Executive Summary

- It has been a difficult twelve months for the Saudi petrochemicals sector. The collapse in global demand for industrial chemicals has eaten into profitability, while the squeeze on bank credit has led to a number of smaller projects being put on hold. The sector has lagged the rest of the Saudi stock market by a considerable margin.

- Despite these current problems, we believe the petrochemicals sector offers one of the most promising long term routes towards economic diversification in Saudi Arabia. The country’s reserves of oil and natural gas give it a substantial cost advantage over global competitors. This will allow the Kingdom to continue expanding basic chemicals output even as a global supply glut begins to squeeze out higher-cost producers in other parts of the world.

- Basic chemicals production offers little in the way of job opportunities, but there is substantial potential for job creation further down the product chain. To this end, government policy will increasingly seek to encourage production of more sophisticated products as a means to creating more jobs for the country’s young and rapidly expanding population.

- This will require a more sophisticated feedstock mix, involving both ethane and liquids such as naphtha, butane and propane. The trend towards integration of refineries and petrochemicals plants will therefore also gather pace. This is likely to favour the larger producers, such as Sabic and Saudi Aramco at the expense of smaller, stand-alone private ventures.

- The integration model will also open the door to further foreign direct investment into Saudi Arabia from established global energy and petrochemicals firms. These large joint ventures should allow considerable technology transfer, though their sheer size will also necessitate more diversified and imaginative financing solutions.

- There are two main challenges to the broadly positive medium-term outlook for Saudi petrochemicals. First is the scarcity of ethane, which Saudi Aramco is working hard to remedy. Second, is the need to ensure that labour productivity is not sacrificed in the push to provide downstream jobs for Saudi nationals. China’s petrochemicals industry, which is likely to be Saudi Arabia’s main competitor in the years ahead, boasts a well-skilled, cheap and flexible labour market. Saudi Arabia will need to respond in kind if it is to compete at the more sophisticated end of the product chain.
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Introduction

It has been a difficult twelve months for the Saudi petrochemicals industry. The onset of global economic recession has bitten hard into sales: Saudi Basic Industries Corp (Sabic), the Gulf’s largest producer, recorded a SR937 million ($250 million) loss in the first quarter of 2009, abruptly reversing a trend of years of large and growing profits. Investors have shied away from petrochemicals firms: the sector’s stock market index has fallen 43 percent since mid-2008, lagging the overall index by some margin. Financiers have also become far more wary about new petrochemicals projects, and a number of them have been put on hold.

This recent buffeting can easily obscure the strategic advantages that Sabic and other Saudi producers enjoy when compared with global competitors. We believe that these advantages are substantial, and should provide the platform for continued profitable growth in the medium-to-long term, as well as providing a realistic basis for economic diversification—a long-standing economic policy.

These advantages, and some of the short- and long-term challenges facing the sector, will be considered in more detail later. First we will sketch out the basic structure of the Saudi economy.

Saudi Arabia’s Macroeconomic Structure

*Hydrocarbons are the bedrock of the economy*

The single largest sector of Saudi Arabia’s economy is the extraction of crude oil and natural gas (hydrocarbons), which accounted for 27 percent of real GDP in 2008. Government services was the next largest contributor, with 17 percent, and was easily the biggest employer. Petrochemicals provided 9 percent of GDP last year, up from 7 percent a decade ago.

The dominance of the hydrocarbons sector extends well beyond its direct contribution to economic output: hydrocarbons account for around 90 percent of export earnings, and thereby provides the main source of revenue for the
public sector. Government spending is in turn the main driver of consumption in the economy, both of itself, and by dint of the fact that the vast majority of Saudi nationals rely on government wages and salaries for their own consumption.

**This provides certain advantages…**

The dominance of oil confers certain advantages. First, the surge in international oil prices over the past five years has been such that export earnings have dwarfed import spending, allowing the country to accumulate substantial foreign assets. On a net basis, these assets amounted to $460 billion at end-2008 or 100 percent of GDP, providing a formidable defence against any sustained downturn in oil prices.

Second, the fact that oil export earnings are generated by one state-owned firm (Saudi Aramco) has allowed the authorities to sterilise excess earnings relatively simply. Put another way, once the needs of the budget have been deducted from oil earnings, the remainder can be channelled into foreign assets. This helps to avoid any build-up of excess liquidity in the domestic financial system, and is one reason why Saudi inflation has historically been very low.

