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Mena Strategy

Natural gas in the Mena region

Regional gas shortages and a higher cost of developing new gas fields will likely put upward pressure on future gas prices. Shorter term, we expect prices to remain at the current levels of up to US$3.00/MMBtu. We keep a close eye on Egypt, where political pressure has created uncertainty about future pricing.

Table 1 : Summary pricing policies and assumed future gas prices

(US$/MMBtu)	2010 prices	Future prices	Assumptions
Saudi Arabia	0.75	0.75-3.00	Assume 0.75 base case until 2015, then 2.00
Qatar	0.95-2.35	1.00-2.75	No change in variable pricing formula
Egypt	1.25-3.00	1.25-3.00	Political pressure, but assume contracts remain valid

Source: MEED, Zawya, company reports, Rasmala research

The natural gas debate continues – is there enough gas and will prices go up?

In light of recent gas price increases from US$1.50 to US$2.25/MMBtu in Bahrain and recent concerns that gas prices in Egypt may follow suit, we take a look at gas price policies across the region. For investors, Saudi Arabia, Qatar and Egypt – where listed gas-intensive industries represent 20-40% of the indices – are particularly relevant. We understand that Saudi Arabia is reviewing its pricing policy for liquids, which is running out this year, and may at the same time change its gas price policy: the market widely expects an increase from the current US$0.75 to a minimum of US$1.25/MMBtu as early as next year.

We believe future prices will have to be in line with neighbours'

Prices in the region of less than US$1.0/MMBtu and up to US$3.0/MMBtu are well below international levels which, combined with low taxes and labour costs, make gas-intensive industries from chemicals to aluminium highly competitive on a global basis. However, in our view, regional competitiveness will also play a role in setting new prices: we don't expect any significant changes in gas prices in Saudi Arabia's neighbours, hence we expect Saudi prices, if they were to go up, to remain within the regional range scenario, as we believe that anything higher would make the strategic petrochemical industry less competitive.

We assume prices will remain fixed until 2015 in Saudi Arabia

Longer term, it is almost inevitable that gas prices will have to go up, but we do not assume an increase short term for now as: 1) recent oil production increases have made more (associated) gas available; 2) we do not expect any major industrial capacity additions in Saudi Arabia in 2011-13; 3) recent new ethane allocations suggest not all allocations have been utilised to date; 4) petrochemical companies are already using mixed-feed crackers, partly to widen the product offering; 5) the power sector is now using heavier fuels as well; and 6) we understand that many gas contracts are in place until the end of 2015.

We see a negative impact on earnings, but margins remain highly competitive

Companies with the biggest cost advantages, and thus the most sensitive to change, are those which use ethane as the main feedstock, such as fertilisers, methanol and cement, which enjoy EBITDA margins in excess of 60%. Even so, if the increase were to happen, the impact would be relatively limited and we believe largely discounted by the market already: we estimate that the cash margin for fertilisers will go down by 6-7ppt. For industries that use mixed feedstock, such as utilities and petrochemicals, a change in the price for heavier fuels, linked to market prices, would have a more profound impact than changes in gas prices.

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Executive summary

Low natural gas prices ranging from US$0.60/MMBtu upwards across the region are a key global competitive advantage, but increases seem inevitable in the near future. We expect these to remain low enough for key strategic industries such as petrochemicals.

Low gas prices as a key global competitive advantage

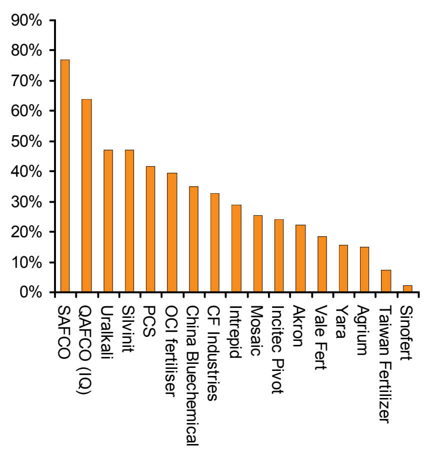
Low gas prices across the Gulf and North Africa ...

Industrials in the Mena region enjoy low (semi-)fixed natural gas feedstock prices ranging from US$0.75/MMBtu in Saudi Arabia to US$0.95-2.35/MMBtu in other Gulf countries (GCC and Iran) and from US$0.60 up to US$3.0/MMBtu in North Africa. These low gas prices, combined with low (or no) tax and low labour costs, are a key global competitive advantage for industrials across the region. Russian gas prices come the closest (about US$3.5/MMBtu in 1H11); in the US, market prices are linked to Henry Hub, recently around US$4/MMBtu; and across most of Europe, producers pay gas prices linked to crude oil formulas, currently in excess of US$10/MMBtu.

... translate into high EBITDA margins

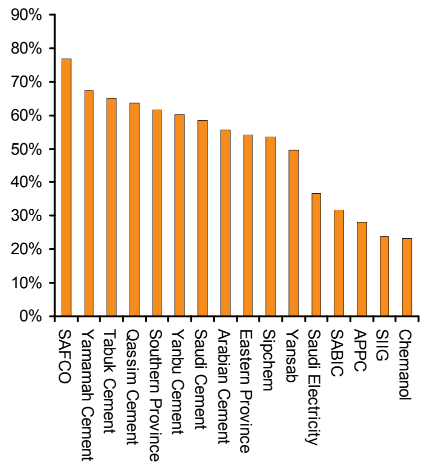
The cost advantage is evident in EBITDA margins in the region: gas-intensive industries such as fertilisers (OCI in Egypt / Algeria, SAFCO in Saudi Arabia, Industries Qatar) enjoy margins well above those in all other regions, in addition to which the geographical location on trade routes to Asia, Europe and the Americas makes it easy to export to all major end markets. In Saudi Arabia, all industries that use gas as a feedstock benefit from the fixed pricing environment: the average EBITDA margin in fertilisers (SAFCO) was 77% in 2010, cement 61% and petrochemicals 35%.

Chart 1 : Mena fertilisers – competitive cost position (EBITDA margins, 2010)



Source: Company reports, Bloomberg, Rasmala

Chart 2 : Saudi industrials – EBITDA margins, 2010



Source : Bloomberg, Rasmala

The feedstock conundrum – are changes on the cards?

Shortage of gas as a feedstock ...

The region holds about 45% of global gas reserves and has three of the top four countries in terms of reserves globally, Iran, Qatar and Saudi Arabia (the fourth being Russia). Nevertheless, gas feedstock availability for industrial use has been scarce, following a decade of strong growth in local demand and a ramp-up of exports, combined with a low rate of success to increase production. The latter is partly hampered by the fact that outside Iran and Qatar approximately 70% of gas reserves are associated fields and dependent on the level of oil production – the recent increase in oil production of about 6% in Saudi Arabia in 2011 ytd is helpful but probably temporary. Our analysis shows that the gas shortage has already resulted in delay or cancellation of major projects from Qatar to Algeria. Between 2008 and 2011, the Middle East accounted for about 40% of ethylene capacity additions, but over the next three years, little new capacity is scheduled to be added, partly as a result of cancellations during the downturn, partly due to the lack of gas feedstock or delays in allocations by governments.

... will only get worse

Gas consumption growth is likely to remain high: BP forecasts 3.9% growth on average during 2010-30, driven by construction of new power generation plants, expansion of strategic gas-intensive industries and usage of gas by the oil sector, particularly for re-injection in maturing oil fields to stimulate oil production using enhanced oil recovery (EOR) techniques. The latter can be significant: for example, according to consultants Wood Mackenzie, in Abu Dhabi around two-thirds of gas consumed is used by the oil industry. As a result, the gas shortage will likely become more acute, forcing governments to: 1) ramp up gas exploration and production; 2) look at alternative sources of power generation (nuclear/renewables); 3) use mixed-feedstock where possible; 4) increase imports – the UAE and Kuwait are already doing this; and 5) review domestic gas prices.

A higher cost base

Such measures are bound to lead to a higher cost base for industrials, although governments tend to allocate gas to certain industries and set prices by industry on the basis of strategic importance: even discounting the fact that other fuels than gas are clearly more expensive, the cost of developing new gas fields, especially those that are offshore in the case of Saudi Arabia and Abu Dhabi, or contain sour or tight gas, could be in the range of US$3.5-5.0/MMBtu, according to the US Energy Information Administration (EIA), also putting upward pressure on future pricing.

The beginning of a new era – new pricing policies and the effect on listed stocks

Historically, low prices made sense, as associated gas used to be flared, gas infrastructure did not exist and gas prices were set at a time when global prices were low – a common misconception is that these low prices are the result of heavy subsidies but this is not the case. However, both Saudi Arabia and Egypt are currently reviewing gas price policies.

Gas-intensive industries constitute a large part of the indices

From an equities perspective, Qatar (listed gas-intensive industries represent about 21% of the DSM Index), Saudi Arabia (around 39% of the Tadawul Index) and Egypt (about 29% of the EGX30) are the most relevant countries, whereas Algeria and the UAE are important, as investments in those countries into the petrochemicals, steel and aluminium industries are significant.

- **Saudi Arabia**: The US$0.75/MMBtu price has been fixed since 1998 and the current price regime is valid until 2016 at the latest. We understand that the Ministry of Petroleum and Mineral Resources is currently reviewing its policy for liquids (currently 30% discount to international prices) and may change gas pricing policy at the same time. However, we assume that prices will remain fixed at US$0.75/MMBtu for existing contracts, but move to a base price of US$2.00/MMBtu from 2015 onwards.
- **Egypt**: The government, under pressure of public opinion, has publicly stated it will revisit gas prices for exports to Israel and Jordan. It also recently stated it would 'increase gas prices to Israel aggressively'. However, we expect existing contracts to remain in place, given that the government had already decided to gradually reduce subsidies for natural gas and electricity back in May 2008 and that it will have to take into account corporate tax of (now) 25%, compared with much lower taxes in the GCC (Qatar 10% for foreign companies) to be able to continue to attract foreign investment.
- **Qatar and the UAE**: We expect no changes in other countries – Qatar already has a flexible pricing structure in place with prices linked to volumes and prices of end products; we believe prices in Algeria are now north of US$2/MMBtu and that the attractive low prices of US$0.60 have not been available from 2008. The UAE is likely bound by costs of importing gas in the future, currently at a level of about US$1.4/MMBtu from Qatar.

Table 2 : Summary pricing policies and assumed future prices

(US$/MMBtu)	2010 prices	Assumed future prices	Comment
Saudi Arabia	0.75	0.75-3.00	Assume 0.75 base case until 2015, then 2.00
Qatar	0.95-2.35	1.00-2.75	Variable pricing formula
Egypt	1.25-3.00	1.25-3.00	Political pressure
UAE	1.10-2.25	1.10 to > 2.00	Cost-plus basis
Algeria	0.60-2.00	> 2.00	No cheap deals since 2008

Source: MEED, Zawya, Wood Mackenzie, company reports, Rasmala research

Cost implications? Of course, but relatively limited

Fertilisers, methanol and cement the most sensitive industries to changes

Companies with the biggest cost advantages, and thus the most operational sensitivity to changes in gas prices, are those which use ethane as the main feedstock and have all plants based in the country/region: fertilisers, methanol and cement fall in the former category, whereas both utilities and other petrochemicals use mixed feedstock and fall in the latter.

