a ROE ratio of 12%. Historically, input gas prices of DPM changed with unpredictable trend by complying with government policy which raises a concern about uncertainty of government policy for this sector. ([details](#))



Coal resource: According to data in 2012, Vietnam total coal reserves is 48.7 bn tons, largely located in Red River Delta area with a reserve of 39.4 bn tons. The Vinacomin is sole supplier of in domestic coal market (supplying 98% of coal volume) and is sole exporter. The coal supply is in difficulties because of: **(1)**. Domestic price is higher than international price but still lower than retail prices. Apart from coal supply for thermoelectricity generation, coal supply for cement, chemical, steel and construction material production is still priced lower than retail prices. **(2)**. In addition to VAT, income taxes and land taxes, coal mining industry also suffers

from natural resources taxes for mining pit (5%), open-pit (7%), increasing export tax rate (from 10% to 13%). **(3)**. The mining condition of new field is becoming tougher as open pits depletion. Remaining open pits (Na Duong and Khanh Hoa) contain a high sulphur level which cannot be exported. Moreover, output and reserve of these mines are low. **(4)**. Exportation to China becomes more difficult, so domestic producers must expand their market to Japan. However, exportation to Japan is not beneficial because it is for relationship between two countries.

Coal prices are determined by Vinacomin. Due to difficulties in cost management and export barrier, Vinacomin had to raise selling price to fertilizer manufacturers although global price dramatically fell in 2014. As of Jan 1st, 2015, coal dust 4aHG price (not including VAT) for fertilizers is VND2mn/tons. However, Vinachem has requested the President to change the coal price for fertilizer manufacturer to comply with Pricing Act in 2012. [\(details\)](#)

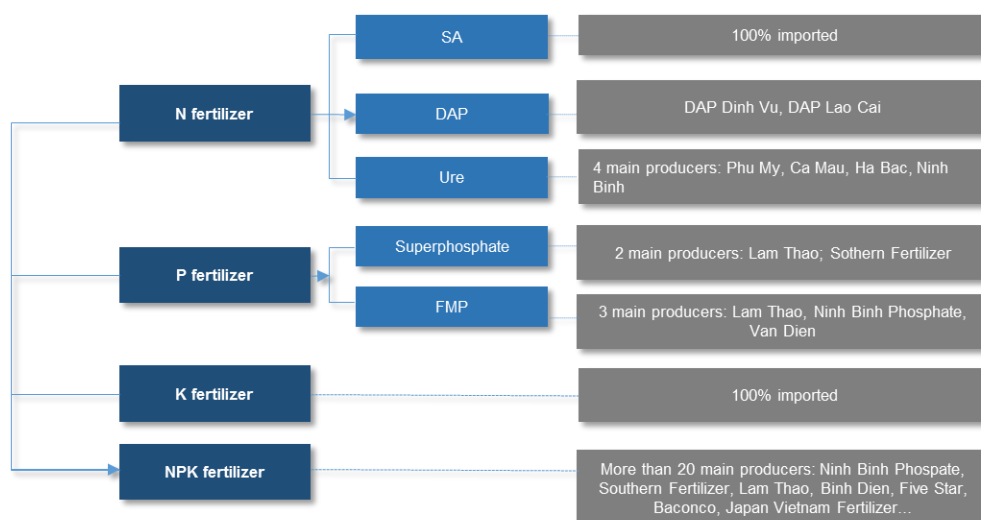


Apatite resource: Cost of apatite takes up 33-38% of P fertilizer production cost. With large reserves, apatite supplier can control the domestic market. Vinaapaco is one of the main apatite supplier, which is member of Vinachem. Legislation on exportation prohibition of apatite creates a great advantage for domestic fertilizer manufacturers because domestic apatite price is substantially lower and it is unaffected by the world prices. Apatite prices is stable and relatively unchanged over years. Apatite buyers are determined by Vinachem. The development plan of this sector is to aim at an average growth rate of 9-10% per year for apatite-related product, and ensure a sufficient level on for fertilizer and chemical industry. [\(details\)](#)

Import source: Input material not available or limited in Vietnam (such as K and SA fertilizers) are prioritized by the government to be imported. In details, only materials for these fertilizer types face no import tariff. Apart from importing, Vinachem is coporating with Laos to produce rock salt for KCl and NaCl production with total capacity of 320,000 tons of KCl/year and 300,000 tons of NaCl/year and total investment of USD522mn. However, time of operation is unclear and Vinachem involvement is only at counselling or project management.

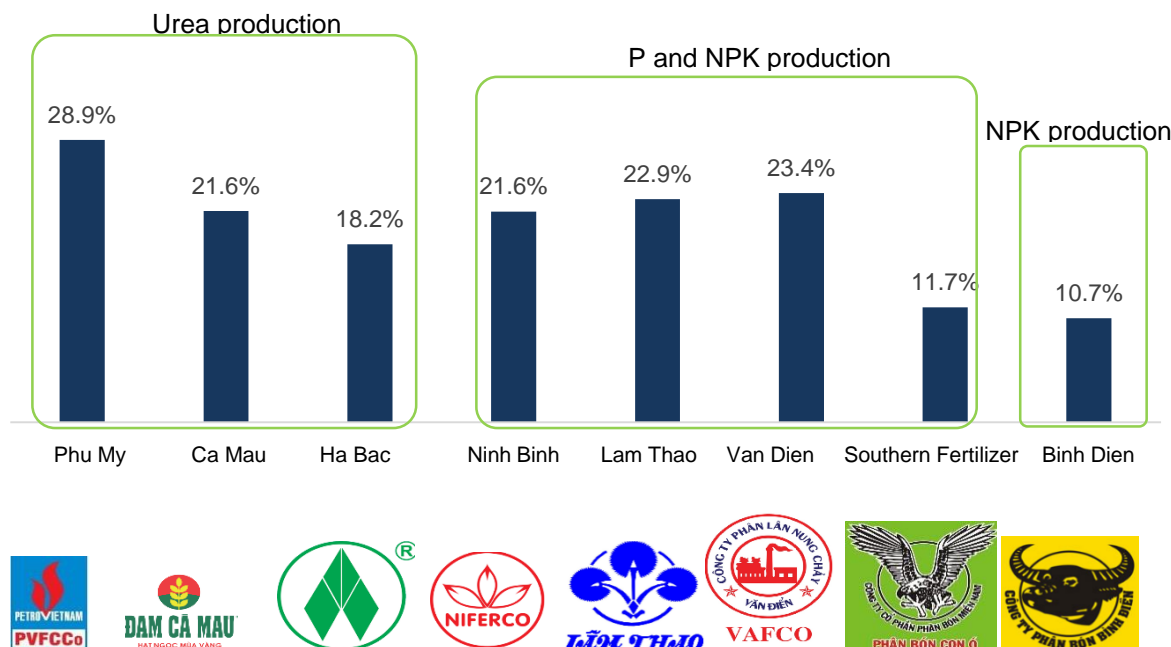
2.2. Production

Vietnam has more than 150 fertilizer manufacturers to produce various fertilizers: urea, phosphate, calcined phosphate, microbial fertilizer, biological fertilizer, spraying fertilizer, NPK with more than 1,420 types and also other types which are not included such as: Crowmore, Nutraphos, Bioted, Harted, ect. Average gross profit margin of this segment is 20.0%. [\(details\)](#)



Source: FPTS Research, 2014

According to FAV's assessment, fertilizer technologies in Vietnam are generally not advanced which mainly apply fertilizer technology from 1960s. They have not been renewed for a long time thus most of them are outdated. However, there are a few factories that applied new technologies such as Phu My Urea Plant, Ca Mau Urea Plant etc. ([details](#))

Net Profit Margin in 2013-2014


Source: FPTs Research, 2014

In recent years, when new quality control policies are introduced, a large number of NPK fertilizer manufacturers have to close or update their plants. A notable point is that worldwide demand for natural mineral NPK and high quality organic fertilizer is increasing to replace chemical fertilizer. Due to cutting edge technologies such as: hitech, nano, prilling tower (high tower), enzyme, biological and molecules technologies, price of these types of fertilizer are falling dragging down chemical fertilizer price. Therefore, harmful chemical fertilizers, causing negative impact on health and environment will lose their market in the long run if there are no improvement in technology.

Gross profit margins are different in terms of product types. Companies that produce N fertilizers have the highest margin followed by compound fertilizer producers then trading firms. An exception is DAP-Vinachem. For details, despite its main production is DAP, due to difficulties in production line, high competitive pressure from China fertilizer, profit margin of this company is very low, only at 6% in 2013 and 0.02% in the first half of 2014.

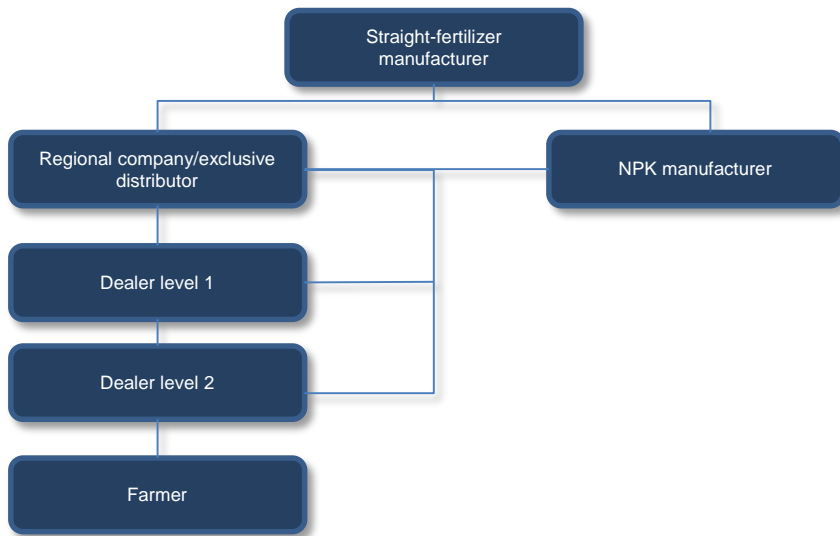
Despite a balanced demand and supply equilibrium, domestic manufacturers keep investing in NPK projects. If all of these projects are implemented, total supply of NPK will increase by 800 thousand tons, exceed 15% of demand.

Company	Project (capacity per year)
Petrovietnam Fertilizer & Chemicals Corporation	90 thousand tons of NH3 and 250 thousand tons of chemical NPK complex.
Petro Viet Nam Ca Mau Fertilizer JSC	40 thousand tons of compound tablet fertilizer
Lam Thao Fertilizers And Chemicals JSC	300 thousand tons of sulphuric acid and 200 thousand tons of NPK
Van Dien FMP Fertilizer JSC	500 thousand tons of calcined phosphate and 200 thousand tons of NPK
Southern Fertilizer JSC	100,000 tons of NPK
Quang Binh Import Export JSC	Upgrade NPK line from 55 to 100 thousand tons

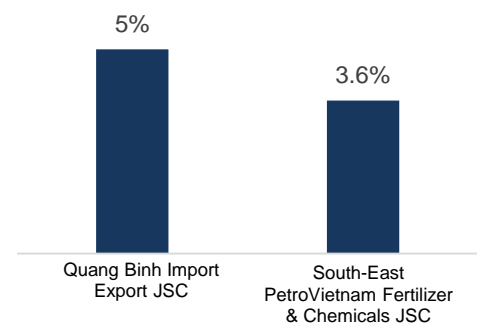
Source: FPTs Research, 2014

2.3. Fertilizer Distribution

Fertilizer industry market operates with market mechanism with the government involvement to protect farmer and domestic producers. There are 3 main distribution channel types: **(1)**. Dealer system, **(2)**. Regional company system and **(3)**. Definitive purchase. The most popular distribution channel is through dealer system. Major brands in fertilizer distribution section are: Vinacam, Apromaco, Thien Thanh Loc, Quang Binh Import Export etc. Gross profit margin of this section is 4.3%. The main purpose of constructing a distribution channel is to ensure a smooth flow of fertilizers from factories to farmers, improve quality, prices control. Farmer can also easily identify trusted point of sale, origin and quality of fertilizers.



**Gross profit margin
2013-2014**



THIÊN THÀNH LỘC
Uy tín, chất lượng, phục vụ tận tâm

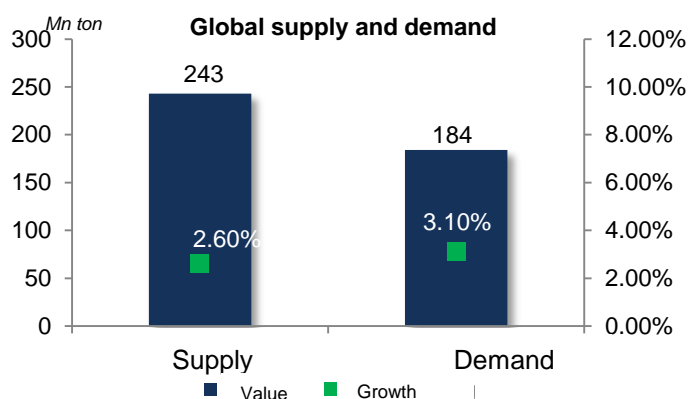
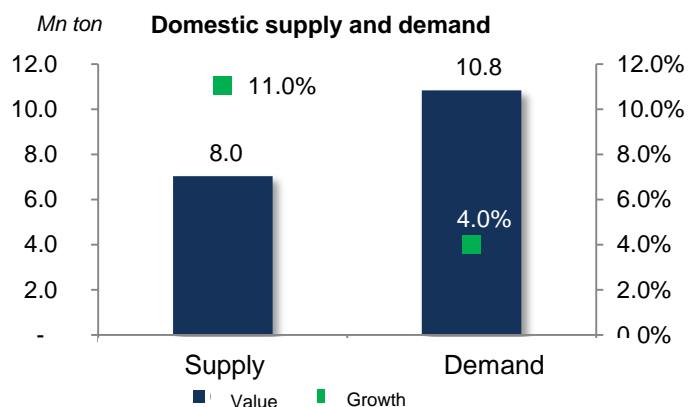


Source: FPTS Research, 2014

NPK manufacturers are more flexible as they can buy from N, P manufactures or directly from a dealer. On the other hand, most of import companies use a definitive purchase contract with domestic dealers. Thus, these dealers have room to speculate, manipulate prices. This will pump up domestic price or increase usage of fake and low quality-fertilizer selling at a much lower price. *(details)*

III. Vietnam Fertilizer Industry Position

Vietnam is a small country in terms of fertilizer production which only contributes 8 mn tons to global fertilizer production of 243 mn tons in 2014. However, fertilizer production growth rate was 11.04% in 2013 while global grow rate was only 2.6%. Considering demand, in 2014, Vietnam consumed 10.8mn tons fertilizers, grew by 4% yoy. It is a faster growth rate compared with global rate of 3.1% (total demand of 184 mn tons). In general, Vietnam occupies 3% of global supply and 6% of demand in 2013.



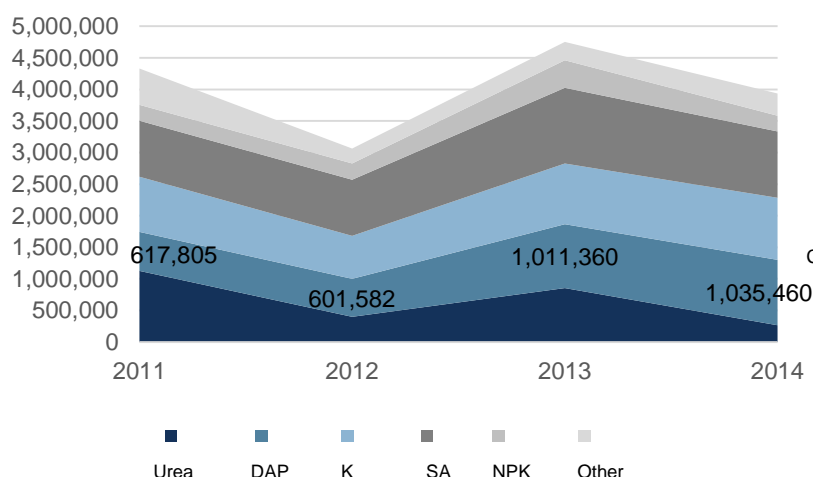
Source: FPTS Research, 2014

The overall domestic production is lower than total demand, however, in some specific products such as Urea, NPK, supply exceeds demand. Import and export analysis will clarify position of Vietnam fertilizer market.

1. Vietnam Fertilizer Import

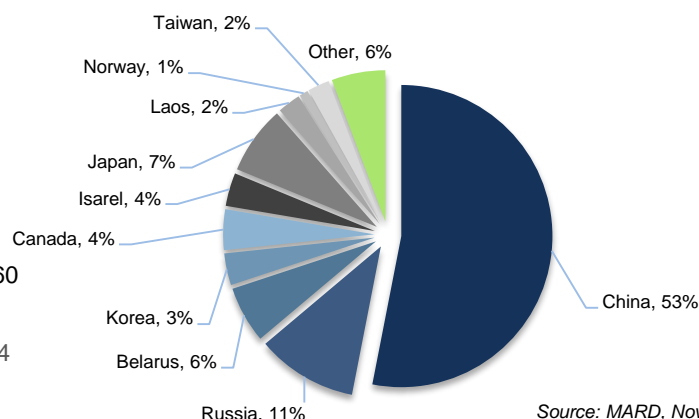
According to GDVC, Vietnam fertilizer import in 2014 reached 3.79 mn tons (-17.85% yoy), valued VND1,237 bn (-26.38% yoy). This reduction was attributed to: **(1)**. Domestic production is increasing; **(2)**. Barrier from China's fertilizer export tax policy in 2014 went along with political dispute between Vietnam and China; **(3)**. Vietnam increased tariffs from 0 to 3% in January 2014 and from 3% to 6% in October 2014 which caused domestic producer to produce more rather than importing. In 2014, China, Russia, Belarus remained main exporters to Vietnam fertilizer market, especially China dominated the first place with 53% of import volume. [\(details\)](#)

Vietnam Fertilizer Import in 2011-2014 period
(Tons)



Source: GDVCG

Fertilizer import by country



Source: MARD, Nov 2014

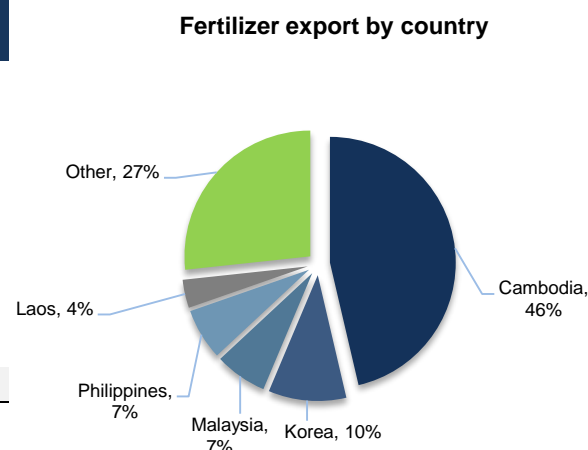
2. Vietnam Fertilizer Export

According to GDVC, Vietnam exported about 1.078 mn tons of fertilizers (+0.51% yoy) in 2014 with value of USD383.7 mn (-8.06% yoy). The cause of this decline was indirect effect of higher import tax to cause domestic producer to supply domestically rather than export and also effect of lower fertilizer price.

Especially, as circular 131/2014/ TT-BTC issuance taking effect on October 25th, 2014, higher import tax has partially caused all fertilizer export to reduce. For details, in 2014 Vietnam exported 338.86 thousand tons of NPK (-31.42% yoy), 300.25 thousand tons of urea (-27.84% yoy). Cambodia is the main export market with 461.79 thousand tons export (-9.17% yoy), accounts for 42.82% of export volume. [\(details\)](#)

Type	Volume (Thousand tons)	Value (mn USD)	% volume	% value
NPK	338.9	140.1	31.42	36.51
Urea	300.3	103.0	27.84	26.85
DAP	210.3	92.8	19.5	24.18
Organic fertilizer	73.0	10.5	6.77	2.73
Phosphorus fertilizer	68.8	10.2	6.38	2.66
Potassium	32.0	12.5	2.97	3.27
MAP	7.2	3.2	0.67	0.84
SA	5.5	0.9	0.51	0.24
Other	42.5	10.4	3.94	2.72
Total	1,079	384	100	100

Source: GDVC, 2014



IV. Porter's 5-Forces Analysis

Force	Description
Barrier to entry	Urea, phosphorus, DAP fertilizer show higher entry barriers because stable material sources must be in government plan. In addition, investment cost is intensive.
	Barriers in NPK fertilizer production are low because of high input availability and common manufacturing technologies.
	The market is in oversupply situation so new plant investment with high interest expenses and depreciation costs will have lower competitive advantages.
Bargaining power of suppliers	Regarding raw material resources such as coal, gas, apatite, the power of suppliers is very high because it is national resources and usually dominated by the Government. Commonly, each resource type is supplied by a single supplier.
	For secondary materials to produce blended fertilizers, power of suppliers is insignificant, because customers can freely choose the type of input fertilizer matching their needs. They can buy from manufacturers or manufacturers' distribution system.
	The customer is very powerful as high supply with various types of fertilizers, so customer has a lot of options.

Bargaining power of customers	<p>Farmers tend to favor fertilizer with low prices, so it incentivizes poor-quality product production.</p> <p>Fertilizer manufacturers usually organize seminars to improve awareness of customers about company brand as well as mind set about fertilizer quality.</p> <p>Besides customers, distributors also have great power over manufacturers because they can directly affect final users. Nevertheless, government has strengthened the fertilizer trading monitoring, it partially reduces the supply of fertilizer with unclear origin.</p>
Substitute products	<p>The substitute products of chemical fertilizers are organic fertilizer and microbial fertilizer. Organic fertilizer originates from plants or corpses of animal, dung...The quality of this fertilizer type is unstable, low nutrient quality and marketed with higher price. Plants cannot directly use this fertilizer but through transmission of microorganism in soil. However, it can make use of waste from animal or plant to produce fertilizer, it is very environmentally friendly.</p> <p>Compared with organic fertilizer, chemical fertilizer has stable supply as well as demand. It takes effect more quickly, provides higher nutrient density and is easy to control. However, it is not friendly to environment.</p>
Rivalry among existing competitors	<p>The product difference is relative, fertilizer selection depends on application habit in different regions, brand awareness and price.</p> <p>The competitiveness in NPK segment is especially high. However, time by time, farmers gradually improve their awareness about fertilizer quality as bearing damage caused by bad fertilizer selection.</p> <p>Selling price in fertilizer market is dominated by the market and rely on supply-demand relationship as well as seasonal factor, speculation, weather...</p> <p>Government regulation regarding import tax has raised the barrier against imported fertilizer such as urea, DAP. Consequently, it reduces fertilizer import and farmers' option, also.</p>

Source: FPTS Research, 2014

V. Government Regulation

Fertilizer is important agricultural material and impacts on farmers' income. Therefore, government always attempts to stabilize this market, supports domestic supply against appointed imported fertilizer and subsidizes farmers to buy fertilizer with good quality and price.