…but also some clear drawbacks

Against this, there are obvious disadvantages. First, export earnings and government revenue are hostage, in part, to global oil prices, which have historically shown great volatility. This makes planning difficult, and leads to sharp swings in expenditure from year to year. The volatility has been smoothed to a certain extent by Saudi Arabia’s own importance to the oil market: as the largest producer (commanding around 20 percent market share) Saudi Arabia is able to influence the price through its production decisions. However, this influence is far from absolute, and has diminished in recent years as the influence of financial markets on the oil price has grown.

**The sector generates few jobs…**

Second, despite being the biggest single contributor to GDP, the hydrocarbons sector generates few employment opportunities. Unemployment among Saudi nationals declined somewhat in 2007, but it remains high. Official figures put the rate at 11 percent, down from 12 percent in 2006, but it is likely a good deal higher in urban areas and among the young. Around 35 percent of the population is less than 15 years of age, compared with an average for developing countries of 31 percent. The number of registered job-seekers surged by almost 30 percent in 2007, with most of the increase concentrated among school-leavers. Some estimates suggest that Saudi Arabia will need to double its current employment level over the next decade just to satisfy the requirements of new job market entrants. Hydrocarbons extraction, which is heavily capital-intensive, is able to provide only a small fraction of the necessary job opportunities (see Box 1).

…and has helped to entrench a culture of dependence

Third, hydrocarbons dependence—and the government’s control of these earnings—has helped to entrench a system that has left most Saudis reliant on public sector employment. This costs the government a lot of money,
Box 1: Employment in the Oil and Petrochemicals Sectors

Incomplete data mean it is difficult to know precisely how many jobs different sectors generate, though it seems clear that the hydrocarbons sector has provided few. The sector is dominated by Saudi Aramco, which is entirely state-owned, and has a remit to provide jobs for Saudi nationals where possible. The firm employed 48,000 Saudis in 2008, representing 2 percent of the total Saudi workforce. Separate official data show that private hydrocarbons firms, such as oilfield contractors, employed 1.4 percent of the private sector workforce in 2007. However, Saudi nationals constitute only 765,000 workers in a private sector workforce of 5.8 million. Thus, the number of Saudi nationals employed in the hydrocarbons private sector is unlikely to exceed 11,000. Taken together, the number of Saudi nationals employed in the hydrocarbons sector is likely in the region of 60,000, representing 2.5 percent of the Saudi national labour force, or just 0.7 percent of the total labour force.

Petrochemicals appears to be a slightly larger employer, though again incomplete data make direct comparisons difficult. Sabic, which is state-owned, is the dominant player, and like Saudi Aramco has a mandate to employ Saudi nationals where possible. It gives no specific figures about this, but it is thought that around two thirds of its 33,000 employees are Saudi nationals, representing 1.4 percent of the Saudi labour force. The petrochemicals sector also has a number of small private firms: official data do not capture these per se, though manufacturing—which also includes oil refining and steel production—employed 11 percent of the private sector labour force in 2007.

Assuming petrochemicals is the main employer in the manufacturing industry, the sector might employ around 60,000 private sector Saudis. Together with Sabic’s employees the sector might therefore employ just over 90,000 nationals, representing 3.8 percent of the Saudi workforce or 1.1 percent of the total labour force.
and is particularly burdensome during extended periods of low oil prices. It also creates and cements inefficiencies, while leaving the private sector heavily dependent on foreign workers.

The socio-economic problems of over-reliance on oil have been at the forefront of the authorities' thinking for some time. Finding a way to diversify export earnings and provide Saudi nationals with a steady stream of sustainable and worthwhile jobs is at the heart of the long term economic planning.

**Petrochemicals and Diversification**

_Some believe that petrochemicals do not offer true economic diversification_…

Much has been written about the best way to diversify an oil-based economy. Many observers believe that Saudi Arabia’s economic future can only be assured if it focuses its diversification efforts on sectors that are unrelated to oil and gas. They argue that refining and petrochemicals production, which are closely bound either to the output or the price of hydrocarbons, would simply reinforce the dependence on hydrocarbons, and in any case provide little in the way of employment opportunities.

…but its strategic advantages make it the most credible option

The argument of those pressing for a complete break with hydrocarbons can be refuted in three main ways:

- First, Saudi Arabia’s comparative advantage lies in hydrocarbons (it has at least 90 years’ worth of oil reserves) and it makes sense to exploit this by creating greater value-added. Oil refining generates value-added in its own right and also opens the door to a variety of industrial products through the petrochemicals product chain.

