

# DOWNSTREAM GAS INDUSTRY

ANNUAL REPORT 2011

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## 1. OVERVIEW OF THE DOWNSTREAM GAS INDUSTRY 2011

The energy sector is the major contributor to the economy of Trinidad and Tobago, providing 58% of annual government revenue and 45% of gross domestic product (GDP) in 2011 (estimated). The petrochemical sector alone contributed an estimated 13% to GDP in 2011.

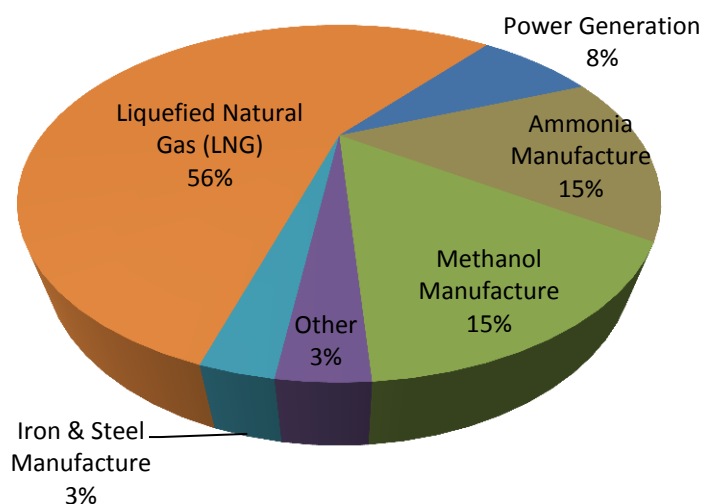
In 2011, the incipient global recovery following the financial crisis of the previous two years faltered badly. Natural disasters in Japan and elsewhere, political turmoil in the Middle East and North Africa and resurgence in commodity prices set back stabilization efforts in several areas. Moreover, despite intense international policy dialogue and support programs, sovereign debt problems rocked the European banking sector, dimmed the growth prospects for most European nations and sent shock waves to international financial markets. As a result, real GDP growth in advanced economies turned out to be much lower than initially anticipated, although performance in the emerging markets was fairly robust.

The Trinidad and Tobago economy was estimated to have contracted by 1.4% in 2011. Output in the energy sector slipped in the context of heightened maintenance operations and maturing oil fields, while non-energy production was adversely affected by a reduction in working hours in the context of a curfew in several areas of the country in August-November.

Natural gas utilization has averaged 4.2 billion cubic feet per day for 2011. As at December 1, 2011 the natural gas reserves of Trinidad and Tobago support the following natural gas based industries in the downstream industry:

- |   |             |
|---|-------------|
| a. Electrical Power generation            | - 6 plants  |
| b. Manufacture of LNG                     | - 4 plants  |
| c. Manufacture of Ammonia                 | - 11 plants |
| d. Manufacture of Methanol                | - 7 plants  |
| e. Manufacture of Direct Reduced Iron     | - 4 plants  |
| f. Manufacture of Melamine and UAN        | - 1 plant   |
| g. Fuel use in Refining                   |             |
| h. Fuel use in Light Industrial Customers |             |

## Natural Gas Utilization By Sector in 2011 (MMSCF/D)



**Figure 1: Natural Gas Usage by Sector in Trinidad and Tobago 2011**

Overall production and export figures for Ammonia, Methanol & Urea decreased in 2011 whereas Melamine and UAN production and export increased in 2011. The decreased of production and export of Ammonia, Methanol and Urea was due to plant repairs, TARs, plant outages and natural gas curtailments (as reported by the various companies). However the average prices for Ammonia, Methanol, Urea, UAN and Melamine increased in 2011 (as compared to 2010).

In 2011, further diversification of the downstream industry was considered by Ministry of Energy and Energy Affairs. The projects included:

- **Methanol to poly olefins** (plastics) where discussions were held with stakeholders May 2011 and submission of proposals were closed on November 30<sup>th</sup>, 2011
- **Methanol to Petrochemicals** project where discussions were held with stakeholders in May 2011 and submission of proposals were closed on September 8<sup>th</sup>, 2011
- The **AUM II facility** (which would produce Granulated Urea, Melamine, Ammonia Sulphate and Melamine Urea Formaldehyde), received a certificate of environmental clearance in February 2012 from the Environmental Management Authority (EMA) for it to perform site preparation work and this would allow for the first part of the construction to begin. The gas supply term sheet and Project Agreement is currently being finalised.

## Production

Table 1: Petrochemical Production 2010-11

Petrochemical	Production / MT	
	2010	2011
Ammonia	5,553,242	5,133,860
Methanol	5,932,232	5,902,313
Urea	708,760	625,742
UAN	1,277,839	1,437,713
Melamine	14,345	39,784

## Export

Table 2: Petrochemical Exports 2010-11

Petrochemical	Export / MT	
	2010	2011
Ammonia	5,254,926	4,669,908
Methanol	5,978,154	5,793,082
Urea	675,711	647,737
UAN	1,194,300	1,509,289
Melamine	13,262	40,805

## Price

Table 3: Petrochemical Prices 2010-11

Petrochemical	Location	Price (\$US/MT)	
		2010	2011
Ammonia	Caribbean	361.58	535.64
Methanol	US Gulf	328.16	370.08
Urea	Caribbean	301.66	426.83
UAN	US Gulf	243.34	351.73
Melamine	US Gulf	2201.42	2305.83



## 2. AMMONIA

Ammonia demand is primarily driven by urea consumption, which is mainly a function of fertiliser demand.

### Global Ammonia Consumption

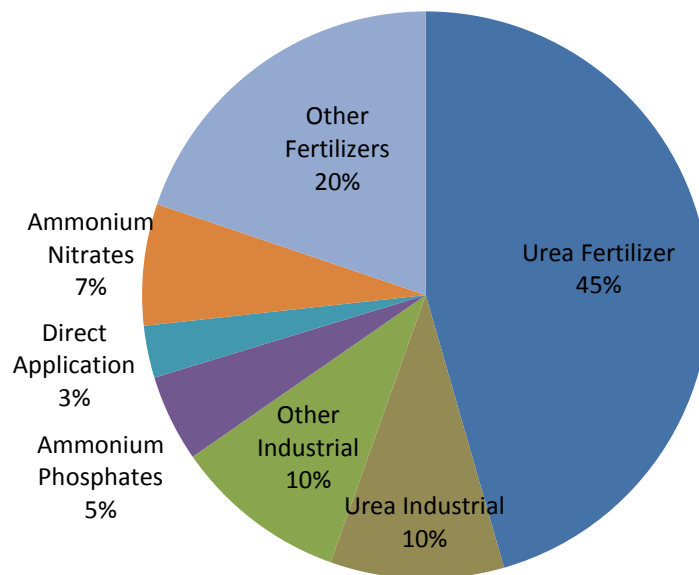


Figure 2: Ammonia Usage (Chemsystems, 2010)

### Ammonia Production and Export / million MT (2007-2011)

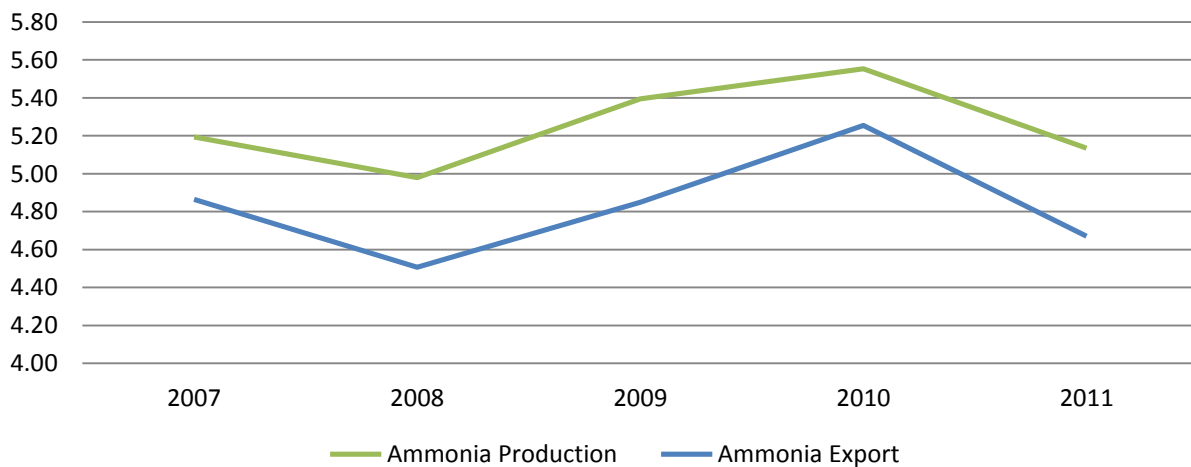


Figure 3: Ammonia Production and Export 2007-2011 (million MT)

## 2.1 Ammonia Production

The total ammonia production from the eleven ammonia plants (including the new ammonia plant of the AUM complex) for the period 2011 was 5.13 million metric tonnes (MT). This represented an 8.17% decrease from 2010 which had a total production of 5.5 million MT.

## 2.2 Ammonia Export

Total ammonia exports from the eleven ammonia plants (with production from AUM diverted into the export streams of CNC & N2000 ammonia plants) for the period 2011 was 4.67 million MT. This represented a 12.5% decrease from 2010 which had a total export of 5.25 million MT.

