

NATURAL GAS: INVESTMENT STRATEGIES IN AN UNCERTAIN WORLD

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ABSTRACT:

Natural Gas investment projects in developing countries (of which Egypt is a typical example) are one of the key industries in the evolving and continually changing energy market. It seems clear that the natural gas industry today is no longer limited by national boundaries, and that countries as well as organizations need to have an adaptive investment strategy and a global perspective if they are to survive and prosper in this uncertain world. Many strategies will succeed or fail on the basis of their ability to deal with this dynamic environment.

Strategy decisions are by their nature complex, and involve many imponderables. The selection of a course of action depends on the availability and interpretation of information, analysis, intuition, emotion, political awareness and many other factors. Different individuals and groups emphasize different aspects and, in the sense that a strategy decision is an **advance into the unknown**, there is no correct course of action; all that can be done is to interpret the current situation, form expectations about the future, and act according to personal views on risk and the likely course of events. It is usually possible to identify courses of action which are unlikely to be successful, and in that sense the strategy process can have real benefits in helping to avoid disastrous courses of action.

Success of the investment strategy formulation basically depends on the commitment of the leader and his enthusiasm and the degree of peer and subordinate involvement. Investment strategy formulation is simply the fundamental pattern of present and planned objectives, resource deployment and interaction of an organization with markets, competitors and other environmental factors and how it can position itself to develop and sustain a competitive advantage over current and potential competitors. The investment strategy should specify the “what” (objectives to be accomplished); the “where” (on which industries and product markets to focus); and the “how” (which resources and activities to allocate to each product market to meet environmental opportunities and threats and to gain a competitive advantage).

The purpose of this paper is to analyze the Egyptian gas sector strategy, and attempts to answer the question: “what is the impact of the economic, commercial, technological risk on Egypt’s natural gas investment strategy?” In other words, this paper will examine and test the relation between the investment strategy as a dependent variable and the dimension of the economical, commercial and technological risk as an independent variable. Finally the paper will recommend a number of alternatives that should be taken into consideration in the Egyptian gas strategy in order to mitigate some of the risks that might arise from its implementation.

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Introduction:

During the previous two decades the world gradually discovered an important alternative fuel; a fuel which is least polluting and with extremely high energy content. It is natural gas which cuts a way towards the top in energy usage; offering less expensive, more secure and more stable alternative to crude oil. There has been a variety of technical, economic and political reasons preventing its growth in the past. However, it is believed that the main constraints in the growth of natural gas consumption are merely economic.

Planning a strategy for Gas projects should scan its unique characteristics and consider its impact on the other economic sectors. On the other hand, the strategy should take into account the following dimensions.

- i. Gas industry requires an intensive capital investment associated with high risk potential.
- ii. Gas industry should be built on the base of the available proven reserve i.e. comparative advantage.
- iii. Exploration or upstream activities dominated by the multi-national organization.
- iv. Long term relation, 20 years or more, between buyer or seller, producers or owners.
- v. gas projects are integrated vertically and horizontally.
- vi. Gas industry market is volatile and still linked to oil prices or final products' price.

- vii. Competition is too tough and once the market is locked by long term contract, new entrance will have a low chance.

The paper will attempt to shed some light on the suitable investment strategy needed to achieve the Egyptian gas sector goals and objectives, as well as, to highlight the vertical and horizontal integration between the producers, local and international consumers.

What is Strategic Management?

Strategic management is briefly the set of managerial decisions and actions that determines the long-run performance of a business. It includes environmental scanning (both external and internal), strategy formulation (strategic or long-range planning), strategy implementation, evaluation and control. The study of strategic management, therefore, emphasizes the monitoring and evaluating of external opportunities and threats in light of a business's strengths and weaknesses.

1. Environmental Scanning for the Egyptian oil & gas sector:

Energy will continue to play an important role in Egypt's economy in the coming decade. While oil exports have been declining as production has fallen at mature oil fields and domestic consumption has risen, natural gas exports are expected to become a major source of hard currency revenues over the next decade.

