

Nitrogen fertilizer



Our findings, observations and/or recommendations are those that we could reasonably derive from the procedures or scope of services performed. The specific procedures performed were agreed with Georgian National Investment Agency (the Client) and were performed by us as set forth in the Report.

Our work was carried out solely based on the publicly available research data.

We have indicated within our Report the sources of the information presented and have satisfied ourselves, so far as possible, that the information presented in our Report is consistent with other information which was made available to us in the course of our work in accordance with the terms of the Contract. We have not, however, sought to establish the reliability of the sources by reference to other evidence.

All recommendations, provided to you with/in this Report that refer to the future have some limitations in the sense that they are based on the assumptions valid on the issuance date. These assumptions could change with time, after the date of this Report issuance, and so could lose their value.

References to 'KPMG Analysis' in this Report indicate only that we have (where specified) undertaken certain analytical activities on the underlying data to arrive at the information presented; we do not accept responsibility for the underlying data.

Nitrogen fertilizer

Optimal industry capacity

In 2014 the target markets of the region imported around USD 8,189 million of nitrogen fertilizer, where the urea was the largest fertilizer among imported nitrogen fertilizers

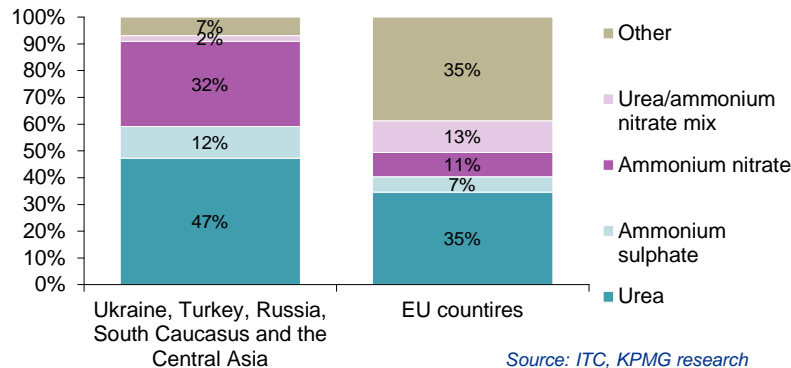
In 2014 the target markets of the region (Russia, Ukraine, Turkey, countries of the South Caucasus, the Central Asia countries and EU 28 countries) imported around USD 9,564 million of nitrogen fertilizer of which the EU countries accounted for USD 8,189 million. Among the target markets, except for the EU countries, Turkey was the largest importing market followed by Ukraine and Kazakhstan.

Among the EU countries the largest importer market was France accounting for 21% of EU import of nitrogen fertilizer products, followed by Germany (14%) and UK (10%).

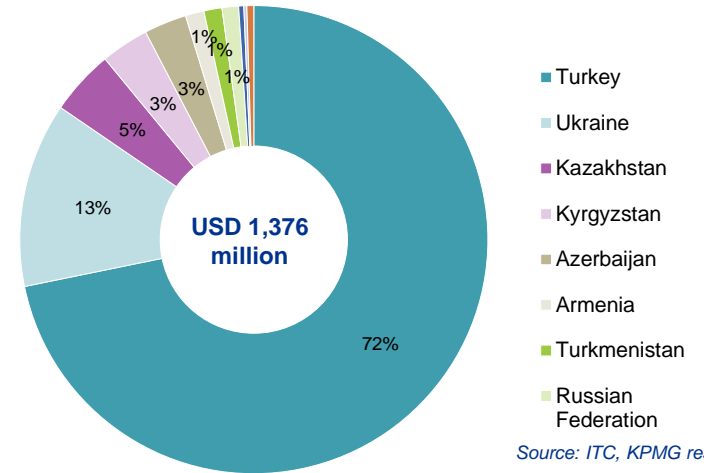
In the target markets urea fertilizers was the largest product group among imported nitrogen fertilizer products both in the EU countries and other target markets.

Considering the existence of the production facility of ammonium fertilizer (Rustavi Azot) and the large share of urea fertilizer in the total import in the target markets we suggest to consider investment opportunity in urea production facility in Georgia.