Major regulations in fertilizer market are:

- **Decision No 6886/QĐ-BCT in 2015** specifies general planning for fertilizer manufacturing and distribution system in period from 2011 to 2020 (also considering to 2025) issued by Ministry of Industry and Trade. This Decision defines content of planning, government's standpoint, orientation and details about developing manufacturing-distribution system of major fertilizer types in period of 2011 to 2015, 2016 to 2020 and considering to 2025. Additionally, it also suggests solutions to ensure material adequacy, investment orientation, environment protection, human resources solution and technology solution.
- **Circular No. 36/2010/TT-BNNPTNT** specifies regulations regarding fertilizer production, distribution and use issued by MARD on June 24th, 2010. This Circular specifies details and guides implementation of provisions about: quality control, production, except for inorganic fertilizers, importing, processing, trading and using fertilizer in Vietnam and it

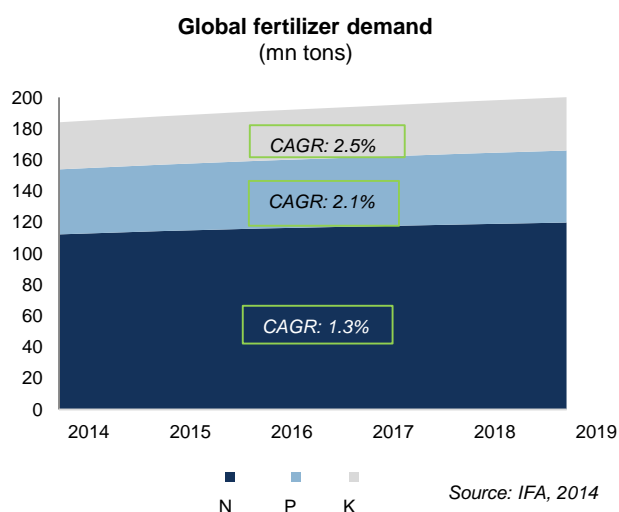
also assigns responsibility of Government management in accordance with Decree No. 113/2003 / ND-CP dated 07/10/2003 or referring to Decree No. 113/2003 / ND-CP about fertilizer production management (referred to as decree No. 191/2007/NĐ-CP).

- **Decree No. 163/2013/NĐ-CP** on 12/11/2013 issued by Government about sanctioning of violations in chemical, fertilizer and industrial explosives activities. It specifies violations, penalties, remedy, competent authority in the field of chemical, fertilizer and industrial explosives. It takes effect from Dec 31st, 2013. It replaces: **(a)** Decree No. 90/2009/NĐ-CP on October 20th, 2009 of Government regarding sanction of violations in chemical activity; **(b)** Decree No. 15/2010/ND-CP on Mar 1st, 2010 of Government regarding sanction of violations in fertilizer production and trading; **(c)** Section 2 of Chapter V in Decree No.100/2005/NĐ-CP on Aug 3rd, 2005 of Government about implementation of prohibiting chemical weapons development, production, stockpiling, use and destruction; **(d)** Decree No.64/2005 ND-CP on May 16th, 2005 of Government about sanction of violations in management of industrial explosives.
- **Circular No. 164/2013 / TT-BTC** on Nov 15th, 2013 issued by Ministry of Finance regarding fertilizer export tax policy in 2014. It specifies new import and export tax incentives for taxable items, including provisions that from January 1st, 2014, import tax of urea and DAP fertilizer increases from 3% (in 2013) to 6% because domestic supply is increasing; Potassium and SA fertilizer import tax unchanged at 0% and NPK at 6% (if originated from Asean, the tax rate is 3%). Regarding DAP fertilizer, domestic supply is increasing in 2015 so there is a probability that Vinachem will request the Ministry of Finace to raise DAP import tax. [\(details\)](#)
- **Law No. 71/2014 / QH13** approved by the National Assembly about tax policy amendments and supplements. Accordingly, from Jan 2nd, 2015, products such as: fertilizers, machinery and equipment for agricultural production, ect are not subject to Value Added Tax from importing to manufacturing and trading compared with VAT of 5% in 2014. This is expected to cause great difficulties for domestic fertilizer producers. [\(details\)](#)

VI. Industry Outlook

1. Global Market Outlook

Demand



2014 – 2015 period: Fertilizer market is supported by world economy recovery and a favorable year for crops, along with expanding arable land trend in Africa, Latin America, fertilizer positive demand growth. In 2014 – 2015 cropping seasons, fertilizer demand will continue to grow by from 2 to 2.1%, reach 187.9 mn tons. It is a consensus forecast of FAO and IFA: **(1)**. N fertilizer demand increases by 1.9% to 114.3 mn tons; **(2)**. P fertilizer demand grows by 2.4% reach 42.6 mn tons; **(1)**. K fertilizer demand will continue rising steadily to 31.0 mn tons (+2.5% yoy).

However, sharp oil price falling from 3Q2014 caused commodity prices, especially agricultural prices to decline, this negatively affects fertilizer demand next seasons. Fertilizer demand is expected to increase in all regions and highest increase will be in East Asia, South Asia, Latin America and North America. Except for Oceania region, the growth is expected to be lower due to rapid growth in last period.

2018-2019 period: According to IFA, in medium term to 2018 – 2019 period, driven by positive forecasts about economic outlook, crop and global agricultural markets, fertilizer demand in 2018-2019 cropping season will continue to achieve CARG of 1.8% and hit a record of 200 mn tons. In particular, demand for K fertilizer has the highest CARG of 2.8%, reaches 34 mn tons, P fertilizer demand grows by

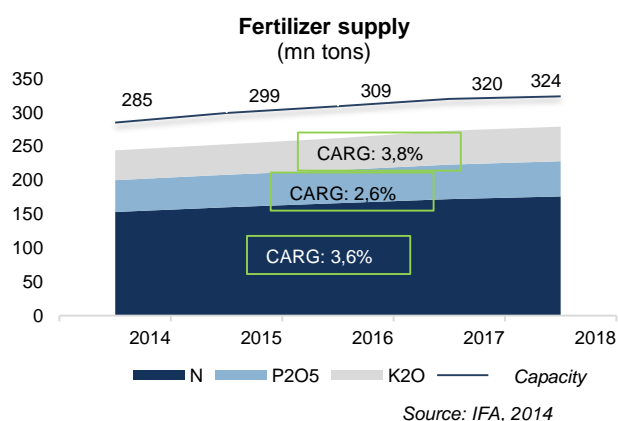
CARG of 1.9%, reaches 46 mn tons, N fertilizer demand grows by CARG of 1.5%, reaches 120 mn tons.

World fertilizer demand during this period grows fastest in Latin America, Africa and West Asia by CARG of 3.7%, 3.4% and 3.1%, respectively, thanks to plantation area expansion, productivity improvement incentive and geopolitical improvement. Demand is also forecast to recover well in South Asia with expected CARG of 2.6%, but in East Asia, it will remain low and rise at CARG of 1.3% mainly due to saturated N and P fertilizer demand in China. However, the East Asia, South Asia and Latin America account for for 27%, 26% and 24%, relatively, of expected global demand.

Additionally, the global fertilizer market is also directly affected by changes in trends of biofuels, agricultural subsidiary policies and management of nutrition plant which will enhance efficiency and balance demand-supply, improve budget efficiency, contribute to environmental protection and prevent climate change prevention, ect. They are main trends of global market and have a significant impact on fertilizer demand.

Supply

2014 – 2015 period: Thanks to demand recovery in 2014, the trading of fertilizers begins to be active and output distribution is also increase. The increase in volume of transactions and consumption has boosted production of the fertilizer factory in the world in order to meet market demand. To actively meet global fertilizer demand, as well as expansion or new mines in the next 5 years, there will be about 200 investment projects and or project expansions. In 2015, the forecast supply will increase by 4.9%, reach 212.7 mn tons. In particular, NH₃ production for fertilizer will grow by 4.4%; H₃PO₄ production for fertilizer will grow by 2.9%; and potash production will increase by 10.9%. Thus, compared with global demand, fertilizer shortages will not exist in 2014-2015 season.



Chemicals (mn tons)	2014	2015	yoy
Potential NH ₃ production	176.5	182.2	3.2%
Actual NH ₃ production	149.7	156.3	4.4%
<i>Other purpose</i>	29.8	30.5	2.4%
<i>N fertilizer production</i>	119.9	125.8	4.9%
Potential H ₃ PO ₄ production	58.1	59.4	2.1%
Actual H ₃ PO ₄ production	47.4	48.8	2.9%
<i>Other purpose</i>	6.3	6.5	1.9%
<i>P fertilizer production</i>	41	42.3	3.1%
Potential potash production	52.7	58.4	10.9%
Actual potash production	45.7	48.6	6.3%
<i>Other purpose</i>	3.8	3.9	2.9%
<i>K fertilizer production</i>	41.9	44.6	6.6%

Source: FAO, 2014

NH₃ supply will be supplemented by expansion projects in Eastern Asia (China, Indonesia), Africa (Algeria, Egypt, Nigeria), Western Asia (Saudi Arabia, Iran, Bahrain) and Latin American (Venezuela, Brazil). Total N fertilizer supply in 2015 is expected to reach 159.5 mn tons and will continue to increase to 165.7 mn tons (2016), 172 mn tons (2017) and 176.4 mn tons (2018).

DAP supply also continues to expand by approximately 22 projects, which China accounts for one third, the rest is from Morocco and

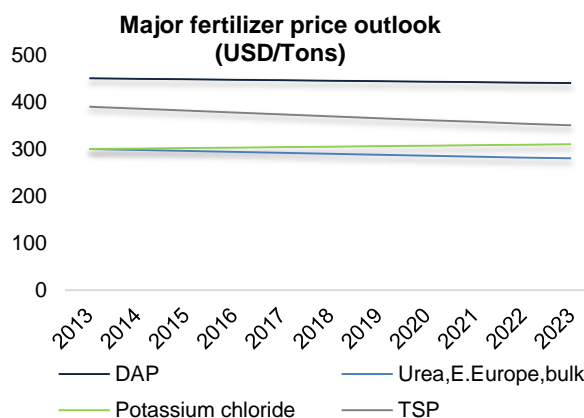
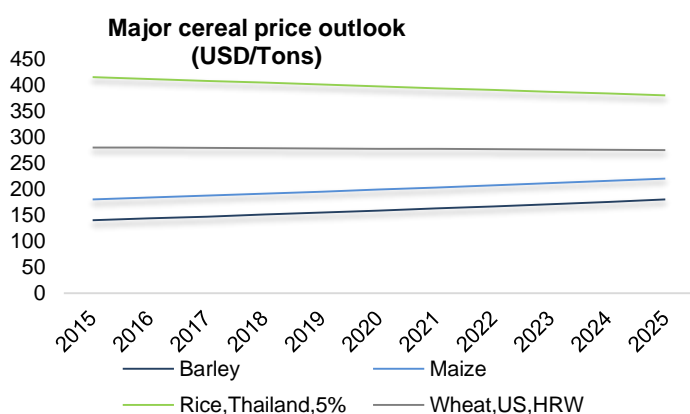
Saudi Arabia. In China, ICL plans to invest up to USD500 mn to gain 50% ownership of to control phosphate production of Van Thien Hoa - Yunnan. ICL initially plans to reduce production capacity of DAP/MAP production and improve capacity of special fertilizers (NP/NPK) and industrial products.

2018-2019 period: FAO predicts that by 2018, world fertilizer supply will be 280 mn tons, grow by CARG of 3.8% and at about 86% of global production capacity. During this period, K fertilizer supply has the highest CARG of 4.5% with 20 expansion projects and mainly concentrates in North America, Central Europe, Central Asia and East Asia. N fertilizer will grow at CARG of 3.9%. However, in terms of volume, urea has highest growth with 60 new projects in East Asia, Africa and North America. P fertilizers supply will grow by CARG of 2.8% through phosphate rock supply expansion in Africa, West Asia, East Asia. Generally, except for K fertilizer, about 1/3 of new fertilizer projects in the world concentrate in China.

Price outlook

Regarding commodity prices, WB forecasts that price of major cereals in the world will decline by 2-7% in 2015 for corn, rice, wheat, and a slight increase of 2% for barley. From 2015 onwards, WB's view on price trend of agricultural products improves slightly: barley price grows by 3% CARG, corn price grows by 2% CARG, wheat price remains stable to 2025. Regarding rice price, WB continues to hold negative views with a negative CARG of 1% till 2025.

Accordingly, two out of 4 common fertilizer types: DAP and N will continue in to be in downward trend with a decline of 5% and 1%, while K fertilizer will rise slightly and TSP fertilizer remains stable in 2015. From 2015 onwards, the trend will be stable for DAP, K fertilizer to 2025. N and TSP fertilizer will reduce by CARG of 1%.



Source: FPTS Research, 2014

2. Vietnam Fertilizer Market Outlook

Arable land use trend

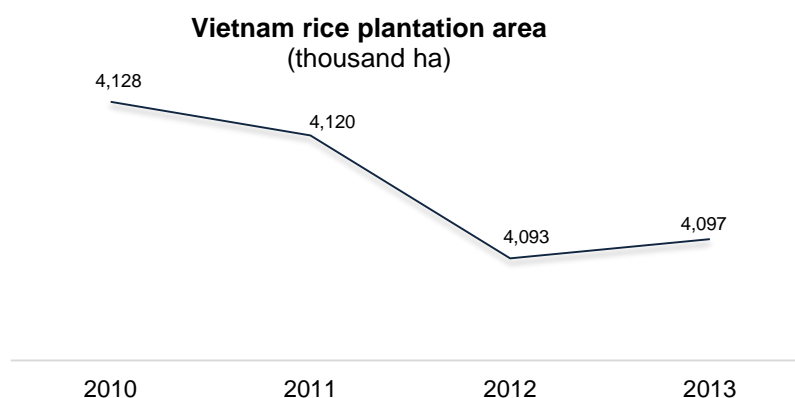
Remaining unused land accounts for about 8.9% of total natural land area but most of this area is in degradation, desertification and loss of value as process of inappropriate exploitation. Besides, in terms of current urban expansion, arable land will not expand further.

Due to complex terrain and location, Vietnam has diverse land resources from plain to the mountainous area, from North to South, from East to West. With population growth, pressure on demand and use land will continue to be issues of concern. The area of agricultural land continues to decline sharply due to urbanization, so agricultural land is converted into industrial land, construction and transportation. According to MARD, the Red River Delta region with rapid

pace of urbanization has the highest rate of land lost of about 0.43%. In addition, the use of agricultural land for other purposes such as golf court development has also posed many problems concerning the agricultural land loss. Also, there are many local establishments of industrial zones in agricultural area.

In Vietnam, rate of paddy land decline from 2010 – 2013 was relatively fast. It was about 4.131 mn of hectares in 2010 and down to 4.097,1 mn of ha in 2013. Especially in some areas such as Red River Delta, it decreased by 43.2 thousand ha (10.8 thousand ha/year) by switching to non-agricultural land (residential land and land for public purposes).

According to Ministry of Natural Resources and Environment (2013), paddy land contraction particularly happens in some provinces in the Northern Vietnam such as: Hai Duong (about 1.6 thousand ha/year), Hung Yen (about 943 ha/year, Hanoi 1.1 ha/year). Key economic region of the Southern Vietnam: HCMC reduced by 3.1 ha/year, Tay Ninh reduced by 2.8/year, Long An reduced by 2.8 ha/year, Long An reduced by 2.7 ha / year, Tien Giang reduced by 1.9 ha/year, Ben Tre 1.7 ha/year.



Source: Ministry of Natural Resources and Environment, 2013

Fertilizer demand - supply

In 2014, Vietnam has capacity to meet 80% of domestic fertilizer demand. In 2015, this trend will continue as: **(1)**. Domestic fertilizer demand is projected to remain stable at about 10.8 mn tons/year; **(2)**. Fertilizer supply capacity of Vietnam is on a slight growth as several new and expansion projects.

Specifically, urea production capacity is more than 2.35 mn tons/year, including 800,000 tons of Phu My Fertilizer, 800,000 tons of Ca Mau Fertilizer, 195,000 tons of Ha Bac Fertilizer, 560,000 tons of Ninh Binh Fertilizer. At the end of 2015, Ha Bac Fertilizer is expected to expand production capacity to 500,000 tons/year so Vietnam will have 2.66 mn tons of urea supply/year. With stable urea demand of about 2.2 mn tons, urea supply will outnumber demand by at least 460 thousand tons in 2015. About DAP, in 2015, DAP Lao Cai is expected to be in operation, then Vietnam is expected to import less DAP fertilizer from China. About phosphorus fertilizer, Vietnam currently has adequate capacity to meet domestic demand. NPK supply is forecast to be at the same level compared with 2014. About K fertilizers and SA, Vietnam will continue to import due to lack of domestic sources.

According to Agromonitor, similar to 2014, in 2015 Vietnam will need about 10.83 mn tons of fertilizers including: 2.1 mn tons of N fertilizers, 850 thousand tons of SA, 1.1 mn tons of K fertilizer, 980 thousand tons of DAP, 4 mn tons of NPK, 1.8 mn tons of P fertilizers. Domestic production is estimated to be 8.290 mn ton in 2015 including: 2.27 mn tons of N fertilizer, 420 thousand tons of DAP, 1.8 mn tons P fertilizer and 3.8 mn tons of NPK.

Forecast fertilizer supply – demand in 2015

Type (Thousand tons)	Demand	Supply
Urea	2,100	2,270
DAP	980	420
P	1,800	1,800
SA	850	-
NPK	4,000	3,800
K	1,100	-
Total	10,830	8,290

Source: Agromonitor, 2015

Forecast fertilizer supply in 2015

Type (thousand tons)	2014	2015
Urea	2,175	2,485
- Vinachem	650	960
- PVN	1,525	1,525
P (Vinachem)	1,563	1,585
NPK	2,594	2,750
- Vinachem	1,974	2,022
DAP (Vinachem)	305	580
Total	6,637	7,400

Forecast fertilizer import in 2015

Type	2014	2015
Volume (Thousand tons)	3,793	4,400
Value (mn USD)	1,237	1,438

Source: Ministry of Industry and Trade, 2015

Fertilizer production cost: The production cost in 2015 will be mainly affected by: lower oil price, Chinese export tax reduction, VAT tax policy No.71, ect, which reduce production costs and also make domestic competition tougher. Specifically, oil prices continue to be in a downtrend 2015 which cause producers to enjoy lower production cost but pressure of oil prices also reduces fertilizer selling price. Regarding government policy, from Jan 01st 2015, fertilizer, machinery and equipment used exclusively for agricultural production, ect will not subject to VAT from import to production. This policy will cause cost of domestic production increase and decrease competitiveness compared with imported fertilizer. There is not only change in Vietnam tax policy but there is also a change in China fertilizer export tax rate, which is favorable for China fertilizer export.

Fertilizer price outlook: According to Agroinform, in 2015, fertilizer price will be lower compared with 2014, because: **(1)**. More supply capacity and current fertilizer plant in smooth operation will increase supply volume; **(2)**. Higher import tax reduces fertilizer import but domestic competition is higher; **(3)**. In early 2015, many factors in supply chain have positive reaction regarding supply surplus and fertilizer prices are stable. This trend is expected to continue in entire 2015.

B. VIETNAM FERTILIZER COMPANY

I. Listed Company

Exchange	Business segment	Ticker	Number of outstanding shares	Market price (Apr 24 th , 2015)	Marketcap (bn VND)	Equity 2014 (bn VND)	Total assets 2014 (bn VND)
HNX	Manufacturing and trading phosphorus fertilizer, NPK fertilizer...	NFC	10,487,551	29.2	306.24	210	322
HOSE	Manufacturing and trading phosphorus fertilizer, NPK fertilizer...	SFG	43,543,306	17	740.24	591	1.579
HOSE	Manufacturing NPK fertilizer Trading NPK, DAP, urea, chemical...	QBS	32,000,000	11.6	371.20	418	1.560
HNX	Manufacturing and trading phosphorus fertilizer, NPK fertilizer...	LAS	77,832,000	33.4	2,599.59	1.496	2.650
HOSE	Manufacturing and trading urea fertilizer, chemical...	DCM	529,400,000	13.4	7,093.96	5.565	16.544
HOSE	Manufacturing and trading phosphorus fertilizer, NPK fertilizer...	DPM	379,934,260	30.5	11,587.99	9.005	10.111

Source: FPTs Research

Among listed fertilizer manufacturing and trading companies, DPM has the largest market capitalization with VND11,588 bn and is followed by DCM with a market capitalization of VND7,093 bn. They rank the 18th and 27th respectively in terms of market cap in Vietnam stock market. The smallest capitalization is NFC with VND306 bn.

In terms of assets size, DCM is the largest company with a size of up to VND16,544 bn, 1.65 times bigger than DPM which ranks the 2nd place. It can be seen that asset size of the listed companies in Vietnam fertilizer industry are not homologous and companies in PVN Group have huge scale compared with remaining enterprises.

Company	Urea	Superphosphate	FMP	NPK
NFC			213,964	56,500
SFG		181,184		244,820
QBS				30,000
LAS		794,720	101,034	730,128
DCM	806,750			
DPM	850,000			
Total	1,656,750	975,904	314,998	1,061,448

Company	Urea	Superphosphate	FMP	NPK
NFC			71%	38%
SFG		91%		82%
QBS				55%
LAS		106%	72%	104%
DCM	101%			
DPM	106%			
Total	104%	103%	72%	88%

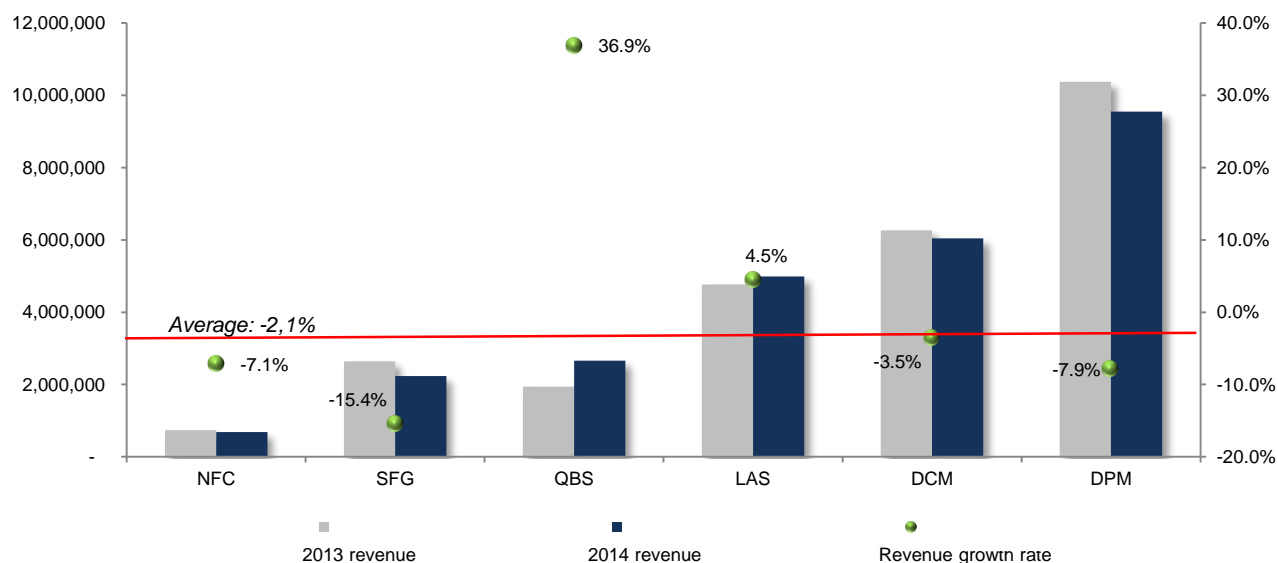
Source: FPTs Research, 2014

In 2014, most of fertilizer listed companies are operating below design capacity, especially phosphorus fertilizer and NPK fertilizer plants. However, the companies in PVN Group is in excess capacity production.