Oil

Egypt produced an average of about 631,616 barrels per day (bbl/d) of crude oil in 2002, down sharply from 748,000 bbl/d in 2000, but only slightly below the 639,260 bbl/d produced in 2001. Egyptian crude oil production had peaked at 922,000 bbl/d in 1996. Demand for petroleum products has declined slightly

since 1998, after rapid growth during the previous five-year period. This is due in part to the weakness of the economy, but also to reductions in subsidies for petroleum products consumption and the increased use of compressed natural gas (CNG) as a fuel for motor vehicles. Egypt hopes that exploration activity, particularly in new areas, will discover sufficient oil in the coming years to slow the decline in output. Egyptian oil production comes from 4 main areas: the Gulf of Suez (about 60%), the Western Desert, the Eastern Desert, and the Sinai Peninsula.

Refining

Egypt's nine refineries are able to process 726,250 bbl/d of crude, with the largest refinery being the 146,300-bbl/d El-Nasr refinery at Suez. The government has plans to increase production of lighter products, petrochemicals, and higher octane gasoline by expanding and upgrading existing facilities.

Natural Gas

In the early nineties, 189 discoveries were achieved, including 89 gas discoveries. Such discoveries made the Mediterranean a "sedimentary basin by international standard" resulting in huge development in Egypt's natural gas reserves, which amounted to over 37 TCF by the beginning of 1999; compared to over 17 TCF approx. in 1992 and 6.3 TCF approx. in 1982.

The rapid rise in natural gas reserves has led to a search for export options, which has become particularly important to Egypt's future international balance of payments due to the decline in oil exports. In late 1999, the Egyptian government stated that natural gas reserves were more than sufficient for domestic needs, and that foreign firms producing gas in Egypt should seek export customers.

By the rise of the new millennium, Egypt achieved a successful effort in the field of gas exploration as its proven gas reserves have reached around 62 TCF with probable reserves of 120 TCF. This encouraged the ministry of Petroleum to formulate a balanced strategy that satisfies the local market needs and opens new regional and international markets without trading off the future generation needs. Such sustainable development strategy shall achieve the national objectives that include: efficient utilization of the natural resources, economic development as well environmental protection.

2. Strategy Formulation:

The strategic planning process is used to help in ensuring that resources are used in an efficient manner, that new policies are well-designed, and that the necessary feedback is received from different parties -both public and private.

2.1 Gas Strategy Objectives:

In recent years, MOP has integrated the sustainable development principles into its strategy and management system. The priorities are economic efficiency, social fairness and environmental protection. The goals and objectives are:

- To Increase Egypt's reserves of crude oil and natural gas through the encouragement and support of onshore and offshore exploration activities.
- To Protect Egypt's resplendent environment through application of the stringent national and international environmental protection laws .

- To make the petroleum sector a major contributor to Egypt's national economy and a principal source of employment for Egypt's large and skilled work force.
- To adopt new technologies.
- To Support and encourage Egypt's private sector to take a more dynamic role in all the activities that the Egyptian petroleum industry has to offer.

The strategy action plans were the reengineering and restructuring of the petroleum sector to cope with the expanding activities of oil, gas and petrochemicals, to support the decision-making process and to improve the petroleum sectors capabilities. In order to achieve such goals the restructuring includes establishing new companies beside the existing Egyptian General Petroleum Corporation (EGPC) which has to focus on the oil activities, including exploration, production, transportation, and refining.

- The Egyptian Gas Holding Company (EGAS) was established to promote investment in natural gas activities, participate in LNG, gas transmission and the gas processing projects as well as Gas exploration and production.
- The Egyptian Petrochemical Holding Company (ECHEM) which promote investment in petrochemicals, facilitate the development of new projects ,establish and own petrochemical plants which will utilize natural gas as the main feedstock.

2.2 Strategic Priority

2.2.1 Local market

The ministry of petroleum is giving first priority to availing the domestic market requirements. A strategic plan is being developed to identify new policies that can accelerate the efficient local use of gas (e.g., evaluation of existing barriers and a review of the major economic and energy sector trends). Specifically, the aim is to assist in the development of policy and market-based solutions that can stimulate gas use in the industrial and commercial sectors. The Egyptian Natural Gas Holding (EGAS) Company, which oversees the development and growth of the gas industry, will play a leading role in this respect.