The market has been widely expecting a price increase in Saudi Arabia, from US$0.75/MMBtu to US$1.25/MMBtu. The US$1.25 implies an increase in ethylene cash cost (ethane feedstock) from US$40-50 to US$70-80/tonne, still well below costs in other regions. Taking freight costs into account of currently up to US$200/tonne, delivered costs are in line with other regions if gas prices exceed US$2-3/MMBtu, which we see as a ceiling to which prices could go in future. Changes in heavier feedstock pricing, which are not fixed but linked to market prices, generate bigger swings in margins. Likewise, the urea cash cost would increase from about US$85 to about US$100/tonne, still yielding very competitive cash margins in excess of 70%.

Exports despite a shortage of gas

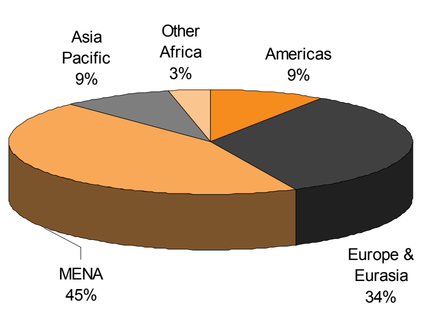
Natural gas consumption in the region has grown at a higher rate than anywhere else in the world over the past decade. This, combined with a ramp-up of exports and relatively limited increases in production, has resulted in a shortage of gas across the region.

Gas shortage in GCC despite large natural gas reserves

Reserves and production concentrated in seven countries

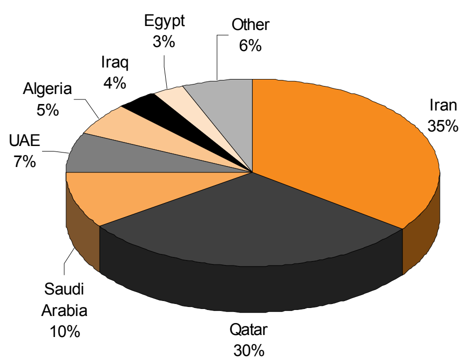
The region accounts for about 45% of global gas reserves and has three of the world's top four gas reserve holders (Russia has the largest reserves, followed by Iran, Qatar and Saudi Arabia). Yet it produces only 19% of global production. Across the region, seven countries (Iran, Qatar, Saudi Arabia, the UAE, Algeria, Iraq and Egypt) account for 94% of regional reserves and 87% of regional production. Despite these large reserves, the GCC in particular has suffered from lack of gas feedstock availability and some countries have become net importers of gas.

Chart 3 : Proved natural gas reserves (% of global reserves at end 2010)



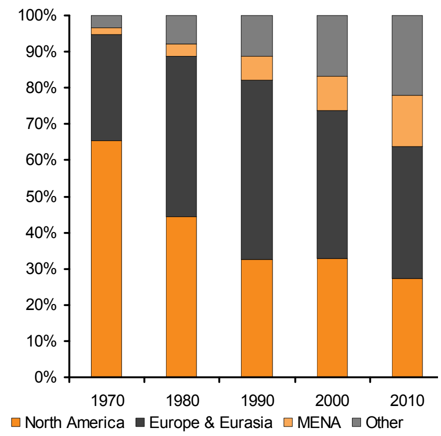
Source: BP 2011 Statistical Review of World Energy

Chart 4 : Proved natural gas reserves (% of Mena reserves at end 2010)



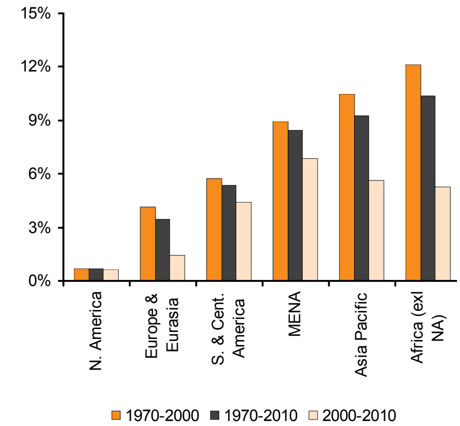
Source: BP 2011 Statistical Review of World Energy

Chart 5 : Global natural gas consumption (% of total by region)



Source: BP 2011 Statistical Review of World Energy

Chart 6 : Natural gas consumption growth (CAGR by region)



Source: BP 2011 Statistical Review of World Energy

Consumption in Mena is growing faster than any other region's

The main question is how production and consumption can remain balanced in the region, given continued strong consumption growth, but relatively limited increases in production. From 2000 to 2010, average consumption growth in Mena surpassed all other regions with a 6.9% CAGR, stimulated by growing populations, increased economic activity and large investments in infrastructure and industrial projects, thus leading to a gradual increase in the region's share of global consumption, from 9% in 2000 to 14% in 2010. At the same time, exports ramped up through both pipeline and LNG.

Theoretically, there is enough gas

Theoretically, reserves are large enough to satisfy demand in the long run: Iran and Qatar have the two highest reserves-to-production ratios of the Mena region; the UAE, Iraq and Kuwait also have reserves-to-production ratios exceeding 100x. However, in practice, this has not been the case and the challenge in many countries is to convert these reserves into production. Part of the problem is that outside Iran and Qatar, around 70% of gas reserves are associated fields (linked to oil production), and new gas fields are more difficult and more expensive to develop as they are offshore, or contain sour and/or tight gas. Also, Qatar has a (self-imposed) moratorium on its giant North Field until 2015.

Table 2 : Natural gas reserves and production, Mena region, 2010

Country	Reserves (trn cm)	Production (bn cm)	Reserves to production ratio (x)
Iran	29.6	138.5	> 100
Qatar	25.3	116.7	> 100
Saudi Arabia	8.0	83.9	95.5
UAE	6.0	51.0	> 100
Algeria	4.5	80.4	56
Iraq	3.2	1.3	> 100
Egypt	2.2	61.3	36
Kuwait	1.8	11.6	> 100
Libya	1.5	15.8	98
Oman	0.7	27.1	25.5
Yemen	0.5	6.2	78.3
Syria	0.3	7.8	33.2
Bahrain	0.2	13.1	16.7

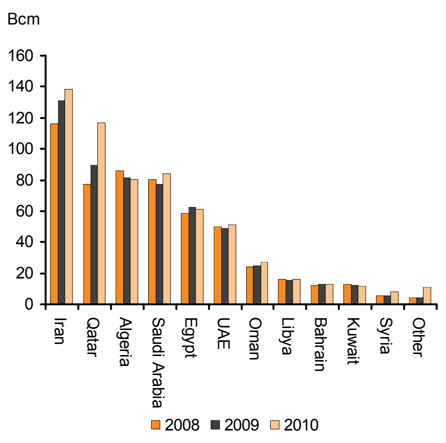
Source: BP 2011 Statistical Review of World Energy

Qatar, Algeria and Egypt are the leading exporters

Most countries in the region are net importers

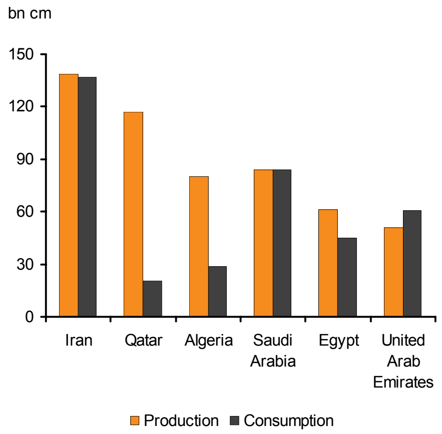
Iran is the leading producer and consumer in the region (22% of Mena gas production, and 31% of Mena consumption in 2010 and the third-largest consumer globally after the US and Russia) and is almost self-sufficient: the country exports a considerable amount of natural gas, but is actually a slight net importer, from Turkmenistan through pipeline. Production and consumption in Saudi Arabia are currently balanced, but Qatar, Algeria and Egypt produce gas that exceeds the amount consumed. Of the major producers, only the UAE (where gas reserves are concentrated in Abu Dhabi) has a noticeable deficit and produces only about 80% of gas consumed, the remaining imported by pipeline from Qatar, although the country is also a significant exporter.

Chart 7 : Natural gas production in the Mena region 2008-10



Source: BP 2011 Statistical Review of World Energy

Chart 8 : Natural gas production and consumption in the Mena region, 2010



Source: BP 2011 Statistical Review of World Energy

Liquefied natural gas (LNG) exports offer flexibility in terms of the final destinations of exports, as the table below shows. However, liquefaction requires its own process and infrastructure, and the necessary vehicles (tankers) to transport the LNG from one area to another. Pipeline exports from the region are focused on Europe and the Middle East.

Table 3 : Major LNG trade movements, 2010

(bn cm) To:	From: Qatar	Algeria	Oman	Egypt	UAE	Yemen	Libya
US	1.29	-	-	2.07	-	1.10	-
Canada	0.25	-	-		-	-	-
Mexico	1.02	-	-	0.16	-	0.18	-
Argentina	0.15	-	-		-	-	-
Brazil	0.59	-	-	-	0.04	-	-
Chile	0.25	0.17	-	0.55	-	0.08	-
Belgium	5.80	-	-	0.17	-	-	-
France	2.43	6.27	-	0.73	-	0.08	-
Greece	-	0.98	-	0.08	-	-	-
Italy	6.18	3.50	-	0.72	-	-	-
Portugal	0.08	-	-	-		-	-
Spain	5.54	3.19	0.17	2.62		0.18	0.34
Turkey	1.92	3.87	-	0.27		-	-
United Kingdom	13.89	1.25	-	0.12		0.26	-
Kuwait	-	-	0.91	0.33	0.25	0.09	-
UAE	0.16						
China	1.61	-	-	0.08	0.08	0.70	-
India	10.53	-	-	0.09		0.37	-
Japan	10.15	-	3.80	0.57	6.86	0.16	-
South Korea	10.16	0.08	6.11	0.98	0.25	2.27	-
Taiwan	3.75	-	0.50	0.17	0.42	-	-
Total exports	**75.75**	**19.31**	**11.49**	**9.71**	**7.90**	**5.47**	**0.34**

Source: BP 2011 Statistical Review of World Energy

Table 4 : Major natural gas trade movements by pipeline, 2010

(bn cm) To:	From: Algeria	Qatar	Libya	Iran	Egypt
Armenia	-	-	-	0.40	-
Azerbaijan	-	-		0.25	-
Italy	24.06	-	9.41	-	-
Portugal	1.43	-	-	-	-
Slovenia	0.38	-		-	-
Spain	8.86	-	-	-	-
Turkey	-	-	-	7.77	-
Israel	-	-			2.10
Lebanon	-	-	-	-	0.15
Jordan	-	-	-	-	2.52
Oman	-	1.90	-	-	-
Syria	-	-	-	-	0.69
United Arab Emirates	-	17.25	-	-	-
Morocco	0.50	-	-	-	-
Tunisia	1.25	-	-	-	-
Total exports	**36.48**	**19.15**	**9.41**	**8.42**	**5.46**

Source: BP 2011 Statistical Review of World Energy

Some countries have established policies that limit gas exports in order to meet domestic demand. Kuwait and the UAE have opted to begin importing natural gas in the form of LNG and through the Dolphin pipeline respectively. However, in our view, it also means that in the future not all industries will be able to get gas at the advantageous prices they are used to, in particular, in Saudi Arabia.