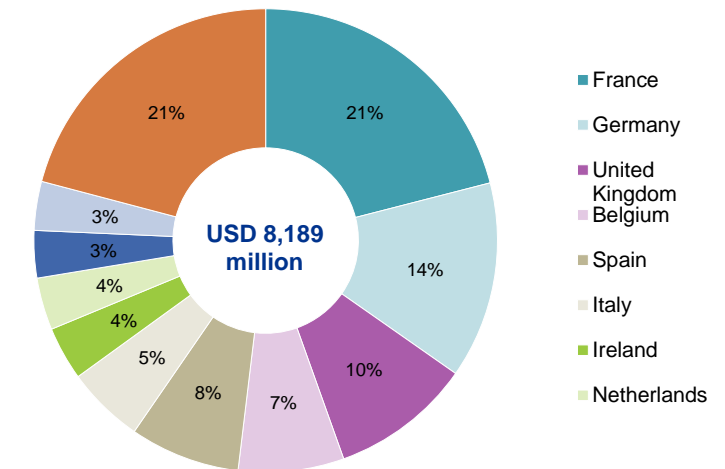
Import of Nitrogen fertilizer by product groups (2014)



Import of Nitrogen fertilizer in the target markets by countries except for the EU countries (2014)



Import of Nitrogen fertilizer by EU countries (2014)



In order to understand the optimal/maximum industry capacity of production of urea in Georgia, we analyzed the potential consumption of the Georgian production by the countries of the region (EU, Ukraine, Turkey, Southern Caucasus and Central Asia) and Russia, assuming that the significant part of the product will be exported to these countries. The consumption has been analyzed based on the supply/demand data. We calculated the gap between import and export in these countries, as well as considered the production, potential capacity increase (pipeline) and consumption data to understand the potential volume of the urea that might be exported to these countries. In addition, we analyzed the main countries from which urea are imported, and considering several factors, identified the countries which can potentially be replaced by Georgia imports (partially). The factors include:

- distance, i.e. transportation costs,
- economic and political factors
- ease of access to these countries by Georgia

Based on the analysis of the above factors for each country in the region and Russia, as well as considering the overall share of the importing countries, which might be potentially replaced, we calculated approximate maximum share of the potential import of the urea by Georgia to these countries.

The results are as follows:

Country	Import/export gap (USD m)	Existence of production facilities	Main exporter country/region	Total export in tons (2014 data)	Potential replacement	Share of import of the potential replacement countries in total import	Total imported tons by the potential replacement countries (2014 data)	Potential share of import from Georgia	Potential volume (tons)
Turkey	540	Yes	Ukraine, Iran, Russia, China, Romania	1,641,338	Ukraine, Russia, China, Romania	91.8%	1,506,224	5%	82,067
Ukraine	-460	Yes				n/a			
Armenia	0.50	No	Iran, China, Russia, Turkey	921	Iran, China, Turkey	95.5%	880	50%	461
Azerbaijan	1.42	No	Russia, Turkey, Ukraine, Uzbekistan	1,112	Russia, Ukraine	90%	997	20%	222
Central Asia	-42	Yes				n/a			
Russia	-1,590	Yes				n/a			
EU	1,297	Yes	Russia, Egypt, Germany, Netherlands, Algeria, Poland	7,855,576	Russia, Egypt, Algeria, Iran, Belarus	43.08%	3,384,385	1%	78,556
TOTAL									161,306

The analysis shows, that there is a gap between the import and export in the countries of the region, except for Central Asia, Ukraine and Russia. As the gap in the Central Asia, Ukraine and Russia is negative, which shows that the export exceeds import, we considered that the possibility to access these markets is low, therefore didn't consider Central Asia, Ukraine and Russia as potential consumers of the Georgian urea.