Developing **local markets** for gas can create new investment opportunities that stimulate economic growth, increase industrial competitiveness, create new jobs, and free-up crude oil for export. The gas demand estimates show an increase in the domestic consumption to over 3500 million cf/d by 2010, to increase gradually there after in order to cope with the requirement of electric power generation stations, as well as those of the industries and the industrial areas, presently on-stream or projected to be supplied with gas as a fuel and / or raw materials requirements for fertilizers, petrochemicals and iron & steel industries.

There are **main policies** and market initiatives that are being evaluated as part of the strategic plan. Each of these initial policy options will be analyzed in terms of their potential fit within the local market and their ability to generate economic and environmental gains. These preliminary policies and market initiatives include:

a. **Pricing schemes:** the subsidization of local energy prices is a major expenditure for the GOE- this includes the subsidy of fuel prices in the industrial and commercial sector. Potential new pricing schemes can be used to gradually and consistently move fuel prices over time towards the full recovery of economic costs.

b. **Cogeneration policy:** the feasibility of cogeneration projects is currently limited by a lack of a defined policy that allow for cogeneration units that operate in parallel to the electric grid and to buy-and- sell back power at an economic price. Previous market studies have estimated that operating in parallel can increase cogeneration capital costs by an average of 25% (due to the over-sizing of units). In addition, the inability of a cogeneration developer to sell their excess electricity back to the utility limits the financial viability of cogeneration investments and hinders their ability to achieve an appropriate thermal-to-electric ratio. The establishment of a cogeneration policy should be linked to the country's economic development plans in particular encouraging the use of cogeneration in new industrial cities or tourism zones that are geographically isolated areas.

c. **Market initiatives:** market-based solutions can be used to help increase the local supply of and demand for natural gas energy services and high efficiency technologies. One objective in the design of market initiatives is to develop solutions that can be revenue neutral to the GOE. Results from a market study conducted in a new industrial city indicate that LDCs can benefits from high-return investments that meet a growing demand for integrated energy services. To achieve revenue

neutrality, one potential option is to link the development of given investment incentive to new pricing schemes (e.g. funding an incentive from the potential gradual removal of fuel price subsidies).

2.2.2 Export market

The first step in developing the industry was to stimulate local demand. Along with developing gas fields, the government embarked on programs to encourage the use of natural gas as a cleaner alternative to gasoline. Initially, the idea was to use more gas domestically.

But since the late 1990s, foreign exchange revenues have fallen, while gas funds have been made at an accelerating rate. The government's way of thinking on petroleum, therefore, shifted. Timing and location have worked in Egypt's favor. While Egypt's oil reserves have been falling, so have North Sea gas reserves, the major source of gas to the Western European market, opening up a host of potential markets directly across the Mediterranean. "With the depletion of the North Sea, there are very few places European countries can get their natural gas from,"¹

Nowadays, despite new discoveries in the Western Desert, most of Egypt's oil fields have hit "middle age," with their output in decline. Combined with rising local demand, Egypt has found itself a net importer of many oil products, with imports expected to rise further in the years ahead.

Natural gas, though, is a whole other story. While fields in the Nile Delta area have been producing small amounts for local consumption since the early 1980s, recent discoveries at offshore, deep-water sites have put Egypt on the world map as an up-and-coming producer.

¹ explained Ian Kelly, vice president Mediterranean & Middle East for drilling company Global SantaFe.

Geologists had long been aware that a sizeable quantity of gas was sitting idly under Egypt's surface, but little thought had been given to extracting it, given negligible local demand and the lack of a viable export market.

“The gas is there, and everyone knows it's there. But it requires investment, and it takes time to get it out of the ground in commercial quantities,”² Unlike oil, which can be exported in barrels, but gas has to be either processed into liquefied natural gas (LNG) or transported through a pipeline. Both options require intricate, expensive infrastructure, but once set up are very cheap to run. In fact, the first returns on investment for Egypt's new gas infrastructure are just around the corner.