Main ammonia export destinations<sup>1</sup> for 2011:

- North America- USA, Mexico, El Salvador
- Europe- Belgium
- South America- Chile, Colombia
- Africa- Morocco

The average Caribbean Spot FOB price for ammonia from 2011 was 535.64 \$US/MT, while during 2010 the average price was 361.58 \$US/MT, as reported in the Fertilizer Market Bulletin.

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<sup>1</sup> 2011 data submitted by CNC, N2K and PLNL

## 2.3 Ammonia Market Perspective (2011)

The ammonia market in 2011 was characterized by a demand-driven rally and widespread production cutbacks, which created tight supply/demand balance with firm prices prevailing globally (CRU, 2011). In response to tight market conditions and attractive grain prices, farmers increased the planted area and crop productivity (Heffer & Prud'homme, 2011).

Agricultural markets remain strong, driven by a disappointing US harvest and robust food and fuel demand. World fertiliser demand grew firmly and achieved full recovery for all nutrients in 2011/12. Global fertiliser demand is estimated to have increased by 6.2% in 2010/11 to 173 million MT. This strong growth was triggered by the sharp rebound of economic activity and tight agricultural commodity markets (Heffer & Prud'homme, 2011).

Two new ammonia plants were commissioned this year:

- Ma'aden Phosphate Company (MPC) (Ras Azzour) – 1.1 million metric tonnes per year (MTPY)
- Qatar Fertiliser Company (QAFCO V) – 3.8 million MTPY

The majority of this ammonia capacity is specifically intended for further processing into diammonium phosphate (DAP) at Ras Azzour and urea at QAFCO V.

The start-up of a large-scale Ma'aden ammonia plant in Q1 2011 was eagerly absorbed by the market adding no relief to the persistent market tightness and climbing prices. QAFCO V started-up on August 30, 2011, making the Qatar Fertiliser Company the largest single-site producer of ammonia and urea in the world. The plant ran at 80-85% capacity till September 8, 2011. The plant shut down because of equipment failure, major problems with the boiler. It then restarted on January 26, 2012, with the urea line scheduled to start up shortly. On February 8, 2012 the Qafco V line went down again.

The success of the shale gas development in North America made the re-start of another two ammonia plants in the U.S.A. possible (CRU, 2011).

## World Nitrogen Supply/Demand Balance

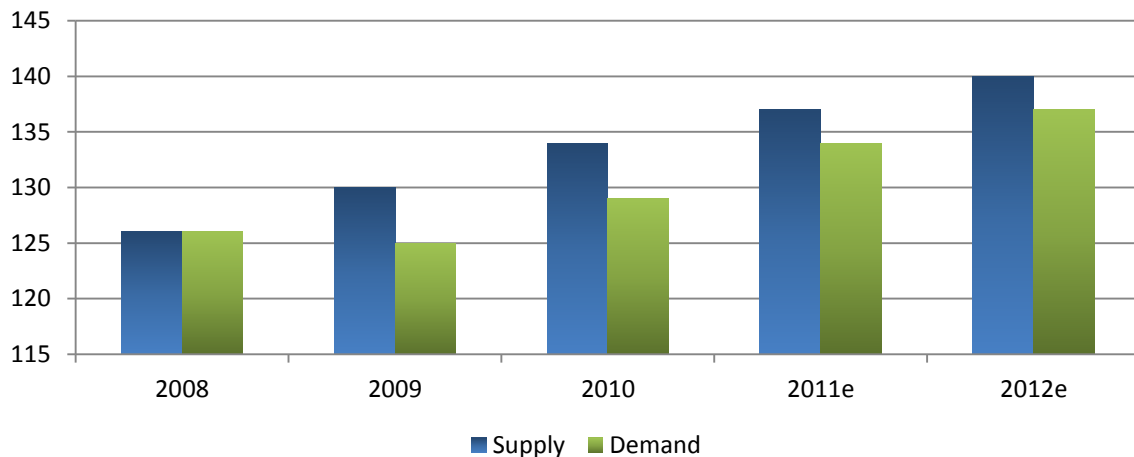


Figure 4: World Nitrogen Supply/Demand Balance 2008-2012 (Heffer & Prud'homme, 2011)

Global nutrient supply in 2011 continued to recover from the depressed levels in 2008. Fertiliser demand was firm in North and Latin America, South Asia and Central Europe, while recovering in Eastern Europe and Central Asia. The rate of growth is seen as slowing down in East and West Asia and West Europe.

The main developments in international trade have included a rather static level of imports for nearly all products, firm import demand in South Asia and Latin America, and a recovery of fertilizer demand and imports in North America and East Asia. As in the past two years, China's export tariffs continue to impact the global trade of urea and DAP. A reduction of exports from China has created sales opportunities for other exporting countries. However, China has exported a significant tonnage of nitrogen and phosphate to India and South-East Asia.

From the geographical angle, the market leader for ammonia is China with Asia-Pacific demonstrating large-scale growth rates. Other important market participants include several countries of Eastern Europe – Russia, Ukraine, and Croatia.

Trinidad and Tobago has contributed 59% of U.S. ammonia imports over the period 2007-10.

## Ammonia Prices 2010-11

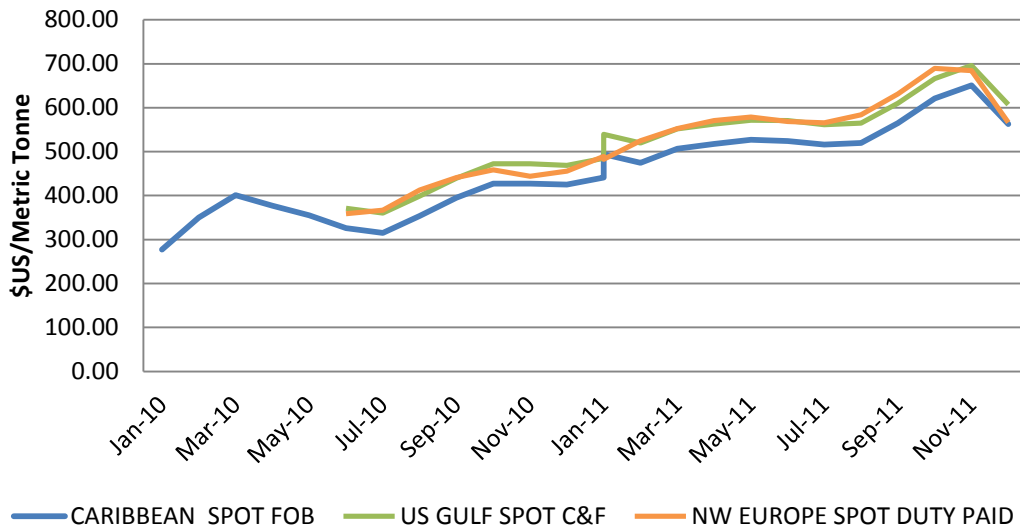


Figure 5: Ammonia Prices 2010-11

Prices have reflected the overall growth in the market and strong demand. Only in December have ammonia prices have fallen abruptly by 14% after a general sharp increase over the past four months. This is because of an oversupply in the market coupled with a reduction in demand. This reduction in demand extends worldwide with the sharpest declines seen in Europe. The fall-off in demand has been attributed to the unsustainable sharp rises in prices over the past year as the market continues to recover from the all-time low in 2008. This, in turn, has contributed to a relatively lesser drop in downstream ammonia products such as urea and urea ammonium nitrate (UAN).

### 2.4 Ammonia Market Outlook (2012)

The global ammonia market looks set to remain firm through 2012. New capacity is due to come on stream over the year but downstream demand is also rising. Prices are likely to remain at historically high levels as a result.

Two new ammonia plants (1.8 million MTPY) are expected to be commissioned this year:

- Algeria: Orascom Construction Industries (OCI) (Sorfert) – 0.8 million MTPY [Q1 2012]
- Egypt: Misr Fertilizer Production Company (MOPCO) – 1.0 million MTPY [Q2 2012]

At the same time, around 1.3 million MT of merchant availability will be lost to captive downstream urea and phosphates production and there will be another 0.5 million MT of increased requirements from existing buyers (Clarke, 2011).

The demand on the global ammonia market is boosting due to impressive growth tempo of such new-age technologies and markets as biofuels, NO<sub>x</sub> emissions, NPK/NP, AdBlue, etc. The global ammonia market is therefore on the expansion track and is projected to reach up to 170 million MT in four-year time (Merchant Research & Consulting, Ltd, 2012).

China is the largest market and consumes almost one-third of the world's ammonia. Although it is the largest global producer, it uses virtually all that it produces and is not a significant factor in world trade.

World fertiliser demand is expected to rise steadily in 2011/12 to a record 178 million MT. Current high agricultural commodity prices are boosting fertiliser demand in market-oriented economies as farmers try to optimize yields. If prices remain high in 2012, farmers will likely maintain higher nitrogen application rates, as in 2011, and limit phosphorus and potassium.