- Second, the profitability of the Saudi petrochemicals sector has a far weaker link to the price of hydrocarbons than elsewhere in the world. This is because Saudi producers benefit from heavily subsidised and/or fixed price feedstocks, while the profit margins of other global producers are closely bound to the cost of hydrocarbons feedstock.

- Third, while it is true that basic petrochemicals manufacturing is capital intensive and of itself is likely to offer few jobs, moving further down the product chain into intermediates and plastics generates far more employment opportunities.

The authorities clearly recognise the value of petrochemicals-based diversification, and appear to have taken a strategic decision to develop the industry over the medium- to long-term. Before considering what course this development might take, it is worth looking at the fundamentals of the industry in a bit more detail.
PETROCHEMICALS
PRODUCT CHAIN

Raw Materials and Feedstock

- Natural Gas
- Methane, Ethane
- Propane, Butane
- Crude Oil, Naphtha

Basic Petrochemicals

- Ethylene, Propylene
- Butadiene, Benzene
- Toluene, Xylene
- Ammonia

Intermediates and Derivatives

- MTBE, Methanol
- Vinyl Chloride Monomer
- Methyl tertiary butyl ether (MTBE)
- Polyethylene
- Polypropylene

Diverse End Market

- Plastics, Coolants
- Cosmetics, Pharmaceuticals
- Packaging, Fibres
- Paper, Textiles
- Tyres & Rubbers
- Detergents, Fertilizers

Petrochemicals Basics

Basic chemicals are derived from one of two main feedstocks...

The starting point for petrochemicals production is the feedstock. There are essentially two types: gas (typically ethane) and liquids (usually naphtha, or natural gas liquids such as butane and propane). Natural gas liquids (NGLs) are derived from the associated gas which is a byproduct of the crude oil production process; ethane can be extracted from either associated or non-associated gas; naphtha is derived directly from crude oil.

These feedstocks are then “cracked”, which means that their long chain of hydrocarbons molecules is broken down to produce a small number of basic commodity chemicals (building blocks). These include ethylene, propylene, benzene, butadiene, toluene and xylene. Ethylene, propylene and butadiene are commonly known as olefins, while benzene, toluene and xylene are known as aromatics. The most important basic chemical is ethylene, which accounts for around 40 percent of global capacity of basic chemicals. Its price is often used as a proxy for petrochemicals prices as a whole.

…but there are a large number of derivatives further down the chain

In stage two, these building blocks are polymerized (made to undergo chemical processes) to produce downstream petrochemical products. These include, but are not confined to, the following:

Oxygenates: these mainly consist of alcohols and ethers, and include ethanol, methanol and methyl tertiary butyl ether (MTBE). Methanol is the starting point for the resins that form the basis of many paints, adhesives and laminates. MTBE, meanwhile, is the octane enhancer that replaces lead in fuel.

Polymers: Major products include polyethylene, polyvinyl chloride (PVC), and polystyrene—all derived from ethylene; and polypropylene, which is derived from propylene. These have a wide variety of uses in the plastics and rubber industries, featuring particularly strongly in the packing and packaging sub sectors. Polypropylene is one of the industry's cheapest and most versatile polymers and is increasingly displacing other less cost-efficient polymers, such as polystyrene, polyethylene and PVC.

Polyster: synthetic fibres used to make textiles. A major product is nylon, which is derived from benzene. Nylon’s position is also under threat from the versatile polypropylene.

Chemical intermediates: include caustic soda, linear alkyl benzene (LAB), maleic anhydride, phenols, ethylene oxide, orthoxylene, and vinyl acetate monomer. These have a wide array of derivatives, including textiles and soaps.

Fibre intermediates: used in the manufacture of antifreeze, detergents, paints and polyester. Include monoethylene glycol (MEG), diethylene glycol (DEG), triethylene glycol (TEG) and purified terephthalic acid (PTA).
Saudi producers benefit from important feedstock subsidies.

**Subsidised ethane gives Saudi producers a key cost advantage**

Ethane has been the feedstock of choice for Saudi producers for one simple reason: the cost advantage is substantial. Owing to the Kingdom’s substantial gas resources, ethane is supplied by Saudi Aramco to petrochemicals producers at $0.75 a million BTUs. This compares with a current market price of $3.5 a million BTUs for most producers in the US, which also tend to use ethane (the price was pushing $14/million BTUs around a year ago). European and most Asian ethylene production is based on naphtha feedstock, which fluctuates in line with crude oil prices. Saudi producers also have a slight cost advantage over other Gulf producers such as Iran, Qatar and the UAE, where ethane is also subsidised, but in a price range of $1.25-1.50 a million BTU.

