Strategic Investment Decisions in Petrochemical Sector: A comparative Study of GCC Countries

ABSTRACT

Strategic Investment Decisions in Petrochemical Sector: A comparative Study of GCC Countries

ABSTRACT

1. Background

Writing about the Arabian Peninsula, the author of an early-day American guidebook was less than flattering in his description of it. "Topography mainly desert. No permanent rivers or bodies of water. Generally, desert climate of extreme heat and little rain. In the interior, summer temperature averages 112°F (44° Celsius) with high humidity on the coasts; frosts and freezing weather occur in the interior regions in winter." Could people live out their lives in such a forbidding place? Could they have ever played a significant role in history? Could a nation actually evolve here that would rise to rank among world leaders in its influence and importance?

The answer to these questions is *yes*. The Almighty may have endowed the Arabian Peninsula with more sunshine, sand, and open spaces than other regions in the world, but He blessed it as well with exceptional natural resources and people capable of putting them to good use.

In another scenario, 30 years ago if a person flew from Tehran to Riyadh during the day, one would have noticed very little from the air except sand and blue sky. However, if the journey were to have taken place during the night, a person would have seen numerous large fires from gas flares associated with some of the largest oil fields in the world in Iran, Kuwait, and Saudi Arabia. Beginning in the mid 1970's, though, this picture began to change as the methane, ethane, and heavier gas liquids associated with crude oil production began to be gathered and processed and converted into materials like methanol and polyethylene.

GCC petrochemical industry has witnessed tremendous growth in the last 20 years. The initiative to add value to gas flared at the crude oil wellhead in Saudi Arabia became the cornerstone of the extremely competitive and robust industry today. It was well planned effort, ensuring that all the necessary building blocks were in place before taking on the challenge. After witnessing this success story, other countries in the region followed suit, promoting projects based on ethane extracted from associated gas.

Today, GCC petrochemical industry stands on the verge of largest ever expansion. The region's indigenous advantage of low feedstock costs, coupled with the inherent economics of scale associated with large investments, create a compelling story for the GCC to take lion's share of new global capacity growth.

This study is designed to find a comparison of strategic investment decisions among GCC countries and their role in economic development of that particular host country. The study also suggests the strategies for petrochemical investments in the GCC region.

2. Introduction

The global petrochemicals industry is estimated to generate well over $2 trillion in sales each year, more than the global market for crude oil. Although demand remains more concentrated in developed markets (US, West Europe and Japan account for 60% of the market), there has been strong growth in emerging economies and the petrochemicals market is truly global.

The global chemical industry is growing at the rate of close to 1.5xGDP and at twice the general rate of manufacturing growth as a whole. However, the multiple to GDP varies between different products and regions depending mainly on their level of maturity. The superior economic growth rates seen especially in China and South East Asia have led to ethylene demand growth in Asia (except Japan) of 6.5% compared to 3.0% for the rest of the world.

Shift in Petrochemical Business from West to East

There is a paradigm shift in the petrochemicals business from the West to the East, with the Middle East emerging as a global hub, backed by the region's advantages of low-cost feedstock and labour, fast growing demand in Asia and new technologies.

There will be a shake-up in the global petrochemical industry, wherein established western companies will exit, shrink, or move eastwards through partnerships, in order to defend their stakes. The Middle East's share in the global ethylene market is expected to grow to 20 % in 2011 from 9 % in 2002, which means that 50% of all new ethylene capacity will be built in the Middle East. The total global ethylene capacity is projected to increase to 150 million metric tons in 2010 from 109 million metric tons in 2002.