Regarding urea production, DPM and DCM are both actively passing design capacity with production of 807 thousand tons and 850 thousand tons in 2014. About superphosphate fertilizer production, LAS is industry leader with 795 thousand tons of production and significantly greater than the 2nd place of SFG with 181 thousand tons. Regarding FMP fertilizer production, NFC manufactures the highest amount with 214 thousand tons in 2014. About NPK fertilizer production, LAS is also the leading producer with output of 730 thousand tons in 2014 and completely outnumbers production of SFG and NFC production with 245 thousand tons and 57 thousand tons, respectively.

1. Operating Result

Revenue (mn VND)

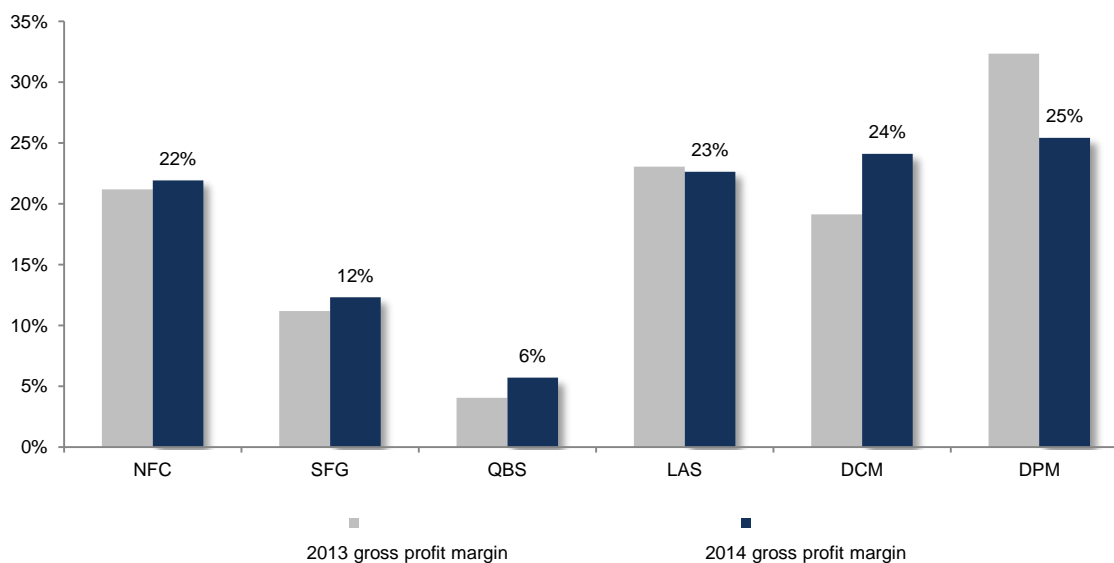


In 2014, total sales of the listed companies is VND26.154 bn (-2.1% yoy). Among listed fertilizer companies, DPM has the largest revenue with total value of VND9,548 bn in 2014 (-7.9% yoy) mainly due to a decrease in DPM urea fertilizer selling prices of 12%.

QBS is in fertilizer distribution sector with main products of DAP and urea. It had impressive sales growth rate of 36.9% in 2014 thanks to: **(1)**. From 2014 onwards, QBS had additional revenue from new product (NPK fertilizer) and bonded warehouse services. **(2)**. QBS signed many contracts in terms of sulfur and sulfuric acid product supply. However, with 72% revenue from fertilizer and 28% from other segments (chemical trading and warehousing), the extent of this growth is not only coming from fertilizer but also from other segments.

LAS is also one of the few companies showing a positive revenue growth in 2014 (by 4.5%) thanks to the fact that in 4Q2014, LAS had boosted sales volume because of new selling policy. However, with unchanged demand in Northern Vietnam, the increase in 4Q2014 is the cause of a volume decline in 1Q2015.

Gross profit



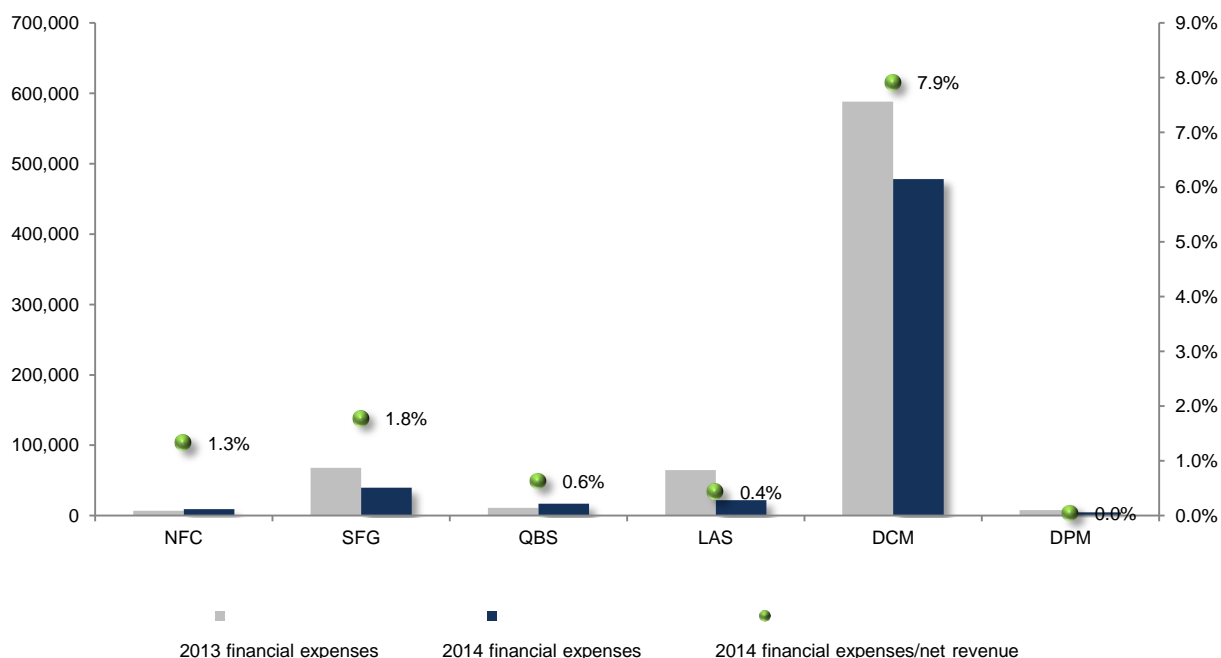
DPM has the highest gross profit margin in both 2013 and 2014 because it has a fully depreciated plant. In 2014 gas price purchase mechanism has turned to market price so decline of oil price has boosted its profit margin.

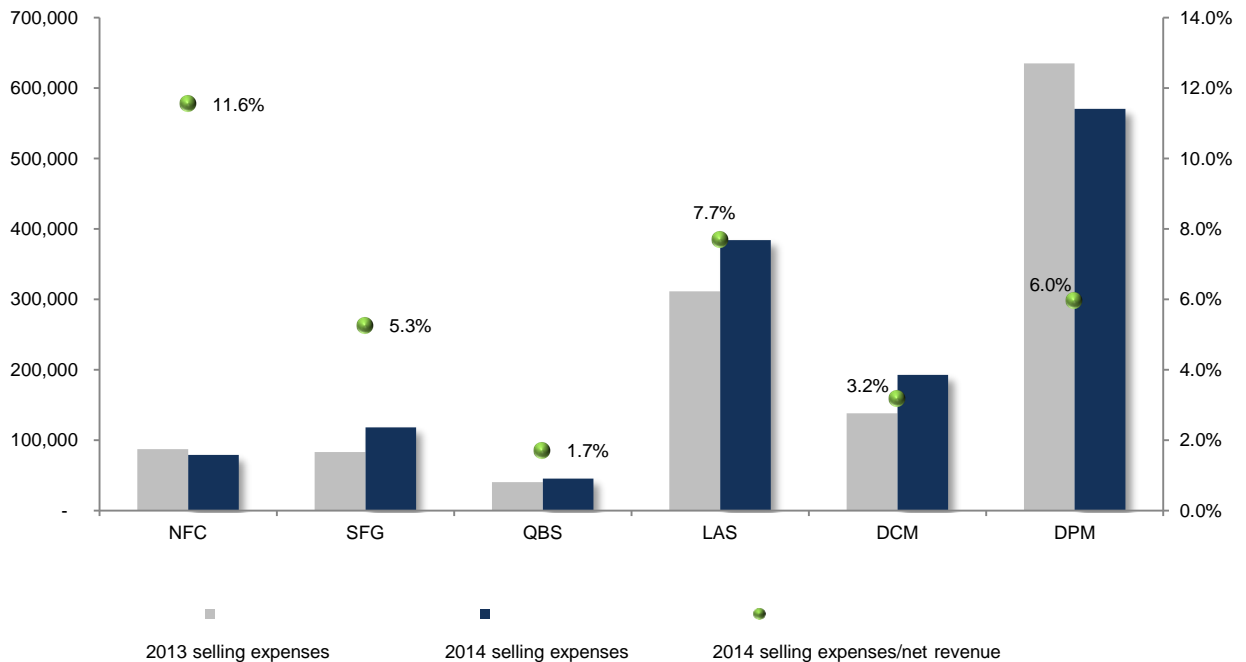
Similar to DPM, DCM is a urea manufacturer. Although DCM still bears significant depreciation expense (VND1,300 bn/year, about 28% of COGS), it receives favorable gas selling policy from PVN and extends depreciation period from 10 to 12 years. Its input gas price is low and still secures a favorable profit margin.

SFG, NFC and LAS have quite similar business activities with main products of phosphorus fertilizer and NPK fertilizer. They have similar gross margins and it is slightly higher in 2014 as the result of stable apatite input cost and especially, price of input fertilizers such as urea, DAP, phosphate and potassium fertilizers have decreased and selling price has not reduced with similar rate. Among this group, profit margin of SFG is at lower level (ranging from 9-12%) compared with NFC and LAS (from 16-20%). QBS is mainly a commercial company so gross profit margin is much lower than manufacturing firms. Profit margin of QBS is 6% compared with the average of listed companies of 18.7% (2014).

Financial expenses (mn VND)

Except for DCM, most companies in this sector are already in stable phase, so the debt need for investment is not high. The financial expenses are mainly interest expenses relating to short-term loans for working capital financing. DCM has its plants operating in 2012 so the repayment of debt does not finish and still bears substantial interest expenses accounting for 8% of net sales in 2014. Thanks to support from PVN for debt restructuring, DCM incurs a lower interest rate in 2014. The financial expenses were down by 19% compared with VND588 bn in 2013. In addition to interest expenses, exchange rate differences also affect financial expenses of DCM as loans mainly are dominated in dollars.

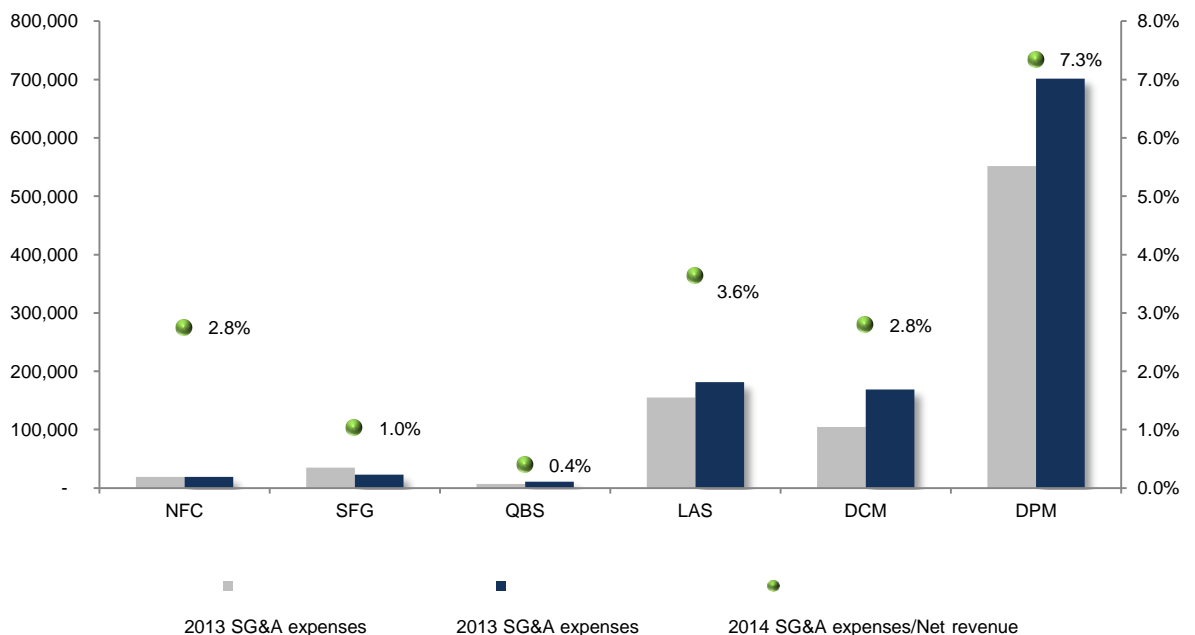


Selling expenses


All fertilizer companies are affected by Circular 06 to tighten management of road payload so selling expenses increased significantly despite revenue decrease in 2014. Regarding NFC, DPM, they have reduced selling expense to sales ratio which reflected an effective cost management.

Besides, selling and administrative expenses have increased over years because fertilizer manufacturers expand scale of production and distribution channel, while there is fierce competition. Also, to ensure consumption, fertilizer manufacturers also export their products such as: LAS exports to Japan, Korea, DCM exports into Cambodia, DPM exports into Jordan, Thailand, ect.

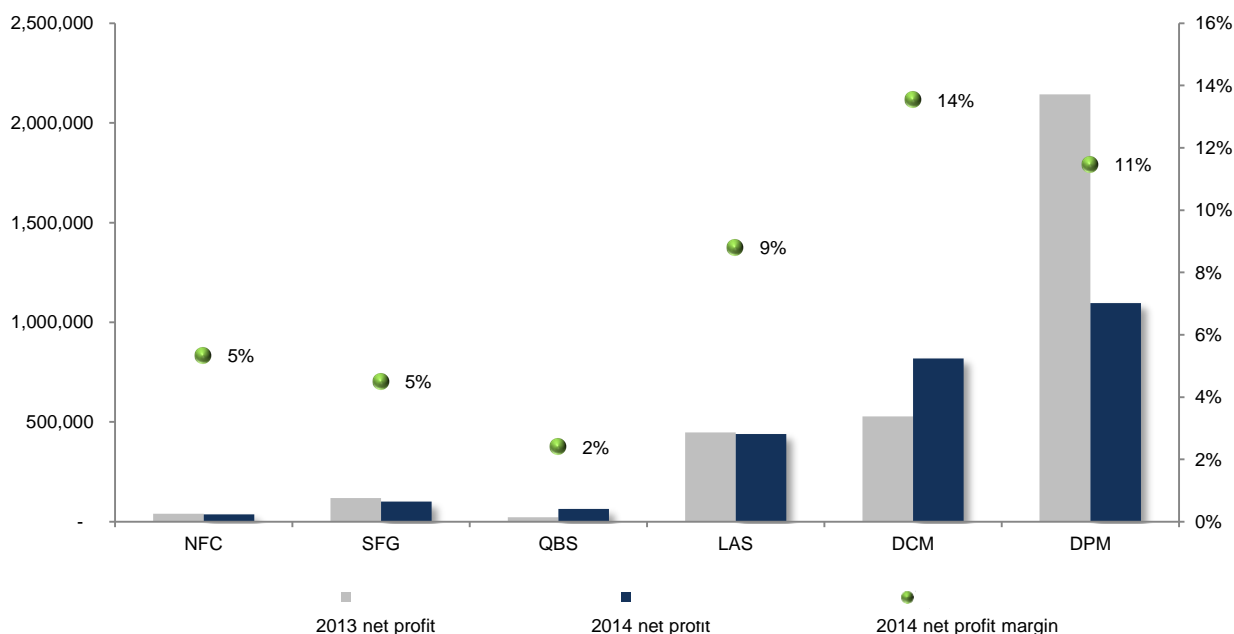
About DCM, although revenue has declined and it is still a new brand to the market (from 2012), so it requires effort to strengthen DCM branding. Commonly, price of granular urea is higher than prill urea but compared with DPM, DCM selling price is still lower as new brand.

SG&A expenses


Administrative expenses to sales ratio of listed fertilizer companies fluctuates from 2-3% in the last 2 years and there is a slight increase due to lower selling price due to competitive pressure. Additionally, this is the time for these companies to maintain operation while actively seek opportunities in fierce market competition, which causes management cost to rise.

DCM's administrative expenses grew strongly by 62% yoy. It is the result of its favor from PVN, so DCM recored administrative expenses of PVN to company's management expenses. DPM has the highest administrative expenses to sales ratio in terms of relative as well as absolute value. Although it has reorganized management system by reducing unnecessary middle management position but it does not show clearly effect. We consider it as downside of complex organizational structure including many regional companies and dealer compared with its peers.

Net income (thousand VND)

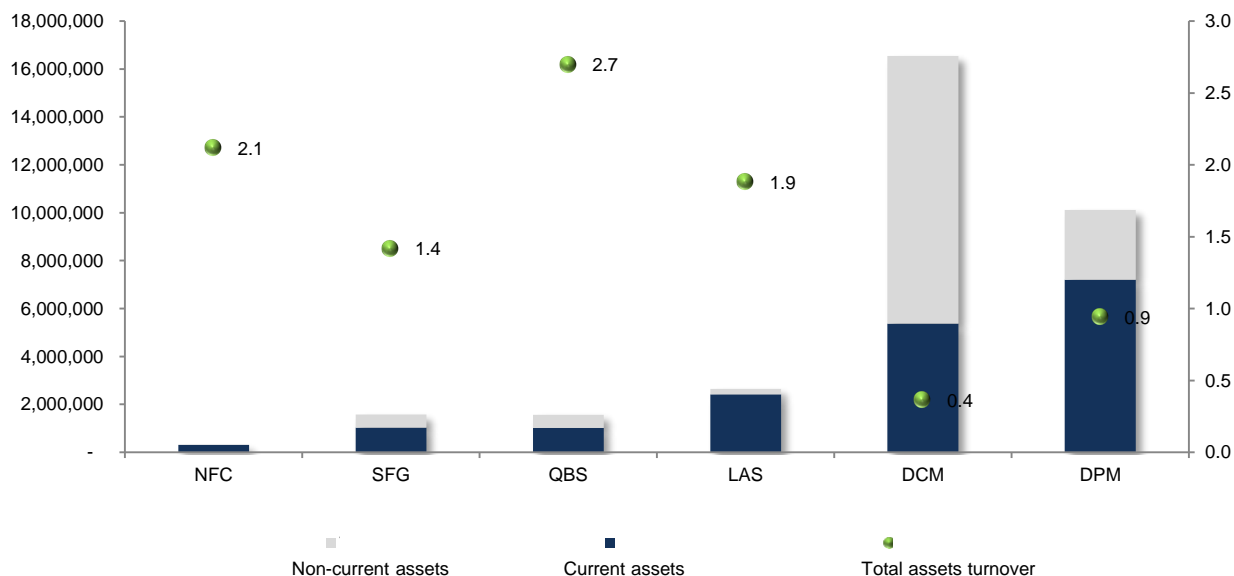


Except for DCM and QBS, other listed companies in fertilizer industry have shown a negative profit growth in 2014. Aggregately, total NPAT of listed companies in 2014 was VND2,556 bn, (-22.5%, 2013), mainly due to industry situation and unfavorable fluctuations of raw material prices.

Regarding DPM, its profit plummeted by 49% due to lower average selling price (-12% yoy), while average gas price was USD6.78/MMBTU (+3.35% yoy). It is partly due to reduction in interest rates so financial revenue of DPM also decreased.

Contrary to DPM, DCM earned VND819 bn in 2014 (+55% yoy) thanks to lower gas input price, which was at USD4.07/MMBTU (-40% yoy), so its profit improved sharply.

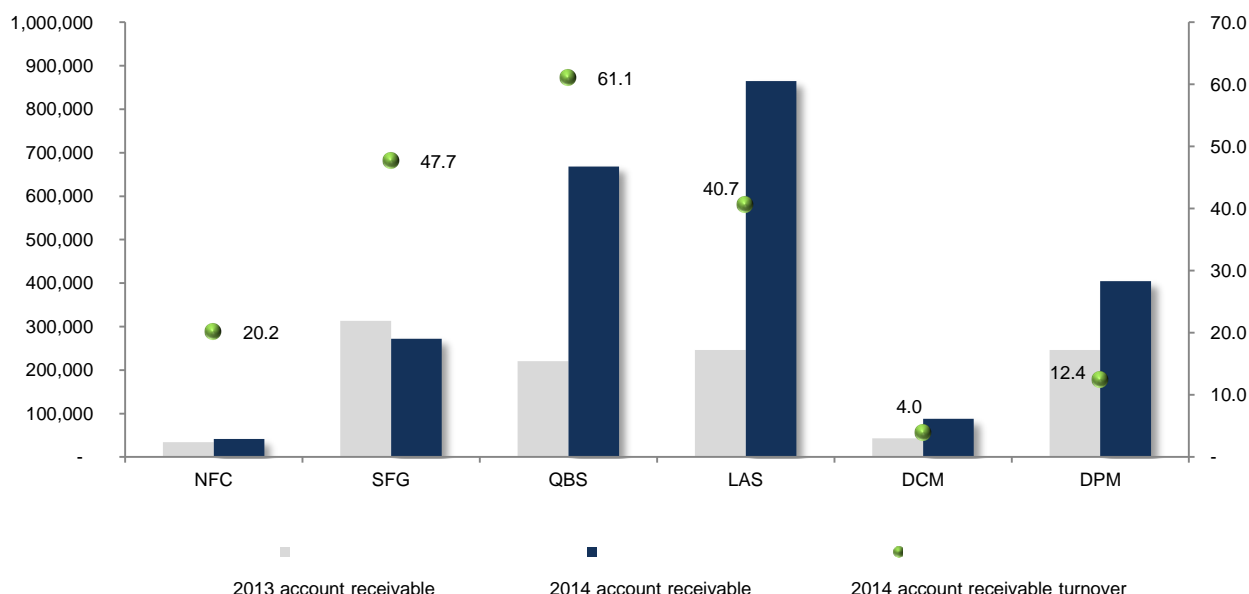
Regarding QBS, in 2014, in addition to excellent growth in sales and gross profit margin, it also made major reforms in selling policy. In details, its fertilizer products are purchased in domestic companies without importing from China and deliveries are made directly from supplier's plant instead of from company's warehouse, so it reduces related costs.

