

LINKING STRATEGIC PLANNING TO PERSPECTIVE PLANNING
FOR THE NIGERIAN PETROLEUM SECTOR

Mr. Chairman
Planning Colleagues
Ladies and Gentlemen

The Nigerian petroleum sector plays two very important and interlocking roles in the nation's economy - supplying cheap and reliable energy to fuel the domestic economy and earning over 90% of foreign exchange available from exports. Both roles are critical to future economic development because the right energy tradeoffs are essential to optimize resource allocation and to build a productive, competitive domestic economy while foreign exchange itself is the critical ingredient for overall economic development through funding investments in capital assets, technology and infrastructure.

Both national planners at the macro level and industry planners at the micro level have challenging and complex tasks, which overlap and require linkage for four reasons. First, the planning horizons overlap because strategic planning looks ahead 5 to 20 years depending on the specific business and projects involved. Second, planning takes place against a moving target, since the industry is driven by dynamic markets and continuously evolving technology, and therefore planning must deal with conditions of considerable uncertainty and frequent replanning. Third, the other participants in the industry, both countries and private companies, are not sitting still, thereby creating the need to carefully study their moves and to position the Nigerian petroleum sector pro-actively to gain competitive advantage within a global industry undergoing fundamental restructuring. Fourth, and lastly, petroleum sector strategies and policies must be established within the framework of a political process, which is subjected to somewhat emotional and uninformed pressures from the public and interest groups, thereby putting a premium on thorough, systematic and objective analysis and effective planning tools and techniques.

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As suggested by today's title, these four reasons combine to make imperative the linkage between national planners responsible for perspective and development plans and strategic planners within the petroleum sector, particularly at NNPC. Furthermore, this linkage should take place not just at the time plans are being developed but should be a continuous process so as to meet the demands of constantly changing market environments and industry economics. Moreover, the key policy makers throughout government and the petroleum sector need to be fully and continuously informed on industry developments and furnished with accurate and objective information to assist their decision making.

The entire planning and management of the petroleum sector is given even more importance once its basic mission is considered. The fundamental aim is to manage a non-renewable resource in such a way that the nation develops permanent earning power during the period that this wasting asset is available to fund economic development and create sustainable growth. In so doing, two short term temptations must be avoided - (a) to favour consumption in place of productive capital investments and (b) to use crude oil uneconomically in preference to natural gas, water, coal and other alternate energy sources. The highly complex political and economic issues involved in the petroleum sector can only be sorted out effectively if this mission is clearly defined and accepted; then all levels of planning throughout government and the industry should be ordered accordingly.

The stakes are high but so are the rewards. We are dealing with a sector currently generating N30 to N40 billion yearly in revenue, which had previously reached those levels in dollars when the market was buoyant and the Naira strong. We are also dealing with a stream of annual capital spending of about N10 billion annually. In strategic planning terms, we are dealing with the "cash cow", which must be well fed so as to provide nourishment to the rest of the economy as it progresses towards maturity. As planners, we are dealing with numbers that really make a difference and merit our closest attention and our best minds to be at work.

Taking the above comments into account, I have divided this paper into six separate sections, as follows -

- (1) understanding of market forces at work,
- (2) review of the Nigerian planning environment,
- (3) characteristics of petroleum sector planning,
- (4) tools and techniques for petroleum sector planning,
- (5) petroleum policy issues to be addressed, and
- (6) linkage of national with industry planning.

MARKET FORCES AT WORK

From a planner's viewpoint, the history of the petroleum industry teaches that market forces work. Petroleum is a commodity - albeit the most important of all commodities - and therefore subject to all of the traditional supply, demand and pricing forces we normally associate with commodities. The planner's focus logically must be trained on understanding petroleum supply and demand and the resulting free market forces that are at work. The planner must keep this focus on market forces even though the real world is not acting as logic says it should. As we shall see, this takes considerable discipline and objectivity to accomplish.

The reason for this view is that petroleum markets have intermittently operated as free markets. The capital invested and the economic stakes have always been so high that the major players have always tried to control markets and prices. This is the primary reason why oil companies organize as integrated operations which optimize product value along the entire chain from exploration and production to supply and distribution to manufacturing and marketing. Producer governments have likewise pursued their interest in high and stable prices and have acted accordingly. We are familiar with OPEC's role today but we should not forget the previous similar role of the Texas Railroad Commission (OPEC's predecessor). Arrayed against these upward market forces are the rest of the world - consumers, consuming countries, and alternate technologies and sources of energy. The battle is continuous and never won; only the relative positions of the players change and major changes in turn cause major shifts in market prices.