The industry's projected growth is 119% in net trade from Middle East to East Asia by 2010, with China accounting for a major part of the increase. In addition to its huge population, China's chemical-intensive and export-driven industry is also driving demand for petrochemicals. The gravity of the polyolefin world is shifting eastwards, and chemical companies that want to stay in the business need to move and transform before their entire economic rationale is swept from under their feet.[1]

USA's share of global trading in ethylene derivatives has fallen to less than 10 % today from 30 % in the 1990s, and it will probably be less than 5% by 2010. Over the same period, the Middle East is likely to increase its share to more than half of the globally traded volume. Besides this, Middle Eastern companies have access to cheaper gas, with ethane costing $0.75 to 1 per MMBTU. The cost of crude oil would need to drop below $ 15 per bbl for western producers to be competitive for polyolefin in Asia.

Analysts observe there are three dimensions to the growth of the petrochemical industry in the Middle East: capacity, portfolio and geography. The Middle East's heavy investments in ethane crackers and polymers will enable it to exploit the huge quantity of gas available. Its ethane supply will be able to meet around 17 % of the global ethylene demand, which is expected to be 150 million metric tons per year by 2010.

[1] *McKinsey, 2005*

3. Review of Literature

The topic for this research is *Strategic investment decisions in petrochemical sector: A comparative study of GCC countries*. Considering the coverage of this research, a detail review of literature has been conducted which not only covers the academic research in the field of investment decisions but also the research or investigation done by corporate and consulting firms in petroleum and petrochemical industry with specific reference of Middle East region.

There are myriad references in literature available on *strategic investment decision***.** The classical school of strategy has evolved a number of sophisticated financial techniques for supporting the strategic decision making process. What these techniques share is an aspiration to approach strategic decision in a structural-rational manner that will finally produce a clear ranking of strategic options.

The major focus in Richard Butler, Leslie Davies, Richard Pike and John Sharp, *Strategic Investment Decisions: Theory, Practice and Process (1993)* is on the process by which investment decisions are made and the means by which this process can be made more effective. This work reports a study of seventeen actual investment decision made in twelve organizations. The organizations studied in this work cover a wide variety. The overall conclusion emphasizes the importance of finding the right pattern in the different decision strategies and other variables for effectiveness. The approach adopted here is to combine both the case study and a quantitative analysis of a larger number of cases.

Chris Carr, Cyril Tomkins and Brian Bayliss, *Strategic Investment Decisions: A comparison of UK and German practices in the motor components industry (1994)*. This study examines strategic investment decisions carried out by forty-two vehicle component companies, split equally between the UK and Germany. In each company, a single major strategic investment decision was examined in depth. Fifteen case studies were presented to illustrate the general features, which emerged and their contextual influences. These cases were used to derive hypotheses to serve as a basis for analyzing the data for the rest of companies.

Although number of studies have been reported in the main report the above mentioned studies on strategic investment decisions have been found more relevant and exhaustive in explaining the investment decision process and took wide perspective and coverage of industry. But the studies on *strategic investment decision* focusing on *oil & gas and petrochemical industry* are negligible except some references made here and there on strategic investments.

The research from economics and business school faculties on oil and gas industry is extra ordinarily heterogeneous, ranging from simple econometric tests of some narrow proposition of firm behaviour to richly elaborated case studies lacking a visible hypothesis.

Among the prominent business schools, *Harvard Business School* took special interest in the petroleum and petrochemical industry and these studies have been published in HBR either in the form of articles or case studies.

The leading management and strategy consultancy firms like *McKinsey, PricewaterhouseCoopers, Boston*

Consulting Group, Booz Allen Hamilton, and Deloitte have shown much interest in petroleum and petrochemical industry.

Academic and business interest in GCC economy is not new, while the six-nation Gulf Cooperation Council (GCC) was specifically created as a political and economic block in 1981, it's only in recent years that it has been gaining acceptance as a trading coalition comparable to other countries. Some of the relevant works on GCC economy and GCC petroleum and petrochemical sector are referred in the main report.

After reviewing the works done in the area of *foreign investment, strategic investment decisions, petroleum* and *petrochemical industry and GCC economy*, it is clear that no attempt has been made so far to explore the strategic investment decisions in petrochemical industry in general and in GCC petrochemical industry in particular.