The calculated optimal capacity of the production of urea in Georgia is 150,000 to 200,000 tons per year

As for other countries/regions the gap is significant. Notwithstanding the existence of the production facilities in most of the countries/regions, the demand exceeds supply and there is a potential for other supplier to enter these markets. As an example, the gap between the import/export in Turkey is USD 540 million. There are big producers in the country (e.g. Ege Gubre Sanayii A.S.), however there is still significant import of urea to the country. The main importer countries are Ukraine, Iran, Russia, China and Romania. Considering the distance factor, as well as ease of access of Georgia to Turkey, i.e. common border, we assumed that Georgia might potentially take up some share of the imports from the Ukraine, Russia, China and Romania. The share of import from Ukraine, Russia, China, Romania to Turkey is 91.8% in the total import of the urea to the country, which is 1,641 thousand tons in volume terms. We assumed that Georgia could potentially take up maximum 5% of the imports from these countries considering the potential specific quality and pricing factors of the Ukraine, Russia, China and Romania. Thus the potential volume of the import from Georgia can be around 82,067 tons.

The same approach has been applied to the analysis of other countries. For the countries, which do not have local production, bigger potential share of import from Georgia has been applied. We also considered the current political factors in the region, however we assumed that this might potentially have a short-term impact, therefore adjusted the potential share accordingly.

In addition, we also assumed that if the local production of urea is established in Georgia it would account for at least 30% consumption of nitrogen fertilizer (in 2012 urea accounted for around 56% of the world consumption of nitrogen fertilizers). In 2012 (latest available data) the consumption of nitrogen fertilizer in Georgia was around 34 thousand tons. Assuming that the consumption has not changed significantly we calculated the local consumption to be around 10,000 tons of urea yearly. Thus, the optimal capacity of the production in Georgia would be around 171,306 tons per year, i.e. range from 150,000 to 200,000 tons per year.

An investment from USD 119 million to USD 159 million is required for a manufacturing capacity of 150,000 to 200,000 tons urea yearly

In order to estimate the approximate investment for a manufacturing facility with the capacity of 150,000 to 200,000 tons per year, we searched for similar projects throughout several countries. Based on the information of investment amount, which includes construction of the plant, storage place and related infrastructure facilities, installation of machines, we calculated the cost per ton, which is USD 794 on average. Thus the estimated investment would be from USD 119 million to USD 159 million. This is an approximate range, as the factors like country specific, construction costs, availability of technologies have not been specifically analyzed for Georgia.

Investments projects

N.	Year	Project	Country	Investment (USD million)	Capacity (ton)	Average investment per ton
1	-	Shahjalal Fertilizer	Bangladesh	659	580,800	1,135
2	2015	Matix Fertilizers	India	1,000	1,300,000	769
3	2017	Shiraz Petrochemical	Iran	600	1,076,000	558
4	-	Public private partnership (government)	Bangladesh	1,000	1,260,000	794
5	2014	BioNitrogen Holdings Corp	Florida, US	200	200,000	1,000
6	2017	Oil and Natural Gas Corporation Limited (ONGC)	Tripura, India	917	1,300,000	705
7	2016	Yacimientos Petrolíferos Fiscales Bolivianos's	Bolivia	843.9	650,000	1,298
8	2015	Olam	Gabon	1,300	1,386,000	938
9	-	PETRONAS	Malaysia	1,500	1,225,000	1,224
10	2015	Orascom Construction Industries	US	1,400	2,000,000	700
11	-	MOPCO	Egypt	392	693,000	566
12	-	Greenpark Petrochemical Company Limited	Alaska	370	666,000	556
13	2015	PetroChina	China, Xinjiang	540	800,000	675
14	-	Sichuan Meifeng	China, Xinjiang	80	180,000	444
15	-	PT Pupuk Kalimantan Timur	Indonesia	700	1,260,000	556
Average investment per ton of capacity						794

Source: World Market Intelligence IFA, Green Markets, IFDC, Ammonia Industry, Macquarie Research, KPMG research and analysis

The difference of the investment required for various projects can be explained by the difference of construction cost, cost of lands, machinery, installations cost, etc in different regions.

The main competitor countries are Russia, Ukraine, Iran, Egypt and Algeria

For identifying main competitor countries we analyzed the urea import structure of the countries of the region.