Clearly, the cost advantage of Gulf producers will shift with swings in the oil (or gas) price. At $60/barrel, the marginal cost of ethylene production is about $800/tonne. A fluctuation of $10/barrel in the oil price in either direction results in a swing of about $120 a tonne.

**Naphtha and NGLs are also discounted**

Domestic Saudi prices of naphtha and NGLs are also subsidised, but not at a flat rate. The government employs a complex discount system for domestic users with NGLs garnering a 30 percent discount on the export price of naphtha and naphtha itself receiving an 11 percent discount on its export price. Costs therefore fluctuate in line with global oil prices, though Saudi producers using liquids still retain a competitive advantage.

**There are some problems with ethane, however**

Ethane’s clear cost advantage is offset by a couple of important disadvantages. First, ethane is scarce. Aramco produced 8.3 billion cubic feet/day of gas in 2008, exceeding domestic demand. However, in March this year demand for gas outstripped supply and the kingdom was forced to import fuel oil to use as feedstock for its major power-stations. Saudi producers with an existing ethane allocation will enjoy an economic advantage for some time, but others looking to enter the market will be less fortunate: Saudi Aramco has not been able to offer any new ethane feedstock since an allocation to Saudi International Petrochemical Company (Sipchem) made in early 2006. Sabic has not received an allocation from Aramco since 2005. Aramco is stepping up efforts to find and bring more gas on line, but there is no guarantee of success (see Outlook).

Ethane’s other drawback is that it yields a comparatively small and low-value slate of products. Ethane produces only basic olefins, such as ethylene. **Naphtha** is the more versatile feedstock, opening up production of a range of aromatics and intermediates. Because naphtha is derived from oil production, there is no shortage of it.

**Naphtha unlocks more sophisticated derivatives, and more jobs**

Liquid-based products also have allure for policymakers because their more sophisticated production process involves considerably more manpower. As discussed above, this is a key consideration for all Gulf governments seeking...
Foreign investors have been attracted by the substantial cost advantages.

**Box 2: Feedstock Pricing and the WTO**

Saudi Arabia’s WTO negotiations were prolonged in part by the issue of feedstock subsidies. European and some developing country WTO members argued that these subsidies constitute an unfair advantage and should be abolished. Saudi Arabia held its ground and argued, in essence, that it should be allowed to exploit its ethane as it sees fit since it is a natural resource that is not being exported. The Kingdom extended this argument to the issue of discounts for naphtha and other liquids, arguing that these liquids are used for domestic purposes and require no investment in export terminals or marketing, they can be sold to domestic customers at a discount to the export price.

Strong support from the US helped Saudi Arabia win the day, and in essence it has been allowed to keep its subsidy system intact. However, the argument has not been entirely extinguished and there are important WTO members who remain sceptical. China and India, which are attempting to expand their own petrochemicals capacity, have made periodic complaints about Saudi “dumping” (see Outlook).

This creates something of a conundrum for investors, who find that returns (measured by IRR) on sophisticated naphtha-based products tend to be less than those for basic ethane-derived products. This partly reflects additional labour costs, but also the fact that complexes based on liquid feedstocks cost more to build, are expensive to maintain, and produce goods that might be difficult to market. In addition, as noted above, profit margins on naphtha-based products are vulnerable to large swings in global oil prices.

Nevertheless, foreign investors understand the demographic forces at play and Gulf governments’ socio-economic agendas. Moreover, there are still considerable cost advantages to be gleaned from investment in liquid-based projects in the Gulf, and the Saudi petrochemicals sector has benefited from a number of high-profile joint ventures between Saudi producers and global energy firms.

We will now consider how the Saudi petrochemical market is evolving in more detail.

**The Saudi Petrochemicals Sector**

*Saudi Arabia is a major producer of basic chemicals*

From being a net importer in the 1970s, Saudi Arabia has emerged as one of the world’s leading petrochemicals exporters, supplying over 100 countries and accounting for around 7 percent of the global supply of basic petrochemical products. It accounts for around 70 percent of the GCC’s output.

Sabic, which was established in 1976, is the dominant player in the industry, and now ranks among the world’s top six producers. Over the past three
years the company has nearly doubled its output of petrochemicals, and now accounts for over 8 percent of the sales of the world’s top ten firms.