Qatar – North Field moratorium limits downstream growth

Emphasis on developing downstream industries

Qatar has developed a number of industries based on natural gas: LNG, GTL (gas-to-liquids), petrochemicals, fertilisers, power, steel and aluminium are the main users, in addition to which the country exports gas by pipeline. Qatar is a world-leading exporter of LNG: it exported almost 50mtpa cm of LNG in 2009, representing more than 20% of the world's LNG supply and achieved its target of 77mtpa by end-2010. In 2010, Qatar accounted for a quarter of global LNG exports. Qatar also exports natural gas to the UAE and Oman through the Dolphin pipeline.

QP calls the shots

Qatar Petroleum (QP) plays a dominant role in Qatar's upstream and downstream natural gas sector and decides on projects in all gas-intensive sectors. Most projects are executed along with international partners such as Shell, ExxonMobil, Total and Yara, but QP retains a majority in all projects. The main utility company Qatar Electricity & Water is also expanding power generation capacity using gas as a feedstock.

North Field moratorium could impact future investment decisions

Most of Qatar's reserves are located in its offshore North Field (the world's largest non-associated natural gas field), which shares boundaries with Iran's South Pars field in the Persian Gulf. In 2005, the Qatar government placed a moratorium on additional natural gas development projects at the North Field to allow time to study field development optimisation and preserve the gas reserves for future generations. The moratorium will officially end in 2014, but the Ministry of Energy has indicated it may stay in place for a longer period, which could become a deciding factor for the viability of future downstream projects for QP and Industries Qatar alike. However, now that the government has achieved its targeted LNG capacity, and the Pearl GTL is about to become operational, QP may well refocus on expanding the petrochemical industry again.

Saudi Arabia – all current and future gas supplies for domestic use

Mostly associated reserves or sour gas

Saudi Arabia has the fourth-largest proven natural gas reserves in the world (8trn cubic metres at end-2010), but the peculiar issue with Saudi reserves is the fact that the majority (55-60%) is associated gas at the large onshore Ghawar field (which holds about one-third of total Saudi gas reserves) and the offshore Safaniya and Zuluf fields. Furthermore, of the 40-45% non-associated natural gas, 75% is sour (ie, it has a high sulphur content) or in tight formations, leaving only less than 10% of conventional natural gas deposits that are easy to develop.

Strategic priority to develop new gas fields

Development of the natural gas industry in the country is the responsibility of Saudi Aramco, the Saudi state-owned oil company. The Ministry of Petroleum and Mineral Resources and the Supreme Council for Petroleum and Minerals have oversight of the hydrocarbon sector and over Saudi Aramco, the latter being responsible for policies in the sector, including contract review of natural gas prices. Saudi Aramco announced a US$9bn strategy to add 50 Tcf (about 1.4trn cubic metres) of non-associated reserves by 2016 through new discoveries (and potentially another 50 Tcf of associated reserves), with the main focus on three offshore fields in the Persian Gulf: Karan, discovered in April 2006, which is on target to come on stream in 2011-12, Arabiyah and Hasbah.

Targeting an increase in domestic gas reserves

Saudi Arabia consumes internally all of the natural gas it produces (and the government has indicated it will continue to use all future gas supplies for domestic purposes), thereby freeing up crude oil for exports. That said, production of associated natural gas cannot increase without raising crude oil production at the same time; consequently, any OPEC restrictions on oil production would cap associated gas production as well. As a result, Saudi Arabia is limited to the exploration and development of its non-associated reserves. This year, there has been some relief, as the country has increased oil production by on average about 6% ytd, thus increasing gas production at the same time.

Domestic demand will continue to grow

Demand will likely continue to be strong. Saudi Aramco expects natural gas demand in the Kingdom to grow by on average 3% between now and 2030, coming from Saudi Arabia's strategic goal to grow the petrochemical sector to reach a 10% global market share by 2015 and demand from power and water desalination projects. Hence, development of natural gas production is key.

Algeria – potential gas supply crunch

Algeria – second-largest reserves in Africa

Algeria ranks eleventh in terms of global proved reserves and second in Africa, behind Nigeria. The Hassi R'Mel field (northwest Algeria) holds about 50% of Algeria's proved reserves, with the remaining associated and non-associated fields located in the country's south and southeast.

Most of the gas production chain is controlled by Algerian state-owned companies, as Sonatrach handles production and wholesale distribution and Sonelgaz handles retail distribution. Many foreign companies (including OCI, BHP Billiton, BP, Eni, Repsol, Statoil and Total) have entered the market through partnerships with Sonatrach. However, Algerian law stipulates that Sonatrach must maintain a 51% stake in any joint project, albeit that there are some exceptions to this rule for projects agreed prior to 2008.

Enough gas but potential supply crunch

The production of natural gas exceeds almost three times Algeria's internal consumption, reflecting the country's position as a net exporter. However, exports have ramped up and domestic consumption has been increasing steadily, but production has been flat over the past decade. At current growth rates, this situation could lead to a potential supply crunch by 2014/15.

Algeria – largest gas exporter through pipeline in Mena region

Roughly two-thirds of Algeria's exports are transported through two pipelines to Europe. The Trans-Mediterranean line connects Hassi R'Mel with Italy, while the Maghreb-Europe Gas pipeline travels from Hassi R'Mel to Spain. The remaining third of exports is transported as LNG primarily to France, as well as Spain, Turkey and Italy.

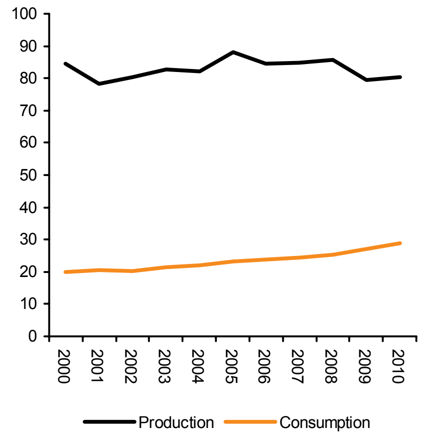
Egypt – watch the politics

Natural gas becoming increasingly important

Although not as large as other countries in the Mena region, Egypt still holds a considerable amount of Mena's proved gas reserves (third-highest in Africa, behind Nigeria and Algeria) and as a result of major recent discoveries, natural gas is the primary growth engine of the country's energy sector. About 80% of Egypt's gas reserves are located near the Mediterranean, with the remaining located in the Nile Delta and Western Desert.

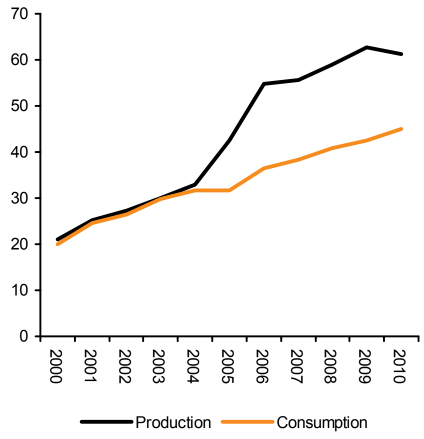
The Egyptian General Petroleum Corporation (EGPC) is responsible for developing infrastructure, granting licences and managing production of natural gas, while the Egyptian Natural Gas Holding Company (EGAS) handles the promotion and strategy of the domestic gas industry.

Chart 9 : Algeria gas production and consumption 2000-10 (bn cm)



Source: BP 2011 Statistical review of World Energy

Chart 10 : Egypt gas production and consumption 2000-10 (bn cm)



Source : BP 2011 Statistical review of World Energy

Enough gas for domestic production

Egypt's natural gas production should more than meet its domestic demand, but policy is a key element in the Egyptian market, as the government requires that one-third of the country's proved reserves are committed to domestic consumption, one third to 'future generations' and the remaining third available for export – in 2010, exports accounted for 25% of Egypt's gas production. For domestic use, the Ministry of Petroleum and Mineral Resources aims to expand the Egyptian petrochemical industry as a significant strategic objective.

Of Egypt's total gas exports, about two-thirds is transported as LNG and the remaining third through pipelines. Of LNG exports, Europe is the primary destination (about 50%), followed by the US (around 35%) and finally various countries within Asia. Pipeline exports are mainly destined for Lebanon, Jordan and Syria through the Arab Gas Pipeline, and to Israel through the Arish-Ashkelon pipeline.

Exports to Israel a hot political issue

Egypt exported 3.4% of its total production to Israel in 2010 – a relatively small amount, but these exports are a hot political issue: public opinion demands increases in prices – the government has not disclosed the actual levels of natural gas export prices to Israel, but the popular view is that these are well below international levels. Jordan may face price increases as well. According to press reports, Jordan pays a concessional price of about 30% below international market prices. However, the Egyptian government, facing budgetary pressure and aiming to reduce its US$15bn energy subsidy to industry, in April said that it had formally proposed a gradual increase in its gas prices despite agreements until at least 2016 in place. Recently, the government stated it would 'increase gas prices to Israel aggressively'.

Power, petrochemicals fuel demand for gas

Domestic demand for natural gas comes from a number of sources: population and industrial growth fuelling demand for power; growth in strategic gas-intensive industries, particularly petrochemicals; and usage for enhanced oil recovery purposes.

Power – the largest user of gas

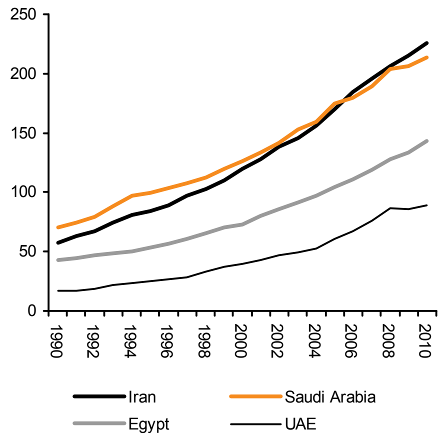
Power sector is the main source of growth

According to the BP Energy Outlook 2030 publication (January 2011), Middle East gas consumption is set to grow at 3.9% annually on average until 2030. The power sector is the single-largest source of this growth (44% of the total), whereas petrochemicals are the main contributor to the projected 3.2% pa growth in gas use demand by industrials. Outside petrochemicals, other energy-intensive industries, either through direct usage of gas or usage of electricity (eg, aluminium), are also putting a claim on future gas supply. Industries such as steel and cement mainly to secure local demand, whereas aluminium is a strategic growth industry and largely aimed at export.