Initial Egyptian exports began in July 2003, where the pipeline will eventually be extended to carry additional gas into Lebanon and Syria, and possibly to further countries. Further stream for exporting Egypt Gas to Europe and beyond is currently under construction (Idku and Damietta LNG plant). As Damietta plant is scheduled to begin commercial production in late 2004 while Idku will begin in 2005. Gaz de France is to be the main off taker for Idku LNG project, having signed contract in October 2002 for 127 Bcf per year beginning in 2005. Spain and North America are the main off takers for train II WHILE Spain and North America as well as Asian will be the main off takers for Damietta plant.

2.3 Gas Strategy and uncertainty:

² a Cairo-based energy executive said.

As future is **uncertain**, all investments involve both risk and rewards. Uncertainty is simply that the return the investor anticipates through income and/ or capital appreciation may differ considerably from the realized return. This deviation of the realized return from the expected return is the risk and/ or reward associated with investing.

Hence, strategy formulation has to be associated with a situation analysis, which is the process of finding a strategic fit between external opportunities, and internal strengths while working around external threats and internal weaknesses (SWOT analysis). In the natural gas industry in Egypt in particular, a detailed scan of natural gas characteristics has to be identified in order to open the door for the proper planning and implementation processes.

Natural gas has now been recognized as a desirable fuel, but the main factors preventing rapid growth in its use are that Gas markets can rarely provide the degree of price certainty or volume that is available for oil. Gas project is made available mostly on long-term basis to a special purpose company; lack of liquidity to finance new investments, limited availability of energy services, and subsidized energy prices that do not fully reflect true economic costs. Moreover, very little gas is traded internationally and the locations of reserves are far from centers of consumption, and that the costs of gas transportation are relatively high. It may cost 10 to 20 times as much to move energy as gas rather than oil depending on the distance. Also, there is no “world price” of natural gas, as there is for coal and oil; the market is so small, and trading patterns is so inflexible, that each deal must be tailored.

Based on the natural gas characteristics, SWOT is used to establish a framework for gas project risk analysis. The analysis begin with analyzing the

project specific details and then continues to wider, often country specific concerns such as the political and currency risk and the viability of the local business institutions.

We will begin by examining how investment appraisal can cope with the fact that the future is largely unknown and that decision making has to be carried out on the basis of expectations. In an uncertain world, capital investment decisions have to be taken on the basis of expected project cash flows, which may or may not turn out to be the same as the cash flows that actually arise.

In the analysis of the handling of uncertainty in decision making, we shall use the two terms "risk" and "uncertainty" interchangeably. Although it is possible to distinguish between the two terms, there is little purpose in doing so for our present needs. Thus when reference is made to a risky investment decision, we are concerned with a situation where we are uncertain about that investment's actual future outcome.

Risk will arise because, when setting the framework of operations in the long-term planning process, Management is making a series of judgments about what the future holds for the business and how it will cope with changing circumstances. Some of the key decisions about the future relate to such matters are:

2.3.1 Economic risks which include the **demand** of natural gas which is a flexible fuel with many potential uses. Its highest-value uses are often where it substitutes for expensive petroleum products such as diesel fuel or kerosene.

In most countries, however, the small quantities of gas that would be required to satisfy such uses fully would not be sufficient to justify the high

initial costs of gas development and transmission. Larger volume- but lower-value-uses of gas are as replacements for fuel oil or coal in the power and industrial sectors.

Leaving aside for the moment the fact that total gas **supply** is constrained by fixed total reserves, the supply functions for gas look much like those for other goods that are subject to economies of scale. Potential production will rise in increments as new fields are discovered and developed and as new transmission pipelines are laid. At some point, however, the reserve constraint will become operative and production will plateau. The productive life of the last fields developed will determine the length of the plateau. For both technical and economic reasons (related to the life of gas-using facilities and thus the length of supply contracts), it is often 10-15 years. After that production falls off rapidly as the remaining fields are exhausted.

Weather variations always have an effect on natural gas price formation. The continuing seasonal cold weather across the world, has led to a strengthening of prices in both the spot and futures markets. The winter has developed into a colder than normal event. Further, the colder than normal temperature regime experienced so far will likely continue well into the balance of the winter. If that scenario happens, healthy storage withdrawals will likely put added upward pressure on wholesale prices.