In 2014 the main exporter countries of urea to the target markets except EU were Ukraine, Russia and Iran accounting for 34%, 21.8% and 21.7% import of the urea respectively and can be considered as the main competitor companies. The main non EU exporter countries of urea to EU market were Russia, Egypt, Algeria and Ukraine. These countries may be considered as the main competitors. The significant share of trade in the EU countries is among the EU countries therefore it would be difficult to capture their market share. Thus EU countries were not considered as competitors.

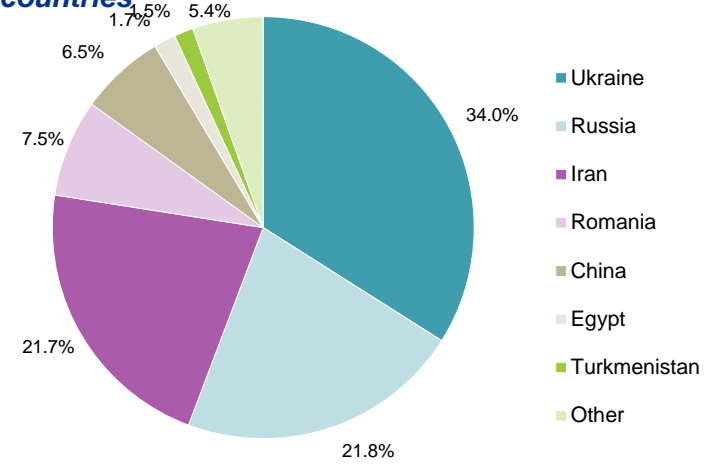
We consider the large producers of urea and nitrogen fertilizers in the competitor countries as the main competitors. In addition the Turkey may also be considered as a competitor as it has significant production in place. We summarize the information regarding the competitor countries and companies in the table below.

Competitor companies by countries

Country	Company
Russia	OJSC PhosAgro, Eurochem, OJSC United Chemical Company Uralchem, SIBUR-Fertilizers, Acron, Rossosh, TogliattiAzot, KuibyshevAzot
Ukraine	PJSC AZOT, Agrotsentr Evrokhim Ukraina-Dochirne Pidpryemstvo, UkrAgro NPK CJSC, Rivneazot OJSC, OJSC "Navoiyazot"
Iran	Kermanshah Petrochemical Industries Company, Pardis Petrochemical Company, Zorka-Mineralna Đubriva u restrukturiranju
Egypt	Abu Qir Fertilizers Co. , Alexandria Fertilizers Company , Chemical Industries Holding Company , Egyptian Fertilizer Co. SAE OCI Fertilizer Group
Algeria	OCI Fertilizer Group, Societe des Fertilisants d Algerie SPA
Turkey	Gubre Fabrikalari Turk Anonim Sirketi, Ege Gubre Sanayii A.S.

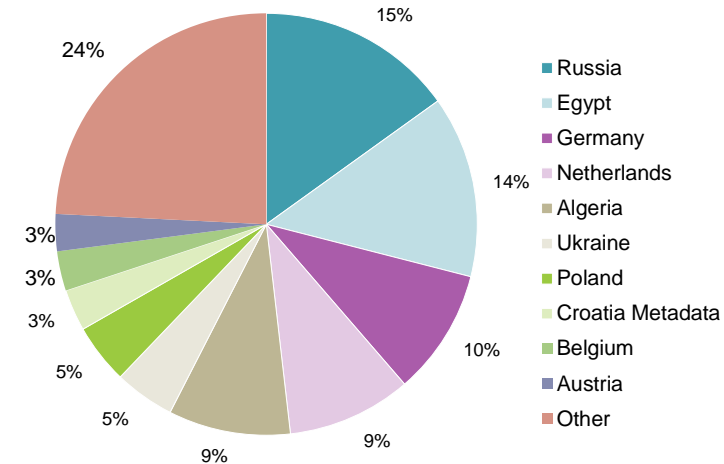
Source: CapIQ, KPMG research and analysis