## **2.5 Ammonia Market Outlook (Beyond 2012)**

Several companies have announced plans to build new ammonia plants in Africa, Brazil, Brunei, China, India, Indonesia, Malaysia, and Turkmenistan, which would add about 6.7 million MT of annual production capacity within the next two to four years. The largest growth in ammonia production is in Africa and Brazil (Apodaca, 2012).

According to the International Fertilizer Industry Association (IFA) 2011, global ammonia capacity will increase by 20% to 224.1 million MTPY by 2014. Only a fraction of the overall net capacity increase will be as merchant ammonia supply since the majority of these projects are associated with increases in downstream capacity for urea and processed phosphates.

The bulk of the growth will be in China, Middle East, Latin America and Africa. The main additions to capacity would occur in East Asia (China and Vietnam), Africa (Algeria and Egypt), West Asia (Qatar, Iran and Saudi Arabia) and South Asia (India and Pakistan). Therefore, the higher rates of urea consumption growth are in regions where agriculture remains a major sector in national economies (such as South America, Central and Eastern Europe and Asia).

In the medium term, the positive agricultural outlook is expected to stimulate fertilizer demand. World demand is projected to be 188.3 million MT in 2014/15.

Forecasts to 2012/13 are highly speculative due to the depressed economic context in advanced economies, which could possibly deteriorate in 2012, dampening world economic activity.

Agricultural commodity prices remain attractive but are highly volatile. Consequently, global fertiliser demand in 2012/13 would continue to grow, but at a more moderate rate than in 2011/12.

### 3. UREA

Ninety per cent (90%) of urea is used to make fertilisers. The remaining 10% is divided among the manufacture of:

1. Urea-formaldehyde (UF) resins
2. Melamine
3. Potassium cyanate
4. Urea nitrate

Emergence of new markets such as biofuels and AdBlue (Aqueous Urea Solution: 32.5%) for NOx emissions is expected to drive market growth worldwide.

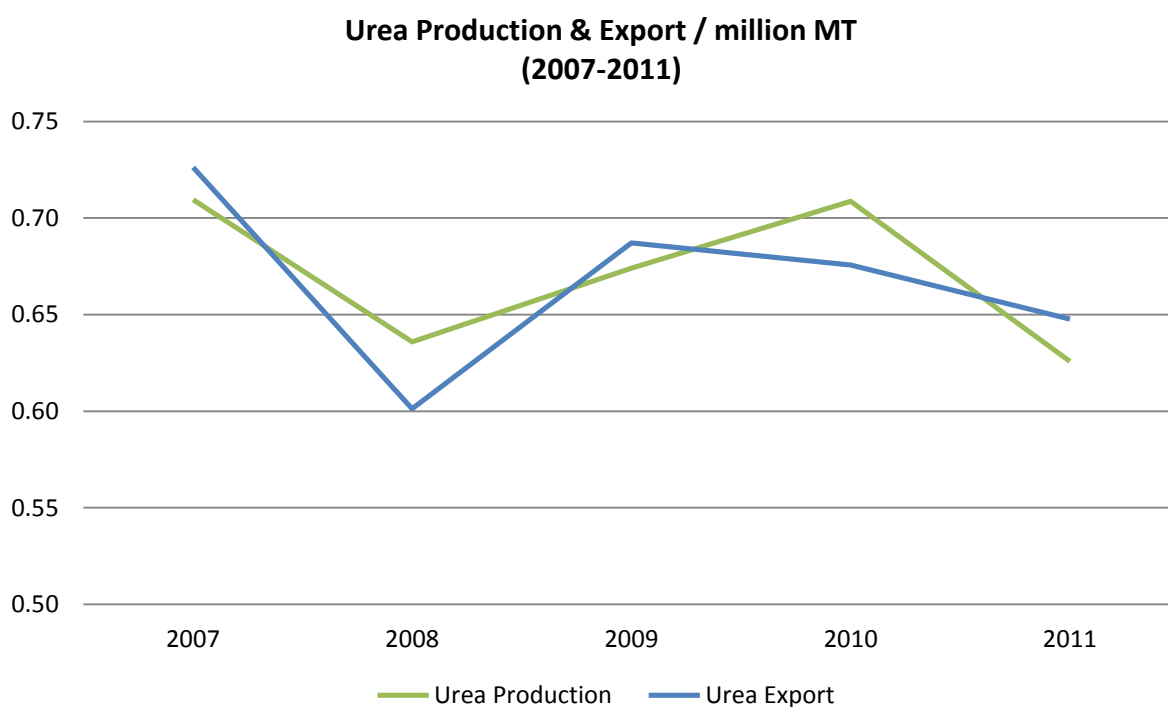


Figure 6: Urea Production and Export 2007-2011 (million MT)

#### 3.1 Urea Production

The total urea production from the single urea plant (PCS Nitrogen) for 2011 was 0.63 million MT. This represented a 13.27% decrease from 2010 which had a total production of 0.71 million MT.



## 3.2 Urea Export

Total urea exports from the single urea plant (PCS Nitrogen) for the 2011 was 0.65 million MT. This represented a 4.32% decrease from 2010 which had a total export of 0.68 million MT.

The average Caribbean price for urea for 2011 was 426.83 \$US/MT while in 2010, the price was 301.66 \$US/MT as reported in the Fertilizer Market Bulletin publication.

## 3.3 Urea Market Perspective (2011)

Global urea production amounted to more than 140 million MTPY, of which about 30 million MT was traded internationally. It is produced in nearly 50 countries worldwide and consumed in every developed agricultural market. The largest producers are Chinese and Indian companies, who have massive domestic markets to serve. The main exporters are producers in areas where feedstock costs are lowest, notably the Middle East, former Soviet Union and Trinidad (Reed Business Information Limited).

### World Urea Supply/Demand Balance

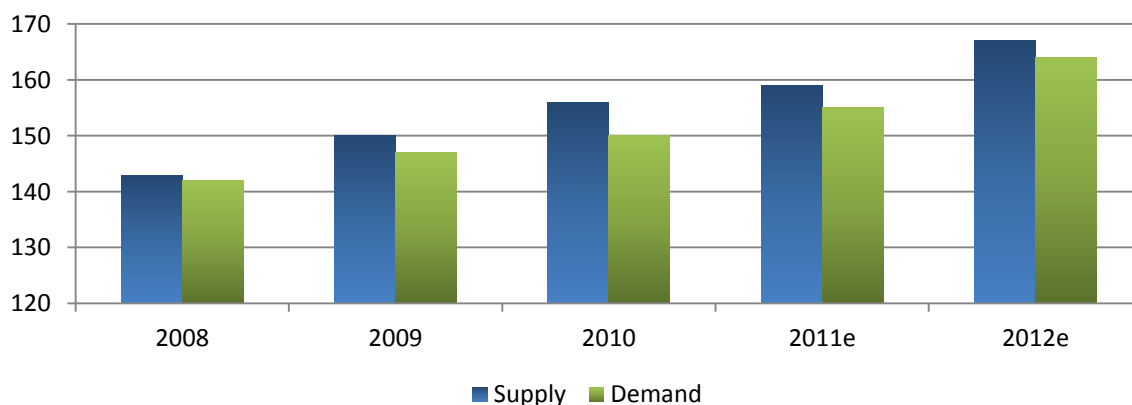


Figure 7: World Urea Supply/Demand Balance 2008-2012 (Heffer & Prud'homme, 2011)

Owing to its primary use being in agriculture, demand for urea is very seasonal. Application generally takes place during the spring season either at the time the crop is planted or during the growth phase of the crop. In the northern hemisphere, this leads to a significant peak in demand in March-April, with a smaller southern hemisphere peak in October-November. The main exceptions to this are in tropical agriculture and the Indian subcontinent, where application follows rainfall patterns. The main application periods in India, for example, are July-September, following the monsoon, and November-December.

Global urea markets have been volatile over the past year and global prices are on a downward trend at the end of 2011 into 2012.

### Urea Prices 2010-11

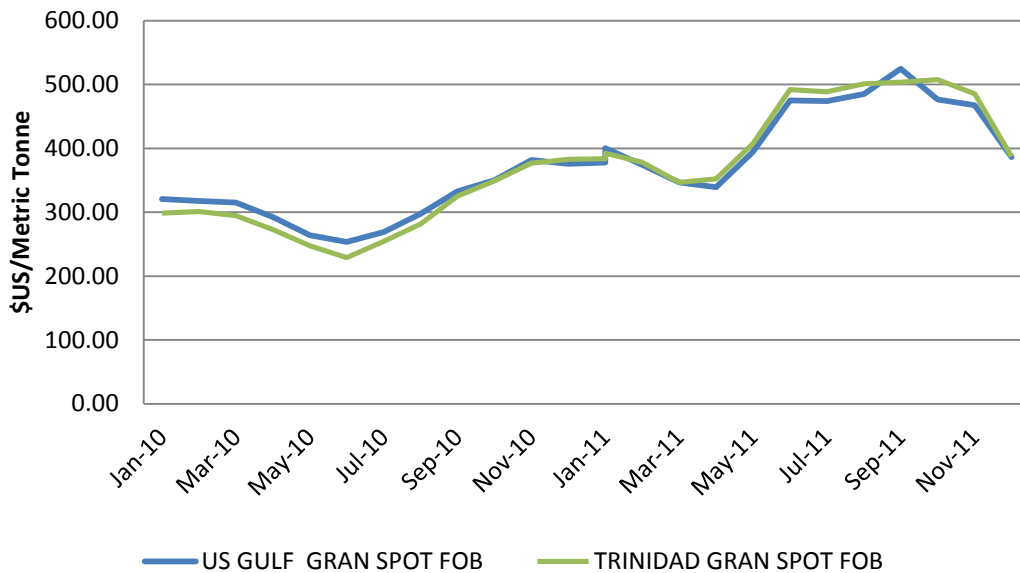


Figure 8: Urea Prices 2010-11

The early part of the year saw demand returning to pre-crisis levels. This increased demand which failed to become self-sufficient in urea production contributed to a stark run-up in urea prices during the second quarter. From April-June, Yuzhny prices rose sharply from 315 \$US/MT FOB (free on board) to 510 \$US/MT FOB.