Growth continues

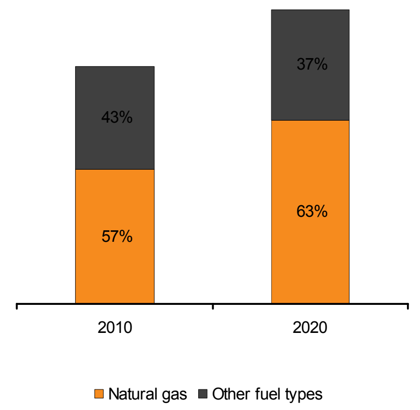
Electricity generation in the region grew strongly by 6% during 2000-10 on average annually, and Qatar (+10%) and the UAE (+8.3%) also showed some of the highest growth rates globally. Gas has been the major source of fuel (almost 60%), but differs from country to country: 100% gas in Qatar, 80% in Egypt and, in the peak summer months, operators in the UAE have shifted to heavier fuels when not enough gas was available. In terms of installed capacity, the Economist Intelligence Unit (EIU) expects average growth of 6.6% in installed capacity during 2010-20 in the GCC-4 countries (Saudi Arabia, Kuwait, the UAE and Qatar) and Egypt, from a combined total of 109GW to 207GW. The EIU expects the highest growth in Qatar (11%), in line with the 10% average for 2000-10. All power plants in Qatar are fuelled by natural gas.

Chart 11 : Electricity generation grew at a 6% CAGR in 2000-10 (TWh)



Source : BP 2011 Statistical review of World Energy

Chart 12 : Natural gas as a source of power generation (% of TWh)



Source : Energy Information Administration, Rasmala

- Saudi Electricity (SEC) has plans to increase power capacity from 48GW in 2010 to 80GW by 2020, or average growth of 5%, in line with the historical average of 5.4% for 2000-10. Of the five plants currently planned by SEC, a 1.2GW power plant in Rabigh will use oil as feedstock, two of the plants will use gas, whereas no decision has been made on the remaining two as yet. Of the existing power plants, about 40% use gas as a feedstock.
- In the UAE, the power sector accounts for around 20% of gas consumed in Abu Dhabi and two-thirds in Dubai. According to consultants Wood Mackenzie, gas usage in the power sector will show a CAGR of 7.5% and 5% from 2010 to 2032 in Abu Dhabi and Dubai, respectively. Abu Dhabi has also looked into other forms of energy: in 2009, the emirate awarded US$40bn in contracts to build two nuclear plants and is making progress in solar energy.
- In Egypt, the EIU expects growth of 7%. However, not all of the electricity generation will likely come from gas-powered plants: the Supreme Energy Council in Egypt aims to increase the share of renewable energy to 20% of total energy generated by 2020 (hydro power 8%, wind and other resources 12%).

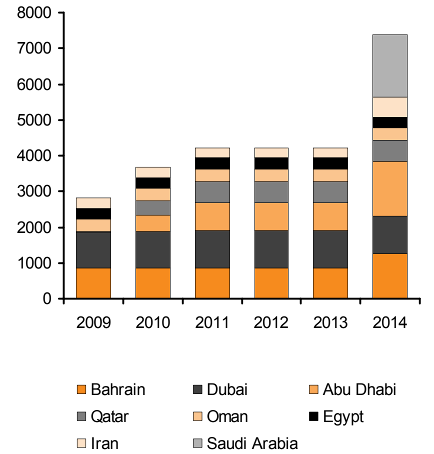
Aluminium – cheap gas makes all the difference

Aluminium – Middle East emerges as a global player

The Gulf appears set to emerge as a major global hub for primary aluminium production and seems on track to reach a 10% global market share in installed capacity by 2014, up from 5% in 2010. There are currently two Middle East companies in the top 10 of global primary aluminium producers: Dubal in Dubai, which is the only major industrial consumer of gas in Dubai, and Alba in Bahrain; there are also major globally competitive plants in Abu Dhabi (Emirates Aluminium), Saudi Arabia (Maaden), Qatar (Qatalum, a Qatar Petroleum/Hydro JV) and Oman (Sohar Aluminium), some already operational, some under construction.

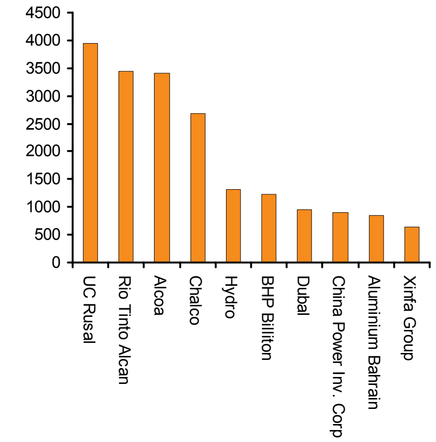
In Saudi Arabia, Maaden has said it is going ahead with its 740kt aluminium smelter in a 75:25 JV with Alcoa and the Bin Laden Group is planning a 1mt smelter in cooperation with Chalco (335kt in phase 1). In Algeria, several projects are in the early stages of planning with a total capacity of about 1mt.

Chart 13 : Aluminium smelter capacity is set to almost double during 2010-14 (kt)



Source: Energy Information Administration, Rasmala

Chart 14 : Top 10 producers of primary aluminium 2009 (kt)



Source : CRU Strategies

Natural gas about 30% of aluminium operating costs

There are no particular advantages of producing aluminium in the region, except for access to cheap natural gas, one of the main operating costs (about 30% of total plant operating costs in 2009 in the form of gas-powered power stations). The region's geographical proximity to end markets also plays a role. The large smelters in the UAE and Bahrain import raw material requirements from outside the region, but Saudi Arabia is the only exception, as the country is aiming to tap into the country's bauxite resources to produce aluminium for domestic and world markets.

Chemicals and fertilisers: strategic industries

Petrochemicals and fertilisers are key industries for the region that can be competitive on a global basis. The region has accounted for a major part of capacity additions in the past few years, but it should be relatively quiet from 2011 to 2015.

Using cheap gas to diversify economy and move down value chain

It's not all gas that's used

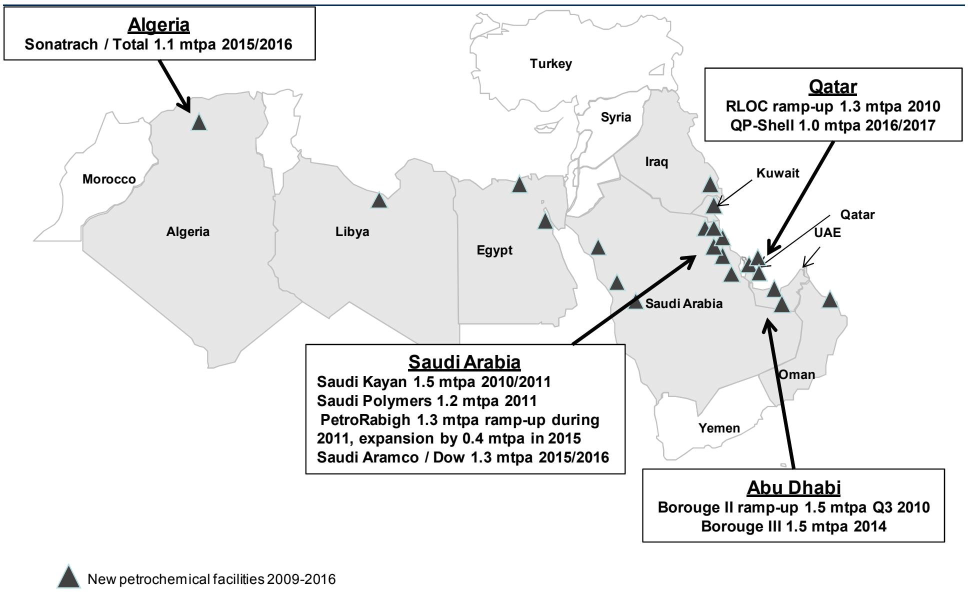
Several countries in the region see the petrochemicals and fertilisers sectors as key strategic industries. The rationale for investing in these sectors is clear: governments across the GCC are trying to diversify the economies away from oil and create jobs, and using available gas domestically for this purpose is an easy and relatively cheap way to do this - petrochemicals either use 100% natural gas as a feedstock (for example in Qatar), or a combination - in Saudi Arabia, natural gas accounts for about 70% of total feedstock requirement in the petrochemical sector. Nitrogen fertilisers are 100% gas-based.

Moving downstream and expansion abroad next goal

Because of the high margins such industrials can achieve, even during downturns, the balance sheets are generally strong and can be used to expand capacity in the country, or use it for acquisitions elsewhere, with the added benefit of gaining access to technology to move even further downstream. Of the major players in the region, the two most acquisitive companies have been state-controlled SABIC (it acquired DSM's basic chemicals operations in 2002 and GE Plastics in 2007) and OCI in Egypt, whereas Qatar Petroleum has hardly ventured outside the country, except for a 10% stake in the Sonatrach/Total petrochemicals venture. Moving downstream from base chemicals into specialty chemicals may take a few years to accomplish, but strategically it makes sense to create higher value-added products and as a result also potentially attract some major customers to set up in the region, for example, car manufacturers.

Projects are currently under development or being planned across the region, concentrated in Saudi Arabia, Qatar, Iran and the UAE for basic chemicals, and in Algeria, Qatar, Saudi Arabia and Egypt in the case of fertilisers. Outside the region, most new capacities are in Asia, mainly in China, including Kuwait Petroleum/Sinopec's 1mtpa ethylene plant due to start in 2015.

Figure 1 : Major petrochemical projects and ethylene capacities starting up



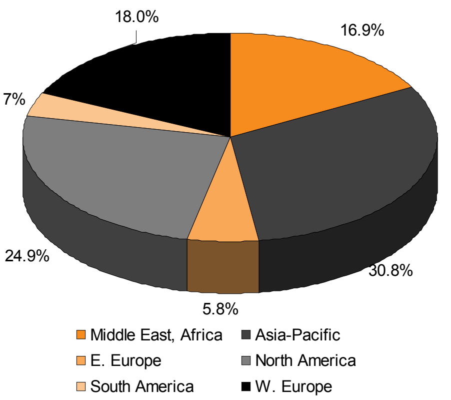
Source: Rasmala, Zawya Projects, MEED Projects

Petrochemicals – 2011-2015: a quiet period for new capacity

We expect global capacity to grow about 3% pa on average in 2010-2015

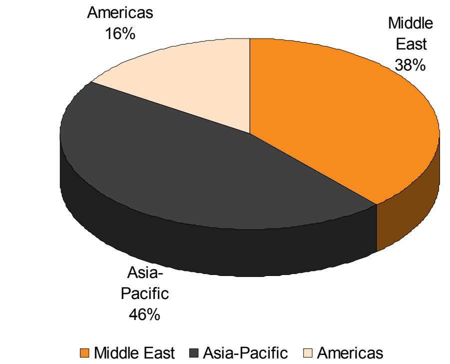
Around 9mt of new ethylene capacity came on stream globally during 2010, of which about 46% in the Middle East and 55% in Asia-Pacific, according to the *Oil & Gas Journal*. Globally, capacity additions are concentrated in Asia-Pacific, particularly China, the Middle East and Latin America, which account for 46%, 38% and 16% of additions between 2010-2015 respectively. On average, we forecast global capacity growth of 3.1% per annum between 2010 and 2015, with ethylene capacity going from 138mt at the end of 2010 to 161mt at the end of 2015.