The growing importance of GCC region in the world economy and the increasing influence of petrochemical industry on global manufacturing industry, jointly offers a very interesting area of research, which successfully guided to my research topic: *Strategic investment decisions in petrochemical sector: A comparative study of GCC countries*.

4. Research Methodology

Statement of the Problem

The statement of the research problem visualized investigation into an international study of strategic investment decisions with a view to achieve two objectives:

- Attempt to provide policy guidelines for GCC countries in order to sustain the lead they have in the global oil and gas industry
- Endeavour to present a basis for corporate policy formulation and choice of appropriate strategy for investment decisions in the petrochemical sector.

In order to take these two objectives into account, the research study examined the investment decisions in petrochemical sector through a *comparative case study method*. The geographical scope for the research study is the region of *GCC countries* (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE). There are two reasons for this choice. *First*, this region has figured prominently in the global economy through the last two decades for their major investment projects and also for their increasing influence on the global manufacturing industry. *Secondly*, this is the sector, where major capital investment projects are at an advanced stage and thus it is particularly desirable to investigate decision-making procedures in such a situation.

The four means adopted to investigate the two areas as above are as below.

- Comparison of the petrochemical investment environments in the six GCC countries
- Comparison of cost competitiveness among the six GCC countries
- Comparison of structural changes in the petrochemicals industries of the six GCC countries
- Comparison of derivers for investment in the six GCC countries

This research will explore the strategic investment decisions in GCC petrochemical industry and presents a comparative case study of six GCC countries to explore the issues listed above. Finally, this study will suggest the strategies for petrochemical investments in the GCC region.

Research Methodology

Many studies of organizational decision making have emphasized the use of case studies, often studying one case in great depth (Pettigrew 1973). Bower's (1971) study of capital budgeting used a *comparative case method* as has the study by Marsh *et al.*(1988) where they analyzed in depth three major strategic investment decisions. In general the case studies provide a very valuable addition to the aggregate survey material. The approach of this research is to combine both the case study and a quantitative analysis of cases.

The variable of the study focuses on investment activities in *petrochemical sector in GCC countries*. It presents the basic information about this sector and then examines the strategic investment decisions and expected changes for GCC countries as developing host countries.

The study attempts to present a comprehensive picture of the characteristics and activities of local and foreign investors in GCC countries and examine their investment decisions at the country level.

Research Process

To carry out this research work, a systematic research process has been followed. Main sources of primary data were interviewing, observing and analyzing documents. For the interviews, a semi-structured interview technique has been followed. For collection of primary data for this project I have undertaken field trips to visit the government offices, companies and organizations in GCC countries and arranged several telephonic discussions. For the interviews, senior level managers - who are responsible for investment decision either in project management department or corporate finance departments of major petrochemical companies of GCC countries, the independent consultants and advisors who are advising these companies - have been contacted.

The response of these executives varied from giving the overview of their investment activities, talking about current and future directions of the investment of the companies, to announced mergers and acquisitions of the companies. Getting the hard data on investments were very difficult and in some of the cases impossible. But these discussions have helped in authenticating the public data used for the analysis. Most of the executives have preferred not to be quoted in the research report keeping in line the cultural sensitivities in this region of the world. The data collected from these sources has been used for the writing of *six case studies*.

Limitation of this study

Some of limitations of the study could be :

- The scope of the study is limited in geographical terms to the six countries of Gulf Corporation Council (GCC), the study, analysis and recommendations are focused on six members GCC countries.
- In terms of the *industry focus* for this study is limited to the *petrochemical industry*. The references to oil and gas industry have been used at many places as it is unavoidable. The petrochemical industry is heavily dependent oil and gas assets and its downstream activities.

- The study considers only the major investment projects made for the purpose of *growth and expansion* within the petrochemical industry and the GCC countries.