Import of target market (except EU) by main exporter countries



Source: ITC, KPMG research

Import of EU by main exporter countries



Source: ITC, KPMG research

- **Strategic location** – Georgia's strategic location is an asset to any investor. As a bridge between Europe and Asia, Georgia offers direct access to European, Gulf Cooperation Council and CIS markets. Its three major oil and gas pipelines, Black Sea ports, well-developed railway systems, together with its airports are playing an increasingly important role in linking the East and West
- **Stable macroeconomic environment** – even though macroeconomic situation in the region is unstable, Georgia demonstrates positive expected economic growth of 2.5% in 2015, whereas in neighboring countries either economic contraction or growth close to zero is expected
- **Liberal Trade Regimes** – Georgia has low tariffs and streamlined border clearance procedures. With a range of Free Trade Agreements, Georgia has access to a 900 million market that is not subject to customs tax, including Turkey, CIS and EU countries
- **Free Industrial Zones** – Georgia has two industrial zones, in which businesses are exempted from all tax charges, except personal income tax
- **High availability of raw materials in the region (gas is available in Azerbaijan)** – gas accounts for up to 70% of the costs for producing urea, as well as 80% of cash costs of the production of the ammonia (the second key raw material for urea).
- **Low electricity cost** – The highest tariff for industrial consumers of one KWh energy in Georgia in 2014 was around USD 0.045 which is lower than in neighbor countries (in Armenia the price is around USD 0.069/per KWh, in Turkey USD 0.093/per KWh and in Azerbaijan 0.057/per KWh).*
- **Labor cost** in manufacturing industry is low amounting to 410 USD monthly on average
- **Legal** - No legal restrictions for importing/exporting and producing urea in Georgia and in the region.
- **Special Customs regime for exporters** – "Internal Processing Customs Regime", which offers tax incentives for exporting companies. A company may get a license from the Ministry of Finance about "Internal Processing Regime" and receive an exemption from VAT and from import/customs tax on raw materials. If an exporting company sells the products in Georgia, then it has to pay VAT and import/customs tax only for these products.
- **Corporate profit tax** is flat at 15%. **Personal income tax** is 20% and there is no social tax.
- **Depreciation of capital assets** – Based on the Tax code legal entities are able to fully depreciate their assets in the year in which they are put into operation. As a result, significant amount of tax loss-carry forward is generated which could be used during the first years of operation



* Note: The prices are converted to USD based on the exchange rates as at 29 April 2015 (GEL/USD - 2.31, AMD/USD - 475.94, AZN/USD – 1.05, TRY/USD – 2.67)

Main chemical substances production sector had 2,815 employees in 2013

We obtained the official data on the average number of people working in chemical production. The number provided below include not only chemists, but also other positions working in the sector (technical staff, administration etc.). The separate data on chemists is not separately available.

Annual average number of people working in chemicals production 2012-2013 (Declared Data)		
Person		
	2012	2013
Chemicals production	5,560	5,414
From above		
Production of main chemical substances*	2846	2815

Note: Main chemical substances include mineral fertilizers.

As of 2013 the number of people employed in the chemical production sectors was 5,414. The number of people in main chemicals production sub-sector was 2,815.

Nitrogen fertilizer Key assumptions

Based on the data gathered and analyzed in the previous stages, we performed high level financial calculations for the potential project on producing urea in Georgia. The more detailed description of the assumptions and relevant calculations are provided further on

- Construction period was forecasted to last three years (industry average period). The capital expenditures will be evenly made during three years of construction
- Capacity utilization was forecasted to reach 85% in the first year of operation and further increase by 5% annually reaching 100% in the 7th projection period
- The delay in the launch of the production is due to the forecasted plant construction period. The delay in reaching full forecasted capacity of the production is due to the estimated time needed for marketing the product and building brand recognition, as well as considering learning curve effect.
- During the forecasted period the maximum capacity has been estimated as the nominal capacity determined based on the analysis of the data obtained during the research, i.e. potential bottlenecks of production has not been considered.
- Maintenance capital expenditures were forecasted based on the initial investment and estimated useful life of the plant of 30 years. As a result, maintenance CAPEX amounted to USD 4,635 thousand, further adjusted for the expected USD inflation
- Maintenance CAPEX was assumed to be incurred starting from the 7th projection year