Chart 15 : Share of global ethylene capacity by region, 2010



Source: Rasmala, ICIS, Zawya Projects

Chart 16 : New capacity additions share by region, 2011-2015



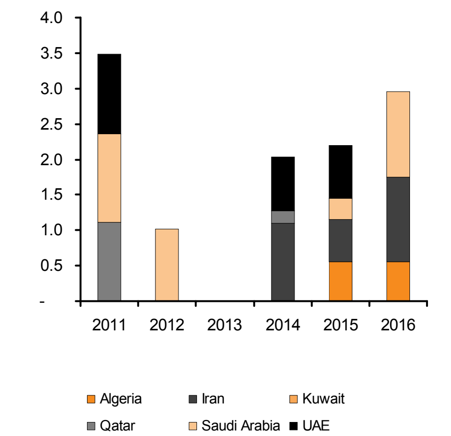
Source: Rasmala, ICIS, Zawya Projects, GPCA

Middle East supply – ramp-up of projects rather than new plants in 2011

We see capacity expansions in the Middle East, but relatively quiet 2011-2015

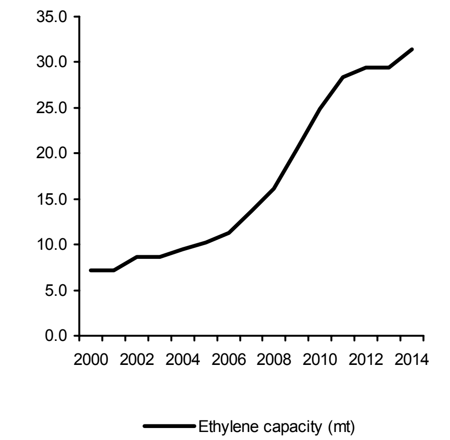
We estimate 11mt will be added in Mena during 2011-2016, but some projects are still uncertain or have already been delayed, such as the Aramco-Dow and Sonatrach-Total plants that are still in the early stages of planning – these will likely be extended beyond 2015, as the construction cycle for such large-scale projects takes around 4-5 years. Furthermore, Iran accounts for about one-third of the total additions in the region, where projects tend to have a high probability of being postponed or cancelled. Excluding these projects, total capacity additions in the region amount to around 8mtpa over the next five years.

Chart 17 : Ethylene capacity additions in the Middle East & North Africa (mtpa)



Source: Rasmala, ICIS, Zawya Projects

Chart 18 : Installed ethylene capacity in the Mena region (mtpa)



Source : Rasmala, ICIS, Zawya Projects, GPCA

2011 – mainly ramp-ups of projects started in 2010

In 2011, we see the start-up of only one new cracker (Saudi Polymers), as well as the ramp-up of three others that started up in 2010 (the massive Saudi Kayan complex, RLOC in Qatar and Borouge II in Abu Dhabi), but then it will be relatively quiet until 2014-2015. In 2014, Borouge III in the UAE is the single largest project due to come on stream.

Table 5 : New ethylene capacity, 2011-2016

Country	Project	Capacity (mtpa)	Start-up	2010	2011	2012	2013	2014	2015	2016
Algeria	Arzew	1.10	2015-2016						0.55	0.55
Iran	Assaluyeh	0.60	2016-2020							
	Chovar, Llam	0.50	Q4 2014					0.50		
	Assaluyeh, Kavyan	2.40	2014-2016					0.60	0.60	1.20
	Gachsaran	1.00	2016-2020							
Kuwait	Al Zour	1.40	2016-2020							
Oman	Sohar	0.85	On hold							
Qatar	RLOC	1.30	2010	0.19	1.11					
	QAPCO	0.18	2014					0.18		
	QP- Shell	1.00	2016-2017							
Saudi Arabia	Saudi Kayan	1.48	2010	0.37	1.11					
	Saudi Polymers	1.17	Q4 2011		0.15	1.02				
	PetroRabigh	0.30	Q1 2015						0.30	
	Saudi Aramco - Dow	1.20	2015-2016							1.20
UAE	Borouge II	1.50	H2 2010	0.38	1.13					
	Borouge III	1.50	2014					0.75	0.75	
	Taweelah	1.45	Delayed							
Total				**0.94**	**3.49**	**1.02**	**-**	**2.03**	**2.20**	**2.95**
Total excl. Iran				**0.94**	**3.49**	**1.02**	**-**	**0.93**	**1.60**	**1.75**

Source: Rasmala, Zawya Projects, Companies, ICIS, CMAI, MEED

Saudi Arabia second to none in the region – but not much extra demand for gas

Saudi Arabia leads the pack...

Saudi Arabia is a leader in terms of installed ethylene nameplate capacity in the region – c12mt out of total GCC capacity of c16.7mtpa (8.6% global market share for ethylene capacity) is located there compared with 2.5mtpa in Qatar, the second largest ethylene producer in the GCC. However, it is getting quieter in terms of new olefins expansions - in addition to the ramp-up of the massive Kayan project, there are only three major olefin projects in the pipeline in the Kingdom:

- Saudi Kayan (SABIC/Al Kayan Petrochemicals) started up units at its 5mtpa complex in Jubail in 2010, which will have capacity to produce 1.48mtpa of ethylene and 0.7mtpa of PE, as well as benzene and other products. SABIC has revealed plans to add 0.3mtpa of HDPE.
- Saudi Polymers (a 35/65 JV between Arabian Chevron Phillips Petrochemicals and the Saudi Industrial Investment Group) will start up an ethane / propane steam cracker in Jubail towards the end of the year. The cracker will produce 1.165mtpa of ethylene, 0.445mtpa of propylene and will include downstream units for polyethylene, polypropylene and polystyrene.
- A 30% expansion and widening of product offering of PetroRabigh's (JV between Saudi Aramco and Sumitomo Chemical) cracker, which should increase ethylene production by 0.3mtpa from the existing 1.3mtpa, due to be completed by 2015. The company started up its refinery and petrochemicals complex in Rabigh last year.
- But the largest project currently planned in Saudi Arabia is the delayed (from the original 2015 planned start-up date) about US$15-18bn petrochemicals complex of Saudi Aramco - Dow Chemical in Jubail. The JV gave the green light for the project in July this year. According to MEED, the US$1.5bn cracker will be using mixed-feed ethane and naphtha to produce 1.2mtpa of ethylene and 400,000tpa propylene. In addition, there will be a number of downstream products, including TDI and MDI.

... and is moving further downstream

If we look beyond ethylene, Saudi Arabia also still accounts for the lion's share of new projects under development, but the country is, in addition to building up basic chemicals capacity, moving ahead with projects further downstream, as illustrated by the recent announcement that SABIC will build a US$2bn elastomer plant in a JV with ExxonMobil Elastomers (using the latter's technology), producing products that are destined for the automotive industry (carbon black, rubber and thermoplastics). This strategic direction in the Kingdom, also helped by the acquisition of GE Plastics (and its technology) by SABIC is aimed at serving end-customers and ultimately with the goal of attracting those to the country.

Qatar – some hiccoughs in expanding the offering

Qatar – QP looking to revive petrochemical projects now; LNG up and running

In Qatar, several projects in the petrochemicals and fertilisers space are ongoing, but the moratorium on the development of the giant North Field means that there is limited potential for new large-scale petrochemical projects, unless based on other feedstock sources. According to press articles, several large-scale petrochemical complexes, which had been planned during the 2005-2007 period, were put on hold due to a lack of feedstock availability, in particular a US$6bn complex in Ras Laffan, which ExxonMobil cancelled in 2010. However, at the same time, other projects are going ahead. Projects in the petrochemicals are driven by Qatar Petroleum directly or through Industries Qatar, but generally in cooperation with major international players:

- Ras Laffan Olefins Co (RLOC), a JV of Qatofin (owned by Industries Qatar (IQ) 63%, Total Petrochemicals 36% and QP 1%) and Q-Chem II (owned by QP 51% and Chevron Phillips Chemicals 49%), started up its 1.3mtpa cracker in 2010 and we expect the plant to run at full capacity this year, an additional 1.1mtpa. RLOC is considering to expanding its cracker to about 1.45-1.60mtpa.
- Shell announced in December 2010 that it will study a large-scale petrochemicals complex in Ras Laffan in cooperation with QP and possibly to be integrated with the Pearl GTL plant for a substantial part of the ethane feed. According to industry consultants ICIS, the project would be based on a mixed-feed 1mtpa cracker and include a monoethylene glycol (MEG) plant with a capacity of up to 1.5m tonnes/year. However, start-up will not be until 2016-2017.
- Total Petrochemicals has also been in talks with Qatar Petroleum about a project in Ras Laffan, but is yet to sign an agreement. Qatar Petrochemical Co (the 80/20 JV between IQ and Total Petrochemicals), plans to expand its 720,000 tpa cracker in Mesaieed to 900,000 tpa by 2014. At the same time, the JV will increase linear low density polyethylene (LLDPE) capacity from 450,000 to 600,000 tpa.

UAE – Abu Dhabi emerging as a major player

Outside Saudi, the UAE is calling the shots

In Abu Dhabi around US$13bn worth of petrochemical projects are underway according to MEED, including Borouge III where contracts have already been awarded.

- Borouge, a joint venture between Abu Dhabi National Oil Company (ADNOC) and Borealis brought its second cracker Borouge II in Ruwais on stream last year, raising ethylene capacity by 1.4mtpa to 2.1mtpa.
- The expansion of Borouge is underway to expand total petrochemicals output by 2.5 to 4.5mtpa by mid-2014. The project, Borouge III, includes construction of a third ethane cracker, with a 1.5mtpa capacity. Downstream products include around 1mtpa each of PE and PP as well as LDPE.
- ChemaWEyaat (Abu Dhabi National Chemicals Company, owned by IPIC, ADNOC and ADIC) has delayed its olefins and aromatics project from the original start-up date of 2014, but may go ahead for start-up after 2015. The project will be based on a 1.5mtpa naphtha cracker.

Not much going on elsewhere except in Algeria

Algeria - Total faces delays

In Algeria, only one major olefins project is currently in the pipeline – the Sonatrach/Total Petrochemicals/QP project with 1.1mtpa of ethylene and with downstream units (MEG, HDPE and LLDPE) in Arzew. The project is now due in 2014, delayed from a previous start-up in 2013 – although we believe that the project is not going to be operational until 2015-2016 at the earliest, given that the project is still in the early stages of planning. Originally, this was a Total Petrochemicals / Sonatrach JV, but in 2010, Qatar Petroleum bought a 10% stake (following new regulations that foreign investors cannot hold a majority stake), which reduced Total's stake from 51% to 41%. Sonatrach now has the largest stake at 49%.