However, deregulation means that there are now a number of private firms operating in the sector. In recent years, the state hydrocarbons producer, Saudi Aramco, has entered the market via joint ventures with foreign partners. One such project, Petro Rabigh, has recently come on stream (see p.12).

All participants were initially attracted by the access to cheap and abundant ethane. Between 1990 and 2007 the Kingdom’s olefins capacity increased five-fold. Currently, there are some $45 billion worth of chemical projects under way. The majority are under construction, including the world-scale Yansab and Sharq olefins complexes developed by Sabic, and the Saudi Kayan complex at Jubail, which is understood to be the largest single-phase petrochemicals complex ever built.

Most petrochemicals production is based in the Gulf Arabian city of Jubail. Other plants are located in Dammam, also on the Gulf coast, and Yanbu on the Red Sea.

More advanced product slates are now being emphasised

Sabic’s joint venture with Kayan, Saudi Kayan, is expected to cost between $8-10 billion, and will consist of an ethylene cracker and units producing ethylene glycol, high-density polyethylene (HDPE), polypropylene and low density polyethylene (LDPE). The Kayan project is also at the heart of its plans to raise the proportion of specialty chemicals to 30 percent of total sales by 2020. Elsewhere, Sabic affiliates are increasing polyolefin and polymer production, including a propane dehydrogenation (PDH) plant at Ibn Zahr, and a polyethylene terephthalate plant at Sharq. Sabic is also partnering with Mitsubishi Rayon of Japan to produce a new $1 billion plant producing material for cars and household appliances. The plant is expected to come on line in 2013.

Separately, Sabic is pursuing a joint venture with Sinopec in China’s region of Tianjin, which should raise the company’s total output by around 3.2 million tonnes. Individual facilities include an ethylene plant, and downstream plants.
Sabic dominates regional output.

providing polyethylene, ethylene glycol, polypropylene, butadiene, phenol-acetone and butene-1. Construction will be completed in September of this year, though a launch date has not yet been finalised. Sales to Asia accounted for 24 percent of the company's total sales in 2008.

### Top Gulf Chemicals and Fertiliser Firms by Current Output (000 tonnes/year)

<table>
<thead>
<tr>
<th>Country</th>
<th>Base Chemicals</th>
<th>Intermediates</th>
<th>Polymers</th>
<th>Fertilisers</th>
<th>Total</th>
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<tr>
<td>Sabic</td>
<td>Saudi Arabia</td>
<td>17,650</td>
<td>10,340</td>
<td>5,620</td>
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<td>Qatar Fertiliser Company (Qafco)</td>
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<td>450</td>
<td>600</td>
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<td>Gulf Petrochemical Industries Company (GPIC)</td>
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<td>Qatar Vinyl Company (QVC)</td>
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<td>Regional total</td>
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Source: Meed
Integration of refineries and chemicals is a growing trend.

The increasing scarcity of ethane and policy makers’ desire to move down the product chain of petrochemicals have encouraged greater integration between refining and petrochemical plants in the Kingdom. The vast majority of the world’s 50 largest refineries are integrated with chemical facilities. Unfortunately, decades of thin margins for refined products on global markets led to underinvestment in Saudi Arabia’s refining sector, with the result that petrochemicals development was also somewhat stunted. This has begun to change and there is a growing consensus that the key to the feedstock issue is the integration of existing refineries with naphtha and NGL-fed petrochemical complexes. As noted above, construction costs are high, but integration allows improved risk management, the reprocessing of off-gas streams and obviously greater feedstock flexibility. A refinery also establishes a platform for further derivatives production.

Saudi Aramco and its joint venture partner Dow Chemical of the US will use mainly naphtha feedstock from an Aramco-operated refinery for their Ras Tanura complex (one of the largest single phase petrochemical projects in history), as well as gas from a nearby processing unit. The plant will produce a broad range of basic and derivative products, including ethylene, propylene, aromatics, chlorine derivatives, and polymers. The companies have delayed a final investment decision until 2010, but some construction packages have now been put out to tender and the project is expected to go ahead. At an estimated $24 billion, it will be the most expensive project of its type.

The Petro Rabigh complex (a joint venture between Aramco and Sumitomo) is also utilising mixed feedstock from the Rabigh refinery. Petro Rabigh began exports (to China) in May, but Aramco and Sumitomo are considering...
Integration should also help to spur job creation.

Smaller chemicals producers have suffered from the global financial crisis.

expanding the complex to incorporate aromatics and intermediates plants, though this will require an additional ethane allocation. In addition, Aramco has earmarked its Yanbu refinery for integration, and is planning to integrate an aromatics plant with its Jubail refinery in partnership with Total of France.