Construction project details

Investment, '000 USD	139,037
Capacity	175,000
Construction timeline	3
Annual maintenance CAPEX	4,635
Domestic sales	3%
Export sales	97%

Source: KPMG Analysis

- As per the Georgian tax code, legal entities are able to fully depreciate their assets in the year in which they are commenced. As a result, the project will generate significant amount of tax loss-carry forward in the first three projection years, making the project effectively exempt from corporate income tax during the first four years
- WACC is estimated to be 15% for all chemicals products
- Based on the data provided by Damodaran, industry average capital structure of the chemicals producing companies in the emerging markets comprises of 29% debt and 71% of equity. The capital structure of the project was assumed to be the same as industry average



Nitrogen fertilizer Financial performance

We have assumed projection period of 10 years, followed by terminal period. The construction of factory is expected to be finished by the end of the third projection period, after which the plant will be commenced.

Gross and EBITDA margins were forecast to amount to 44.79% and 37.21%, respectively throughout the forecast and terminal periods. To calculate the ratios, we selected comparable companies and calculated the average of the ratios of these companies. The industry average has not been taken as a basis) EBT margin was projected to vary between 29.58% and 31%. Volatility of EBT margin is explained by increasing capital expenditures starting from year 7 and absence of corporate income tax till year 9.

Projected statement of Profit and Loss											
'000 USD	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TP
Revenues	-	-	-	60,805	65,670	70,774	76,138	77,737	79,369	81,036	82,657
<i>Growth</i>	-	-	-	-	8.00%	7.77%	7.58%	2.10%	2.10%	2.10%	2.00%
COGS	-	-	-	-33,572	-36,257	-39,075	-42,037	-42,920	-43,821	-44,741	-45,636
Gross profit	-	-	-	27,234	29,412	31,698	34,101	34,817	35,548	36,295	37,020
<i>Gross profit margin</i>	-	-	-	44.79%	44.79%	44.79%	44.79%	44.79%	44.79%	44.79%	44.79%
SG&A	-	-	-	-4,611	-4,980	-5,367	-5,773	-5,895	-6,019	-6,145	-6,268
EBITDA	-	-	-	22,623	24,433	26,332	28,327	28,922	29,530	30,150	30,753
<i>EBITDA margin</i>	-	-	-	37.21%	37.21%	37.21%	37.21%	37.21%	37.21%	37.21%	37.21%
Financial Depreciation	-	-	-	-4635	-4635	-4635	-4724	-4904	-5089	-5277	-5373
EBT	-	-	-	17,988	19,798	21,697	23,603	24,018	24,441	24,873	25,380
<i>EBT margin</i>	-	-	-	29.58%	30.15%	30.66%	31.00%	30.90%	30.79%	30.69%	30.71%
Corporate Income tax	-	-	-	-	-	-	-	-	-706	-3,667	-4,606
Net Income	-	-	-	17,988	19,798	21,697	23,603	24,018	23,734	21,206	20,774
<i>NI margin</i>	-	-	-	29.58%	30.15%	30.66%	31.00%	30.90%	29.90%	26.17%	25.13%

Source: CapIQ, KPMG Analysis

Note: For our calculation purposes, we have not adjusted corporate income tax for the changes in deferred tax