Kuwait – not much in the pipeline

In Kuwait, only one major project is in the pipeline for start-up after 2015, a 1.4mtpa mixed-feed (ethane/naphtha) cracker, planned by Kuwait Petrochemical Industries (PIC) and Equate (a JV of PIC, Dow Chemicals and Kuwaiti investors). The Olefins III project, which is expected to include plants for polyethylene and polypropylene, would be located at Al Zour, alongside a fourth refinery being planned by Kuwait Petroleum Corp. (KPC).

The wildcard, Iran

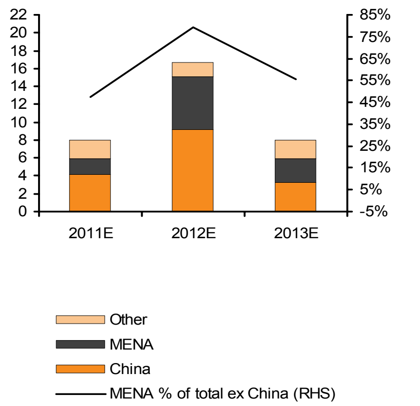
With 4.7mtpa installed ethylene capacity at end-2010, Iran is a heavyweight in the region (the second largest ethylene producer after Saudi Arabia), but Iran is notorious for project delays and petrochemicals are no exception, despite highly ambitious plans to reach ethylene capacity of 11.5mtpa by 2015. International sanctions against the country make it more difficult to export the product and to finance large-scale projects, thus delaying projects, whilst feedstock availability (at a cost of US$1.25/MMBtu for ethane) has also been an issue. We do not pencil in any projects coming on stream in 2011-2013 but the first phase of the Busheyr (Kavian Petrochemical) 1.2mtpa of ethylene project, which was due to start up in 2011/2012 could happen in the 2014-2016 period, according to CMAI.

Fertiliser capacity increases across the region

The Middle East accounts for the majority of global nitrogen fertiliser capacity increases outside China

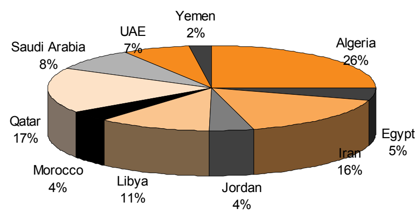
Fertilisers are another area where capacity increases account for a major share of global expansion. Currently, there are a large number of projects ongoing across the region, with a total value of around US$24bn for all types of fertilisers, according to MEED projects data, of which we estimate around US$16bn in nitrogen fertilisers. We estimate that around 10mtpa of new urea production capacity will come on stream in the region from 2011 to 2013, and about 8mtpa ammonia capacity – over 60% of global additions outside of China, especially in 2012 and 2013. North Africa and the Gulf each account for about half of the capacity expansion, which is concentrated in Algeria, Qatar and Saudi Arabia, and to a lesser extent in Egypt and the UAE.

Chart 19 : Global fertilisers – urea capacity additions in 2011-2013 (mtpa)



Source: IFA, Zawya Projects, Rasmala

Chart 20 : Fertiliser projects across the Mena region (% of total value, 100% = US$24bn)

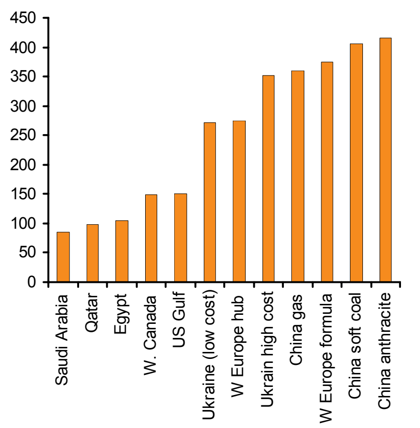


Source : MEED Projects, Rasmala

Low costs and ideal geographic location

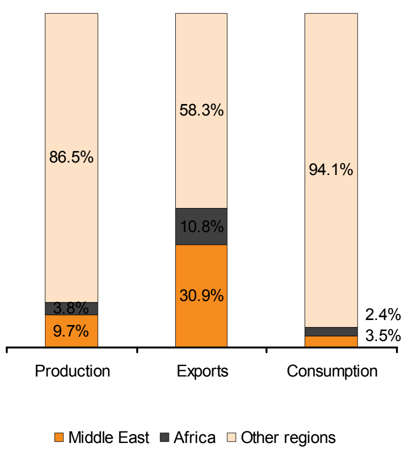
As with petrochemicals and aluminium, the main drivers for investing in this industry are:1) the low cost of energy in the region - even more relevant for nitrogen fertilisers as natural gas represents at least 50-70% of the total cash cost; 2) the advantageous geographic location: North Africa's proximity to European markets and US transhipment routes, and the Gulf's proximity to Asian markets. The region is already the largest exporter in the world, with a global share of 31% for the Middle East (The Gulf) and 11% from Africa, reflecting the lack of a major agricultural industry and hence very low consumption compared with other regions.

Chart 21 : Mena fertilisers enjoy the lowest cash cost globally (US$/tonne)



Source: Company reports, Rasmala estimates

Chart 22 : Middle East & Africa: more than 40% of global exports (2009 100% = 147mtpa)



Source : IFA

Global players emerging

Some projects cancelled but most going ahead

In the region, several fertiliser projects experienced delays as a result of the downturn (the largest being Pakistan's Engro Chemicals' scheme in Algeria, a US$1.5bn phosphoric acid plant) and the unrest in the region. Yara's project in Libya, the revamp of the Marsa Al Brega ammonia/urea plant, is likely to be delayed as a result of the civil war there.

Table 6 : Major nitrogen fertiliser projects in the Mena region

Project	Country	Company	Urea (mtpa)	Ammonia (mtpa)	Value (US$m)	Completion
Qafco V	Qatar	Industries Qatar 75%, Yara 25%	1,330	1,540	2,750	Q3 2011
El Djazairia El Omania Lil Asmida	Algeria	Suhail Bahwan Group Oman 51%, Sonatrach 49%	2,300	1,300	2,400	Q2 2012
Sorfert Algeria - Arzew	Algeria	OCI 51%, Sonatrach 49%	1,200	800	1,700	Q4 2011
Mopco - Damietta	Egypt	Misr Fertilizer Production Company	1,132	799	1,700	Q2 2012
Fertil - Ruwais	UAE	ADNOC (66%), Total (33%)	1,166	666	1,200	Q1 2013
NPC - Hormuz	Iran	National Petroleum Company Iran	650	1,000	800	2015
Safco 5	Saudi Arabia	SAFCO	1,500	1,200	500	H2 2013
Qafco VI	Qatar	Industries Qatar 75%, Yara 25%	1,300	-	440	Q3 2012
Total			**10,578**		**11,490**	

Source: Zawya Projects, Company reports, Rasmala research

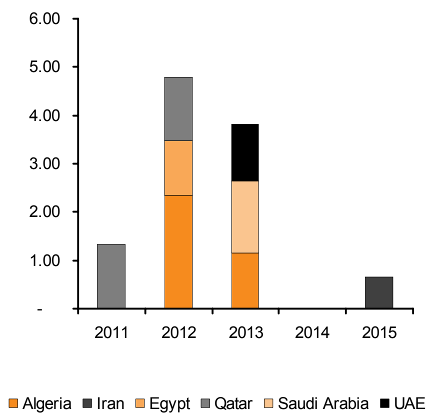
Biggest increase in Algeria

The majority of new projects are planned in Algeria, which has set ambitious targets to reach 20mtpa capacity by 2020 from the current 1.7mtpa. Most projects are in the Arzew industrial zone, including Sorfert Algerie (JV between OCI and local state-owned oil and gas company Sonatrach) and Sonatrach's JV with Oman's Suhail Bahwan Group, both due in the next 12 months. We expect Algeria's pipeline of projects to add 3.6mtpa ammonia and 4.1mtpa urea capacity when completed by 2012, but given that no other projects are currently in the pipeline, consider the 20mtpa target as ambitious. In our capacity forecasts, we assume that OCI will start commercial production by the end of this year and the Suhail Bahwan project by the middle of 2012.

Elsewhere, Egypt has been actively expanding its fertiliser capacity in recent years with five plants coming on stream during 2006-2010, but only one new plant is due for 2012. In Qatar, QAFCO, the 75:25 JV between IQ and Yara, is working on two schemes (QAFCO V and VI), on track to finish in Q3 2011 and Q3 2012 respectively, thus keeping the company in the number one slot for nitrogen fertilisers in the region.

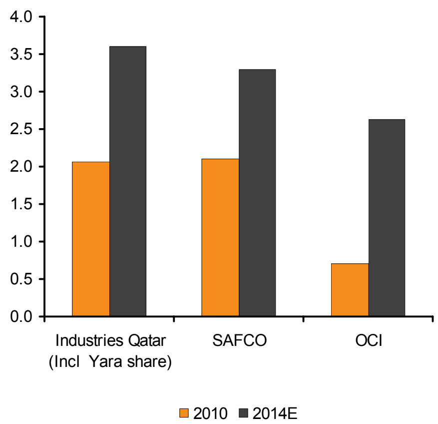
In Saudi Arabia, SAFCO decided to resume work on SAFCO 5 earlier this year, after the company finalised an agreement with the Ministry of Petroleum and Mineral Resources regarding feedstock supply. The plant was originally put on hold in December 2009, waiting for Aramco's feedstock decision. Iran is working on nine projects worth $3.7bn, but the overall addition over the period 2011-2015 is limited and any additional output will be used to meet local demand, as international sanctions limit Iran's exports.

Chart 23 : Mena fertilisers – urea capacity additions in 2011-2015 (mtpa)



Source: Zawya Projects, Company reports, Rasmala

Chart 24 : Mena fertilisers – urea capacity in 2010 and 2014E (mtpa)



Source : Company reports

All three listed major nitrogen players in the region (Industries Qatar, SAFCO in Saudi Arabia and Orascom Construction Industries in Egypt) are the main drivers behind the expansion in nitrogen fertilisers in the region. The capacity these three are adding between the end of this year and 2013/2014 will double their combined capacity for ammonia and urea. After completion of the plant in Algeria and revamps in Egypt, OCI will reach a total capacity of just over 7mtpa, thus the company becoming one of the top three nitrogen producers.