2. Financial Analysis
Total assets (mn VND)


Among fertilizer manufacturers, because of different investment time point, assets structures in terms of current assets, long-term assets to total assets are various. Most of assets are cash, inventory and receivables as result of approximately fully depreciated plant. Because fertilizer production technology has no significant change from last 10 years so the fully depreciated plant is a major advantage.

Regarding DCM, its plant started to operate in 2012 so plant value is still very significant. Also, DPM is expanding its domestic market as well as export, so its assets turnover is at the lowest compared with other listed companies.

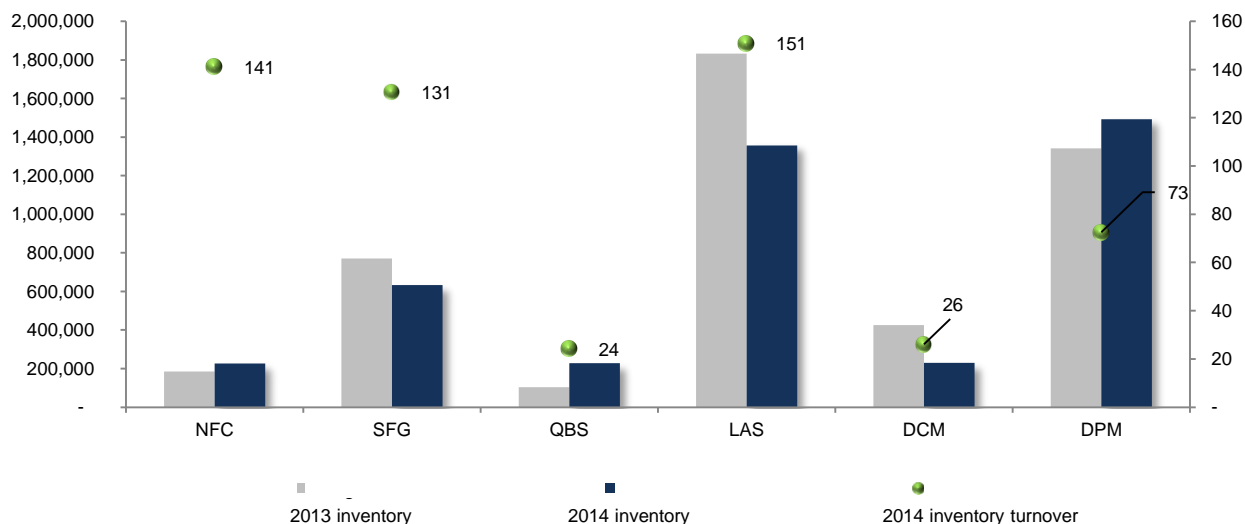
Regarding asset utilization, as commercial fertilizer activities, QBS has the highest asset utilization. Among fertilizer manufacturing companies, NFC although is the smallest company, it has highest assets efficiency when generating VND2.1 of net sales with VND1 of assets.

Account receivable (mn VND, day)


Due to difficult industry situation, manufactures have to concentrate on incentives to dealers, customers through extended time for receivable collection. Therefore, sales decrease but total

value of receivables has increased by 112%. Especially, scales of revenue and assets of LAS and QBS are relatively small compared with DCM and DPM, but their receivables soared by 3 times compared with 2013 and even exceeded that of DCM and DPM. DCM's receivable management is relatively efficient compared with its peers. It is less than one and a half month in 2014 because most of its dealers conduct pre-delivery payments and even pay penalty if they do not receive goods when already pay cash.

Inventory (mn VND, days)



The total value of inventories of listed companies in 2014 was VND4,167 bn (-11% yoy), this is a positive sign of reasonable production management when the industry have adapted well to week demand. It is also the result of lower fertilizer price.

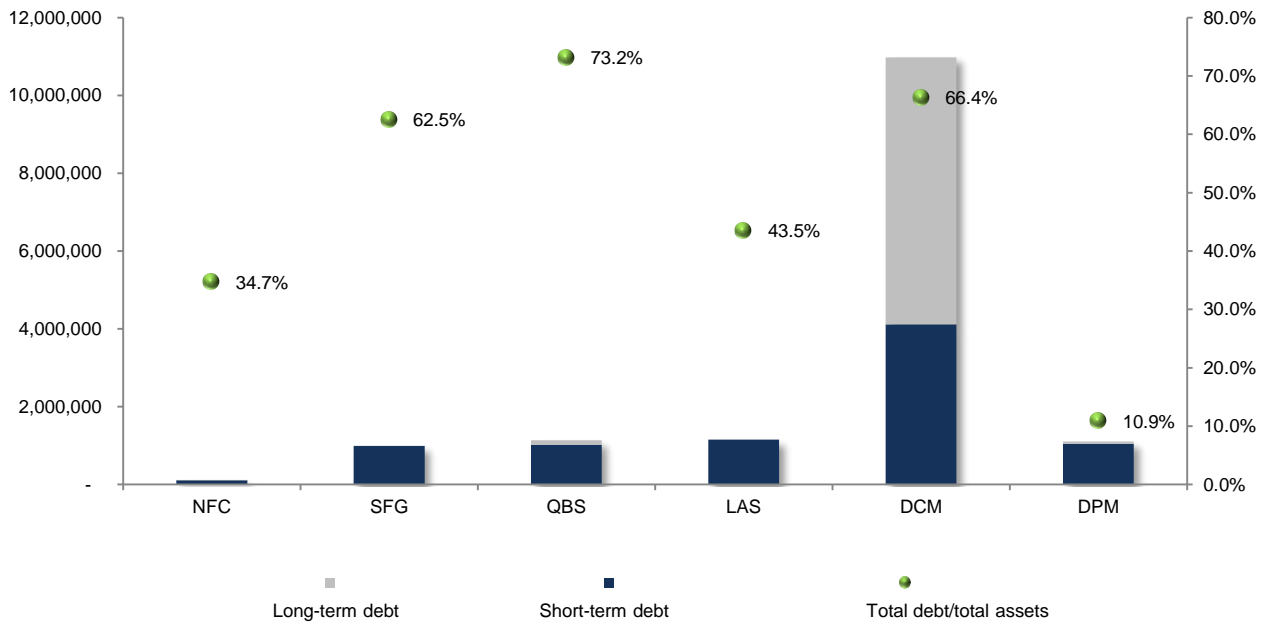
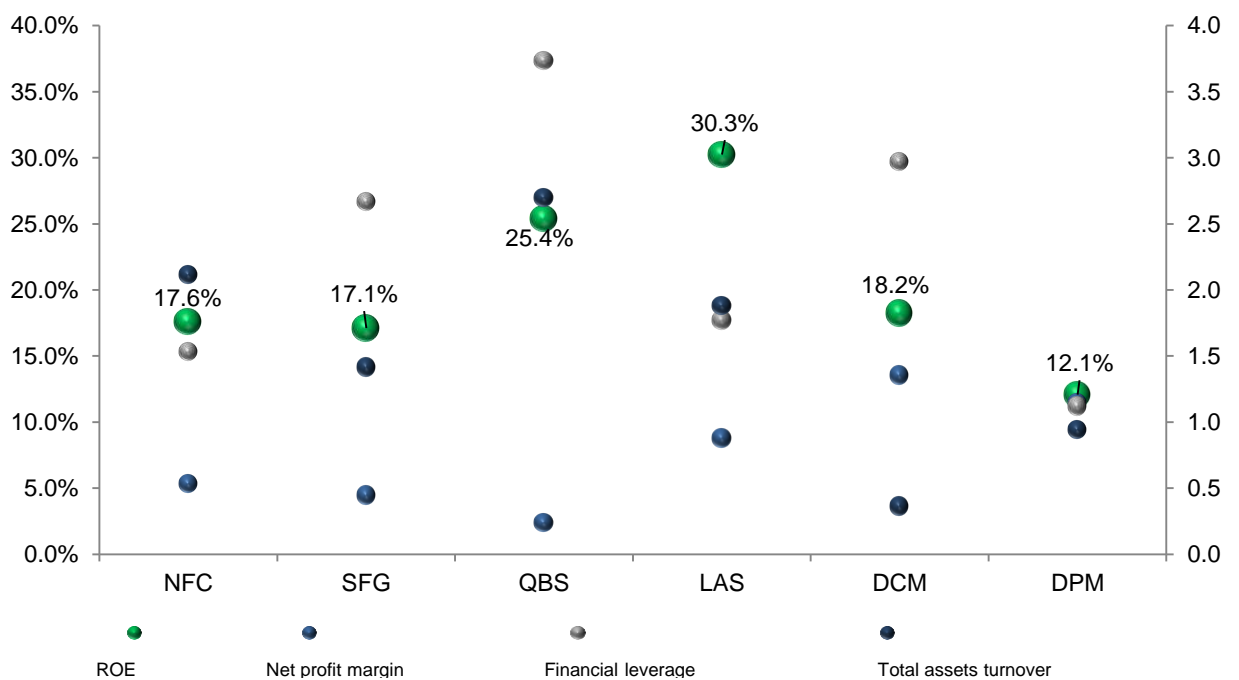
Regarding QBS and DCM, despite of different business nature, their inventory management is very superior to industry average. In 2014, QBS has changed its policies when it does not imports from China manufacturer but exportes directly from gate of domestic manufacturers. Inventory value of QBS increases because in 2014 a NPK production line of 55 thousand tons has put into operation, anh it increases QBS's inventory level.

For DPM, it will maintain its plant in 2 months, so it must reserve inventory to ensure uninterrupted operation and supply.

Borrowings (mn VND)

There is a common ground in fertilizer manufacturers that except for DCM, most of firms do not have long-term debt. Because at this stage of fertilizer market, most of fertilizer companies do not have need to expand production. The short-term debt is mainly used to finance working capital, which will be borrowed and paid within a year, and ending balance will be significant changed year by year and points of time within a year.

Regarding DCM, at the end of 2014, total short-term debt balance is VND1,254 bn and long-term debt balance is VND6,739 bn, and mainly dominated in US dollars at average rates of 3-4% per year. With this level of funding, the exchange rate fluctuation will cause DCM to bear additional risk.


Dupont analysis


ROE ratio of fertilizer companies differs among them as different financial leverage, total assets turnover and net profit margin. Two enterprises has the highest ROE and the lowest ROE was LAS with 30.3% and DPM with 12.1%. LAS shows highest ROE ratio because it has the highest net profit margin combined with the use of financial leverage and efficient asset use. Although DPM has highest net profit margin, company's ROE is not high because of limited leverage. QBS has very low net profit margin, but thanks to the high use of financial leverage and effective use of assets so ROE ratio is high at rate of 25.4%. However, slim margin along with the use of high leverage will make QBS vulnerable to market changes.

Cash flow analysis

	Operating cash flow		Investing cashflow		Financing cashflow	
	2013	2014	2013	2014	2013	2014
NFC	39	-12	-3	-4	-52	19
SFG	267	304	-16	-19	-122	-552
QBS	-86	53	-28	-499	74	444
LAS	882	144	-77	-48	-589	-414
DCM	1,923	4,391	-46	-3,157	-1,333	-1,635
DPM	1,941	975	-1,969	1,561	-1,569	-1,490

Source: FPTS Research, 2014

Operating cashflow. Most firms have positive cashflow from operations in 2013-2014 period except for QBS and NFC. Regarding QBS, it has -VND86 mn in operating cash flow in 2013 as significant payments to suppliers. But in 2014, thanks to lower payments and good revenue growth, QBS has its cash flow improved. Regarding NFC, its cash flow from operation is negative due to negative revenue growth along with increasing inventories and receivables by 22% and 22.2%, relatively. Cash flow from operating activities of DCM had a strong growth nearly doubled thanks to impressive profit growth, and partially its changes in accounts payable. Specifically, after the IPO, balance of other liabilities increased to VND1,940 bn primarily reflects proceeds from the IPO that DCM has to return to PVN.

Investing cash flow. In 2013-2014 period, most companies have no significant investment in fixed assets. Cash flow for investing activities mainly comes from savings deposits at banks. Particularly, QBS has two main investing activities in 2014 to: **(1)**. Investment to become a strategic shareholder of DAP - Vinachem JSC (an investment of VND220 bn); **(2)**. Expanding Thuy Nguyen - Hai Phong NPK plant, bonded warehouse and company offices.

Cash flow from financing activities. It is mainly related to dividend payment and loan payment for working capital financing during the year. QBS has the cash flow from financing activities of VND444 bn because of issuing share (receives VND264 bn) along with loan for working capital. For DCM, although it had IPOs and increased charter capital but due to significant debt payment, its financing cash flow remained at -VND1,635 bn.

II. Major Unlisted Company



Binh Dien Fertilizer JSC (BFC)

It is a subsidiary of Vinachem – Ministry of Finance

Subsidiaries of Binh Dien are:

- Binh Dien – Quang Tri Fertilizer JSC
- Binh Dien – Lam Dong Fertilizer JSC
- Binh Dien – Mekong Fertilizer JSC
- Binh Dien Sport LLC
- Binh Dien – Long An Sport Single Member LLC
- Binh Dien – Long An Fertilizer Plant
- Ninh Binh Branch

With one main plant, one branch, one joint venture company and 4 joint stock companies, Annually, BFC can produce and supply more than 1.2 mn tons of fertilizer. BFC is famous for its buffalo-head brand. Some major fertilizer types of BFC are:

- Regular NPK: NPK 20-20-15, NPK 16-16-8-13S, NPK 15-10-15, NPK 16-8-8...
- NPK + TE: NPK 20-20-15+TE, Buffalo Head TE + Agrotain, NPK 25-20-10+TE, NPK 25-25-5+TE...
- Specialized fertilizer: Buffalo Head TE+Agrotain Rice 1, Buffalo Head TE+Agrotain Rice 2, Buffalo Head Coffee Agrotain, Buffalo Head Rubber...
- Organic mineral and bio mineral fertilizer.
- Foliar fertilizer
- Plant protection chemical

Operating results in 2014:

- Production: 670,213 tons
- Selling volume: 644,637 tons

Profit/loss indicators	2013	2014	Yoy
Net revenue	6,585,109	6,377,224	-3.2%
Gross profit	697,889	680,493	-2.5%
Gross profit margin	10.6%	10.7%	0.1%
Net operating income	318,831	356,145	11.7%
Net income	261,683	288,548	10.3%
Net income margin	4.0%	4.5%	0.6%
Balance sheet indicators			
Total assets	2,917,550	2,985,914	2.3%
Short-term assets	2,433,755	2,496,670	2.6%
Long-term assets	483,795	489,244	1.1%
Total capital	2,917,550	2,985,914	2.3%
Total liabilities	2,132,347	1,980,273	-7.1%
Total equity	669,112	842,442	25.9%

Source: FPTS Research, 2014

Ha Bac Nitrogen Fertilizers And Chemical Company

Main businesses:

- Producing, trading urea fertilizer
- Producing, trading basic chemical: liquid NH₃, liquid-solid CO₂, industrial gas.

It is a subsidiary of Vinachem in Northern Vietnam to supply urea fertilizer in this area. Competitive advantages of Ha Bac products are high purity, stable quality, well-known brand. Ha Bac has achieved many awards such as: Vietnam Rice Gold, Vietnam agriculture golden cup in national economic fairs, international fairs, Vietnam Industrial chemical fairs.

Ha Bac plans to upgrade its capacity from 180 thousand tons of urea to 500 thousand tons at the end of 2015.



Profit/loss indicators	2012	2013	Yoy
Net revenue	2,009,942	1,842,435	-8%
Gross profit	447,091	334,453	-25%
Gross profit margin	22%	18%	-4%
Net operating income	484,366	300,319	-38%
Net income	373,951	227,156	-39%
Net income margin	19%	12%	-6%
Balance sheet indicators			
Total assets	3,891,687	8,191,622	111%
Short-term assets	2,253,239	1,546,809	-31%
Long-term assets	1,638,448	6,644,813	306%
Total capital	3,891,687	8,191,622	111%
Total liabilities	1,669,186	6,188,331	271%
Total equity	2,222,501	2,003,291	-10%

Source: FPTS Research, 2014



Five Star International Group

Five Star uses one-grant NPK product technology with major products: NPK 20-20-15+TE, NPK 20-16-16-8+TE, NPK 20-0-20+TE, NPK 17-17-17+TE. Five Star also has specialized products for rice such as: Five Star TE-01 (20-16-8+TE), Five Star TE-02 (20-0-20+TE).

Beside fertilizer production, Five Star International Group also invests in real estate projects such as: luxury villa and golf course (400 hectares) in Long An, residential project, Phuoc Ly ecotourism (419 ha), Long Dinh shopping mall, Five Star urban area, Beautiful Hotel project, Green World Restaurant (4 Star) in Vung Tau City; Luxury Apartment in District 7; Red River Deltal Trade Center - International Tourism in Nam Dinh, ect.

To develop fertilizer manufacturing, trading business, in 2004, Five Star International Group built a plant and warehouse in Long An province with capacity of 300 thousand tons/year, which is equipped with modern facilities and ISO 9001: 2008 management system to meet international standards.

At the end of 2009, Five Star Fertilizer Plant in Cambodia built a NPK plant with total capacity of 350 thousand tons/year (phase 1) and 500 thousand ton/year (phase2), total invested capital was USD65 mn. This plant uses optimized logistics system and ISO 9001:2008. This is considered as the most advanced technology in Southeast Asia.



Que Lam Group

This is one of few companies manufacturing and trading of organic fertilizers in Vietnam with production capacity of 100 thousand tons of organic fertilizer per year. It is also one of the leading companies in this field.

Main business:

- Producing micro organic fertilizer, bio organic fertilizer and chemical product for agriculture and environment protection.
- Producing foliar fertilizer, liquid humic acid, liquid fertilizer, NPK fertilizer
- Education development, financial investment, investing and trading real estate, civil construction...

Que Lam products are distributed through 4 main plants in different regions:

- Que Lam Phuong Nam Plant – In Tam Phu Trung Industrial Zone, Ho Chi Minh City
- Que Lam Tay Nguyen Plant – Hoang Anh Industrial Zone, Chuporong, Gia Lai Province
- Que Lam Phuong Bac Plant– Binh Xuyen Industrial Zone, Vinh Phuc Province
- Que Lam Mien Trung Plant – Tu Ha Industrial Zone, Huong Tra, Thua Thien Hue

Agricultural Products And Materials Jsc (Apromaco)



Apromaco was formerly named as Agricultural products and Materials Company of MARD. Apromaco was equitized in November 2005. It is one of the biggest fertilizer trading companies in Vietnam. Annually, Apromaco imports 500,000 to 700,000 tons of chemical fertilizer with value from USD130 mn to 150 mn to domestic market.

Apromaco has built a superphosphate and NPK plant in Lao Cai province with a capacity of 200,000 tons of superphosphate fertilizer and 150,000 tons of NPK fertilizer. It has good relationship with internationally well-known brand such as: Transamonía, Keytrade, Ameropa, Topfer, Agrosin, Mitsui, Samsung, Bearusian Potash, Hyunsung...

Song Gianh Corporation



This is the first company to apply successfully biological technology in fertilizer production in Vietnam. With 20-year experience in bio-organic fertilizer production, it has supplied nearly 2 mn tons of fertilizer for domestic market as well as exporting.

It has a total capacity of 150 thousand tons/year and main products are: micro-organic fertilizer, bio-organic phosphorus fertilizer, mineral-organic fertilizer, macro NPK, foliar fertilizer.

Thien Sinh JSC



Thien Sinh has more than 40 types of fertilizer which are divided into 3 main groups: fertilizer to root, fertilizer to leaf and bio products. They are used for different development phases of plant: Komix for rubber – new plantation, mature, selling, Komix for coffee, pepper, cashew, fruit, rice, corn...It has an automatic production chain with capacity of 20 ton per hour.

Van Dien JSC



VAF was established in 1960, is a subsidy of Vinachem with 67% ownership. The core business is to produce FMP fertilizer and NPK fertilizers with capacity of 300 thousand tons of FMP and 200 thousand tons of NPK. It has built a well-known brand in domestic market. It plans to be listed in 2015.

In Vietnam, VAF is one of 16 biggest fertilizer manufacturers, with large market share in FMP and NPK market. The major FMP clients are in Central Vietnam, Central Highlands and South Vietnam (64% revenue contribution), in the mean while the the consumption of NPK products is mainly in North Vietnam (contributing 33% of revenue). In addition, VAF also exports with insignificant volume, accounting for only 3% of revenue.

Ninh Binh Nitrogenous Fertilizer Ltd.Company



It is a company in Vinachem Group with total invested capital of USD667 mn, charter capital of VND2.500 bn to supply urea for Red River Delta area and nearby provinces. It is expected to replace imported fertilizer to stabilize Northern urea market with total capacity of 560 thousand ton/year.

However, according to Vinachem, Ninh Binh lost VND75 mn in 2012, VND759 mn in 2013 and VND237 bn in 1H2014. The main reason is poor-quality production line from China and supplies, backup equipments rely on China contractors. So production usually faces disturbance. Besides that, coal price also impacted its operating efficiency.


DAP – Vinachem JSC

This is first DAP fertilizer plant in Vietnam, invested by Vinachem with advanced technology of America and Europe. This is also one of the largest fertilizer plant in Vinachem Group with the main product name of DAP Dinh Vu, total capacity of 330,000 tons/year. It plans to be listed in 2015.

DAP – Vinachem is specializing in manufacturing and trading fertilizers and basic inorganic chemicals:

- Fertilizer: DAP fertilizer
- Chemical: H2SO4, H3PO4; nitrogen chemical...
- Power generation: internal use and sale excessive power to national power network

Japan Vietnam Fertilizer Company

JVF was established in 1995 with a total investment of USD39.75 mn invested by 3 investors: Sojitz Corporation (Japan) with 75% ownership, Vietnam Chemical Corporation (Vinachem) with 18.9% ownership and Central Glass (Japan) Company with 6.1% ownership.



JVF is specializing in NPK fertilizers with a capacity of 350,000 tons/year, located in Go Dau Industrial Park, Dong Nai Province. Its products has high quality and suitable for almost land types in Vietnam. JVFC received various awards, such as: Golden Rice, Vietnam Farmer's Friend, Gold Medal, Vietnam top-ten fertilizer and pesticides, Golden Cup at the Highland Festival...

Baconco Group


Founded in 1996, BACONCO was a joint-venture with SCPA, a subsidiary of the French Group Potasse d'Alsace, a 100 year-old mining and fertilizer company, known worldwide for its famous Stork brand. 200,000t of NPK, specially adapted to soil and crop conditions, are manufactured and distributed, thus contributing to the development of dynamic and competitive Vietnamese agriculture.

Baconco Group has a strong network of more than 300 wholesalers distribute BACONCO's products to more than 5,000 nationwide retailers. BACONCO is also developing exporting specific products to Asia and Africa. In 2004 BACONCO began distributing crop protection products. This additional service offers the same policy of quality and innovation.