The economic **price** of any good- gas included- is determined by the intersection of its aggregate demand and supply curves. For many goods, that value is simply the price resulting in an open market- place through the bargaining of many buyers and sellers. For goods that are traded internationally, such as oil or wheat, the economic price in a small country is

often determined almost independently of the local demand and supply conditions.

Gas must be competitive with a whole range of other fuels in different uses, and this often tempts governments to try to cream the market by applying a complex, use-specific array of gas tariffs. Unless these are perfectly calculated and adjusted every time other energy prices or demand factors change, they provide little incentive side ring a switch to gas. In many developing countries, not only gas prices but the full range of gas development questions need to be addressed. These include the allocation of gas among competing uses, the sequence of field development, the reduction of flaring, and the speed of depletion, to name but a few.

There is an important **environmental premium** attached to gas as it is a cleaner fuel than oil or coal. Under such conditions, it is not surprising that natural gas prices vary widely around the globe or that one country will be heavily dependent on gas for its electricity generation while a neighboring country will limit its use of gas to fertilizers and petrochemicals production. Such seeming anomalies result from the mixture of technical and market forces that make the economics of natural gas such a varied and interesting subject.

Unfortunately, there are several reasons why the economic price of gas generally cannot be so easily observed. First, it is not a widely traded commodity and, owing to the high transport costs involved as well as the presence of competing imports by pipeline to the major consuming markets, the export of LNG is not an economically viable option for most countries. Second, although oil is a traded good, gas is not a perfect substitute for all petroleum products. In some uses, such as home heating and electricity generation, the two are closely substitute; but for most transport uses, gas is

only an oil substitutable at a prohibitively high cost. Third, in domestic markets for gas, political and economic factors have generally led to price regulation because of monopolistic production and distribution. In many developing countries, the demand side is also characterized by an effective monopoly held by the electricity company, which often accounts for more than three-quarters of purchases. Thus, whatever price bargaining takes place is often between two sellers. If unregulated, the outcome will reflect their relative bargaining skills and political clout rather than the underlying economic parameters.

Finally, the economic price of gas may not be immediately observable arises because its total stock is fixed. Gas is a depletable commodity. A country has a fixed stock, and consumption of a BTU today means forgoing the consumption of a Btu at some future date. The value of this forgone consumption has been called many things in the economic literature: depletion, premium, royalty, user cost, net price or resource rent. We use the term depletion premium to refer to the present value of the forgone consumption. The key pricing distinction between a depletable and a renewable resource is that the opportunity cost of the former will include a depletion premium as well as its production cost.

The problems of uncertainty are compounded together with changes in the fiscal and economic environment within which a business operates; in particular inflation may have an important impact on the outcome of a project. Management should have a strategy for ensuring that the business takes account of inflation in its pricing policies etc., but there may be contractual or political factors which might inhibit that. The biggest problem that it poses is, however, how one forecasts what the rate of inflation will be in two or three year's time.

2.3.2 Financing risks attempts to balance the reward and risk elements in the way in which the business is financed. In general, it is likely to be the case that the higher the level of debt that is used to finance the business, the lower will be the cost of capital and the higher the gearing effect on the return to shareholders. However, at the same time, the more the business relies on debt finance, the higher the risk of business failure because of its fixed commitments to pay interest, etc. even more critical is the great reliance on short-term credit. This can be withdrawn at any time leaving the business in a position where it cannot meet its commitments to creditors. This is perhaps the greatest reason why so many new small businesses fail.

These risks endanger the viability and sustainability of the project through excessive construction and operation costs, shortfall in revenue or the margin caused by price and market risks and through uncertainty about safety and transferability of investments and returns.

The Technical design of **ownership structure**, like conceptual design, is arranged in conjunction with the financing and security structures and deals with the type of company (joint venture, partnership or single-purpose stock company); place of incorporation or establishment; and so on. These arrangements should be devised to:

- optimize the sponsors' tax position, taking into account both host and home country tax rules;
- achieve the desired risk-sharing objectives of the sponsors;
- maximize the level of non-recourse financing at lowest cost; and
- Provide protection for individual sponsors against default by other sponsors.