Gas pricing across the region

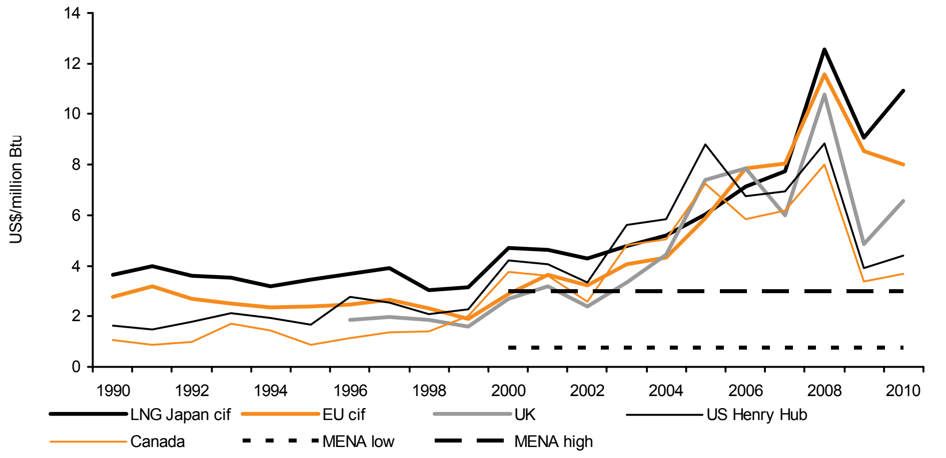
Gas prices are undoubtedly low in a global perspective. We expect these to remain low in the US$1-3/MMBtu range over the next five years, but higher costs to develop offshore and or sour/tight gas fields will put upward pressure on future pricing.

Politics and economics together determine gas pricing

Historically, gas prices in the region made sense

Current prices are undoubtedly low in a global perspective, ranging from about US$0.75/MMBtu in Saudi Arabia to US$0.95-2.35/MMBtu in other Gulf countries (GCC and Iran) and up to US$3.0/MMBtu in North Africa. Russian gas prices come the closest (about US$3.5/MMBtu in 1H11); in the US, market prices are linked to Henry Hub, recently around US$4/MMBtu; and across most of Europe, producers pay gas prices linked to crude oil formulas, currently in excess of US$10/MMBtu. Historically, low prices made sense, as associated gas used to be flared and gas infrastructure did not exist. A common misconception is that these low prices are the result of heavy subsidies, but this is not the case. In addition, only in the past six years or so has the differential in global gas pricing widened.

Chart 25 : Regional pricing in a global perspective



Source: BP, Rasmala

Qatar – a sensible and competitive pricing structure

A sensible approach to feedstock pricing

Qatar applies a variable gas price formula in which prices are linked to price and volume of the end product, varying from industry to industry and even from plant to plant. In 2010, Industries Qatar's feedstock costs were about US$0.95/MMBtu for steel, US$1.75 for petrochemicals and US$2.35 for fertilisers. For 2008, when commodity prices reached record levels, we estimate that IQ paid just under US$3/MMBtu for fertiliser feedstock. We expect no changes to this pricing structure: costs for all projects/plants are decided on a case-by-case basis and subject to availability of gas.

Saudi Arabia – higher level still competitive in regional perspective

Saudi Arabia – we use a base case of US$1.25/MMBtu

Natural gas prices are low in Saudi Arabia, set by the Ministry of Petroleum and Mineral Resources at US$0.75/MMBtu for industrial and petrochemical use. This level has been kept since 1998 and we understand that most projects have this under contract until the end of 2015. This low price has to be seen in the context of gas production from inexpensive associated gas. However, the IEA estimates the cost of high-sulphur gas coming from new offshore fields between US$3.50 and $5.50/MMBtu, hence the current low price does not seem sustainable in the long run. The Ministry is considering a change in natural gas pricing, but has indicated that prices will not rise to international levels, at the same time taking into account the hesitance of foreign operators from developing the country's relatively more costly non-associated gas reserves. With international prices varying wildly and competition from other low-cost regions (Russia and the US), we believe that regional prices of up to US$3 provide a ceiling Saudi prices could touch, possibly under a flexible pricing structure, as is the case in Qatar. Anything higher than that would make the strategic petrochemical industry less competitive in a regional perspective.

Egypt – gradual increase in prices already in place, but beware of high taxes

Prices for domestic use range from US$1.25 – US$3.00

Prices for domestic industrial usage vary by industry and also depend on individual agreements. We believe that prices vary from about US$1.25 (for existing long-term agreements) to US$3.00. In 2010, Egypt's Committee for Energy Pricing approved the increase in the prices of energy for non-energy-intensive industries (which consume about 30% of energy allocated to industrial sectors) to US$2 and kept the price for energy-intensive industries including steel, cement, aluminium and fertilisers (combined, these consume about 60% of energy allocated to the industrial sector) at US$3/MMBtu. The main aim of the government is to gradually reduce energy subsidies and make the country more attractive to foreign operators in the oil and gas space, but since the uprising, political motives for pricing also have come into play.

Egypt: by popular demand

In Egypt, the government, under pressure from public opinion to raise export prices, has publicly stated it will revisit gas prices for exports to Israel and Jordan. This would result in additional much-needed revenues of cUS$3bn-4bn, according to the government. It is possible that this will result in increases for industrial users as well, simply to reduce subsidies to industry and free up money to pay for increased food subsidies to the population (up 26% in the next budget). However, this has been ongoing since May 2008, when the government already had decided to gradually reduce subsidies for natural gas and electricity.

Egypt should be careful not to reduce competitiveness too much

But Egypt should be careful not to increase gas prices too much under political pressure to avoid a barrier for future investments in the industrial sector, bearing in mind that a too-low ceiling may deter development of more expensive offshore fields. The government will also have to take into account corporate tax of 25% (recently increased from 20%), compared with much lower taxes in the GCC (Qatar 10% for foreign companies) to be able to continue to attract foreign investment. Hence, we expect existing contracts to remain in place.

Algeria – probably already above US$2/MMBtu

Some of the cheapest gas feedstock price globally

Some projects, signed before 2008, enjoy the lowest gas costs in the region: OCI entered an agreement for its fertiliser complex for a price of about US$0.60/MMBtu, escalating about 5% annually. However, the Algerian government does benefit through a dividend, receiving about 67% of net profits of the JV in which it owns 49%, effectively bringing the natural gas price more or less in line with other countries in the region. But these favourable prices are now unavailable and we understand that gas prices are now north of US$2. With many projects planned in the petrochemical space, the source and cost of gas feedstock for such projects have become an issue for progress. Recent press articles suggest that the US$7bn petrochemical project by Sonatrach, Total Petrochemicals and Qatar Petroleum is being delayed exactly because of that, although changes at Sonatrach management level have also been a factor.

Table 7 : Summary overview gas pricing in the region

Country	Gas market summary	2010 prices (US$/MMBtu)	Assumed future prices (US$/MMBtu)	Future pricing rationale
Saudi Arabia	All current and future gas supplies for domestic consumption	0.75	0.75 - 3.00	Liquid pricing under review, but assume gas price regime stays in place for now
	Only less than 10% of gas reserves easy to develop			Assume a base price of 2.00 from 2015
	Priority to add 50 Tcf non-associated reserves by 2016			Higher cost of future gas production
	Goal: 10% global market share in petrochemicals by 2015			
Qatar	Third-largest gas reserves in the world after Russia and Iran	0.95 - 2.35	1.00 - 2.75	Variable pricing seems sensible
	Strategic priority to develop downstream industries			Steel will keep low pricing
	Moratorium on developing the giant North Field means limited availability of gas for large petrochemical projects			Fertilisers, petrochemicals dependent on selling prices and volumes of end product
Egypt	Country started to increase gas prices to industry in 2008	1.25 - 3.00	1.25 - 3.00	Pricing will be dominated by politics:
	One-third of gas production earmarked for exports, Israel accounts for less than 3% of Egypt's production but political issue. Economic policy towards neighbours could result in upward price pressure			1) Popular demand; 2) decrease subsidies to industry; 3) attract foreign upstream investors However, we assume that existing contracts for industrial will remain in place
UAE	Net importer of gas,	1.10- 2.25	1.10 to > 2.00	Dependent on import prices
	Qatar main supplier at low cost (about US$1.30/mmBTU)			Qatar will likely not increase gas supply
	Prices for Dubai utilities (DEWA) on cost-plus basis			Dispute with Iran regarding pricing
	Prices up from US$1.53 in 2007 to US$2.26 in 2010			Higher cost of future gas production
Algeria	Eighth-largest reserves in the world, second in Africa	0.60 - 2.00	> 2.00	At least 51% government ownership
	But production has been virtually flat over past decade; gas exports rising, Megaz pipeline to Spain started in 1Q11			Potential gas supply crunch puts upward pressure on prices
	Potential gas supply crunch in 2013-14, according to MEED			

Source: Rasmala research, MEED, Zawya, Wood Mackenzie, company reports

Competitive cost position looks set to stay

Even with an increase in gas prices from the current levels, industrials in the region are likely to keep high levels of profitability and remain cost competitive on a global basis.

The case for investing in gas-intensive industries remains strong

For the region, the business case for investing in petrochemicals and fertilisers remains strong. Global demand growth drives the need for continued investment in additional world-scale plants as the bulk of this growth comes from East and South Asia and, to a lesser extent for fertilisers, Latin America. The Middle East is geographically well-positioned to serve these markets. Besides the aim for governments to diversify their economies further down the value chain, thus also creating jobs, these industries are cost competitive on a global basis and remain highly profitable even during downturns.

EBITDA margins well over 50% are common

Hence, it is important to consider future increases in feedstock pricing. At current gas prices, we believe industrials in the region can achieve EBITDA margins of well over 50%. Clearly, an increase in the gas price will diminish the cost advantage somewhat, but even so, they should remain high. From an equities perspective, listed gas-intensive industries (petrochemicals, fertilisers, cement, aluminium, steel and power) represent a substantial percentage of the respective indices: in Saudi Arabia, about 39% of the Tadawul Index; Egypt, about 29% of the EGX30; and Qatar, about 21% of the DSM Index.

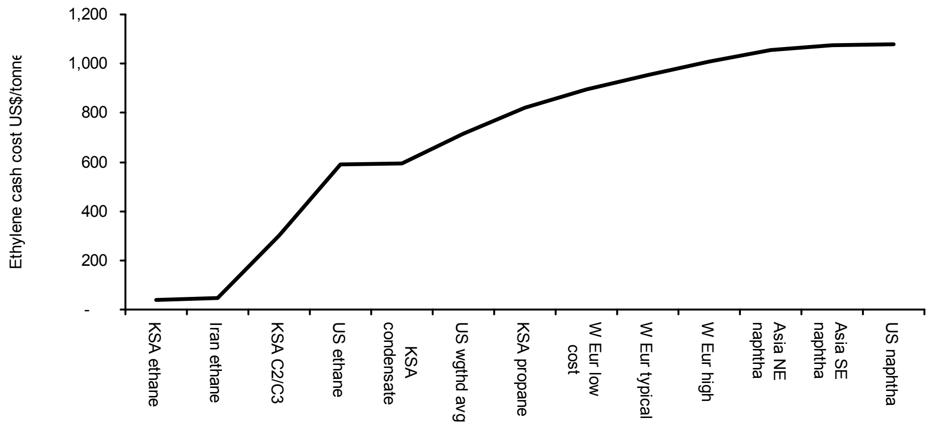
Algeria and the UAE are important as investments in those countries into the petrochemicals, steel and aluminium industries are significant. As Saudi Arabia has the largest petrochemical base in the region, we look at the country in more detail below.