The third quarter was pocked with volatility as prices would correct downwards to around \$460/tonne FOB and then move up to the 500 \$US/MT FOB mark, followed by subsequent downward price corrections.

Moving into the fourth quarter of the year, a lack of demand has seen urea prices slide. Benchmark Yuzhny prices are currently at \$315-330 \$US/MT FOB, down 170 \$US/MT since the start of October and some 60 \$US/MT lower than this point last year (Clarke, 2011).

### 3.4 Urea Market Outlook (2012)

The global economic situation is causing some uncertainty in fertiliser pricing, dampening trade in general. Increasing demand for food, however, maintains an underlying upward pressure on prices which is likely to continue until fertiliser supply exceeds demand by a safe margin.

Urea prices are not expected to drop to the post-crisis low of \$205/MT FOB seen in December 2008, but the short term prospects for price improvement do not look favourable. Effectively, northern hemisphere spring demand will play the largest role in price determination late in the first quarter of 2012 and into the second.

But by the end of 2012, an expected additional 4 million MT of annual granular urea capacity is due to come online and the market will be oversupplied, which will help keep prices at lower levels than seen over the past year.

Qafco is scheduled to start up its 1.3 million MTPY Qafco V urea plant in February 2012 and then a second 1.3 million MTPY Qafco VI plant in Q4 2012. Additionally, in Algeria, Sorfert is due to start up a 1.1-1.2 million MTPY plant in Q1 2012, and MOPCO in Egypt is due to start two 660,000 MTPY plants in the second half of the year. Additional capacity is also due on-stream in Vietnam and Venezuela.

While there may be some delays to these projects, it is clear that the urea market looks to be moving into an oversupply situation in the next few years.

#### Global Urea Capacity Additions

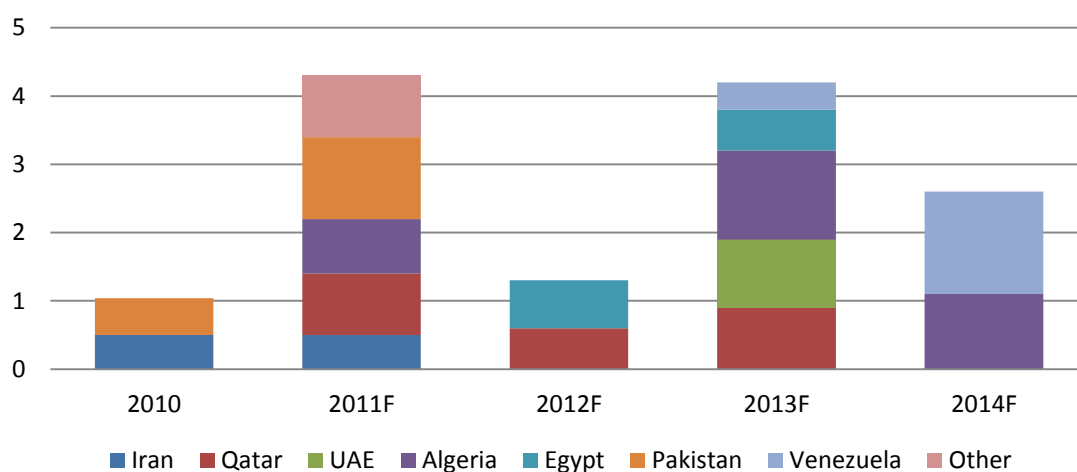


Figure 9: Global Additions in Urea Capacity (excluding China) (PotashCorp, 2010)

## 4. METHANOL

### Global Methanol Derivatives (2010)

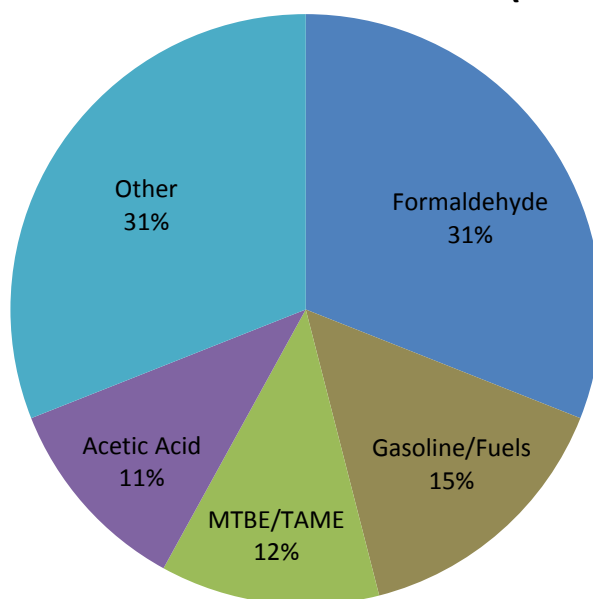


Figure 10: Methanol Consumer Derivatives for 2010 (CMAI, 2010)

Smaller methanol derivatives include:

- Dimethyl Terephthalate (DMT)
- Methyl methacrylate (MMA)
- Chloromethane
- Methylamines
- Glycol Methyl ethers
- Fuel

New uses of methanol are also expected to grow with increased methanol consumption for use in methanol to olefins/methanol to propylene plants.

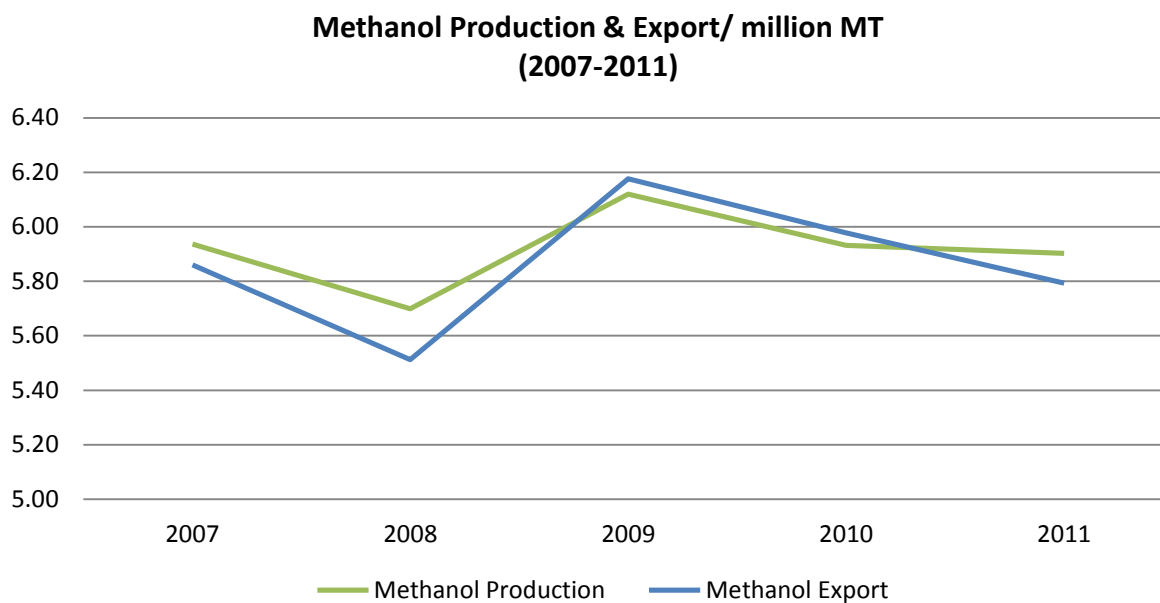


Figure 11: Methanol Production and Export 2007-2011 (million MT)

#### 4.1 Methanol Production

The total methanol production from the seven methanol plants in 2011 was 5.90 million MT. This represented a 0.51 % decrease from 2010 which had a total production of 5.93 million MT.

#### 4.2 Methanol Export

Total methanol exports from the seven methanol plants for 2011 amounted to 5.79 MT. This represented a 3.19 % decrease from 2010 which had a total export of 5.98 MT.

Main methanol export destinations<sup>2</sup> for 2011:

- North America- USA, Canada, Mexico, Panama
- Europe- Belgium, Greece, Spain, France, Italy, Netherlands, Portugal
- South America- Peru, Chile, Colombia
- Asia- South Korea

The average US Gulf price for methanol for 2011 was 370.08 \$US/MT, while during 2010 the average price was 328.16 \$US/MT, as reported in the IHS Methanol Market Reports.