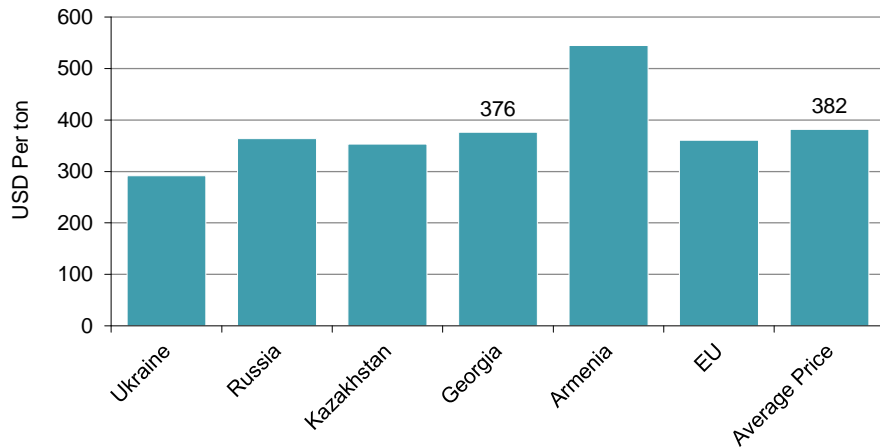
Sales volumes

Production of urea was projected to start in Year 4 at the level of 148,750 tons further increasing to 175,000 tons in Year 7. Sales volume on the domestic market was estimated to be 3% of total production, while remaining 97% is expected to be sold on export.

Sales price

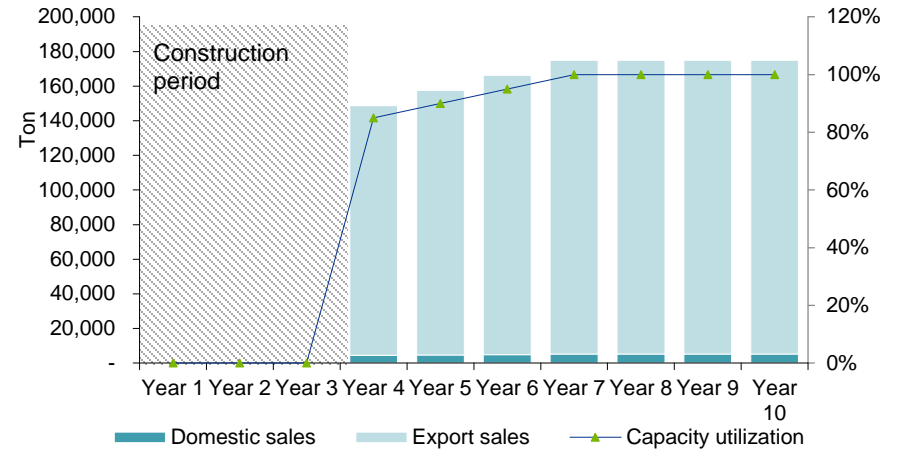
Average price per ton for the domestic market was estimated to be USD 376 based on average import price as provided by International Trade Centre (ITC), while export price was forecast based on average import price per ton in the target markets and amounted to USD 382 per ton.

Import price of urea in target markets



Source: ITC, KPMG Analysis

Sale volume of plant



Source: ITC, KPMG Analysis

Nitrogen fertilizer COGS and SG&A expenses

Cost of Goods Sold and Selling, General and Administrative expenses were forecast based on 3 year average of comparative companies (we have selected the leading producers in various regions and globally to get the average industry margins) Gross and SG&A margins of 44.79% and 7.58%, respectively.

70% of COGS were accounted for ammonia cost and 20% for process gas cost and 10% for other production costs (overheads).

COGS and SG&A											
'000 USD	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TP
COGS	0	0	0	-33,572	-36,257	-39,075	-42,037	-42,920	-43,821	-44,741	-45,636
<i>Ammonia cost</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>-23,500</i>	<i>-25,380</i>	<i>-27,353</i>	<i>-29,426</i>	<i>-30,044</i>	<i>-30,675</i>	<i>-31,319</i>	<i>-31,945</i>
<i>Process Gas Cost</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>-6,714</i>	<i>-7,251</i>	<i>-7,815</i>	<i>-8,407</i>	<i>-8,584</i>	<i>-8,764</i>	<i>-8,948</i>	<i>-9,127</i>
<i>Other production costs</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>-3,357</i>	<i>-3,626</i>	<i>-3,908</i>	<i>-4,204</i>	<i>-4,292</i>	<i>-4,382</i>	<i>-4,474</i>	<i>-4,564</i>
SG&A expenses	0	0	0	-4,611	-4,980	-5,367	-5,773	-5,895	-6,019	-6,145	-6,268

Source: CapIQ, KPMG Analysis

In addition, we looked for the average prices of the Natural gas (in gaseous state) imported from Azerbaijan and Russia, as the main potential importer countries. In 2014 the weighted average price of the Natural gas (in gaseous state) imported to Georgia was USD 219.