C. RECOMMENDATION

Ticker	Recommendation	Market price 10/06/2015	Target price	Upside	EPS		Room for foreign ownership	PE	
					2014	2015E		Trailing	Forward
DPM	ADD	29,400	33,900	11.5%	2,885	2,900	24.2%	9.8	9.8
DCM	ADD	13,200	14,300	8.3%	1,988	1,600	47.3%	8.5	8.0
LAS	NEUTRAL	27,700	28,500	2.9%	5,637	3,800	40.3%	6.7	7.3
SFG	NEUTAL	15,100	15,800	4.6%	2,317	2,100	49.0%	7.3	7.2

Source: FPTS Research, 2014

DPM

ADD – Target price VND33,900

DPM – ADD - Petrovietnam Fertilizer And Chemicals Corporation

DPM is a market leader in Vietnam urea market with Phu My Urea brand. Domestic fertilizer market is strongly competitive with the oversupply situation while domestic supply keeps growing. DPM is aiming to maintain 40% market share in domestic urea market and prepare market for NPK and chemical products such as NH₃, UFC85, ect. which will be launched from 2017.

Falling oil price positively impacts on earnings. The gas price accounts for about 70-80% of urea production cost and it is bought at market price so declining gas price has brought a positive impact on DPM's earnings. In 2015, based on assumption of Brent oil price at USD60/barrel, the gas price for DPM after rising tariff (from 0.63 to USD0.92/MMBTU) is USD5.03/MMBTU (-25% yoy) compared with USD6.78/MMBTU in 2014 (average Brent oil price of 2014 was USD97/barrel). This is seen as positive factors affecting performance of DPM in 2015.

Less losses from investments in PVTEXT Dinh Vu. PVTEXT Dinh Vu beared a loss of VND1.098 bn, and is projected to lose VND676 bn in 2015 (according to DPM's planning). This loss is considered as planning in early years of spinning mills. With this loss, DPM expectedly records a loss of VND203 bn for this investment (also included in company's plan). However, compared with the loss of VND280 bn in 2014, that of 2015 is expected to be more positive.

Negative influences from new VAT tax law. In 2015, similar to its peer companies, DPM will be negatively affected by new VAT tax law (No 71), we estimate the damage around VND230 bn. However, we believe that in 2015, market price will fell by about 5% (compared with price with VAT rate in 2014) then DPM average selling price will fell slightly.

Recommendation. In 2015, we forecast that DPM will reach VND1,268 bn of NPAT, equivalent to EPS of VND2,900/share. By DCF valuation method, DPM target price is VND33,900/share, 15.3% higher than the current price. Therefore, we recommend an ADD. In 2015, DPM's business activity as well as peer companies will suffer from new VAT tax laws and benefit from lower oil price as floating gas price policy. New projects will contribute to the company's profit from 2016 (UFC85/formaldehyde project) and 2017 (Ammonia/chemical NPK complex project). DPM has relatively stable operating cash flow, with dividend ratio of 25%, or dividend yield of 8.3%, it is attractive compared with current interest rate. [\(back\)](#)

DCM
ADD – Target price VND14,300

Strong earnings improvement in 2014 profitability. In 2014, DCM reached 6044 bn of net revenue (-3.5%, yoy), but profit after tax increased by 55% (yoy), corresponding to EPS of 1,550 VND/share. The results achieved in the context of sales volume increased slightly (1.2% yoy) and 11.2% reduction in prices but it is still subsidized by PVN with low gas price. With this support, DCM does not directly benefit from lower oil prices like DPM, but input gas price of DCM in 2014 is 30% less than of DPM.

Probability of new strategic investors. According to DCM's planning, DCM will sell 24.36% of its share to strategic investors, reduce ownership of PVN to over 51%. Mitsui are aiming to be one of these investors. If it is successful, Mitsui will support to improve DCM's value chain as well as ammoniac project. Beside Mitsui, others domestic and Korean investors also want to engage. However, it takes time to clearly process these changes in ownership.

2015 earnings continues to occur with similar scenarios to 2014. In 2015, the domestic urea supply expectedly continues to exceed demand (2.66mn tons over 2.2mn tons) when Ninh Binh Plant operates at full capacity (560 thousand tons compared with 360 thousand tons in 2014), Ha Bac Plant operates with higher capacity (500 thousand tons compared with 180 thousand tons of 2014). This will put domestic urea market under pressure. Unlike DPM, DCM has been receiving support from PVN to ensure an average ROE of 12% which will reduce negative effects from exchange rate volatility, new VAT tax laws and continuously declining urea price. However, a positive prospective for DCM is granular fertilizer characteristics, its plant has been only operating for three years but now is at maximum capacity and earns appreciation from neighbouring importers such as: India, Thailand.

Recommendation. We project that in 2015, DCM will reach VND5.790 bn in net sales and VND852 bn in NPAT, corresponding to EPS of VND1,600/share, by DCF model, we recommend an **ADD** with target price **VND14,100/share**. ([back](#))

SFG
NEUTRAL – Target price VND15,800

Beneficial from reducing fertilizer price. Products of SFG are made of different fertilizer types which are different from Ca Mau or Phu My urea by: **(1)**. Not suffer from pressure from imported fertilizers and supply-demand balance of domestic market is relatively stable (around 4 mn tons/year of which imported fertilizer accounted for only about 6% of supply) **(2)**. Trend of declining fertilizer price helps companies benefit from lower fertilizer inputs (nitrogen, phosphorus, potassium, SA, ect.) NPK input prices go down but selling prices are relatively stable, which is forecast to continue to improve SFG profit margin (increase slightly by 2.1% in 2014).

Delay new project. NPK products have many different technologies but low and middle very low barriers to entry so we believe that the company will not implement projects of 100 thousand tons of NPK factory in Hiep Phuoc and implement the project of new investment for package plant.

Negative impact from new VAT law. Similar to DPM, the change in VAT for fertilizer implementing from Jan 01st, 2015 will increase fertilizer production costs of companies increased from 3% to 5 % compared with previous year's level, which will reduce competitiveness of business SFG. Thanks to the fact that most of SFG's revenues came from product NPK products which ingredient fertilizer are not produced so it can reduce negative impact new tax law.

Recommendation. In 2015, we estimate that SFG will reach VND2,130 bn in revenue and 101.4 bn in NPAT, according to EPS of VND2,100/share. With current PE ratio of peer companies is 7/5, our target price is VND15.800/share, which is a **NEUTRAL** recommendation. ([back](#))

LAS

NEUTRAL – Target price VND28,500

Negative earning growth in 2015 due to new VAT law. To avoid this negative effect, in 4Q2014 LAS has boosted sale of goods by discount policy. This was a very fast reaction to deal with the new tax law but the demand is stable so when the dealer restored more inventory in 4Q2014, it led to low demand in 1Q2015. As a result, the business result of 4Q2014 has been abnormal and that of 1Q2015 was not positive (earnings reduced by 49%).

New project delay. Domestic fertilizer market is nearly saturated, supply and demand of fertilizer was approximately the same. However, some companies have plan to expand scale of NPK production: DPM invests in chemical NPK plants with capacity of 250,000 tons/year, VAF invests in NPK plants of 200,000 tons/year, 300,000 tons/year of phosphate fertilizer. Therefore, LAS considers this is not the appropriate time to deploy its projects: acid 300,000 tons acid/year combining with power generation, NPK production line with capacity of 200,000 tons/year.

Recommendation. We project that in 2015 NPAT is VND330 bn, equivalent to EPS of VND3,800/share. With average PE of 7.5 for this sector, target price of LAS is **VND28,500/share**, we recommend a **NEUTRAL**.
[\(back\)](#)

D. APPENDIX

Overview About Major Fertilizer Types

Nutrient composition of fertilizers is divided as follows:

Straight fertilizer. Each type of fertilizer contains only one nutritional ingredients, other types can be added: Urea contains 46% N, FMP fertilizer contains 16.5% P₂O₅, superphosphate fertilizer contains 16.5% P₂O₅, potassium fertilizer contains 60% K, ect. Major single-nutrient fertilizer manufacturers in Vietnam are: Ha Bac Urea Fertilizer Plant, Yen Khanh Urea Fertilizer Plant, Ca Mau Urea Fertilizer Plant, Phu My Urea Fertilizer Plant, Van Dien FMP Fertilizer Plant, Ninh Binh Phosphat Fertilizer Plant, Lam Thao Fertilizer Plant, Long Thanh superphosphate Fertilizer Plant, ect.

Compound fertilizer. Multi-nutrient fertilizers include other types of straight fertilizer, main types of compound fertilizers in Vietnam are: NPK5-10-3, NPK6-6-6, NPK15-10-10, NPK16-8-16, NPK20-10-10, ect. These kinds of fertilizer are produced by: Binh Dien Fertilizer Plant, Japanese Vietnam Fertilizer Plant, Song Gianh Fertilizer Plant, Five Star Fertilizer Plant, Southern Fertilizer Plant, Can Tho Agricultural Chemical Fertilizer, Vinh Fertilizer Plant, ect. Depend on production technology, nutritional ingredients in compound fertilizer are variable. Manufacturers are deliberate to use different material to improve their quality, reduce production costs.

Bio-organic fertilizer. This fertilizer is manufactured through advanced technology to supply adequate essential nutrition for crops, and also improve soil porosity thanks to useful microorganisms, provide organic nutrients to create mud for soil. The main ingredients are peat, phosphate ore, useful species of yeast organism originated from animals, plants, marine species. There are many fertilizer manufacturers specializing in this type, widely selling on the domestic market and exporting to some countries such as: South Korea, Laos, China, Thailand. The nutritional composition of bio-organic fertilizer includes: 13% P₂O₅, 3% N, 1% protein, 0.5% K, 2% humic acid and some minerals extracted from seaweed and trace minerals, ect. This is a good fertilizer type for ecological restoration.

Microorganisms fertilizer. Species of yeast organism are cultured to a certain density that will paralyze them with a density of 5 mn units/gram. Once applying to fields with appropriate conditions, microbial spores work again and continue to divide cell to make up populations of useful microorganisms. Corpses of microorganisms provide soil with nutrients. If the soil is continuously applied, land becomes porous, fertile. There are also a number of microorganisms which probably create nodules in legumes, are blended with seed when sowing.

Trace element fertilizer. The trace elements in fertilizers are added in small amounts, in accordance with each fertilizer type and crop development phase. Consequently, fertilizer producers mainly put on through leaf absorption, some are added through root. Currently, the most effective way is to applied through leaves. This fertilizer type is foliar fertilizer – foliar fertilizers are complexly constructed including: NPK, trace elements, secondary element, minerals, disease-resistance substance, ect. Trace elements are calculated as part per million. Unlike original raw fertilizer, foliar fertilizers have pure ingredients so they are easily absorbed by plants.

Main function of 3 key fertilizer elements

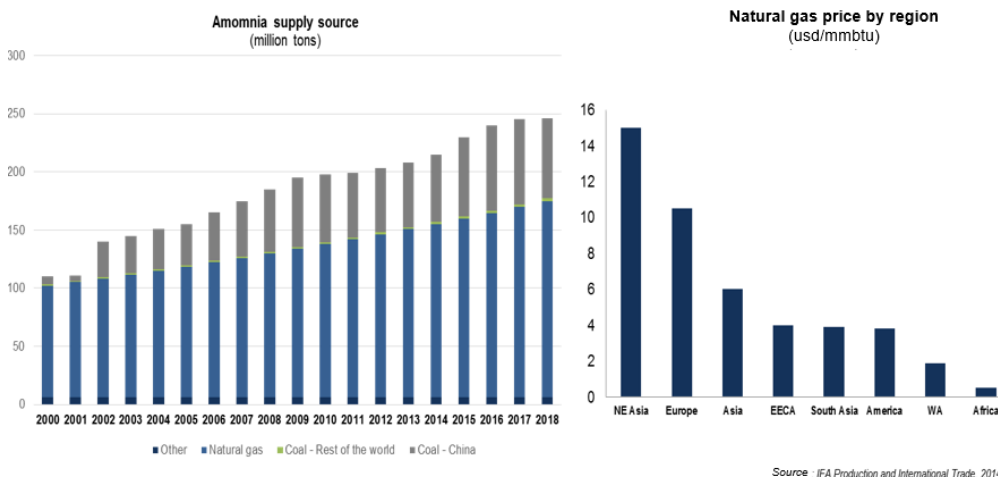
N	P	K
<ul style="list-style-type: none"> • Important in periods of rapid growth: boost height, enlarge leaves, generate branches, boost crop productivity • Excessive amount causes imbalance development: plants easily to collapse, more pests and diseases. • Lack of N causes weak development, leaves become yellow and body is stunted . 	<ul style="list-style-type: none"> • Important in protein and energy exchange • Stimulate root development to dig deeper in soil to prevent collapse • Stimulate branch generation, budding, blooming • Lack of P causes leaf death, dark blue color, slowly ripe 	<ul style="list-style-type: none"> • Increases permeability across the cell membrane, adjust pH, water content in stomata of leaf cell. • Causes solid body, increases cold tolerance, disease and other adverse conditions tolerance • Increases grain size, hardness, starch level, sugar level and agricultural quality • Lack of P causes sere leaf

Source: FPTS research, 2014

[\(back\)](#)

Fertilizer Production Material
Materials for N fertilizer production

2/3 ammonia amount in the world is generated from natural gas, and the rest is from coal, of which 95% is produced in China. In Europe, natural gas is main raw material source, accounts for 92% of ammonia production. Gas costs account for about 87-95% of cost of ammonia production and 78%-91% cost of urea production. Gas prices vary significantly by area.

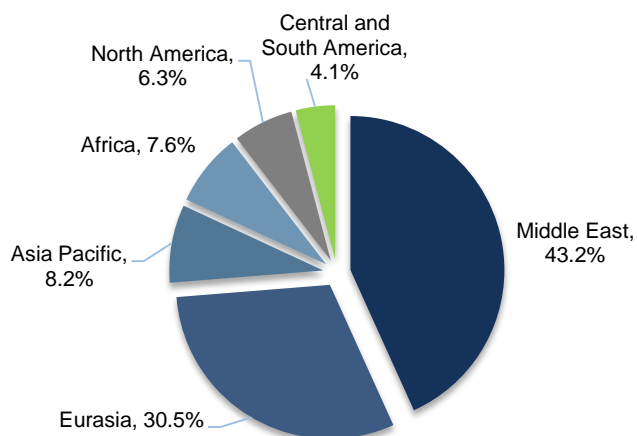


Natural gas source: Total global natural gas reserve (2013) is 186 trillion m3, mainly concentrates in Middle East, up to 43.2% of the global reserve. Eurasia contributes approximately 31% of total global gas reserves.

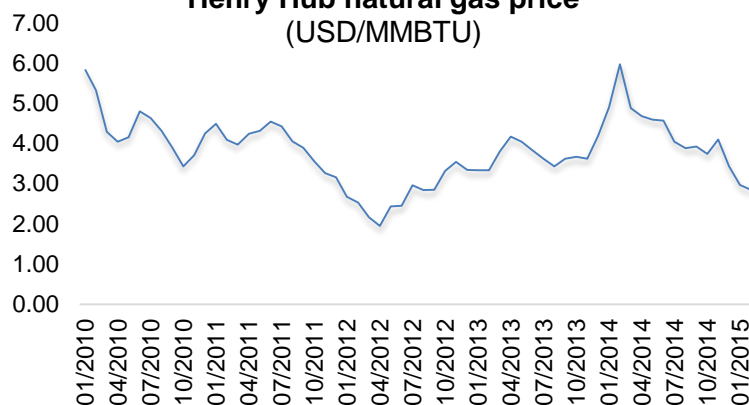
Production and consumption growth rate was 1.4% in 2013, below average rate of 2.6%. The consumption growth rate in developed country group is 1.8% and 1.1% for the group outside OECD. The growth rates are at average level for most areas except for North America. Demand from China and US was 10.8% and 2.1% relatively, accounted for 81% of demand growth. That of India fell by 12.2% and it has the strongest demand decline rate in the world, while that of EU is at the lowest level since 1999.

The natural gas production growth rate was 1.1%, lower than the 10-year rate average of 2.5%. Below-average growth occurred in most regions except for Europe, Eurasian. America is the internationally leading manufacturer with growth rate of 1.3%, Russia and China grew by 2.4% and 9.5%, respectively. Production fell sharply in Nigeria, India, Sweden by -16.4%, -16.3%, -5%, respectively.

Gas price fell very sharply in 2014 due to political instability in Russia and concern about shale gas supply in the US from mid 2014.

Natural gas reserve by region


Source: BP, 2013

Henry Hub natural gas price (USD/MMBTU)


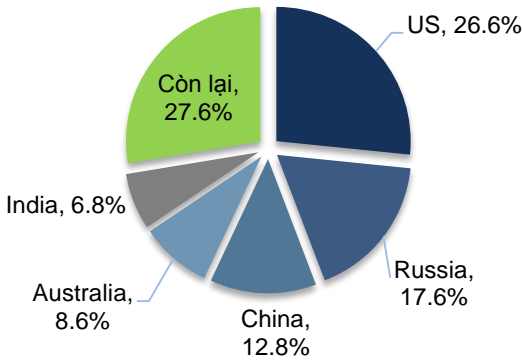
Source: Indexmundi, 2015

Coal source: According to BP, total coal reserve worldwide in 2013 was 892 bn tons, United States, Russia, China have largest coal reserves with the proportion of 27%, 17.6% and 13%, respectively. Although China does not have largest coal reserves, but China demand is largest with 1.9 bn tons accounting for 50% of global coal demand. Global coal consumption rose by 3% in 2013, was lower than the 10-year average rate of 3.9%, but coal is still a fossil fuel with the highest growth consumption rate.

India recorded strongest growth in demand at record level and accounted for 21% of global growth. OECD consumption grew by 1.4%, the US and Japan growth compensated for the decline in EU. Global coal production rose by 0.8% to the lowest level since 2002. The growth in Indonesia (+ 9.4%) and Australia (+ 7.3%) offset the decline in the US (-3.1 %), while China (+ 1.2%) is at the lowest production growth rate in production since 2000.

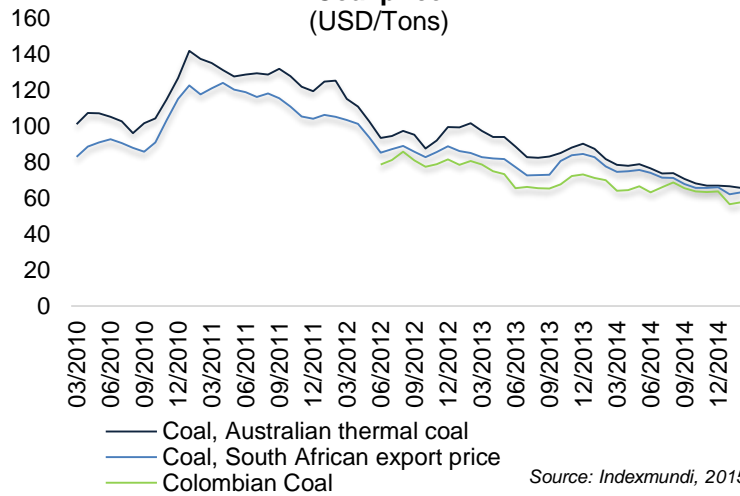
From 2011 onwards, coal prices have continued to decrease and decreased by 12.1% on average in 2014 in some major markets. This creates advantages for Chinese urea fertilizer manufacturers as Chinese urea is mainly produced from coal. [\(back\)](#)

Coal reserve by country



Source: BP, 2013

Coal price (USD/Tons)



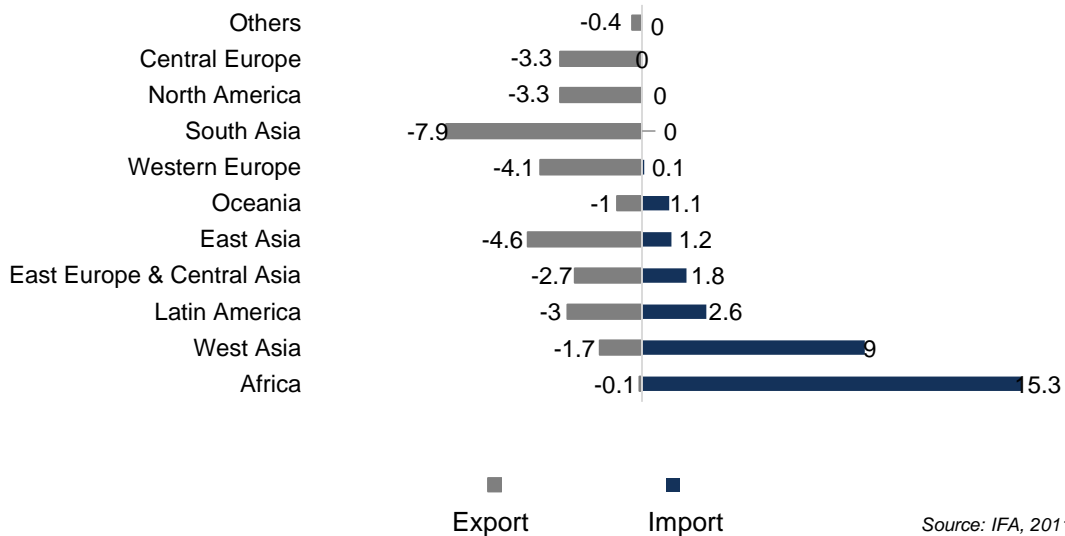
Source: Indexmundi, 2015

Materials For P Fertilizer Production

P is produced from phosphate and apatite mine but production from phosphate mines is more popular. Overall, phosphate rock production is in an uptrend, only interrupted by the sharp decline in production and demand from 1989-1994 due to the collapse of the Soviet Union and a period of demand decline from North America and Western Europe.

Except for a handful of underground mines, phosphate rock is mined in the large surface mining in different regions of the world. In 2011, China was seen as the world's largest phosphate rock producer (81 mn tons), followed by the US (28.1 mn tons), Morocco (28 mn tons) and Russia (11, 2 mn tons). These four countries account for nearly 75% of global phosphate rock production.

Phosphate ore trade (mn tons)



Source: IFA, 2011

Based on phosphate rock transactions, it can be seen that in 198 mn tons of rock mined in 2011, about 16% was exported, which mainly came from North African and Middle East countries such as Jordan, Syria, Egypt (up to 78%) and Morocco (36.7%).

According to the IFA (2007), phosphate ore reserves in the world is about 63.1 bn tons, enough for 450-500 years of consumption, of which 91.6% (57.8 bn tons) is phosphate ore and 8.5% (5.3 bn tons) in form of apatite. Apatite reserves are mainly in Russia, South Africa, Brazil, Finland, Zimbabwe, Canada; phosphate ores are spread in many areas, especially in Africa, North America.

Although ore resources concentrate in some countries, production is distributed equally as low barrier to entry and highly competitive industry. Regarding Middle East countries and North African countries, the production and export are strictly controlled by government.

The reserve level often changes annually due to exploitation and new mine exploration. According to USGS, China has reserves of 1 bn tons of phosphate ore (calculated in terms of P2O5), ranks 12th in the world. Impure ore reserves of China are up to 10 bn tons, rank third only behind Morocco and Western Sahara. Known reserves in China are mainly in the form of deposits, concentrated in Yunnan, Guizhou, Wuhan, Hebei and Sichuan.