<sup>2</sup> 2011 data only submitted by Methanex

### 4.3 Methanol Market Perspective (2011)

The methanol industry saw capacity changes in all regions as new large scale plants came online. Approximately 10 million MT of new capacity was added in 2011, most of which was in China (IHS Chemical, 2012):

- EMethanex Egypt - 1,000,000 MTPY
- JSC Shchekinoazot, Russia - 850,000 MTPY
- Methanex, Canada – 470,000 MTPY (re-start of idled capacity)
- Total China – 7,770,000 MTPY

Methanex restarted their 470,000 MTPY methanol plant in Medicine Hat, Alberta, Canada. The current lower natural gas price environment in North America has made the Medicine Hat plant a competitive new supply to the region. The rest represents new methanol production.

Table 4: Annual Methanol Capacity additions and timing ('000 MTPY)

		2010	2011	2012	2013	2014	2015
<b>Canada</b>	Methanex		470				
<b>United States</b>	Pandora Methanol			850			
<b>Venezuela</b>	Metor 2	850					
<b>Azerbaijan</b>	Azmeco				560		
<b>Russia</b>	JSC Ammoniy						230
	ZAO Ural Methanol Group						600
	Azot Shchekino		450				
<b>Iran</b>	Kharg 2					1,400	
<b>Oman</b>	Salalah Methanol	1,300					
<b>Egypt</b>	EMethanex		1260				
<b>India</b>	GSFC			165			
<b>Brunei</b>	Brunei Methanol	850					
<b>China</b>	Total China	11,050	7,770		4,200	3,600	
<b>Total</b>		<b>14,050</b>	<b>9,950</b>	<b>1,015</b>	<b>4,760</b>	<b>5,000</b>	<b>830</b>

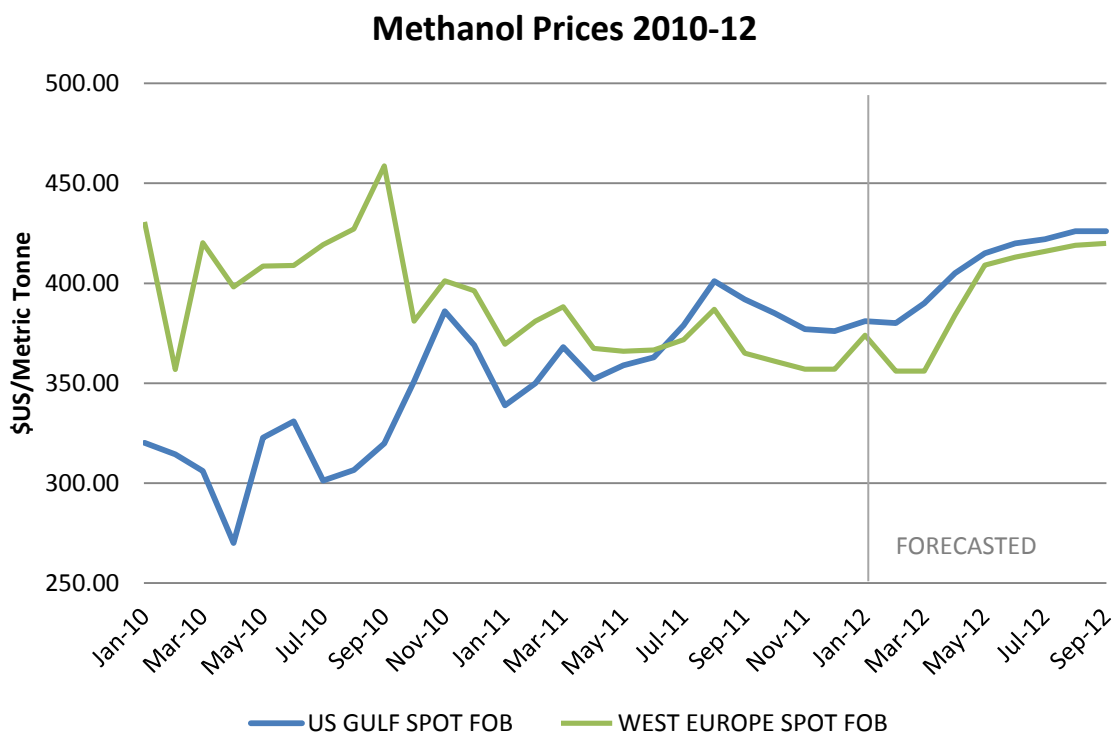


Figure 12: Methanol Prices 2010-12

#### 4.4 Methanol Market Outlook (2012)

Methanex announced that they will be relocating one of their idled methanol plants in Chile to Geismar, Louisiana. The company has begun engineering work and expects production to begin in the second half of 2014. With Pandora Methanol (850,000 MTPY) restarting the Beaumont, Texas site in 2012 and LyondellBasell (780,000 MTPY) restarting its Channelview, Texas methanol plant in late 2013, U.S. methanol capacity make a nearly fourfold increase by 2015. The North American market imported around 5.5 million MT of methanol in 2011 and these developments will have an impact to trade dynamics as supply is shifted (IHS Chemical, 2012).

Latin America is a primary supplier to North America, with significant volumes to Europe as well. The region has approximately 11.6 million MTPY of capacity. The major supply points are Trinidad, with approximately 6.6 million MTPY of capacity; Venezuela, with 2.4 million MTPY; and Chile, with approximately 1.8 million MTPY of effective capacity.

#### 4.4 Methanol Market Outlook (Beyond 2012)

Thus from 2010 to 2015, North American capacity will grow by 2.9 million MT, a near fourfold increase. Meanwhile from 2010 to 2015, North American domestic demand is expected to grow by around 670,000 MT, meaning that the capacity additions far exceed demand growth and a large volume of imports will not be needed due to this growth in capacity. With domestic capacity running at 85% on average, in effect we will see the region shift from a situation in which imports represent around 95% of domestic demand to a market in which imports represent around 58% of domestic demand. On a volume basis this means that around 2 million MT less methanol will be sent to North America in 2015 when compared to 2010.

China will restructure its methanol industry in the next five years with improvements in energy conversion rates, rationalization of uncompetitive assets, and controls on new builds. In derivatives, China will encourage strategic new sectors in specialties, new energy feedstocks, and biopharma. The Methanol-to-Olefins (MTO) and Methanol-to-Propylene (MTP) will receive emphasis with production in resource-rich regions. MTO/MTP is fast emerging with yet unknown implications to the merchant methanol market, growing from nothing in 2009 to 20.1 million MT of demand in 2016. With some of the MTO/MTP plants sourcing from the merchant market and many plants sourcing merchant material (with up to 2 million MT methanol demand rates) during extended start-ups, this has a dramatic impact on merchant methanol.

There are no further capacity additions in the Middle East apart from Iran due to gas availability issues. Iran has 14 methanol projects under consideration totalling 4 million MT forecasted to come on-stream by the end of 2016. However, the November 2011 sanctions targeting the petrochemical industry are likely to delay these projects. There is little demand growth in West Europe through to 2016 averaging just 2.5%. Africa is set to become the new Middle East with ever increasing quantities of gas being discovered in Ghana, Mozambique, Nigeria and Tanzania and the likelihood of further capacity being added in Algeria and Egypt. Projects totalling 9.6 million MT have been identified but unlikely to be on-stream until after 2016.



## 5. UREA-AMMONIUM NITRATE (UAN)

Urea-ammonium nitrate (UAN) is made by dissolving urea and ammonium nitrate in water. This results in an aqueous solution usually containing 28% nitrogen by weight (a more concentrated product containing 32% is also available in some locations). Liquid UAN solution is popular because of the versatility of a liquid source, as well as widespread availability.

UAN can be applied more uniformly than non-liquid forms of fertilizer. It can be mixed with herbicides, pesticides, and other nutrients, permitting farmers to reduce costs by applying several materials simultaneously rather than making several separate applications.

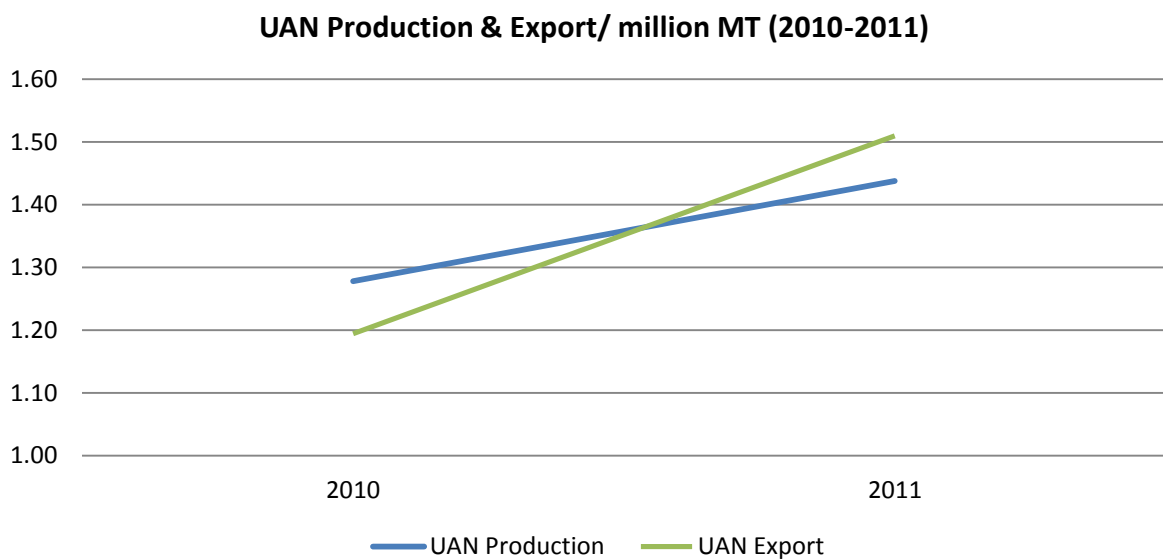


Figure 13: UAN Production and Export 2010\*-2011 (million MT)

\*UAN export commenced February 2010

### 5.1 UAN Production

The total UAN production from the AUM I complex for the period 2011 was 1.44 million MT. This represented an 11% increase from 2010 which had a total production of 1.28 million MT.