Integration should foster more jobs than stand-alone sites

One drawback of the integration model is that it tends to favour state-owned firms—in this case Saudi Aramco, which owns the refineries. Local private sector firms that do not have access to refineries might find themselves squeezed out of the process, and to some extent this has been borne out by the recent spate of private sector projects being put on hold (see below). However, the macroeconomic upside of integration is considerable: Petro Rabigh and Ras Tanura will both have associated parks to mould and finish their output, all of which will require considerable labour. The idea of "clustering" associated industries around integrated complexes is credible, and underpins many of the Economic Cities that the authorities are promoting across the Kingdom.

Global credit crisis has hit sector hard

Despite its obvious cost advantages, the Saudi petrochemicals sector has not escaped the ravages of the global credit crisis; indeed, it is one of the sectors that has been hardest hit. The downturn in global chemicals demand has led local banks to look far more critically at new petrochemicals projects requiring funding, especially as they have a much smaller capital pool than previously. Banks are still favourably disposed towards projects with well-known sponsors such as Sabic, Aramco and their foreign partners, but have had to utilise a more imaginative mix of financing to provide the necessary capital. For example, the $24 billion Ras Tanura project is expected to use corporate debt, export credit agencies, equity and Islamic and conventional bonds.

Smaller private sector projects have suffered most

However, smaller, exclusively private-sector projects have found it more difficult and certainly more expensive to raise finance. In the first seven months of 2009 petrochemicals projects totalling $27 billion were put on hold, according to Meed Projects. The majority were small or mid-level private projects.

Outlook for the Saudi Petrochemicals Sector

The sector’s medium- to long-term prospects are sound...

The Saudi petrochemical sector will continue to expand, and should become the primary centre of global production—at least for basic chemicals—over the long term. The sector has been buffeted by the ongoing financial crisis and the associated collapse in global demand for industrial chemicals. However, its cost advantage is substantial and this should allow it to ride out—and indeed thrive in—an environment of overcapacity. We believe that the cost of crude oil would have to fall dramatically to negate this advantage;
as its stands, we believe that oil prices are set to rise over the medium term. Up to around 2012, ethane will remain the dominant feedstock in Saudi Arabia. However, all allocations up to then have now been made and it seems that naphtha and liquids will become much more important from 2012 onwards, though any new gas discoveries will clearly soften this equation. The Saudi authorities, mindful of the macroeconomic benefits of investment further down the chain, will continue to encourage liquids-based investment through direct discounts or indirect incentives.

From a long-term global perspective, the main battle will pitch the Saudi (and broader GCC) petrochemicals producers against their East Asian counterparts. The GCC looks set to win this struggle assuming it can maintain labour cost flexibility.

…but the short-term global outlook remains weak

The immediate market outlook remains fragile. Demand for many petrochemicals collapsed during the second half of 2008. The price of high-density polyethylene (HDPE) in Asian markets, a key benchmark, fell by almost 60 percent between July and November 2008. The collapse in ethylene prices was even more severe, with the Japanese spot price plummeting 80 percent over the same period. Part of this was due to the fall in global oil prices since the price of naphtha-based products tend to set prices for all basic petrochemicals. But more fundamental was the collapse in global industrial and consumer demand as the world-wide recession began to bite.

Prices are currently being supported by Asian demand…

The situation has recently improved somewhat, with demand in Asia showing renewed vitality. US HDPE prices had recovered to around $1000/tonne by early August, still well down on the $1830/tonne peak, but a solid recovery from the $600/tonne nadir reached in January. Ethylene has followed a similar trend, though its recovery has been somewhat shallower.

This has been reflected in an improved set of results for Sabic. The company reported net profits of SR1.8bn ($480m) for the second quarter of 2009, down from SR7.5bn in the same period of 2008, but a considerable improvement on the SR937 million loss recorded in the first quarter of 2009. Tellingly, the company performed much better than large global competitors: both Canada’s Nova Chemicals and the US’ Dow Chemical reported losses for the period. In 2002, Dow spent around $8 billion on feedstock; this year it is likely to exceed $30 billion.