The ownership structure should also include a choice between whether each partner is to be individually responsible for financing, as is typical in oil projects, or whether finance is to be raised for the venture as a whole ("common financing") backed by several undertakings of the sponsors and appropriated inter-partner default clauses. Common financing is normal in the power sector.

2.3.3 Commercial risk that includes cost overruns, delays, and shortfalls in project revenues caused by uncertain sales and prices. Commercial risk is considered to be under the control of project sponsors. Natural gas project risks are allocated to the different parties involved through numerous agreements and contracts included in the security package. These documents are aimed at protecting the interests of the sponsors and, more often, at providing assurance to lenders that risk will be managed to a reasonable extent.

From a lender's point of view, three questions need to be answered. First, can the project be constructed and commissioned within the planned schedule and budget? Second, can the project generate the projected net revenue? Third, can the net revenue be allocated and paid back to the lenders and investors according to the project agreement? In connection with these questions, lenders want to know who would be responsible for damages in the event the project fails in any of these areas.

Most investors and financiers are convinced that commercial risks can be effectively addressed when the time comes, but they feel that political risks cannot be controlled by anyone, Thus they do not take the proposal seriously until they receive some assurance that

political risks are manageable. The issue of political risk should be addressed at the outset of project preparation.

Commercial risks can be mitigated through two distinct avenues. First, sponsors need to reach an agreement with the government of the host country or with governmental entities regarding some aspects of marketing the project's output. The government's role varies depending on the country and the type of project.

For gas projects, the government's role is substantial because most of the output is bought by a state entity or is sold at prices regulated by the state. Therefore, project sponsors need to secure take-or-pay or throughput agreements with the state entities. The government needs to guarantee the credibility of the state entities or to provide assurance that it will permit any necessary increase in energy prices. Securing government guarantees and agreements takes a relatively long time, particularly in countries that lack clear precedents.

The second avenue involves negotiating with contractors, equipment suppliers, operating companies, and so on, to determine their willingness to compensate for damages if they fail to fulfill their obligations. Although technically complex, this process is normally accomplished efficiently as it is driven by commercial incentives.

Project financing should be associated with economies of scale to generate its benefits to the stakeholder and all those interested parties. Project financing can get even more complicated when the project is built in a different country where many more parties will be involved and political risks arises alongside the commercial and other risks (as we'll discuss latter in our presentation). Moreover, Regional or

international projects faces a higher degree of risk as it remains exposed to risk for a much longer period of time.

Many businesses have relied on this philosophy over the years and it has seemed to serve them well. Today, however, it is being questioned for a number of reasons, perhaps the most persuasive of which is that the very diversity of activities makes it difficult for top management to control everything that is happening, that there is a limit to the extent to which one can stretch management skills.

2.3.4 Political risk that includes expropriation of assets, civil unrest, and foreign exchange inconvertibility and these factors are not under the control of project sponsors. Moreover, the lack of a well-established legal, institutional, and regulatory systems and policies makes it possible for governments to take unpredictable actions that can substantially affect the cost and revenue of natural gas projects.

Political risks can be mitigated through a variety of measures, including different forms of guarantees and the involvement of certain types of partners—for example, a key state entity or powerful local individuals and companies. Formal guarantees can be provided by host governments and by multilateral and bilateral agencies. Often, rather than choosing one form of security over another, sponsors will try to combine them to get the most comprehensive coverage at the lowest possible cost.

2.3.5 Technological risk that is related to continued technological innovation. It is increasingly possible to obtain both economic and environmental benefits from use of natural gas and this trend is expected to accelerate as gas-based

technology for power generation, space heating, chemicals manufacture, and road transport continues to advance.

The natural gas industry faces new challenges in a highly competitive and globalizing economy. First, the ability to source commodities and finished goods from anywhere in the world has highlighted the important role played by domestic transportation systems in international supply chain structures. Second, changing trade patterns impact directly upon the nature and extent of the Egyptian Natural gas transportation system.