The phosphate mining countries are divided into 3 groups:

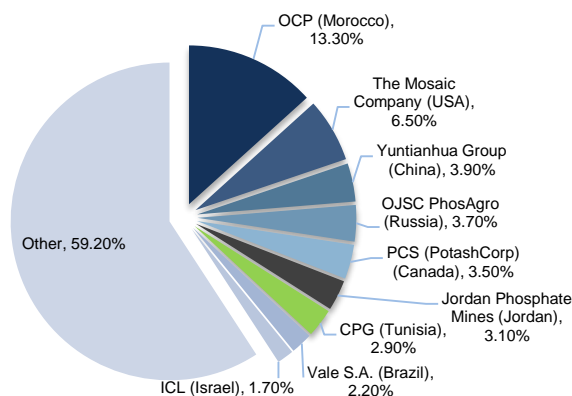
- Group 1: Country with large production volume: US, China, Morocco, CIS countries...account for 74.3% of the world output.
- Group 2: Tunisia, Jordan, Isreal, Brazil, South Africa, Togo, Syria, Xenegal, India, ect, account for 21.7% of the world output.
- Group 3: Canada, Egypt, Angeria, Finland, Mexico, Korea, Nauru, Vietnam, ect.

Global phosphate rock reserve is relatively geographically concentrated, it can be seen that Marrocco phosphate reserve accounts for 74% of global reserve. Consequently, political instability in North Africa and Middle East could cause unstable supply of phosphate rock.

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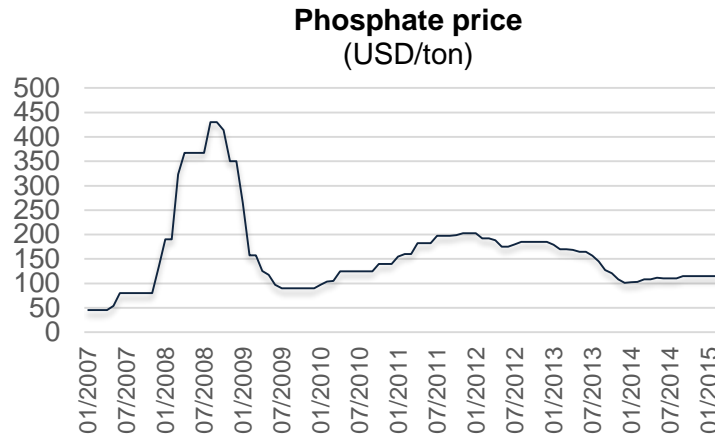
Market share of 10 largest phosphate producers

Country	Phosphate ore reserve (mn tons)
Tunisia	2,000
SNG	3,000
Sahara	3,700
US	5,000
Other African coun	7,000
Morocco	38,100
Other	4,300
Total	63,100



Source: ICL, 2013

Phosphate rock price trend. Phosphate ore prices, agricultural prices and agricultural commodity prices have close relationships, however phosphate prices are lagged. Despite rapid change in demand, supply changes at slower rate because it is limited and time consuming, and it is often related to mining costs. Average time between investment decisions and production of phosphate ore is 3-5 years. In 2014, average phosphate prices have fallen by 26% yoy. [\(back\)](#)



Source: Worldbank, 2015

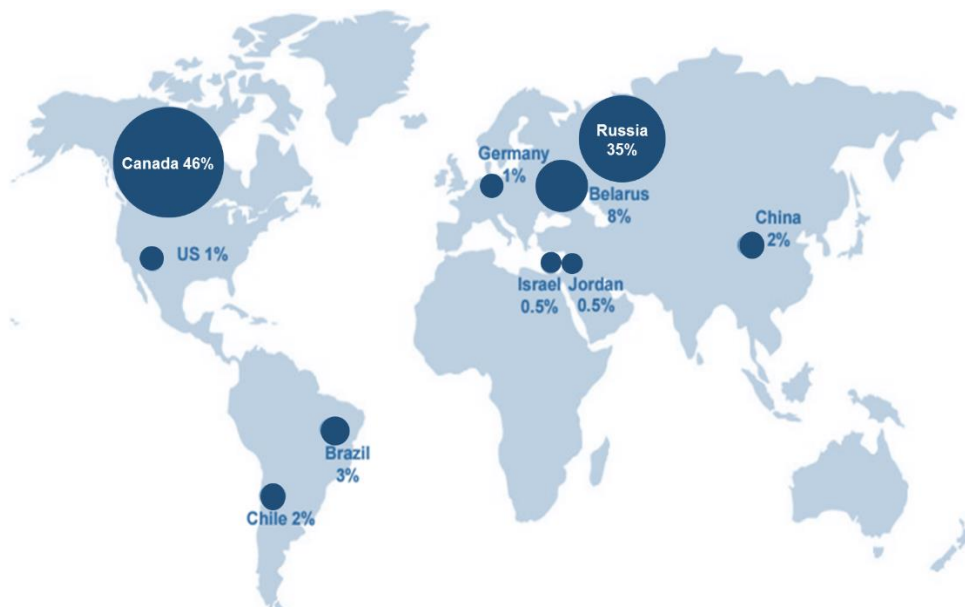
Materials For K Fertilizer Production

K fertilizer is produced from potash mines. Potash mine is found with large quantities and high quality in some countries, especially in Canada. According to USGS, potash mines are mainly concentrated in Canada and Russia, account for 81% reserve volume of global potash mines. In third position, Belarus accounts for 3%, the remaining countries are China, Brazil, Chile from 1-3% of global reserves. The total global potash reserves is 210 bn tons, able exploit to 288 years (USGS, 2013). The largest reserve is in Saskatchewan (Canada) with very high potassium level (25- 30% K₂O) and accounts for 37% of global supply.

Besides production from potash mine, potash is also produced from sea water. The Middle East countries extract potash from the Dead Sea with reserve of about 1 bn tons. In Asia, potash ore concentrates in Qinghai Province of China with a reserve of about 440 thousand tons/year. Compared with other types of mines, potash ore is relatively uncommon in many countries.

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Global potash resource allocation



Source: USGS, 2014

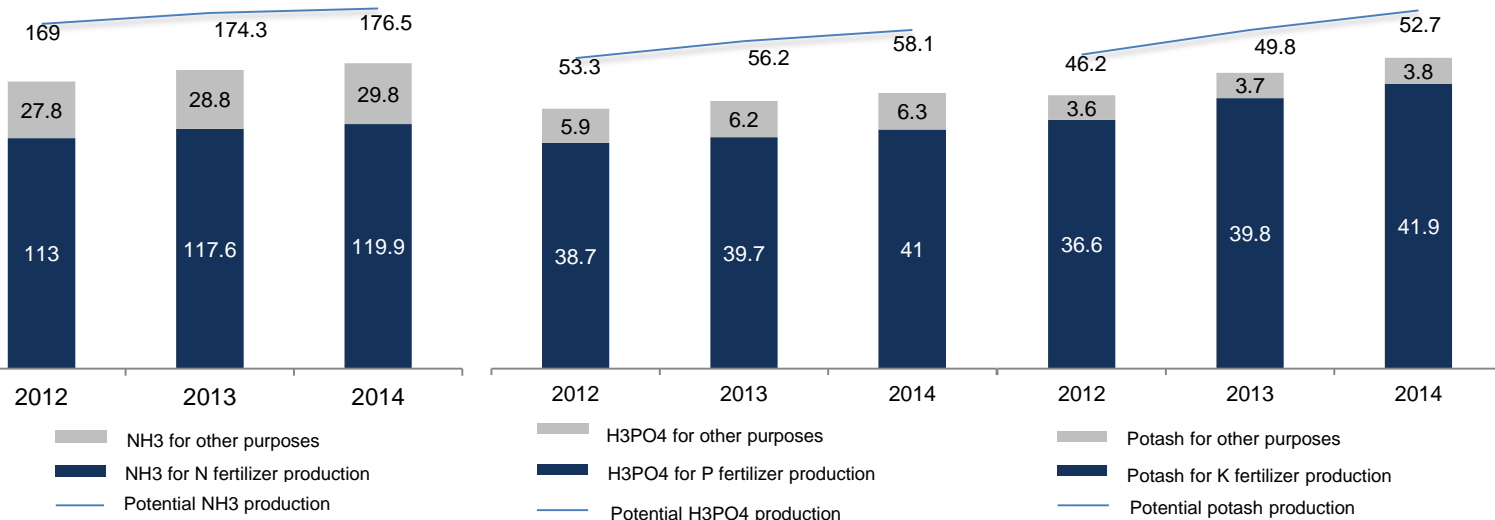
Production Of Major Fertilizers
Chemical production

N, P, K fertilizer are in turn produced from intermediate chemicals such as: ammonia (NH₃), phosphoric acid (H₃PO₄) and potash ore resources.

Chemical for N fertilizer. According to FAO, ammonia potential production in 2014 reached 176.5 mn tons. However, only 149.7 mn tons were successfully synthesized for consumption. Additional 29.8 mn tons were used for other purposes such as: inputs for industrial production, inputs for animal feeds, ect. 119.9 mn tons were for urea synthesis. Compared with 2013, global N fertilizers provide has increased by 1.9%.

Chemical for P fertilizer. Supply of phosphoric acid reached 58.1 mn tons in 2014 (+3.4% yoy). The portion of phosphoric acid for industrial production was 81.5%. 41 mn tons are used to produce P fertilizers and 6.3 mn tons are for other industrial production...Compared with 2013, the amount of phosphoric acid for P production rose by 3.4%.

Chemical for K fertilizer. Potential potash ore supply in 2014 was 52.7 mn tons. In particular, the amount of actual use reached 45.7 mn tons including 41.9 mn tons for K fertilizer and 3.8 mn tons for other purposes. Potash ore used for K fertilizer production increased by 5.3% compared with 2013. ([back](#))

Chemical for N fertilizer production
Chemical for P fertilizer production
Chemical for K fertilizer production


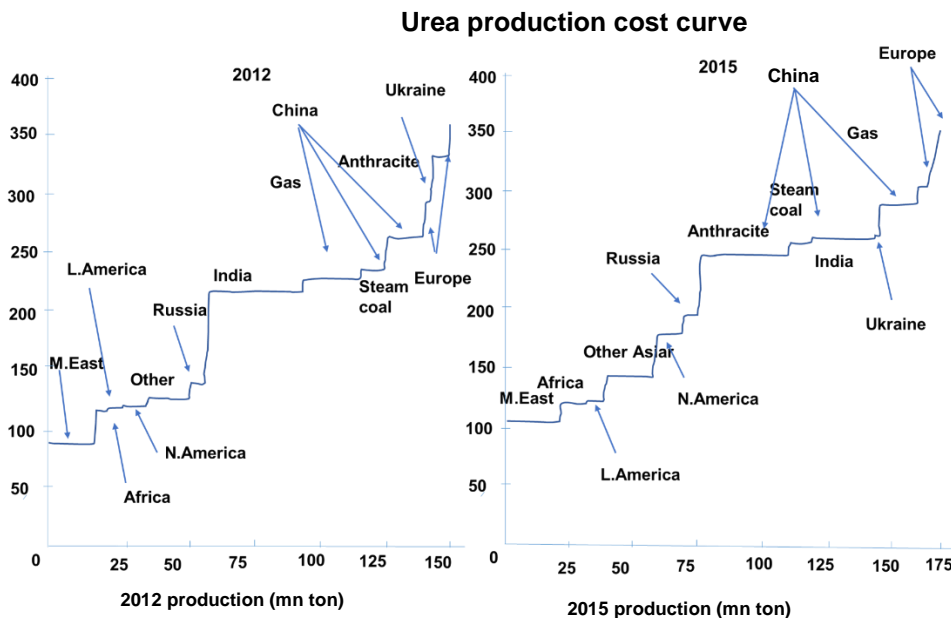
Source: FAO, 2014

Fertilizer Production
N fertilizer production

3 largest exporting countries are China, Russia, Qatar. Production costs is at the lowest level in the Middle East when it is about USD80-110/ton. According to Fertecon, China production cost fluctuates around 240-270 USD/ton, and that of Russia is USD130-170/ton when taking advantages of gas source. Production cost is highest for Western European countries and Ukraine with the average cost of above USD300/ton. Urea prices fluctuate around USD300/ton in the current period, most of the factories in Ukraine and Europe are close to production cost. However, also according to Fertecon, Western European countries have factories operating more efficiently than in the US and even more than some factories in North Africa and Middle East but due to high input gas prices, urea costs in European countries are higher.

Urea market is expected to continuously show a cyclical trend in the future and recovery period is expected to take place after a great market downturn from 2014 – 2018. In the downturn period, the number of new projects implemented will be limited. There are about 60 new urea

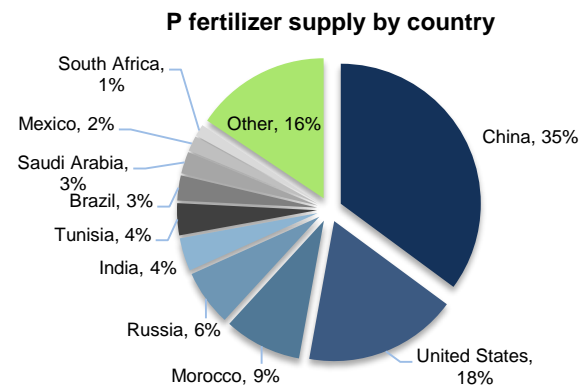
plant projects and 25% of them coming from China. But the risk also lies in large projects of North America, if these projects continue, it will reduce US imports and cause international urea price continue to sluggish. Urea prices are expected to fall below production cost of major Chinese exporters from 2016 and also cost of Ukraine exporters in this period. While export volumes from Ukraine are expected to rebound to higher levels at the end of the recovery period when international market recovers, China export is believed to reduce but mainly export to neighboring markets.



Source: Fetercon, 2014

P fertilizer production

Among 10 largest P fertilizer producing countries, supply from the United States and China account for over 50% of total supply. China has been the biggest P fertilizer supplier in recent years. In 2013, it supplied 19.2 mn tons, accounts for 35% of total global supply which was 54.5 mn tons. North America is second largest producing region and materials are mainly self-supply. However, in recent years, North America has become more dependent on phosphate rock from Morocco and Peru. P-related fertilizers is dominated by large multinational corporations such as Yara International ASA (Norway), Agrium Inc. (Canada), Coromandel International Ltd (India), PotashCorp (Canada), CF Industries Holdings Inc (US), EuroChem (Russia), OCP (Morocco), Mosaic (USA), ICL (Israel), and Phosagro (Russia).



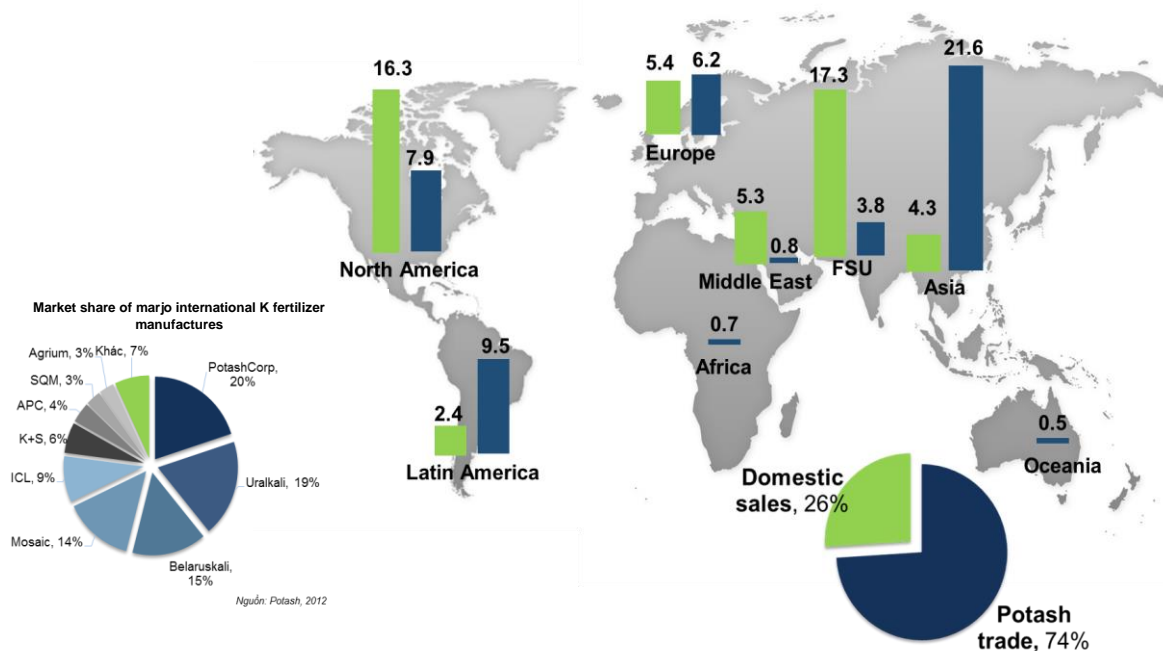
Source: Fetercon, 2013

K fertilizer production

Because Canada accounts for up to 46% of global potash reserves so the world's leading companies in K production such as PotashCorp, Mosaic and Agrium locate here. Russia with reserves of about 2.2 trillion tons of potassium has two international market leaders: Uralkali and Silvinit. They use the Urals mines from 1931.

Germany has the fourth largest potash reserves in the world (0.8 bn tons) but K + S ranked the 4th place in the field of K fertilizers production. The disbandment of joint venture between Uralkali and Belaruskali in March 2013 had caused negative effect on the international market and drive P fertilizer prices to lowest level in 4 years. This joint venture was largest P fertilizer producer with 42% of world exports.

Although the main demands for K fertilizer are in Asia and Latin America but domestic producers cannot meet demand of market and are mainly dependent on imports. This is a key difference between K fertilizer and other fertilizers. [\(back\)](#)



Source: FPTS Research, 2014

Vietnam Fertilizer Supply

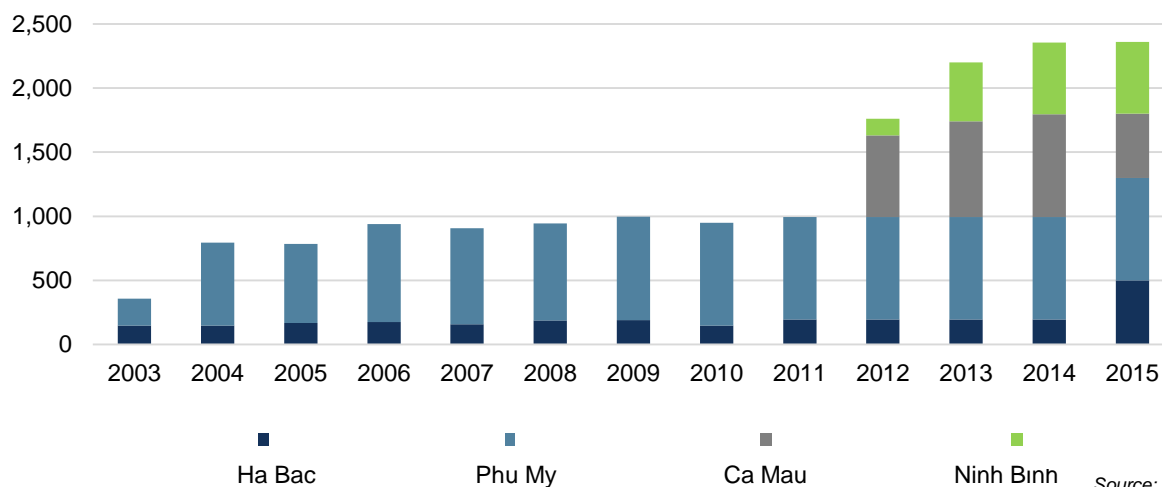
N Fertilizer Supply

Vietnam possesses two main raw materials for N production dominated by two State-Owned Enterprises: **(1)**. Natural gas source produced by subsidiaries of PVN: Phu My Fertilizer Plant (of Petrovietnam Fertilizer And Chemicals Corporation) and Ca Mau Fertilizer Plant (of PetroVietnam Ca Mau Fertilizer JSC); **(2)**. Coal sources produced by subsidiaries of Vinachem: Ha Bac Fertilizer Plant (Ha Bac Nitrogenous Fertilizer and Chemicals Company Limited) and Ninh Binh Nitrogenous Fertilizer Plant (Ninh Binh Nitrogenous Fertilizer Ltd.Company).

Before 2012, there were only two urea plants in Vietnam: Phu My Fertilizer Plant (design capacity of 800,000 tons/year) and Ha Bac Fertilizer Plant (design capacity is 195,000 tons/year). From 2007-2011, domestic production of urea was approximately 1 mn tons/year at about 50% of demand, the remaining 50% imported from abroad, which mainly from China. However, from 2012 onwards, when Ca Mau Fertilizer and Ninh Binh Nitrogenous Fertilizer Plant have been in operation, the domestic supply has risen to 1.8 mn tons of urea.

At the end of 2014, Vietnam urea production capacity reached 2.4 mn tons/year, including Phu My Fertilizer Plant of 800,000 tons, Ca Mau Fertilizer Plant of 800,000 tons, Ha Bac Fertilizer Plant of 195,000 tons and 560,000 tons from Ninh Binh Fertilizer Plant. In 2015, Ha Bac Fertilizer is expected to upgrade capacity from 180,000 tons to 500,000 tons/year, the total supply of Vietnam will be 2.66 mn tons/year.

**Vietnam urea supply
(Thousand tons)**



P Fertilizer Supply

In Vietnam, P fertilizer is mainly produced in form of super phosphate and FMP. Vietnam currently has 5 major phosphorus fertilizer plants, in which: **(1)**. 3 superphosphate fertilizer plants with total capacity of 1,150 mn tons/year: Lam Thao Fertilizer Plant - capacity of 750 thousand tons/year; Long Thanh Fertilizer Plant - capacity of 200 thousand tons; Apromaco Fertilizer Plant – capacity of 900 thousand tons/year; **(2)**. 3 FMP fertilizer manufacturers with total capacity of 900 thousand tons/year: Lam Thao Fertilizer Plant - capacity of 300 thousand tons/year; Van Dien Fertilizer Plant - capacity of 300 thousand tons; Ninh Binh Phosphate Fertilizer Plant - capacity of 300 thousand tons. Compared with superphosphate, FMP is not complicated (mainly made of apatite and coal) and has lower production cost. It is suitable for industrial plantations, especially, in Central Highlands.

The total phosphate production capacity is about 2.05 mn tons/year, while the demand is only about 1.8 mn tons/year (by MARD). Vietnam currently has capacity to meet 100% of domestic demand and there is no imported amount.

K and SA Fertilizer Supply

Vietnam has no plant for K and SA production, so these fertilizer types are fully imported. To encourage importing activity, the Government keeps import tax rates of 0% in 2014 for these kinds of fertilizer. Additionally, Vinachem also implements project to exploit potash mine with capacity of 320,000 tons/year in Laos.

DAP Fertilizer Supply

Vietnam used to import 100% of DAP fertilizer before the Dinh Vu DAP Fertilizer Plant (Hai Phong) came into operation in late 2009. Vietnam currently has only one DAP fertilizer plant (Dinh Vu DAP plants) with a design capacity of 330,000 tons/year. Following DAP Dinh Vu, Vinachem also implemented Lao Cai DAP Fertilizer production project with similar capacity. This project has launched since November 2011, it is expected to go into operation in 2015, with a capacity of 330,000 tons/year.