…but this is in part due to stockpiling, which might not last

It is not yet clear that the recovery in prices will prove durable. The upswing in Chinese demand partly reflects stockpiling: Chinese producers and traders are anticipating a revival in US and European demand for Chinese plastics and are stockpiling chemicals in advance. However, this revival in Western demand may be some time coming given the retrenchment in consumption and investment in these markets. If Asian traders decide that the demand outlook is in fact much weaker than when they began stockpiling, they may decide to dump their excess holdings on the market at whatever price they
can get. This would send prices sharply lower. Chinese domestic demand has also firmed, but this has in some sense been “artificially” stoked by the government’s fiscal and monetary expansion package, and may also lack durability.

Supply glut is looming

Prices are also likely to come under pressure from extra supply. The past six months has seen less additional supply coming on line than markets were expecting (see below) a dynamic that has helped support prices to some extent. However, this is likely to be a temporary phenomenon. With the region’s significant cost advantage set to remain intact, Gulf producers will continue to unveil substantial new capacity, particularly for ethane-fired chemicals, over the next few years. Indeed, around 50 percent of all new ethylene projects being developed in the world are located in the Gulf region. Business Monitor International forecasts that by 2013 the Middle East region will be contributing 25 percent of global ethylene capacity, up from around 16 percent in 2008.

Glut will enhance position of Middle East producers…

The resulting price trough will further support the growing dominance of Middle East producers, whose margins will allow them to ride out this period of weakness relatively comfortably. Adding to the pain of higher-cost producers is a likely medium-term increase in global naphtha prices, as oil prices are forced up by recovering global demand and under-investment in new fields. The increase in naphtha prices will squeeze margins to the point that we expect additional mothballing of capacity in Western Europe and little if any new investment. Plants in Asia, which also typically use naphtha as a feedstock, will also feel the pinch. The main exception in Asia is China, which will continue to benefit from a cheap and skilled labour force (see below).

…and Saudi Arabia will continue to take market share in a range of products

This in turn will mean two developments. First, Saudi Arabia will continue to take market share in a range of product categories, mostly towards the beginning of the product chain where its feedstock advantage is most pronounced. Second, the likely shakeout among higher-cost (i.e. US and European producers) will open up acquisition opportunities for Saudi (and other Gulf) producers, particularly if valuations remain depressed. Similar acquisitions to Sabic’s 2007 purchase of GE Chemicals’ US plastics division therefore seem likely. Distribution is important in this regard: Saudi Arabia has the feedstock, the utilities and infrastructure availability; what it does not have are the markets, particularly for specialised products. Thus, distributors in mature markets in Asia, Europe and the US will become more attractive.

Foreign producers will step up their investment in Saudi sector

Simultaneously, international players are likely to step up their investments in Saudi Arabia through joint ventures (such as those formed between Saudi Aramco and Dow, Sumitomo, Total and others). International investors will acquire cheap feedstock (either ethane or discounted liquids), and potentially other government incentives. Saudi firms, meanwhile, will gain access to
best-of-class manufacturing, procurement, integrated engineering and marketing techniques—elements of foreign direct investment that should benefit the whole economy.

**Future is bright, but potential constraints are significant**

Thus, despite the current slowdown and the coming supply glut, the future looks bright for Saudi producers. However, it is worth keeping in mind the various actual and potential constraints on growth for the sector.

**In the short term, banks will continue to take a conservative view**

In the short term, credit constraints will likely keep capacity growth in check, particularly for smaller private sector producers. We have noted how in the absence of international banks, local banks have been challenged to provide adequate finance for many industrial projects. They have also taken a more critical look at petrochemicals and refining projects than previously given the backdrop of brittle global demand.

We think Saudi petrochemicals firms remain an excellent long term play given their feedstock advantage and government priorities for the sector, but banks are likely to remain cautious for the next 6-12 months or so, at least until global petrochemicals demand shows signs of a sustained upswing and/or international banks return in numbers to the Saudi corporate finance sector. In the meantime, projects will utilise a wider array of financing options to raise the necessary capital.

A further short term constraint is a shortage of skilled contracting personnel. A good deal of Gulf petrochemical capacity is coming on line at around the same time, and contracting firms have been exposed by a shortage of experienced project engineers. This has led to delays in the rollout of projects such as Yansab and Sharq, and has also had an impact on output in Kuwait and Iran. The lack of skilled personnel will not be remedied overnight, but the market will adjust in due course. Thus, we do not see this bottleneck as a long-term constraint on Gulf capacity rollout.