Natural gas Industry is also confronted with rapid technological change and associated risks. Delays in adapting to rapid technological change may create problems that threaten to put Egyptian companies at a competitive disadvantage.

In transportation, the dilemma of risk management is pronounced because of long innovation cycles and infrequent breakthroughs. In Egypt, these “natural” barriers to innovation have been exacerbated by a regulatory environment that offered few incentives to innovate producing a culture of resistance to innovation in the freight transportation services industry.

On the whole, however, the Egyptian natural gas transportation services industry is playing catch up to our competitors when it comes to technological innovation. The reasons are varied, but many relate to the absence of strong market incentives to be innovation leaders.

In an open competitive industry, one does not normally expect a noticeable lag between the availability of a cost effective technological advance and its implementation. In Egyptian natural gas transportation, however, lack of competition, as well as high entry costs and high levels of

operating complexity, has lead to resistance to innovation and delays in adopting new technologies. In other words, transportation innovation involves a high degree of risk at each stage of the innovative process, including:

- the design and construction process (development risk);
- user acceptance of new technology (acceptance risk).

To meet the high risk involved in exploring the potentials of frontier areas or the ultra deep water, several phrases in the model agreement are added to encourage the use of the high technology available at the international companies R & D centers. One international bid round or more is scheduled on a yearly basis in order to accommodate all the open areas available in the gas prone areas in the Mediterranean Sea, Nile Delta and Western Desert, in order to secure continuous aggressive exploration campaigns capable of revealing the most likely reserves into proven.

However, Technological change presents opportunities. New technologies may lower costs, increase efficiency, and create competitive advantages for firms, while simultaneously providing solutions to societal concerns over safety and the environment.

3. Strategy Implementation and Control:

Strategy implementation is a process by which strategies and policies are put into action through the development of programs, budgets, and procedures. The management of a business will always be faced with making decisions about the future of that business. While one might have a view of the outcome of some future events, the actual outcome may turn out to be quite different for a number of reasons- technology may change, new competitors emerge, governments may change policies, and consumer preferences change, and so on.

Since 1979, Egypt through the Ministry of petroleum tried to resolve several important issues to encourage gas development in the country. The most principal issues were the following:-

- Production sharing agreements between the government and the concessionaire as an incentive to encourage International Exploration Companies to invest in gas exploration and development.
- Promoting the gas utilization in the local market by applying cost recovery and profit sharing of gas.
- Commercial terms: base price and indexation for local market.

Since the year 2000, There are some of the new issues being carried out or negotiated with the partner such as substantial amendments to the current Egyptian production sharing model agreement which is the first challenge to cope with the needs of the producer (Concessionaire) who aims at getting fair profits to compensate for his exploration and production risks, and the buyer who expects a compatible and reasonable price of gas. Both EGAS and EGPC are studying the proposed amendments with the supervision of the Ministry of

Petroleum who is trying to stimulate gas developments with more attractive fiscal terms.

Moreover, continuity of the research and exploration operations in order to discover additional natural gas and to develop the achieved discoveries is underway. Another approach in value adding projects, as butane and condensates production as a result of increasing gas production to participate in covering the increasing domestic consumption of the butane and the middle distillates and maximize benefits of natural gas production and reserves.

Conclusion:

- **In conclusion**, the main benefit of the strategic planning process is that it provides MOP decision-makers with the vehicle to determine what are the most pressing policies and market issues to tackle and help ensure that the efficient use of natural gas plays a key role in achieving sustainable economic development.
- The whole process has to start with an immense and detailed market study and data base structure to form the base for the gas master plan. This study has to cover all economic and technical issues with regard to the natural gas industry in particular (both national and international), and the world's economic and political scanning in general. These studies, or so called SWOT analyses is an on-going process that has to continue before, during and after the strategy formulation and implementation and form the base for the preventive and corrective actions through the strategy life time.
- Strategy planning and implementation will dictate on decision-makers the essentiality of restructuring part of the petroleum sector in general, and the natural gas sector in particular. Hence, decision makers has to meet challenges that will arise as an outcome out of this process regarding employment rate and top management shifting, cultural resistance...etc.

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