NPK Fertilizer Supply

This market is relatively competitive when there are about over 20 major NPK producers with hundreds of spontaneous companies with a total capacity of 4.8 mn tons/year compared with the total demand of 3.8 mn tons/year. The major domestic manufacturers are: Binh Dien, Southern Fertilizer, Five Stars, Supe Lam Thao, Baconco, Japan Vietnam Fertilizer, ect. Vietnam NPK manufacturers currently operate at about 75% of total capacity. The NPK factories of Vietnam are mainly locate in the Southern Vietnam (57% capacity), limited in the

Northern region (38%) and Central region (5%). However, the domestic production is not advanced in terms of technology with 60-70% production by simply blending different types of component fertilizer. The low barrier leads to oversupply, but Vietnam also imports high-quality NPK fertilizer.

Material Sources For Vietnam Fertilizer Production

Compared with the world, Vietnam only has material sources for N and P production. N fertilizer is produced from coal and gas, P fertilizer is produced from apatite mine. Vietnam does not have resources for K fertilizer production so relies on imports.

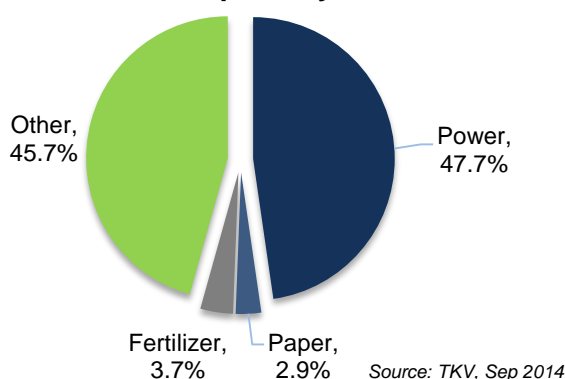
Materials for N fertilizer production

Coal resources are under control of Vinacomin and approved by Ministry Of Finance. Natural gas is supplied by PVN and gas price is approved by the Prime Minister. Also, coal is used as fuel for fertilizer production.

Coal sources. Vietnam coal market primarily operates based on Government's provisions. Despite orientation of the Government to develop coal market under market economy and not subject to state pricing, coal price is still under Government control because it is the input for major industries such as cement, steel, fertilizer... The coal price adjustment must be made by competent entities, especially for these industries.

Coal consumption has increased significantly from 10 mn tons in 2002 to about 28 mn tons in 2013. Domestic production was 27.5 mn tons, while coal imports was only 0.5 mn tons (1.8%). In 2014, Vinacomin produced 37.5 mn tons and sold 35.5 mn tons of coal. In the first 9 months of 2014, coal sales volume for fertilizer was 976 thousand tons, met 3.7% of domestic coal demand.

Coal consumption by sector



Vietnam total coal reserves is 48.7 bn tons (2012), which mainly locates in Red River Delta (39.4 bn tons). Vinacomin is the main supplier to domestic coal market (accounting for 98%) and sole coal exporter. Coals sold to fertilizer producers are divided into two categories: Coal dust as fuel (coal dust 5aHG) for power generation and raw coal (coal dust 4aHG) for fertilizer production (account for 60% of N fertilizer cost). Government allows coal dust 5aHG sold to Ninh Binh Nitrogenous Fertilizer Plant to be equal to price for power plants.

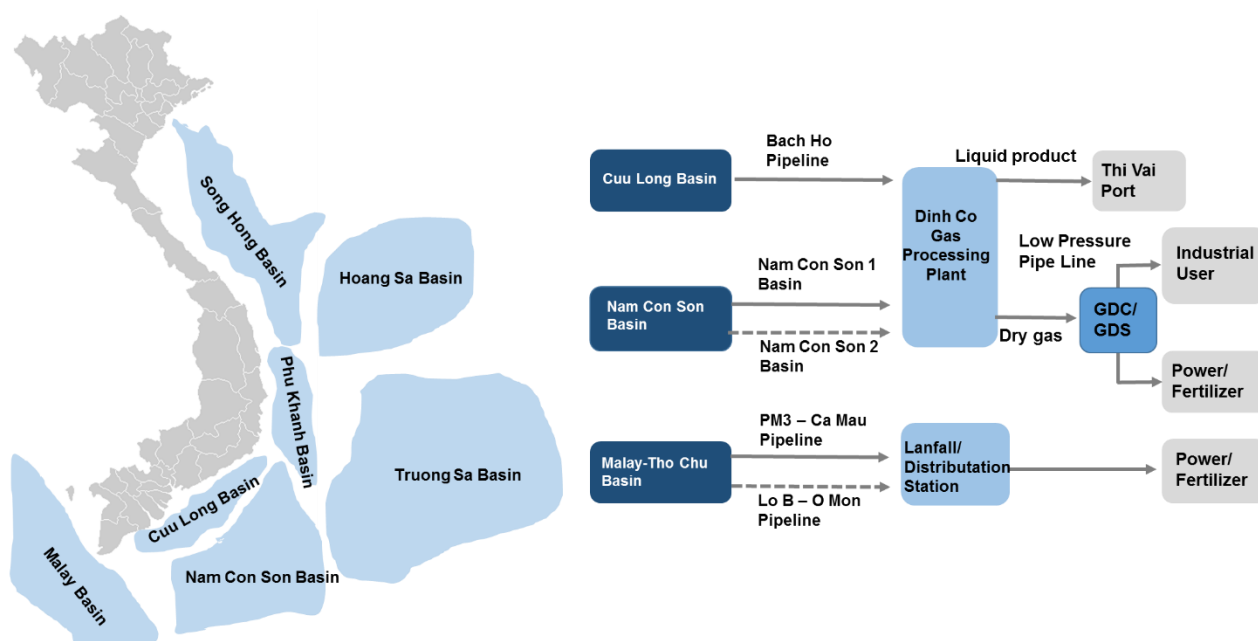
Region	Reserve (bn tons)
Notherwestern Basin	8,827
Red River Delta Basin	39,352
Other Basin	550
Total	48,729

Source: TKV, 2012

According Government planning from 2011 to 2015, Vinacomin must ensure to produce 55 mn tons of coal, build 28 new mines and expand 61 old mines. But Vietnam current coal industry is still in difficulties so the reinvestment is very difficult. At the end of 2013, Vinacomin reported that total reserves in the Northeast Vietnam had decreased by 20.8% compared with the Planning 60 of the Government. As of Dec 31st, 2013, the total reserves of Northeast coal basin and inland region were 6.93 bn tons remaining.

In addition, coal exploitation in the Red River Delta is unclear about technology and environment solution, trial exploitation is also delayed. Therefore, maximum output level by 2025-2030 under the Planning 60 can be just about 65 mn tons and may be even lower. According Vietnam Energy Association, based on forecast demand and domestic exploitation from 2015 and 2020, there might be coal shortage and supply might only meets 50% of demand, especially coal for power generation will be severely lacking. The shortage level will be about 3 mn tons in 2015 and at least 40 mn tons by 2020. [\(back\)](#)

Gas sources. The 2 current fertilizer plants consume an average of about 1 bn m3 of gas to produce 1.6 mn tons of urea. Gas supplied to the urea production accounts for about 9% of the total gas production of PV Gas, nearly 84% of PVGas supply for the power generation, and the rest for industrial users. Vietnam natural gas resource focuses mainly in 7 basins: Cuu Long, Nam Con Son, Song Hong, Malay Tho Chu, Phu Khanh, Hoang Sa and Truong Sa. These basins mainly locate in the Southern Vietnam with complex characteristics. Cuu Long Basin is the oldest basin (23 years) and it has the largest oil reserve but is showing signs of decline in volume. Malay Tho Chu has huge potential remaining, Song Hong Basin reserve is modest.



Source: PVGAS, FPTS Research, 2014

Gas sources for DPM. DPM's dry gas material is supplied from Bach Ho oil field from Nam Con Son and Cuu Long Basin. PVGAS buys gas from PVN (PVN buys gas from mine owners) and sells to customers. Phu My – Bach Ho pipeline system has a length of 220 kms transporting gas from the Rang Dong, Bach Ho Field at the Cuu Long Basin. The first phase of this pipeline

system was completed in 1995 and second phase was in 2002 with a total investment of USD400 mn and a capacity of 2 bn m³/year for power generation in Ba Ria, Phu My, Dinh Co Gas Processing Plant and Phu My Fertilizer Plant.

In 2012, dry gas selling price for DPM rose from USD4.59/MMBTU to USD6.43/MMBTU. From 2013, gas price was contractually expected to rise only 2% per year to 2016 but from Apr 1st, 2014 onwards DPM buys gas prices at market price with a certain formula based on FO price. This indicates an uncertainty in agreement among PVN Group.

After two contract adjustments in 2014, gas price contract for DPM from Jan 1st, 2015 to Dec 31st, 2015 is:

$$P = P_n + T_{cl} = 46\% * MFO + 0.92 \text{ (USD/MMBTU)}$$

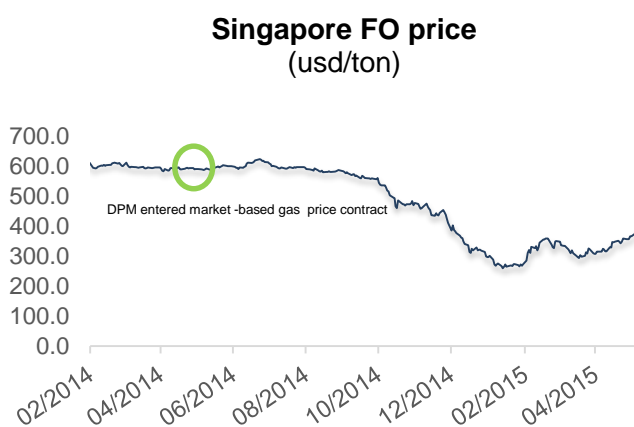
In which:

- P is gas price, not include VAT, unit: USD/MMBTU
- $P_n = 46\% * MFO$ is gas price converted as 46% of average monthly FO price in Singapore market, reported by Platt's magazine, and rounded to 6 decimal places
- T_{cl} is shipping and distribution charges from Cuu Long Basin in USD/MMBTU.

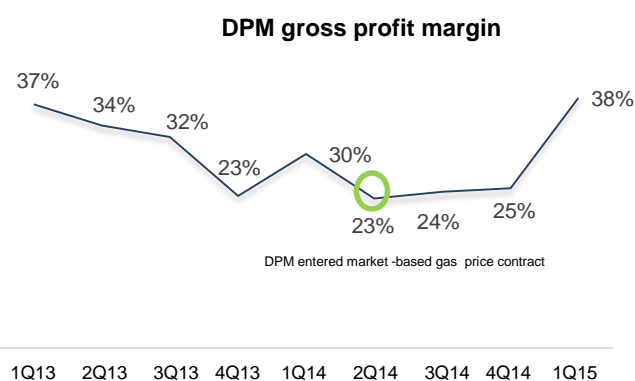
Shipping and distribution charges to 2019 as following:

	2015	2016	2017	2018	2019
Charges from Cuu Long Basin for DPM	0.92	0.94	0.96	0.98	1

From 2Q2014 onwards, FO prices have decreased continuously so DPM gross margin improves significantly, in 1Q2015, DPM recorded the highest gross profit margin since 2012. It is contrary to the concern about negative impact resulted from floating gas price.



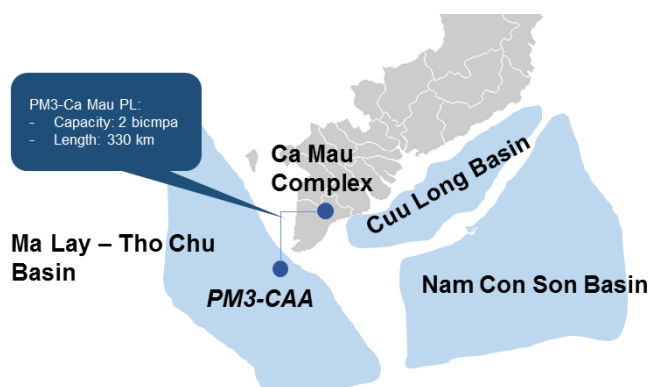
Source: Bloomberg, 2014



Source: FPTS Research, 2014

Gas sources for DCM. DCM purchases gas from PM3 field pipeline through PM3 - Ca Mau pipe line system, similar to DPM, DCM receives gas from PVGas which represents PVN. PM3 - Ca Mau gas source is from 2 lots: **(1)**. PM3-CAA Plot is part of Ca Mau gas - power – fertilizer complex which provides electricity and gas for Ca Mau Fertilizer Plant. Gas volume in offtake agreement for each contract is 1.29 bn m³ to 2023 and can be renewed for subsequent periods according to Vietnam and Malaysia consensus; **(2)**. 46-Cai Nuoc Plot which PVGas has right to purchase 100% of this plot. Gas consumption in offtake agreement per year is 206 mn Sm³ contract until 2023 and may be renewed for the next stage according to consensus between Vietnam and Malaysia. In addition, gas source from Lo B – O Mon pipeline project is expected to provide gas source for DCM in the future.

In 2012-2013 period, gas price contract was based on FO prices. After equitization, gas contract is changed. Through gas price contract, PVN guarantees for DCM to have a profit on average equity ratio of 12%/year from core business from 2015 to 2018.



Source: FPTS Research, 2014

[\(back\)](#)

Apatite source. Apatite demand for superphosphate fertilizer, FMP, DAP, yellow phosphorus and phosphoric acid is forecast as following table:

No	Type	Unit	2015	2020	2025	2030
1	Apatitte >32% P ₂ O ₅	Thousand ton	2,124	3,641	3,641	3,641
2	Apatitte ≥23% P ₂ O ₅	Thousand ton	1,110	1,480	1,480	1,480
Total		Thousand ton	3,234	5,121	5,121	5,121

Lao Cai apatite mine is the sole and largest apatite reserve in Vietnam. Although the reserve is large, it is often inefficient due to exploitation capacity as well as transportation to manufacturer. Apatite reserve forecast as December 31st, 2013 was 2,622,230 thousand tons, of which:

- Forecast reserve: 1,783,970 thousand tons;
- Proven reserve: 839,260 thousand tons, in which: Type I: 49,940 thousand tons, Type II: 243,970 thousand tons, Type III: 244,430 thousand tons, Type IV: 300,920 thousand tons. [\(back\)](#)

Fertilizer application density

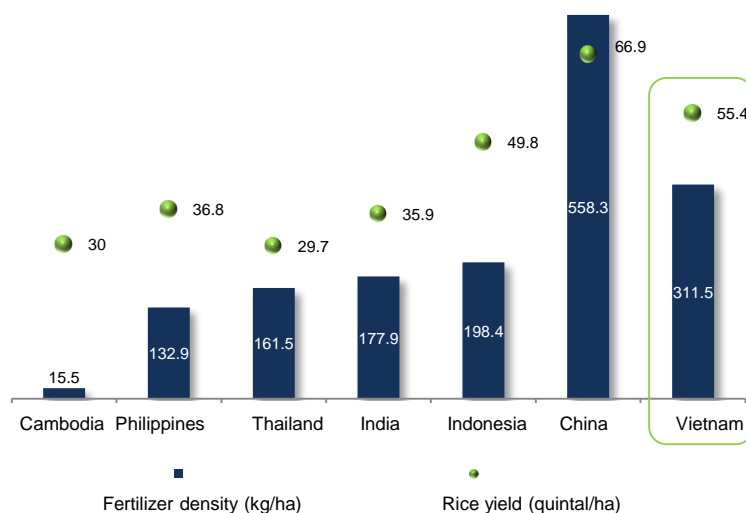
In 2010-2012 period, China had rapid growth in density of fertilizer use compared with neighbouring countries. But overuse of fertilizers and pesticides is increasing environmental pollution so China builds 5-year plan to reduce pollution in rural areas. Chinese Ministry of Agriculture will determine what and how much fertilizers to use. China sets target growth of 0% for fertilizers and pesticides use until 2020.

Cambodia is different from neighbouring countries when agriculture sector of this country is at an early stage so fertilizer consumption will grow faster in the coming period also because the Government will focus on agricultural development and rice export. Therefore, fertilizer use of Vietnam is relatively high compared with neighbouring countries. [\(back\)](#)

Fertilizer application and rice yield

Country (kg/ha)	2010	2011	2012	CARG
Cambodia	115	15.5	16.6	13.0%
China	579.9	558.3	647.6	3.7%
India	179.1	177.9	163.7	-3.0%
Thailand	162.2	161.5	153.2	-1.9%
Indonesia	181.5	198.4	194.8	2.4%
Philippines	148.6	132.9	113.5	-8.6%
Vietnam	323.3	311.3	297.1	-2.8%

Source: FAO, 2012



Source: FAO, 2011

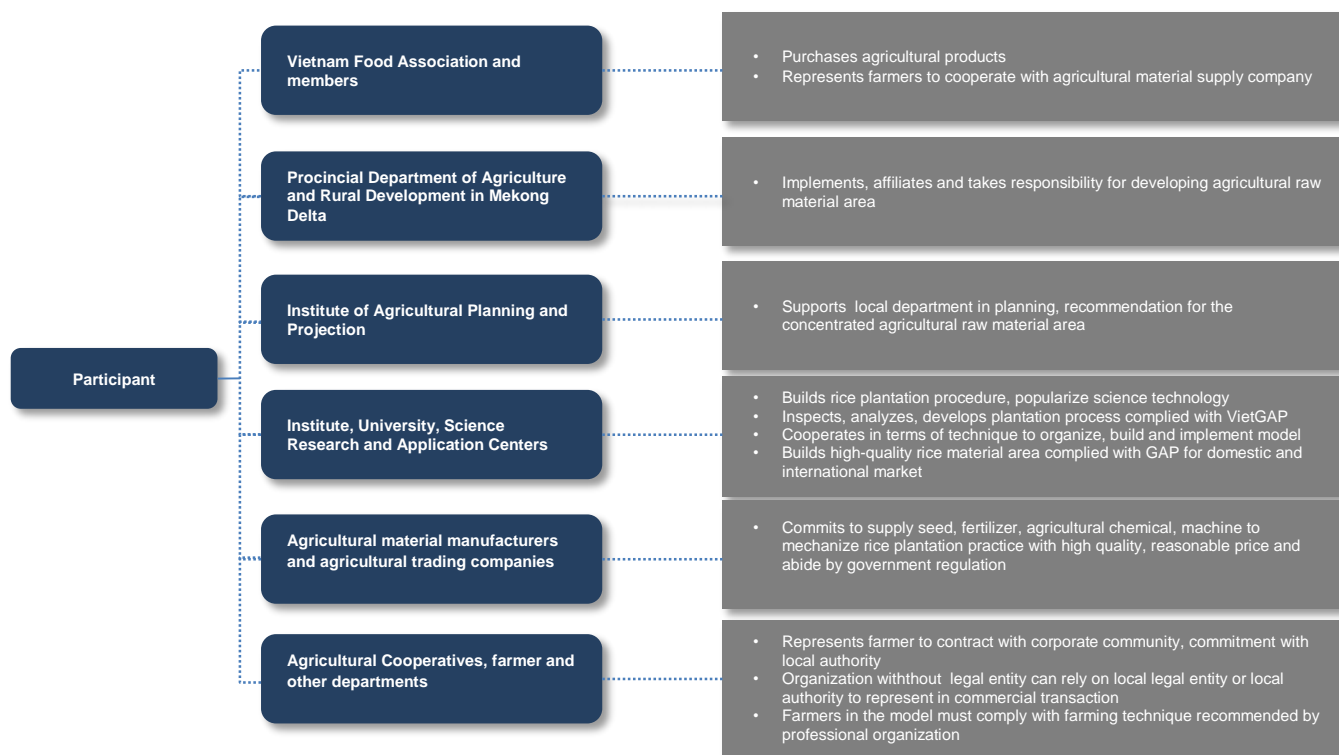
Overview about Large Sample Rice Field Model

Farmers participating in the model have to meet technical requirements and be trained to follow farming procedures. Farmers must comply with legal requirements and have organizations legally representing. One major farming technique is 03 reduction - 03 increase, namely: reduce seeds – reduce pesticides – reduce fertilizers. According to MARD, despite agricultural chemical reduction, each hectare of paddy field will have higher yields by about 15-20% compared with average rice yield of traditional plantation of 57.7 quintals/hectare (2014)

In 2014, the Mekong Delta had the largest number of farmers participating in this model with more than 200,000 hectares; Southeast Vietnam and Central Highlands had nearly 16,820 hectares, accounts for 6% of total rice area in the country.

Region	Area (thousand ha)
Mekong Delta	200.0
Tra Vinh	69.0
Tien Giang	33.0
Can Tho	26.0
Soc Trang	22.0
Other	50.0
Nothern VN	27.5
Southeastern VN and Central Highland	16.8
Area of model	244.3
Total rice area	4,097
Percentage	6.0%

Source: FPTS Research, 2014



Source: FPTS Research, 2014

This is a new progress in Vietnam's agricultural sector with participation of almost agricultural management unit, institutions, companies and farmers, so it requires time for further development. It was the results of weak commitment among parties, high initial investment costs, and unfamiliar farming practices cannot change in the short term, unidentical offtake contract... However, we believe that this model will be widely adopted as benefits of improving mechanization, reducing input costs thanks to economies of scale, creating homogeneous materials region with high quality, ect. More importantly, it will improve living standards of farmers to strengthen commitment to this model. [\(back\)](#)

Distribution Network

The market is operating primarily through a system of dealers nationwide. A strong distribution system ensures smooth flow from production to consumption, from imports to farmers, strengthens quality, price control and reduces unreasonable circulation. Farmers easily recognize trusted point of sale, purchase goods with clear origin. Most of fertilizer enterprises build their own distribution network. Agents in these distribution networks are incentivized by trade discount policy, transportation charges, flexible storage, ect. Regarding import fertilizers, it is through many intermediate levels to final consumers (farmers). For domestically produced fertilizer, it is also through intermediate levels, mostly in the form of selling at factory gate, then intermediary trade before reaching final consumers.

A special type of distribution network is through regional subsidies. In the world, very few number of companies manufacture and sell to end-consumers without distribution system due to limited human and finance resources. DPM is the only company to apply this system by a network of subsidiaries in four main regions: The Northern Vietnam, The Central Vietnam, The Southwestern Vietnam and The Southeastern Vietnam. DPM also combines subsidiaries with dealers (level 1,2). This improves market monitoring, but slowly accesses to changing market situation and increases management costs.