Having the average price per ton of gas USD 219, domestic and export prices of urea of USD 376 and USD 382 respectively, and average conversion factor of 49.26 Mmbtu (British thermal unit) per ton of natural gas we calculated the gross margin to be around 58-59%*, which is higher than the forecast, where industry average gas price is used. This analysis is based on the assumption that all other factors except the gas price will remain constant.

Note: We used the correlation between the gas price and production costs of urea to come up with approximate production costs of one tone of urea at a give price of natural gas.

Nitrogen fertilizer NPV analysis

The NPV of the project is
positive amounting to
USD 3,998 thousand

Discounted cash flow results											
'000 USD	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Terminal period
Total revenues	-	-	-	60,805	65,670	70,774	76,138	77,737	79,369	81,036	82,657
<i>% of growth</i>	-	-	-	-	8.00%	7.77%	7.58%	2.10%	2.10%	2.10%	2.00%
EBITDA	-	-	-	22,623	24,433	26,332	28,327	28,922	29,530	30,150	30,753
<i>EBITDA margin</i>	-	-	-	37.21%	37.21%	37.21%	37.21%	37.21%	37.21%	37.21%	37.21%
EBT	-	-	-	17,988	19,798	21,697	23,603	24,018	24,441	24,873	25,380
Income tax (adjusted)	-	-	-	-	-	-	-	-	-706	-3,667	-4,606
NOPAT	-	-	-	17,988	19,798	21,697	23,603	24,018	23,734	21,206	20,774
Cash flow adjustments											
Depreciation	-	-	-	4,635	4,635	4,635	4,724	4,904	5,089	5,277	5,373
CAPEX	-46,346	-46,346	-46,346	-	-	-	-5,360	-5,473	-5,588	-5,705	-46
Change in working capital	0	0	0	-6,081	-486	-510	-536	-160	-163	-167	-162
FCFF	-46,346	-46,346	-46,346	16,542	23,946	25,821	22,431	23,290	23,072	20,611	25,938
WACC	15.00%										
Terminal growth rate	2.00%										
Terminal value											16,891
Discount period	0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10
Discount factor	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0
Discounted FCFF	-43,218	-37,581	-32,679	10,143	12,767	11,971	9,043	8,164	7,033	5,464	52,889
Sum of discounted cash flows	-48,892										
Terminal value	52,889										
NPV	3,998										

Source: CapIQ, KPMG Analysis

Nitrogen fertilizer Key profitability factors of the Project

Based on the high-level calculations the project is feasible

Key profitability factors of the project											
'000 USD	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TP
Revenues	-	-	-	60,805	65,670	70,774	76,138	77,737	79,369	81,036	82,657
EBITDA	-	-	-	22,623	24,433	26,332	28,327	28,922	29,530	30,150	30,753
Net Income	-	-	-	17,988	19,798	21,697	23,603	24,018	23,734	21,206	20,774
EBITDA margin	-	0	0	37.21%	37.21%	37.21%	37.21%	37.21%	37.21%	37.21%	0.00%
Net income margin	-	0	0	29.58%	30.15%	30.66%	31.00%	30.90%	29.90%	26.17%	25.13%
NPV of the Project	3,998										
IRR	15.05%										
Payback period	8.2										

Source: CapIQ, KPMG Analysis

Our assumptions and analysis have been performed based on the general economic and sector indicators. The detailed calculations for the given capacity in Georgia such as labour costs, construction costs, specific legal and environmental costs etc. have not been considered. However, the country specific taxation, as well as the CPI and the pricing data have been considered.

Per the general analysis, the results show that the project is feasible for the calculated optimal capacity and the relevant investment, as well as given costs assumptions. The NPV of the project is positive amounting to USD 3,998 thousand, the IRR is amounting to 15.05 %. The payback period is estimated to be 8.2 years.



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