### 5.2 UAN Export

The total UAN exported from the AUM I complex for 2011 was 1.51 million MT. This represented a 20% increase from 2010 which had a total export of 1.19 million MT.

The average NOLA Gran Spot FOB price for UAN for 2011 was 351.73 \$US/MT, while during 2010 the average price was 243.34 \$US/MT, as reported in the Fertilizer Market Bulletin. The average Rouen

Gran Spot FOB price for UAN for 2011 was 237.44 € EURO/MT, while during 2010 the average price was 176.07 € EURO/MT, as reported in the Fertilizer Market Bulletin.

### 5.3 UAN Market Perspective

Despite its relatively modest size compared to urea, the global UAN industry continues to attract investment driven by the diversification of the product portfolio and the expansion of the supply chain via the introduction of the new value-added products to existing fertilizer complexes. The three new UAN projects that came on-stream in the period 2006-2011 are all export-orientated plants with nearly 100% of the output entering the international UAN trade:

- Orica – Indonesia (145 mtpd)
- MHTL – Trinidad (4,300 mtpd)
- Abu Qir – Egypt (1,000 mtpd)
- Acron – Novgorod, Russia (2,000 mtpd)

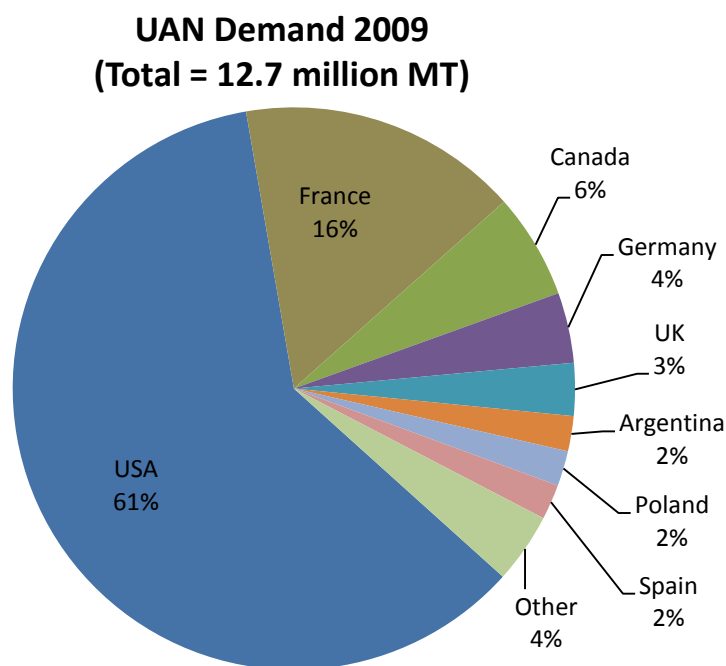


Figure 14: UAN Demand 2009 (Integer Research Limited, 2011)

## UAN Export Destinations 2010 Total = 1.2 million MT

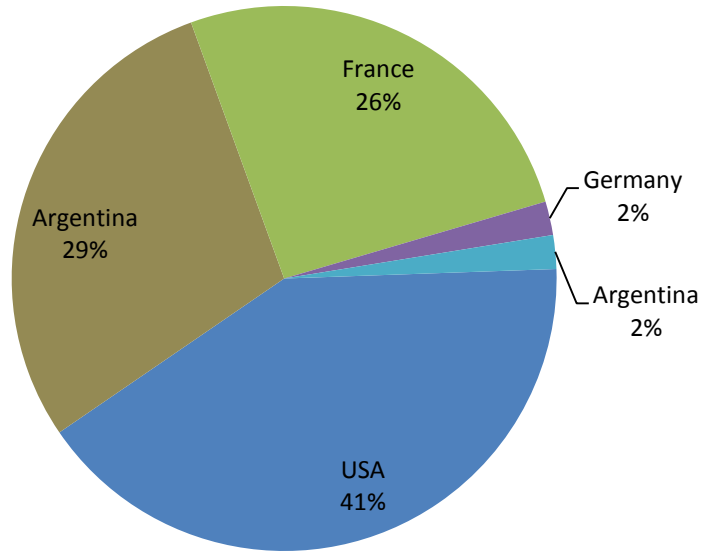


Figure 15: UAN Export Destinations 2010

## Urea Ammonium Nitrate (UAN) Prices 2010-11

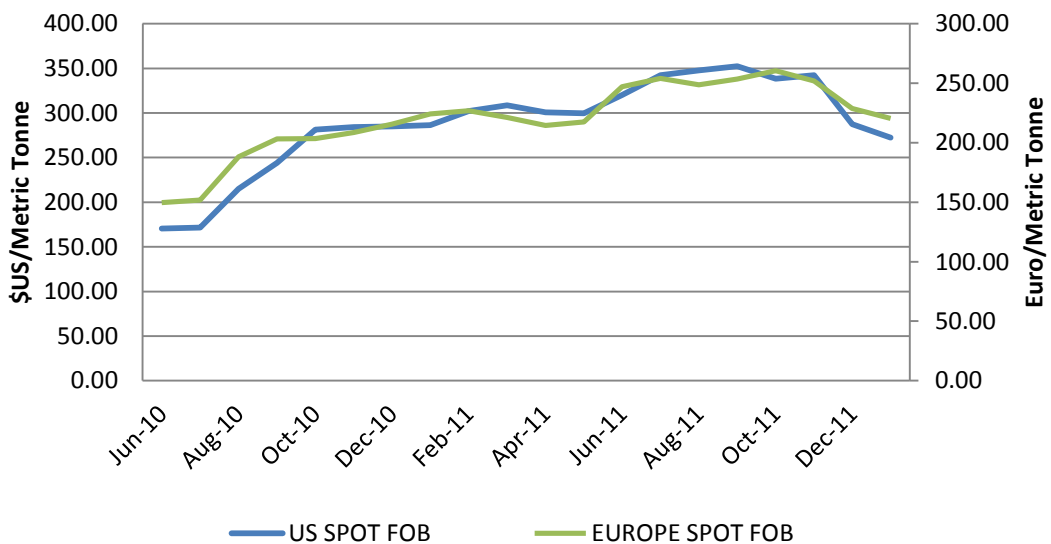


Figure 16: Urea Ammonium Nitrate (UAN) Prices 2010-11

## 6. MELAMINE

Melamine is used in a wide range of applications and is primarily produced in Europe, Asia and North America. The chemical is used in laminates, surface coatings, flame resistant materials, textiles and moulding compounds. Demand for melamine between 2011 and 2015 is expected to grow at 3%-5% across the world.

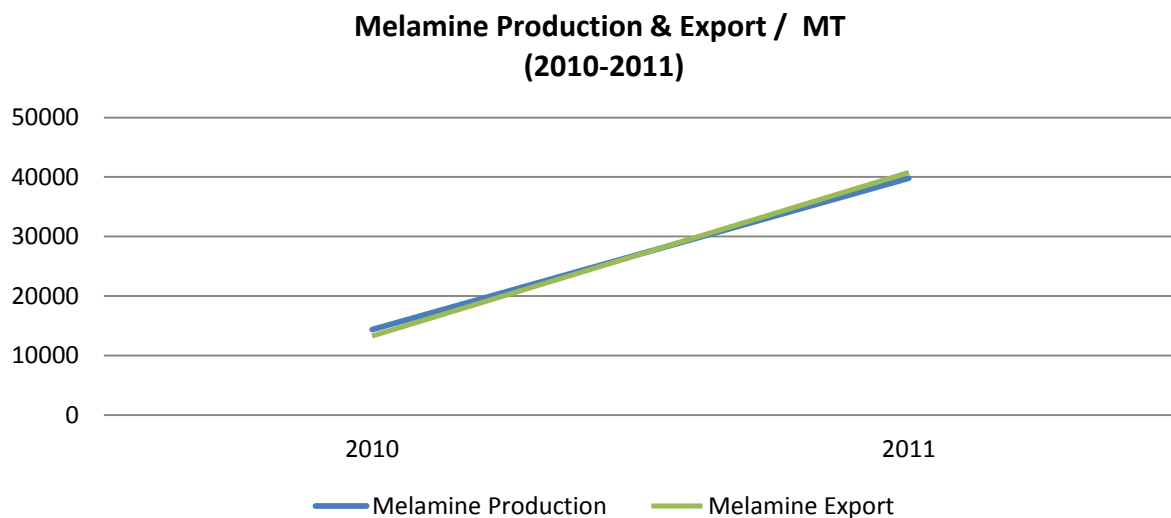


Figure 17: Melamine Production and Export 2010\*-2011 (MT)

*\*Melamine production commenced May 2010 and export began June 2010*

### 6.1 Melamine Production

The total Melamine production from the AUM I complex for the period 2011 was 39,784 MT. This represented a 63.94% increase from 2010 which had a total production of 14,345 MT.