- There are limitations in terms of the research methodology used. Use of case study has been made precluding the use of other direct methods such as survey questionnaires.

- The analytical methods used are deductive and discursive in nature limited to the nature of the methodology of case study used. Rigorous statistical methods could not be applied owing to the limitations of the case study method.

This study explores and compares the industry structure of petrochemical sector in GCC countries, for this purpose selected individual firms of petrochemical sector and their strategic investment decisions are discussed.

Contribution of this Study

The *immediate* contribution of the study is to add to the available literature on strategic investment decisions in petrochemical sector.

The significant contribution of this project is to make a comparison of the petrochemical investment environments in the six GCC countries studied and reported in the study.

The project makes an in-depth analysis of cost competitiveness of the petrochemical industry and compares it across the six GCC countries.

The study makes a detailed analysis of the structural changes ongoing in the petrochemical industry in the six GCC countries. These industry profile can serve as a basis for industry analysis of petrochemical industry.

The study compares the derivers for investment among GCC countries and their role in economic development of that particular host country.

The description of the contributions that informed strategic investment decisions could make to the economic development are indicative of the efforts that national governments could make to make their countries widen the ambit of economic and industrial activities for a balanced growth.

Finally, the contribution is to suggest the strategies for petrochemical investments in the GCC region. These could be of special interest to decision-makers in the petrochemical industry not only of the six GCC countries but of other countries that have a substantial contribution from the petrochemical industry.

5. GCC Petrochemical Case Study

The purpose of GCC case studies is to evaluate the status and structure of petrochemical industries, current and future production capacities; the competitiveness of petrochemical companies and review of major petrochemical investment projects.

There are six GCC countries petrochemical industry case studies listed in this section. A detail analysis of these cases has been presented as the comparative study of GCC Petrochemicals. These case studies also contributed in final recommendation and suggestion presented as a last chapter of this report.

6. Comparative Study of GCC Petrochemicals

A comparative study of GCC petrochemical industry has been presented covering different aspects of strategic investment decisions.

1. Comparison of Structural Changes
2. Comparison of the Petrochemical Investment Environments
3. Comparison of Cost Competitiveness
4. Comparison of Drivers for Investment

The GCC countries in the midst of a massive expansion in petrochemicals which is driven by increasing natural gas and associated natural gas production, relatively low feedstock prices, high oil prices (which increase the costs of petrochemical producers using naphtha), strong demand, high operating rates and product prices due to limited global investment in petrochemicals over past five years globally.

Based on our comparative study, *Saudi Arabia* emerged as *highly favourable* destination for SID among the GCC countries as all four variables of SID are working effectively and will further support the future investment. *Kuwait, Qatar and UAE* are **f***avourable* destination for SID among the GCC countries whereas Oman and Bahrain are *unfavourable* destination for investment in petrochemical sector.

8. Recommendation & Suggestion

This section of the report distils the issues discussed in earlier chapters and also examines some strategic issues that will impact the future development of the GCC petrochemical industry.

Strategic Issues

Reliance on Hydrocarbon Exports

It is expected that the fortune of GCC countries will continue to be dependent on the crude oil price movements and are expected to experience relatively more stable revenues in the future as compare to past. Therefore, the expansion of petrochemical activities in GCC countries has to be used strategically to diversify the economy.

Pressure on State Budgets

The availability of resources for promoting further industrialization will continue to remain a function of the governments' earnings. Although, the GCC governments shall continue to provide support required to promote industrialization but at the same time they should encourage the private sector investment by rationalizing over all policies through appropriate pricing and various buy-back schemes like build–operate-own (BOO) or build -operate–transfer (BOT) arrangements.

Petrochemical Feedstock

The GCC countries should adopt enhanced gas recovery techniques and reduce flaring at the well-heads to the minimum possible.