Ethane-based production is the most competitive

Fertilisers and cement the most sensitive industries to changes

Companies with the biggest cost advantages (and thus the most operational sensitivity to changes in gas prices) are those which use ethane as the main feedstock and have all plants based in the country. Fertilisers, methanol and cement fall in this category, whereas both utilities and other petrochemicals that use mixed feedstocks and thus sensitivity to gas price changes is lower.

Chart 26 : Current ethylene cash cost curve by region and feedstock



Source: CMAI, Rasmala

The mix has been changing for petrochemicals

But even within petrochemicals, cost advantages differ from product to product. Ethylene can be produced by a wide variety of hydrocarbon feedstocks, but the end products vary as a result: naphtha, gasoil and condensates, commonly used in Europe and Asia, yield more propylene, C4 olefins and aromatics as co-products; ethane and propane, the dominant feedstocks in North America and the Middle East, produce only ethylene and propylene. Because naphtha costs are more similar across regions than ethane, the polypropylene cost curve is flatter than for ethylene. In addition, plants that produce just ethylene and propylene are cheaper to construct and less complicated to operate. According to consultants CMAI, in 2010, 50% of global ethylene production was based on naphtha and 32% on ethane. In North America and the Middle East, the average use of ethane is 60-70% in ethylene production; in Europe, around 10%.

High EBITDA margins

The result of the cost advantage is clear: EBITDA margins in the fertiliser and cement segments have been very high in a global context – in 2010, SAFCO (a pure nitrogen fertiliser company) achieved an EBITDA margin of 77% and the average margin in the Saudi cement industry was 61%. Profitability in the petrochemical sector has been more diverse, the result of product mix, phase of start-up of new capacities and the level of diversification of international operations. The most profitable petrochemical company in Saudi in 2010 was Sipchem, with a 54% margin.

Table 8 : Saudi Arabia – profitability of listed petrochemical companies 2010

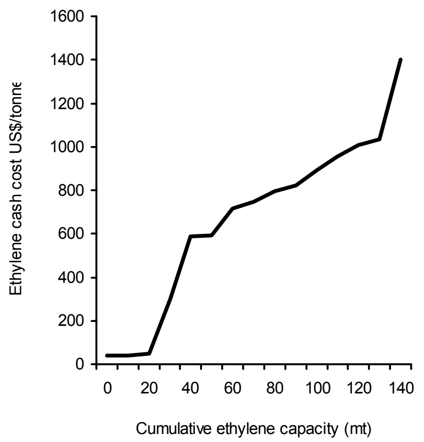
Company	products	EBITDA margin
SAFCO	Nitrogen fertilisers	77%
Sipchem	Methanol	54%
Yansab	Ethylene, propylene	49%
SABIC	Diverse range of petrochemicals	32%
APPC	Polypropylene	28%
SIIG	Petrochemicals	24%
Chemanol	Methanol derivatives	23%
Petrorabigh	refining and petrochemicals	NM
Saudi Kayan	Petrochemicals	NM
Sahara	Ethylene, Propylene, PP, PE	NM
NPC	PE, PP, PS	NM

Source: Rasmala, Bloomberg

The US has become more competitive with the advent of shale gas

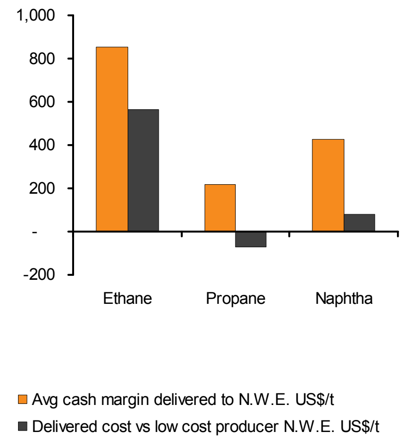
With a fixed gas price, the cost advantage is the highest during times that selling prices are high, and vice versa. The ethylene cost curve moves up and down with changes in crude oil and natural gas price swings, but also to the right, with additions of new low-cost additions in the Middle East. With the advent of shale gas in the US, producers there have become much more cost competitive on a global basis and have moved to the left on the cost curve. As long as natural gas prices remain near the US$4-5/MMBtu range, this advantage appears set to stay for US ethane-based producers. At those levels, production costs are in the US$600-650/tonne range, well below marginal naphtha-based costs of US$1,250-1,350/tonne and current prices of about US$1,400/tonne. The regions falling behind on the cost curve are Europe and Asia, and we would expect inefficient plants to feel the pressure and possibly close down in the future.

Chart 27 : Ethylene cash cost curve for global capacity



Source: CMAI, Rasmala

Chart 28 : Ethane-based production in Middle East is by far the most competitive (2010)



Source : CMAI, Bloomberg

The case for petrochemicals – higher oil production means more gas available

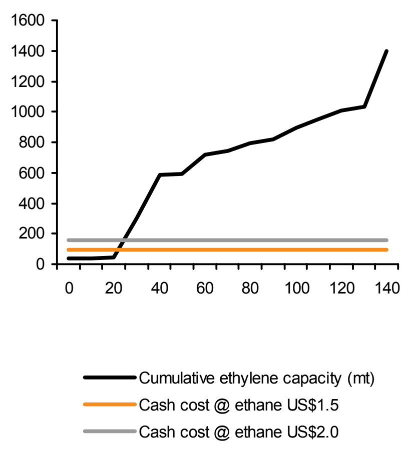
Ethane feedstock costs could double

We estimate that for every US$1/MMBtu increase in the natural gas price, the average ethylene cash cost will rise by cUS$60/tonne, assuming no change in co-product credits, or other costs (utilities, catalysts and chemicals). Therefore, if the gas price in Saudi Arabia were to increase from US$0.75 to US$1.25, we estimate that the average cash cost for ethylene increases from US$40-50 to US$70-80/tonne, still well below costs in other regions, even taking into account freight costs of up to US$200/tonne currently.

But fluctuations in the oil price have a more profound impact on profitability

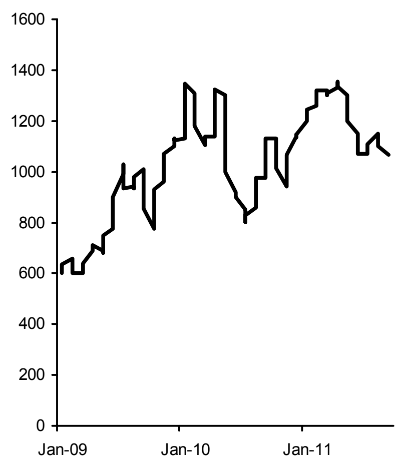
About half the new crackers in the Kingdom have ethane as a feedstock, the rest heavier feedstocks. Some recent capacity additions (Kayan etc) have already been based on a mixed-feedstock cracker and the latest projects under consideration are destined to be oil based or mixed feed, including the largest petrochemical project, the Aramco–Dow US$15bn petrochemicals complex in Jubail, which was recently given the go-ahead. The shift away from gas to heavier feedstocks has a more profound impact on margins than an increase in natural gas prices, even if these are doubled or tripled. Liquid prices in Saudi Arabia are at a 30% discount to market prices, rather than being fixed like ethane. It takes about 3.3t of naphtha to produce 1t ethylene; hence the sensitivity to a change in oil prices is high and has a potentially large impact on cash costs. The good news is that the recent increase in oil production in Saudi Arabia of about 6% ytd also means that more gas becomes available.

Chart 29 : Cost advantage for ethane looks there to stay



Source: Rasmala

Chart 30 : High ethylene prices support strong cash margins (US$/t)

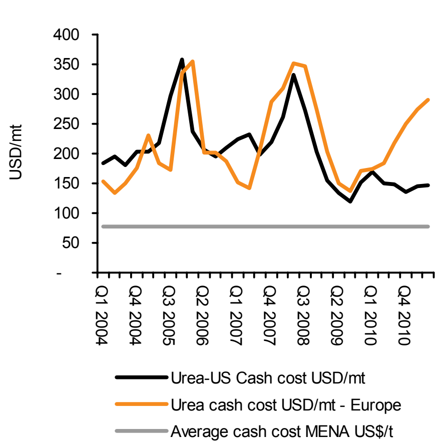


Source : CMAI, Rasmala forecasts

Fertilisers have somewhat higher sensitivity to changes

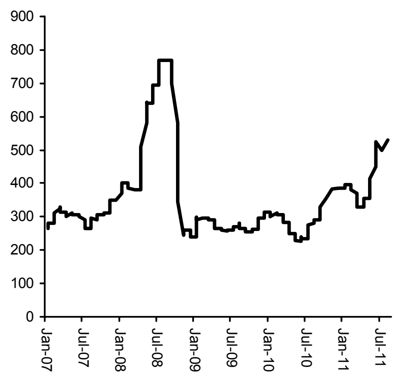
For fertilisers, the sensitivity is higher, but still not disastrous. Similar to ethylene, if the gas price in Saudi Arabia were to increase from US$0.75 to US$1.25, we estimate that the average cash cost for urea would increase from about US$85 to US$100/tonne. This is still well below cash costs in other regions, even taking into account freight costs of cUS$30/tonne. It is clear, however, that prices should not rise too much, to remain competitive. We estimate that in a new pricing scenario, the cash margin impact for urea fertilisers in Saudi Arabia would have been 6-7ppt lower in 2010, when urea prices averaged around US$300/tonne, still above 70%. At current prices over US$500/tonne, margins are well above 80% in both pricing scenarios.

Chart 31 : Urea cash cost Mena versus US and European producers



Source: Bloomberg, Rasmala

Chart 32 : Urea prices (US$/t)



Source : Bloomberg, Rasmala forecasts

Recommendation structure

Absolute performance, long term (fundamental) recommendation: The recommendation is based on implied upside/downside for the stock from the target price and only reflects capital appreciation. A Buy/Sell implies upside/downside of 10% or more and a Hold less than 10%.

Performance parameters and horizon: Given the volatility of share prices and our pre-disposition not to change recommendations frequently, these performance parameters should be interpreted flexibly. Performance in this context only reflects capital appreciation and the horizon is 12 months.

Market or sector view: This view is the responsibility of the strategy team and a relative call on the performance of the market/sector relative to the region. Overweight/Underweight implies upside/downside of 10% or more and Neutral implies less than 10% upside/downside.

Target price: The target price is the level the stock should currently trade at if the market were to accept the analyst's view of the stock and if the necessary catalysts were in place to effect this change in perception within the performance horizon. In this way, therefore, the target price abstracts from the need to take a view on the market or sector. If it is felt that the catalysts are not fully in place to effect a re-rating of the stock to its warranted value, the target price will differ from 'fair' value.

Valuation and risks to target price

For a discussion of the valuation methodologies used to derive our price targets and the risks that could impede their achievement, please refer to our latest published research on those stocks at http://research.rbsm.com

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