### 6.2 Melamine Export

The total Melamine exported from the AUM I complex for 2011 was 40,805 MT. This represented a 67.5% increase from 2010 which had a total production of 13,262 MT.

The average US Gulf price for melamine for 2011 was 2305.83 \$US/MT, while during 2010 the average price was 2201.42 \$US/MT.

## Melamine Export Destinations 2010 Total Exports = 13,262 MT

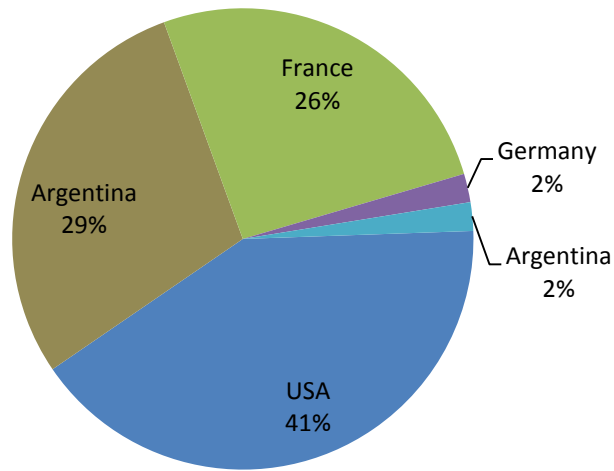


Figure 18: Melamine Export Destinations 2010

## Melamine Prices 2010-11

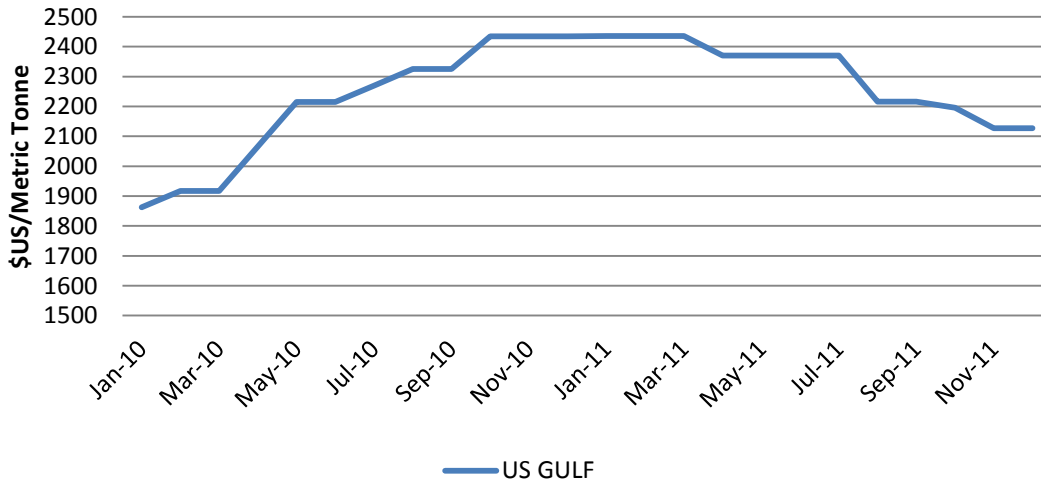


Figure 19: Melamine Prices 2010-11

### 6.3 Melamine Market Perspective

The current world market for melamine is tight. Supplies constricted in early 2010, as world consumption accelerated in response to recovering economies. Factors behind the tightness in supply include production outages, low inventories, increased world consumption and the fact that melamine production from capacity commissioned in mid-2010 did not contribute significantly to world supply.

China is the largest single participant in the melamine market, accounting for 39% of world consumption in 2010; it accounted for 53%, 46% and 26% of world capacity, production and exports, respectively, in 2010. This trend is expected to continue during 2012–2015, as significant growth in Chinese consumption will result in the commissioning of additional capacity and increased production. Europe is the second-largest melamine market, accounting for nearly 32% of world consumption in 2010.

World consumption of melamine is expected to be robust during 2012–2015; average annual growth is expected to be 3–5% in most regions. China, Central and South America, the Middle East, and Central and Eastern Europe are expected to exhibit rapid demand growth.

China is forecast to experience the fastest growth rates (around 8%) and volume increases in melamine consumption during 2010–2015. However, China's share of exports is expected to decline as a result of increased domestic consumption, competition from other sources of supply including Qatar and Trinidad, and increased regionalization of supply, in which many consuming regions are likely to source melamine locally.

During 2010–2015, melamine consumption in Europe is forecast to grow at an average annual rate of almost 4%. Growth in Central and Eastern Europe is expected at almost 8%, largely the result of increased production of laminates and wood adhesives; consumption growth in Western Europe is forecast at a more moderate rate of 3.0% during 2010–2015. Other Asian countries, excluding Japan, are expected to show large volume increases during 2010–2015, at an average annual growth rate of 4.4%.

Overall economic performance will continue to be the best indicator of future demand for melamine. Demand in most downstream markets is greatly influenced by general economic conditions. As a result, demand largely follows the patterns of the leading world economies. The major end-use markets include construction/remodelling, automotive production and original equipment manufacture (OEM).

## 7. NATURAL GAS LIQUIDS<sup>3</sup> [from PPGPL]

### 7.1 NGL Production

Table 5: NGL Production 2010-11

	Production/ million BBL	
	2010	2011
Propane	6.32	5.84
Butane	4.76	4.51
Natural Gasoline	6.14	5.69

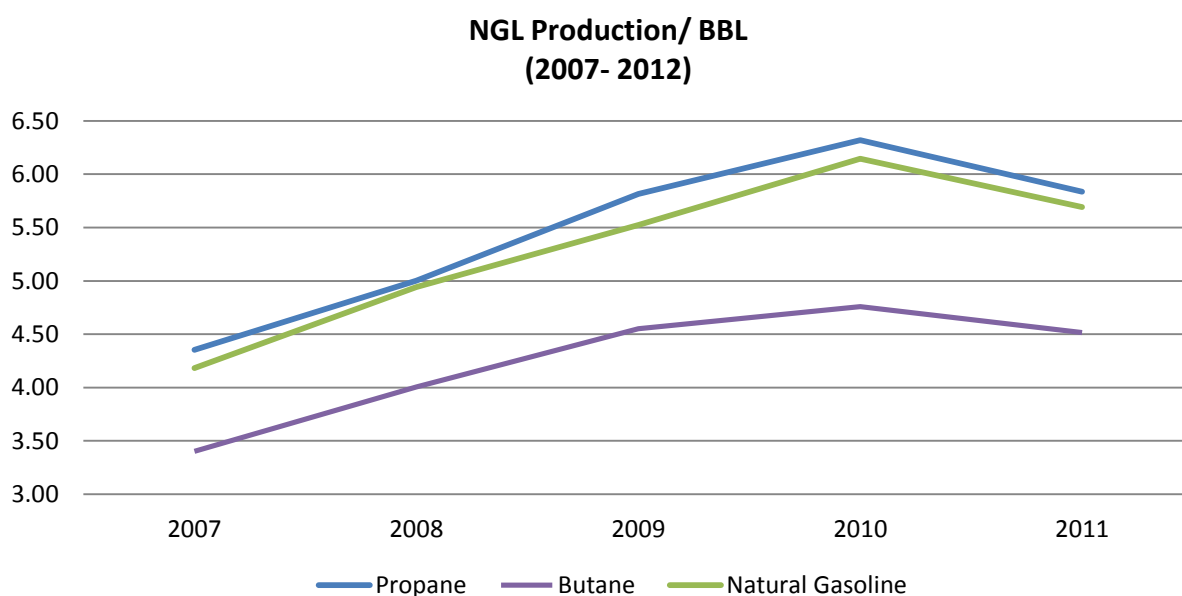


Figure 20: NGL Production 2007-2011 (bbl)

#### Propane

The total propane production in 2011 was 5.84 million bbl. This represented an 8.27% decrease from 2010 which had a total production of 6.32 million bbl.

<sup>3</sup> PPGPL production & export of commercial grade NGLs of particular specifications (not National NGL production)

## Butane

The total butane production in 2011 was 4.51 million bbl. This represented a 5.43% decrease from 2010 which had a total production of 4.76 million bbl.