The price of ethane should thus be set at such level that it provides an incentive for investment. As the cyclicality of the petrochemical business continues to play a crucial role in the overall profitability of the petrochemical business, margin sharing formula could be developed such that neither the petrochemical plant owners nor the feedstock provider are adversely disadvantage at any given point of time.

Petrochemical/Refinery Integration

In contrast to the GCC, there is higher integration between Asian refinery and petrochemical facilities with many large sites already exploiting synergies, like Reliance's facilities at Jamnagar in India. The initiative taken by Saudi Aramco, as mentioned in report, is a strategic decision for creating the synergy. It is recommended that other GCC countries should also take the necessary step for integrating their refinery with petrochemical complexes in order to achieve better economies of scale.

Demand and Supply

It is essential that the GCC producers establish a firm foothold in the main markets of Asia and Europe. GCC in coming decade is going to be a net exporter of a number of petrochemical products, which will require substantial efforts in arranging economical logistics to ship these products to the destination markets. GCC countries should also stress on promoting domestic consumption either through export oriented production or through import substitution scheme.

Cost Competitiveness

The impact of oil price movements on the competitiveness of GCC petrochemical production is significant and feedstock prices offered to both current and future projects should continue to remain the key cost factor. As oil prices increase, the profitability of pure ethylene derivatives facilities should generally become higher in the GCC countries. Therefore, such investments should be considerably more favoured in GCC countries as compared to Asian countries, if high oil prices are sustained.

Petrochemical Infrastructure & Logistics

The large scale industrial parks and economic zones require massive investments. The recommendation here is that GCC countries should use a mix of project finance, private sector equity and some supports form the government.

The logistics are expected to play a more critical role in the future as exports from the region grow almost four fold in this decade. Proper planning will have to be undertaken in order to ensure that there is sufficient storage, warehousing and port facilities available to handle these exports.

Strategies for GCC Petrochemical Investment

The GCC petrochemicals industry is going through a period of unprecedented expansion. With its substantial feedstock cost advantage, global chemical producers and technology providers alike are investing billions of dollars in regional petrochemicals projects as they seek to create new, more cost-effective hub for production. Till June 2006, more than $20 billion worth of contracts have been awarded to build new capacity in the six GCC states. The strategies for GCC petrochemical investment will take into account the entire value chain and discuss the appropriate actions at each point in an integrated manner. Following are the *strategy elements* for strategic investment decisions in GCC countries

Optimisation of Oil & Gas Industrial Capabilities

GCC countries account for 40% of the world crude oil reserves and 29% of the world gas reserves. Oil and gas reserves shape the future developments in petrochemicals across the GCC region. The strategy focus in all GCC states is optimisation of oil and gas production.

Optimisation of Petrochemical derivatives capabilities

The global plastic converting industry landscape is changing, with new focus areas in Asia and the Middle East. The time is right now for the GCC converting industry to grow. The export oriented conversion is possible in GCC region due to: desire to diversify, low labour and utilities cost, availability of soft loans, availability of low price resin and lower tax rates.

Logistics & Supply Chain Management Capabilities

With growing additional supply, more liquid storage facilities are required in GCC countries. Containers availability and movement are the concern in the region. There is a need to plan for increased cooperation among the GCC member nations for a wider road and rail network that would give easier container access. These challenges can be tackled at two levels: country level and corporate level.

Market development

In the changing market scenario, GCC suppliers need to partner with key customers to develop innovative solutions that will allow them to differentiate in a highly competitive market environment. Another crucial strategy for GCC petrochemical producers will be developing market intelligence and competitor surveillance capabilities.

Forward integration

The best examples of vertically integrated companies are in the oil industry. With the availability of huge reserves of oil and gas, GCC countries, with the exception of Saudi Arabia, have failed to establish forward integration in petrochemical industries. In their efforts to add value to the products that they produce, GCC countries should reduce the exports of crude oil and instead gradually increase the production and exports of petroleum products and must profit from every stage of the oil and gas value chain.