**Aramco is stepping up efforts to bring more ethane on line...**

More serious from a long term perspective is the scarcity of ethane. Saudi Aramco is making concerted efforts to increase the flow of ethane and in late July, Aramco approached contractors to bid for work on the Arabiyah gas development scheme in the Eastern Province, with a view to awarding the main engineering, procurement and construction packages as early as the second quarter of 2010. New production should come on line by 2014. Separately, Aramco has awarded three contracts to the local/Chinese BGP Arabia to gather seismic data to identify fresh gas reserves in the Empty Quarter and the Red Sea. Meanwhile, in August Aramco and Shell announced a find at the Kidan structure in the Empty Quarter with an initial flow rate of 90 million cubic feet/day. The find was still being evaluated as this report went to press.

Aramco is clearly devoting a lot of energy and resources to finding and bringing on line new gas. How much and how soon new gas comes on line are open questions, but the scale of the country’s probable untapped oil reserves suggests that there is plenty of associated gas that could yet be
 Authorities will encourage expanded use of liquid feedstock.

China will be Saudi Arabia’s main competitor in the long term.

Authorities will encourage expanded use of liquid feedstock.

brought on stream. However, the issue of ethane availability also needs to be considered through the prism of overall government strategy, which is bent towards encouraging greater use of liquids.

...but the authorities will increasingly seek to encourage liquid feedstock

We have seen how the Saudi government is keen to foster more investment in downstream, employment-intensive products—that is, projects that are less attractive based on IRR, but have a broader socio-economic role to play. Thus, perhaps more pertinent than Aramco’s recent decision to fast-track the Arabiyah development, was its simultaneous announcement of plans to install an NGL recovery facility at its Shaybah field in the Empty Quarter. While the search for ethane is expected to continue, the emphasis should gradually switch to extracting more liquids via the oil recovery and refining process. By extension, the integration model will continue to grow in prominence.

Chinese competition will be the main long-term challenge to Saudi producers

The final constraint—or more properly, challenge—to Saudi petrochemicals growth is China. China is the most important source of demand for Saudi petrochemicals, both in its own right and as a processing centre for US and European demand. However, China is also building its own petrochemicals capacity, and this has the potential to eat into demand for foreign imports. For example, the country is set to add almost 12 million tonnes per annum of new ethylene production capacity over the next five years. China is still expected to remain a net importer of ethylene, but its import needs are forecast to fall from an estimated 13.5 million tonnes in 2008 to 8.9 million tonnes by 2013, according to BMI.

We think that Saudi Arabia and the rest of the Gulf will be able to meet this challenge. Saudi Arabia’s feedstock advantage will be critical in helping it to expand its market share even as China raises its own capacity. We assume that oil, and hence naphtha, prices will continue to rise over the medium to long term, putting pressure on the margins of those producers without access to subsidised feedstock. Nevertheless, the Chinese challenge remains formidable.

Saudi Arabia will need a well trained and flexible labour force further down the product chain

China’s key strength is its flexible, cheap and well-trained labour force, and this will allow it to provide fiercer competition further along the value chain. Thus, the key challenge for Saudi Arabia is to ensure that its own labour supply remains sufficiently flexible to enable it to produce competitively priced aromatics and derivatives. Importing expatriate workers would be one means of maintaining labour flexibility, which is a tried and trusted model for the Gulf’s economy as a whole. However, this would negate the broader goal of creating sustainable job opportunities for Saudi nationals.
Labor flexibility will be important in maintaining Saudi competitiveness.

Box 3: Friction with China

The expansion of China’s domestic production also indicates that there may be occasional episodes of friction between China and the Gulf, similar to that involving Chinese officials and Sabic recently. In July, China accused Sabic of “dumping” polypropylene on the Chinese market—an accusation that largely reflects Chinese frustration with Saudi Arabia’s feedstock advantage. Such complaints could become more frequent as marginal Chinese producers struggle to survive in an oversupplied market. Consequently, Sabic and other Saudi producers might find themselves subject to occasional anti-dumping duties. Nevertheless, trade and diplomatic links between the two countries are deep enough to suggest that this will not develop into a systemic threat to bilateral petrochemical trade relations. Sabic’s joint venture with Sinopec underscores this point.

Ultimately, the country’s feedstock advantage in naphtha alone is such that the Saudi petrochemicals sector will remain competitive against most global producers. However, to take full advantage of the potential benefits that could stem from a sustained expansion and diversification of its petrochemicals output, Saudi nationals will need to be equipped with the requisite technical skills. This will be a long-term process involving a broadening and deepening of scientific education in Saudi school and university curricula. Yet it is a vital one if the country is to lessen its dependence on hydrocarbons.
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