## Natural Gasoline

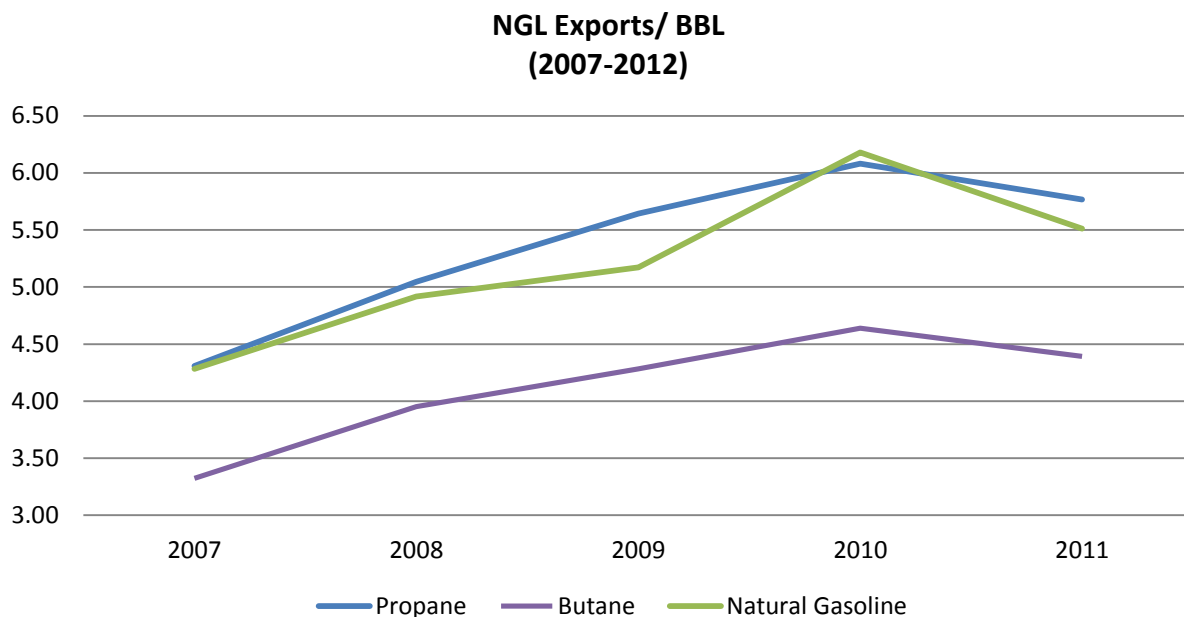
The total natural gasoline production in 2011 was 5.69 million bbl. This represented a 7.95% decrease from 2010 which had a total production of 6.14 million bbl.

## 7.2 NGL Export

Table 6: NGL Exports 2010-11

	Export/ million BBL	
	2010	2011
Propane	6.08	5.93
Butane	4.64	4.47
Natural Gasoline	6.18	5.58





**Figure 21: NGL Exports 2007-2011 (bbl)**

### **Propane**

The total propane exported in 2011 was 5.77 million bbl. This represented a 5.49% decrease from 2010 which had a total export of 6.08 million bbl.

The average price for propane for 2011 was 1.47 \$US/US gallon while during 2010 the average price was 1.16 \$US/gallon, as reported in the PPGPL Shipping Reports.

### **Butane**

The total butane exported in 2011 was 4.39 million bbl. This represented a 5.64% decrease from 2010 which had a total export of 4.64 million bbl.

The average price for butane for 2011 was 1.86 \$US/gallon while during 2010 the average price was 1.50 \$US/gallon, as reported in the PPGPL Shipping Reports.

## **Natural Gasoline**

The total natural gasoline exported in 2011 was 5.51 million bbl. This represented a 12.11% decrease from 2010 which had a total export of 6.18 million bbl.

The average price for natural gasoline for 2011 was 2.34 \$US/gallon while during 2010 the average price was 1.78 \$US/gallon, as reported in the PPGPL Shipping Reports.

## **Main PPGPL export destinations for 2011**

*Caribbean* - Antigua, Anguilla, Aruba, Bahamas, Barbados, Bermuda, Cayman Islands, Colombia, Costa Rica, Dominica, Dominican Republic, Eastern Caribbean, Grand Cayman, Grenada, Guadeloupe , Guyana , Haiti, Jamaica, Martinique, Montserrat, Panama, Puerto Rico, St. Kitts & Nevis, St. Lucia, St. Maarten , St. Vincent, Tortola.

*South & Central America* - French Guiana, Suriname, Uruguay, Mexico.

*Other Regions* - West Africa, Senegal, Europe.

## 8. IRON AND STEEL PRODUCTS AND CEMENT

Iron and steel markets displayed increased activity in 2011. Billet and wire rod prices rose in 2011 by 19.9% and 15.4%, respectively, compared to 2010. The average billet price (for Latin America) was US\$648.76 per tonne during 2011 while the price of wire rods averaged US\$710.13 per tonne. A weaker tone prevailed in the iron and steel market following the Japanese earthquake and political instability in the Middle East. By mid-year however, upward momentum returned as prices were driven by increasing raw material costs and, to a lesser extent, strengthening demand. Markets grew weaker by the fourth quarter as higher prices began to push buyers out of the market (Central Bank of Trinidad and Tobago, 2012).

Available data for the local iron and steel industry suggest improved activity in 2011. During January to September 2011, billet production increased by 3.2% while wire rod production expanded by 19.1%. Direct Reduced Iron (DRI) production remained relatively unchanged from levels in 2010. In late 2011 however, ArcelorMittal Point Lisas Limited temporarily sent home 30 workers, citing reduced demand for its DRI. The company indicated that it expected to resume normal operating rates in January 2012 (Central Bank of Trinidad and Tobago, 2012).

**Table 7: Direct Reduced Iron Production and Export 2010-11**

Direct Reduced Iron ('000 MT)	2010	2011 (Jan-Sep)
<b>Production</b>	1,752	1,409
<b>Export</b>	1,003	824
<b>Own Consumption</b>	603	469

**Table 8: Billets Production and Export 2010-11**

Billets ('000 MT)	2010	2011 (Jan-Sep)
<b>Production</b>	572	467
<b>Export</b>	151	94
<b>Local Sales</b>	27	30
<b>Own Consumption</b>	285	336

Table 9: Wire Rods Production and Export 2010-11

Wire Rods ('000 MT)	2010	2011 (Jan-Sep)
<b>Production</b>	361	320
<b>Export</b>	317	272
<b>Local Sales</b>	28	25

Table 10: Cement Production and Export 2010-11

Cement ('000 MT)	2010	2011 (Jan-Sep)
<b>Production</b>	791	600
<b>Local Sales</b>	548	401
<b>Exports</b>	245	198

## Billets and Wire Rods Prices 2006-2011

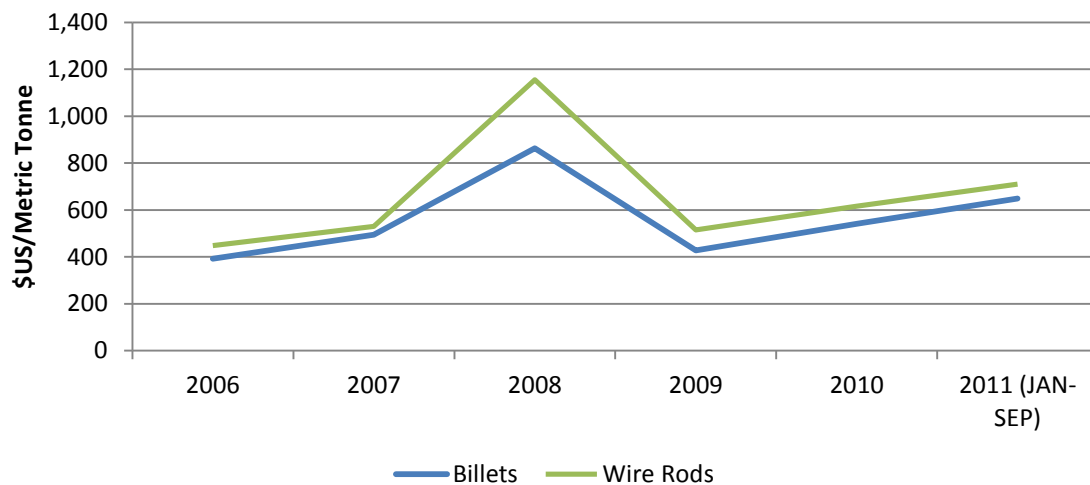


Figure 22: Billets and Wire Rods Prices 2006-2011 (Central Bank of Trinidad and Tobago, 2012)

## 9. PROPOSED DOWNSTREAM GAS PROJECTS

Table 11: Upcoming Downstream Gas Projects

PROJECT	PRODUCT DESCRIPTION	PRODUCTION (MTPY)
<b>Carisal Calcium Chloride Plant</b>	Calcium chloride	120,000
	Caustic soda	85,000
	Sodium hypochlorite	8,000
	Hydrochloric acid	1,000
<b>Severstal DRI/HBI Plant and Steel Mill</b>	HBI	750,000
	Cold DRI	750,000
	Steel Billets	235,000
<b>Derivative Melamine Products</b>	Moulding Compound	220
	Dinnerware	220
<b>Methanol to Petrochemicals</b>	Gasoline	299,000
	LPG	60,000
	Oxo-alcohols (eg. N-Butanol, 2-Ethyl Hexanol, Iso-Butanol)	108,000
	Mixed Acrylate Esters	200,000
<b>Ammonia &amp; Downstream Derivatives – AUM II</b>	Granulated urea	934,467
	Melamine	27,139
	Ammonium Sulphate	247,500
	Melamine Urea Formaldehyde	10,350
<b>Maleic Anhydride</b>	Maleic Anhydride	50,000
<b>Methanol to Polyolefins</b>	Copol/Homopol Polypropylene	572,000

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