Problem of Vietnam fertilizer industry is managing smuggling fertilizer with unidentified origin. In general, fertilizer supply system in Vietnam still overlaps. The problem of counterfeit goods, pirated goods has still not been resolved. Although government has attempted to prevent commercial fraud and low-quality imported fertilizer, it is not really effective. [\(back\)](#)

Vietnam Fertilizer Import
Fertilizer Import By Type

Type	2014		YoY	
	Volume, Ton	Value, USD	Volume (%)	Value (%)
Potassium	986.4	333.0	-0.57	-21.58
DAP	965.7	444.1	-0.64	-3.59
SA	906.2	122.6	-18.82	-36.04
NPK	264.7	115.5	-37.29	-42.41
Urea	220.3	66.2	-72.12	-74.70
Ammonium Chloride	124.1	14.7	64.45	34.34
Ammonium Nitrate	122.5	55.1	7.77	7.31
Other	109.5	44.2	29.94	13.58
MAP	61.2	23.7	31.10	14.75
Foliar fertilizer	31.2	16.3	656.86	-11.44
MKP	1.9	2.5	28.82	21.16
Total	3,793.6	1,237.8	-17.85	-26.38

Source: Agromonitor, 2015

Import companies: In 2014 there were 416 enterprises participating in fertilizer import. Vinacam is the largest importer with value of USD101.93 mn. The second and third ranks are Long Hai Group JSC and Apromaco, with USD99.94 mn and USD85.11 mn, relatively.

Import value of Vietnam Top 10 importers, mn USD

Company	2014	2013	YoY
Vinacam JSC	101.9	111.9	-8.89%
Long Hai Group - JSC	99.9	49.6	101.52%
Apromaco	85.1	109.4	-22.20%
Thien Thanh Loc Manufacturing and Trading Ltd	68	78.5	-13.32%
Ha Anh Import-Export JSC	54	49.9	8.20%
Petrovietnam Fertilizer & Chemicals Corporation - JSC	49.2	50.8	-2.98%
Japan Vietnam Fertilizer Company	49.2	48.3	1.95%
CT TNHH Baconco	48.1	52.8	-8.93%
Nguyen Phan Ltd	45.2	59.5	-24.05%
Hoa Phong Ltd	44.3	67.2	-34.11%

Source: Agromonitor and GDVC, 2014

Export country. Addition fertilizer imported officially through border gate, fertilizers are also imported from unofficial way from China with high risk of low quality and unclear origin. However, management currently still faces various difficulties such as: limited authority of market management, low penalties, ect which still have room for low quality fertilizer.

Top 15 Exporters to Vietnam

Market	2014		YoY	
	Volume, Ton	Value, USD	Volume, Ton	Value, USD
China	2,001.3	634,743.7	-20.91	-25.82
Russia	316.4	118,840.7	22.03	1.78
Japan	236.5	37,956.7	-21.83	-33.66
Israel	177.4	60,258.2	-20.38	-38.07
Lithuania	166.1	55,324.7	1918.89	1450.98
Canada	14.2	47,971.4	-9.18	-31.39
Korea	129.8	60,798.8	-25.01	27.92
Laos	96.8	26,927.6	34.91	-0.32

Taiwan	80.5	16,308.0	34.49	11.94
Belarus	53.2	18,095.6	-75.33	-80.85
Jordan	51.1	19,921.9	223.73	149.14
Singapore	44.6	15,989.5	-3.04	-23.5
Thailand	33.7	6,861.7	283.37	-33.69
US	30.5	14,486.0	2489.79	289.6
Australia	29.8	12,371.4	229.86	127.4
Other	44	15,130	-39.95	-49.32
Total	3,794	1,237,848	-17.85	-26.38

Source: Agromonitor And GDVC, 2014

Fertilizer import from China

In 2014, fertilizers imported from China reached 2.0 mn tons (-20.91% yoy) and valued USD 634.74 mn (-25.82% yoy). Especially, from June, July, August, China imposes low export tax for urea and DAP, but in 2014, imports from China was relatively low compared with same period in 2013. In Sep 2014, fertilizer imports from China rebounded however it continued to decline in 4Q2014.

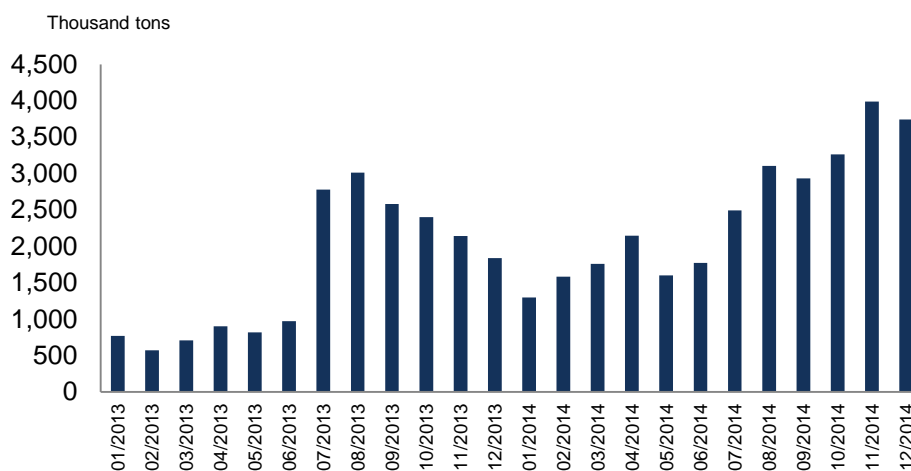
Fertilizer imports from China in 2014 were mainly DAP, SA, urea, ammonium nitrate and Chloride Amonium. DAP, SA imports were down by 3.5% and 8.2%, relatively, while urea import remarked a sharp drop of 73.9% in volume. On the other hand, ammonium nitrate and ammonium chloride increased by 7.47% and 60.22%, respectively.

Fertilizer types import from China

Type	2014		YoY	
	Volume, Ton	Value, USD	Volume (%)	Value (%)
DAP	856.3	385.0	-3.5	-6.47
SA	575.2	72,765.1	-8.22	-26.52
Urea	187.4	56,247.3	-73.97	-76.4
Ammonium Chloride	119.5	14,108.5	60.22	30.8
Ammonium Nitrate	117.9	53,173.5	7.47	7.28
MAP	60.7	23,307.7	32.13	16.02
Other	48.2	14,256.3	15.35	8.41
NPK	19.3	7,896.7	171.25	117
Potash	14.5	5,477.9	-0.95	-21.78
MKP	1.5	1,806.6	27.07	16.95
Foliar fertilizer	0.8	658.3	-20.78	-24.07
Total	2,001.3	634,743.7	-20.91	-25.82

Source: Agromonitor And GDVC, 2014

China fertilizer export



Source: Agromonitor, 2014

China export tax rate in from Aug 01st, 2015

Type	Tax rate
Urea	80 CNY/Ton
MAP, DAP	100 CNY/Ton
TSP	5% export value
SSP	5% export value
Ammomia	180 CNY/Ton
Ammonia solution	60 CNY/Ton
NPK	30% export value
NP	5% export value
MOP SOP	600 CNY/Ton
Ammonium chloride/ potassium nitrate	5% export value
Phosphate rock	35% export value
Phisphoric acid	300 CNY/Ton

Source: Agromonitor and GDVC, 2014

[\(back\)](#)

Vietnam Fertilizer Export

Regarding exporters. There are about over 130 fertilizer exporters. The top 10 largest firms account for a proportion of about 81.63% of total export volume. Quang Binh Import and Export JSC is the leader in fertilizer export with a proportion of 9.38% in volume with export value of USD38.48 mn. Baconco ranks 2nd with exports proportion of 8.51%, value of USD36.85 mn.

Vietnam Top 15 Exporters - 2014

Exporter	Value, mn USD
Quang Binh Export Import JSC	38.5
Baconco	36.9
Ha Anh Export Import JSC	26.8
Binh Dien Fertilizer JSC	39.9
Petro Viet Nam Ca Mau Fertilizer JSC	29.0
Vedan Vietnam Ltd	9.1
Can Tho Fertilizer And Chemical JSC	25.3
Tuong Dung Private Enterprise	24.7
Chinh Phuong Export Import Single Member Ltd	20.8
Southern Fertilizer JSC	19.6
Tuong Nguyen Export Import Trading Ltd	12.5
Petrovietnam Fertilizer & Chemicals Corporation	8.7
Five Stars International Group	5.5

Hoang Anh Gia Lai Raw Material Company	8.4
Thanh Tuan Phat Export, Import, Trading Ltd	6.3
Other	71.9
Total	383.7

Source: Agromonitor and GDVC, 2014

Import countries. Cambodia is the largest fertilizer importer of Vietnam with 461.79 thousand tons in 2014 (-47.38% yoy), accounted for 42.82% of total export volume. The Philippines, Laos also imported less fertilizers from Vietnam in 2014 compared with 2013. On the other hand, Korea, Thailand, Bangladesh imported more in 2014. Noteworthily, fertilizer import from following countries grew significantly in 2014: Ghana (1,382%); Indonesia (627%); Mozambique (62%).

Regarding urea market, export is a mean to expand market. Total consumption of Southeast Asia is about 5.5 mn tons per year, main demand comes from Cambodia, Malaysia, Thailand (about 3.9 mn tons). Especially, urea demand from Cambodia is forecast to double in the next 10 years (currently 250 thousand tons/year).



Source: GDVC, 2014

Fertilizer export to major market

Market	Type	Volume, ton	Value, mn USD
Cambodia	Urea	178.2	61.5
	NPK	121.7	56.0
	DAP	76.8	36.8
	Potassium	27.7	10.6
	Organic	17.6	2.9
	Phosphorus	13.6	1.9
	Total	46.2	177.5
Korea	DAP	81.3	33.9
	Organic	35.2	2.3
	Phosphorus	21.5	2.8
	Other	6.1	1.1
	NPK	1.4	0.4
	Urea	0.7	0.2
	Total	14.6	40.9
Malaysia	NPK	24.7	8.3
	Urea	24.4	7.6
	Phosphorus	18.4	2.8
	DAP	13.3	5.5
	MAP	1.8	0.7

	Total	84.4	25.2
Philippines	NPK	29.1	9.8
	Urea	17.5	5.7
	DAP	12.0	4.9
	Total	64.6	20.5
Thailand	Urea	28.2	9.8
	NPK	23.2	7.5
	Total	53.7	17.8
Bangladesh	Urea	38.5	13.6
	Total	38.5	13.6
Laos	NPK	15.3	8.2
	Phosphorus	4.2	0.8
	Urea	3.3	1.4
	Potassium	2.9	1.4
	Microbiological	1.5	0.0
	DAP	1.4	0.1
	Total	30.9	13.7

Source: GDVC. 2014

Fertilizer export by border gate

In 2014, fertilizer exportation through Cat Lai Port was 152.44 thousand tons accounting for largest proportion of 14.13% in total Vietnam fertilizer export volume. In ports of Haiphong, fertilizer export in 2014 reached 137.98 thousand tons, accounted for 13.23%. Meanwhile, fertilizer export via border crossing Southwestern (An Giang, Dong Thap) in 2014 accounted for 31.15% and mainly shipped to Cambodia including: 145.07 thousand tons in Thuong Phuoc border gate; Khanh Binh border gate reached 142.63 thousand tons; Vinh Xuong border gate and Tinh Bien border gate reached 26.430 thousand tons and 21.8 thousand tons, respectively. In 2014, exports through Cat Lai Port was mainly to the Thailand, Malaysia, Philippines, Mozambique. Exports through ports of Hai Phong are mainly to Korean, Malaysia, Philippines.

Fertilizer export through major border gate

Port/Border Gate	Export to	Portion (%)
Cat Lai Port (Ho Chi Minh)	Thailand	16.46
	Malaysia	15.32
	Philippines	13.43
	Mozambique	11.86
	Myanmar (Burma)	6.04
	Korea	5.24
	Total	100.00
Thuong Phuoc Border Gate (Dong Thap)	Cambodia	98.90
	Comoros	1.10
	Total	100.00
Khanh Binh Border Gate (An Giang)	Korea	100.00
	Total	100.00
Hai Phong Port	Korea	48.67
	Malaysia	16.60
	Philippines	13.04
	HongKong	8.55
	Indonesia	4.99
	Total	100.00
Vedan Port (Dong Nai)	Korea	100.00
	Total	100.00
Sai Gon Kv3 - Ben Phao Port	Bangladesh	80.00
	Thailand	20.00
	Total	100.00
Vinh Xuong Border Gate (An Giang)	Cambodia	100.00
	Total	100.00
Tan Cang Hai Phong Port	Thailand	32.52
	Malaysia	26.54
	Philippines	24.84
	Indonesia	4.69
	Total	100.00
Tinh Bien Border Gate (An Giang)	Cambodia	100.00
	Total	100.00

Source: Agromontior and GDVC

Domestic Fertilizer Manufacturers

- **Small manufacturers:** 1-3 thousand tons/year with simple technology (using shovels, hoes, pan mixer)
- **Medium manufacturers:** 5-40 thousand tons/year with ordinary technology
- **Large manufacturers:** 50-150 thousand tons/year such as: Song Giang Company, Komix Thien Sinh Company, Nghe An Agricultural Materials Company, Vinh Chemical Company, Tien Nong Company...
- **Very large manufacturers:** 150-1,000 ton/year such as: Petrovietnam Fertilizer & Chemicals Corporation, Lam Thao Fertilizers And Chemicals JSC, Petro Viet Nam Ca Mau Fertilizer JSC, Ninh Binh Phosphate Fertilizer Joint Stock Company, Van Dien Fused Magnesium Phosphate Fertilizer JSC, Ha Bac Nitrogenous Fertilizer Company, The Southern Fertiizer JSC, Japan Vietnam Fertilizer Company, Five Star International Group...[\(back\)](#)

Vietnam Fertilizer Production Technology

Urea technology. Ha Bac Urea Plant and Ninh Binh Urea Plant use shell coal gasification technology with coal input. Phu My Fertilizer Plant and Ca Mau Fertilizer Plant do not use this technology but use gas as material. All four urea plants use Topsoe technology (50% of plant in the world use), Snamprogety Technology (45% of plant in the world use). Especially, only DCM uses Toyo technology.

Dimension	Ninh Binh Urea Plant	Ha Bac Urea Plant (*)	Phu My Urea Plant	Cam Mau Urea Plant
Design capacity	1,760 ton/day (560.000 ton/year)	1,562.5 ton/day(500.000 ton/year)	2,385 ton/day (800,000 ton/year)	2,385 ton/day (800,000 ton/year)
Product quality				
+ Nitrogen density (% dry)	> 46.3	≥ 46.0	46.3	46.3%
+ Biuret (%)	< 0.9	≤ 1.5	<1	<0.99
+ Moisture (%)	< 0.5	< 0.5	<0.4	<0.5
+ Formandehyde (%)	0.07-0.1			
+ Particle size	0.85 - 2.80mm >90%	1 – 2.5mm>90%	1.4-2.8mm>95%	2 – 4 mm > 90%
Amonia production	1,000 ton/day (320,000 ton/year)	937,5 ton/day (300,000 ton/year)	445,000 ton/year (for 740,000 ton of urea /year)	1,350 ton/day
Material	Coal	Coal	Natural gas	Natural gas
Technology				
+ Air separation stage	Air Liquid (France)	Air Liquid (France) or Linde		
+ Coal gasification	Shell Coal gasification (Holland)	Shell Coal gasification (Holland)		
+ Ammonia synthesis	Haldor Topsoe (Denmark)	Topsoe (Denmark) or Casale (Switzerland)	Haldor Topsoe (Denmark)	Haldor Topsoe (Denmark)
+ Urea production	Snamprogetti (Italia)	Snamprogetti (Italia) or Stamicarbon (Holland)	Snamprogetti (Italia)	Snamprogetti (Italia)
(*) Ha Bac is in upgrade progress				
Year starting	2010	1975	2004	2012

Source: FPTS Research

DAP production technology. Dinh Vu DAP Plant and Hai Phong DAP Plant use most advanced technology. However, impurities in apatite ore are high and inidentical so quality of products from Dinh Vu DAP Plant is not high and faces difficulty in competition.

P fertilizer production technology. Single superphosphate and FMP production technology of existing plants in Vietnam are not advanced and energy consumption per raw materials unit is higher than same products of the world.

NPK production technology. Except for NPK plant in form of join venture company with relatively advanced techonology, most of domestic NPK plants use physically mixing method, steam drum granulation. Therefore, degree of mechanization and automation is low.

Besides 3-grant NPK, some large companies invest in one-grant NPK production line (approximately 30-40% of total capacity) by applying steam granulation or chemical technology. The one-grant NPK product has higher quality, contains higher trace element level.

The popular NPK products in Vietnam fertilizer market are: NPK 25 - 25-5, NPK 20 - 20 - 15, NPK 16-16 - 8, NPK 16-16 - 8 + 13S, NPK 20 - 15 - 20 Agrotain, NPK 16 - 8-16, NPK 5 - 10-3, ect.

- **Bulk blending NPK technology:** ingredient fertilizer is quantified then mix roughly together. This product often has from two to four colors (color of ingredient fertilizers and fillers, additives). The advantages of this method are: simple process, low investment and operating costs. Furthermore, production is very flexible relevant to market demand. The downside is that the quality is not stable, heterogeneous and difficult to preserve, ect.
- **Physical granulation:** Manufacturers use mainly compression or tower granulation or pelletizing disk/drum to form grant. Also, grant is created by centrifugal force, gravity, compression, steam to create a single grant. Products often have uneven size, storage difficulty (easy to agglomerate). It is hard to produce products with higher than 16% of N or higher than 10% of P and granulation process control is very complex.
- **Chemical granulation:** This is the most advanced technology. The production process consists of a series of chemical reaction among materials containing N, P such as H₃PO₄, H₂SO₄, NH₃. Single K fertilizer is combined by mechanical processes. This technology produces hard homogeneous grant, and it is slow to release compared with other technologies. Chemical products that can be produced are: 15 - 15-15, 20 - 20-0, 20 - 20 - 15, 18 - 46 - 0 (DAP), 16-16 -8 + 13S, 13 - 25-5 + TE, 10-25 - 5+ TE, 13-24 - 12+ TE, 10-25 - 20+ TE...[\(back\)](#)

Vietnam Land Use

No	Region/Land type	Total	Northeastern	Northwestern	Red River Delta	North Central Coast	South Central Coast	Central Highlands	Southeastern	Mekong Delta
	Total natural land	33,097.2	6,386.7	3,737.0	1,506.3	5,126.5	4,436.4	5,490.0	2,362.7	4,051.6
I	Agricultural land	26,371.5	5,265.5	2,523.3	950	4,067.6	3,393.2	4,869.0	1,904.4	3,398.5
1	Land for plantation	10,210.8	1,056.1	583.8	734.6	868.8	1,013.7	1,998.1	1,358.4	2,597.3
1,1	Annual plant	6,422.8	736.5	500.2	659.4	645	684.7	854.6	314.5	2,027.9
a	Rice	4,097.1	392.8	169	597	401.3	286.1	168.4	180.4	1,902.1
b	Pastures	42.7	21.1	4	0.9	6.1	4	2.5	3.1	1
c	Other	2,283.0	322.6	327.2	61.5	237.6	394.6	683.7	131	124.8
1,2	Perennial crop	3,788.0	319.6	83.6	75.2	223.8	329	1,143.5	1,043.9	569.4
2	Forest area	15,405.8	4,163.4	1,933.6	129.5	3,159.8	2,341.1	2,862.3	511.3	304.8
3	Aquaculture land	71	45.1	5.5	81.2	35.4	20.4	8.2	27.1	487.1
4	Land for salt production	17.9	0	0	1.3	1.6	6.4	0	3.1	5.5
5	Other agricultural land	27	0.9	0.4	3.4	2	11.6	0.4	4.5	3.8
II	Non-agricultural land	3,777.4	539	189.9	525.6	559.5	521.5	359.1	454	628.8
III	Unused land	2,9483	582.2	1,023.8	30.7	499.4	521.7	261.9	4.3	24.3

Source: Statistical Year Book, 2013

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Fertilizer Demand By Region

The Northern Vietnam

The Northern Vietnam has diverse geography and topography which includes mountain and plain. Mountainous area occupies for 2/3 area of Southern of this region and the rest is plain. The plain is an innning of Red River system and Thai Binh River system. This area is used to grow cash crops such as rice, vegetables and industrial crops. Statistics from the Department of Crop Production shows that fertilizer demand of the Northern accounts for 32.5% total domestic fertilizer demand. This market is in fierce competition with imported fertilizer from China.

The Central Vietnam and Central Highlands Vietnam

Central Highlands Vietnam region is mainly mountainous area with high altitude, is suitable for industrial crops with high economic value and accounts for 17.3% of domestic fertilizer demand. The North Central Vietnam and South Central Vietnam are characterized by short and steep rivers; the plains are the innning of river and ocean; climate is relatively harsh for farming. Farmers in the Central Highland purchase high-quality fertilizer which are suitable for crops with high economic value. This region is frequently affected by severe weather. For example,

prolonged drought conditions in the Highlands has caused damage for coffee crop. The Central Vietnam also has to deal with floods.

The Southeastern Vietnam and Mekong Delta

Southeast region is a transition zone among The Highland Region, South Central Coast Region and Mekong Delta. This is a key economic zone of the South Vietnam and the most developed region. Plants in the area are industrial crops of high value such as rubber, pepper, cashew. Similar to the Central Highland, farmers are always looking for fertilizers with high quality and appropriate for each plant to achieve the highest yield. Mekong Delta has a huge potential for agricultural development and it is the key agricultural product production region of Vietnam. Rice area of Mekong Delta accounts for more than 90% of total Vietnam rice land, which is particularly important for ensuring national food security and export. The fertilizer demand of Southeastern Vietnam and Mekong Delta is about 50.2% of domestic demand. In recent years, fertilizer demand has also been reducing because of declining crop prices. Given low prices of agricultural products, farmers face many difficulties in reinvestment.

Fertilizer Import Tax Rate

According to Circular No. 164/2013/TT-BTC issued on Nov 15th, 2013, effective from Jan 1st, 2014 and the Circular 131/2014/TT-BTC effective from Oct 25th, 2014, the preferential imports tax for fertilizer is as follows:

Effective from	Urea code 3102.10.00	SA code 3102.21.00	DAP code 3105.30.00	Kali code 3104.20.00 and 3104.30.00	NPK. Code 3105.20.00
Oct 25 th , 2014	6%	0%	3%	0%	6%
Jan 1 st , 2014 to Oct 25 th , 2015	3%	0%	3%	0%	6%

Source: Agromonitor
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Impact Of VAT Tax Law No.71/2014/QH13

This new law reduces competitive advantage of domestic producers when they will not receive input VAT refund. According to FAV's estimates, cost of fertilizers might grow by over 7%, and variate among fertilizer type, such as N fertilizers increasing by 7.2-7.6%; DAP fertilizer increasing by 7.3-7.8%, FMP increasing by 7.8-8%, ect. Therefore, it is not easy for domestic producers to reduce burden for farmers. However, fertilizer price in 1Q2015 has reduced by 3-5% depending on fertilizer type. It would partially limit the negative impact caused by the new tax law. [\(back\)](#)

INTERPRETATION OF RECOMMENDATION

This recommendation based on the difference between targeted value and market value of each stocks in order to provide appropriate information for investors in 12-month investment period from recommend day.

The expected at 18% is estimated based on 12-month government bond rate in addition to market risk premium in Vietnam.

Recommendation	Explanation
12 months period	
Buy	If targeted price is higher than market price by 18%
Add	If targeted price is higher than market price by 7%-18%
Neutral	If targeted price compared with market price is within -7%-7%
Reduce	If targeted price is lower than market price by -7% to -18%
Sell	If targeted price is lower than market price by -18%

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