International expansion

The profit earned so far due to high oil price need to be spent for the international expansion of the industrial activity beyond the geographical limits of GCC region. SABIC's international expansion and diversification is the best example for the rest of GCC petrochemical players.

International investments

So far major investment from Middle East has directed towards the Western Europe and North America. From strategic investment point of view GCC countries should look closely to the BRIC economics. BRIC economies are expected to dominate by 2050 with 40% of global population and $15 trillion combined GDP. In petrochemical terms, India and China are suppliers of manufactured goods and Brazil and Russia are suppliers of raw material. GCC –the oil and gas rich region can add more excitement to this combination. The business partnership between GCC economies and BRIC economies will add more meaning to the polyolefin industry by shifting demand

pattern away from "old economics"

Management of value chain Relationship

Petrochemical companies make strategic decisions based on capital, technology, competency and market access. They use integration to feedstock as a means to capture value where as international integrated energy companies use petrochemical business to add value to hydrocarbon resources and to strengthen their global position. All these strategies need a sound management of value chain relationship through building capabilities including IT infrastructure, marketing and management of diverse workforce.

Development of integrative capability

Management of value chain relationship calls for development of integrative capability where GCC countries need to get involved in the forward integrated industries. As we have seen that pattern of development of oil and gas industry in GCC countries are not the same, mainly because of variation in hydrocarbon resource availability.

Diversification of national economic Strategies

The most important common economic characteristic of GCC countries is their heavy reliance on oil and gas exports. This reliance, though, has made their economies vulnerable to fluctuations in the price of oil. To cope with this vulnerability, GCC countries need to make further progress in their economic and industrial modernization drives. The diversification of national economic strategies to move from being merely oil- and gas dependent economies to a wider base of industrial development needs to be carried on with full force.

Balanced regional development within individual GCC countries

The income and development gap among regions within the country are significant and is expected to widen in GCC nations. The benefits of oil and gas industries and petrochemicals industries need to be spread out for balanced regional development within each of the GCC countries. Further, this balanced regional development will help these six GCC nations in achieving the greater economic integration of GCC economics which is due from its formation in 1981.

Development of petrochemicals human resource management

The challenge of development of human resource management in GCC countries can be tackled at the *policy level* by the government and *at corporate level* by the companies, for relevance of our study of petrochemicals companies.

At corporate level, their work with the Higher Council of Manpower in their respective countries should be extended to include active participation in programs directing young students toward technical schooling as well as direct participation with colleges and universities in building curricula and channeling graduates into their training programs and employment.

As the human resource development program has been identified as a major challenge for the GCC diversification and expansion of petroleum and petrochemical industry in this study, GCC petrochemical players may take up joint responsibility of developing world class petroleum and petrochemicals institutions on the pattern of Institut

Français du Pétrole (Institute of Petroleum) in France or University of Petroleum & Energy Studies in India, which will act as research centre for solving their technical and management problems, training centre for skill enhancement and advance degree and training program for their existing staff and will provide a pool of talent at graduate and research level for their future recruitment. These comprehensive strategies will definitely go a long way in solving the skilled manpower problem in GCC industry.

Development of institutional Framework

Continual development of an institutional framework to support integrative and balanced growth of petroleum and petrochemicals and related industries are required.

In long term, GCC nations should progressively develop a coordinated regional economic strategy that aims at (a) encouraging public-private partnerships, (b) encouraging economic diversification, and (c) improving governance through stronger and more efficient institutions.

The diversification strategy should lead to the development of high-tech industries within the oil and gas sector and a public-private partnership to train local engineers. Efforts to accelerate economic diversification should continue with strategic research and development (R&D) investments, capturing more of the energy value chain and increasing the world market share of associated industries.

Overall, institutional development can be expected to go a long way in creating a solid foundation for the development of GCC countries to attain great heights in fulfilling the aspirations of their citizens.