From the planner's viewpoint, it is necessary to take into account the relative positions of the players and the long term market forces while forecasting for the particular business or country planning situation. In recent years, forecasting has become a nearly impossible task. All planners in this audience are fully aware of the tremendous swings in revenue experienced by Nigeria in recent years and the dramatic impact this has had on government plans, budgets and spending programmes. The same swings cause fundamental adjustments throughout the entire petroleum industry. The result is an industry planning under conditions of uncertainty and highly dependent on good forecasts.

Arthur Andersen & Co. joined with CERA recently in 1984 to study the forecasting problem. A quotation from "The Future of Oil Prices: The Perils of Prophecy"⁽¹⁾ will help put the problem in perspective:

"The price of oil is the most important commodity price in the world, and the one subjected to the closest scrutiny. Yet for fifteen years, oil prices have stubbornly refused to behave as predicted. The perils of prophecy have created much skepticism about forecasting, as well as concern about how to plan in the energy industries. But despite the skepticism -- and in the face of the tremendous uncertainty about future oil prices -- we found nearly unanimous agreement today within the oil industry and financial community regarding the future of oil prices. We interviewed over 125 price forecasters and executives who use forecasts. Nearly all expect falling real oil prices for the next several years, to be followed by a period of rising real prices. A strong consensus now exists that oil will be more valuable in the 1990's than at present.

The costs of incorrectly anticipating long-term oil price behavior have in the last few years proved staggering, both for companies and for countries. We estimate that in 1980-81 alone, on the order of half a trillion dollars was invested around the world on the assumption that oil prices would continue to rise throughout the rest of the century. Some of this investment remains highly viable under today's very different expectations. A significant part of it will, however, add up to be one of the most expensive business errors ever. The perils of prophecy are already evident in the current troubles of the oil and gas and oil services industries throughout the world; in the growing number of non-performing loans in North America, which have caused or threaten to cause the collapse of major financial institutions; and in the mountainous debt of oil-exporting countries."

(1) The Future of Oil Prices: The Perils of Prophecy, by Arthur Andersen & Co. and Cambridge Energy Research Associates, 1984.

"Today's consensus could also pose major risks. We have found that since modern, long-term oil price forecasting began in the early 1970s, consensus has been the norm -- and, in each case, the consensus proved incorrect. We have identified five distinct periods of consensus predictions for future oil prices.

Our research shows that the current consensus could be overthrown by three key factors:

- New forces at work on energy and oil demand. These are poorly understood and are receiving inadequate attention. Oil prices and the oil market remain vulnerable to a new "demand surprise."
- Oil as a commodity. The world oil industry is undergoing a basic structural revolution, characterized by de-integration. These changes point to a fluctuating oil price and will have a major impact on the way the market operates and the profitability of investments.
- Geopolitics. Despite the limited impact of the Iran-Iraq war, the disposition of oil reserves around the world virtually ensures that the oil market will, over the longer term, be vulnerable to political upheavals.

The ability to analyze and interpret world oil market developments has improved a great deal since the 1973 embargo sent shock waves throughout the industry and international economy. Very important lessons have emerged concerning the limitations on what forecasts can deliver in the face of the wide range of uncertainties and how misleading dependence on single-line forecasts can be. We conclude from our analysis that the real challenge is not to try to make forecasts more "accurate" through technical advances. Rather, the focus should be shifted to developing better ways to use forecasts in the planning process. In particular, the task is to uncover and appraise the uncertainties inherent in the forecast, and to develop planning mechanisms that help to anticipate and prepare for contingent developments.

In the course of our research, we found that some of the most successful companies have developed such techniques. Putting uncertainty on center stage -- in a disciplined and creative way -- can help overcome many of the problems identified in the forecasting process. This, in turn, can help to make companies less vulnerable to turbulence and surprise."

Market developments since 1984 have proven even more dramatic and further validated the study conclusions. In a later section, we'll briefly review the techniques of scenario and contingency planning along with stressing the need for models and continuous plan updating as strategic plan assumptions change. Let me simply restate the key messages that the petroleum industry is driven by dynamic free market and technological forces which are stronger than industry and regulatory attempts to manage prices and these competing forces create a high degree of uncertainty as well as difficulty in planning and forecasting.

NIGERIAN PLANNING ENVIRONMENT

The Nigerian petroleum sector is a highly regulated environment. Its domestic role is carried out almost entirely within a framework of government established prices. While the international role is almost completely open to global market forces, it too is highly regulated and constrained by funding limitations. The end result is a petroleum sector where production of crude oil is driven by global market forces but generally the remaining petroleum sector is not driven by market and profit forces due to the way pricing and capital spending decisions are taken.

Planners must therefore either cope with, or seek to change, a planning environment which works systematically to wrongly allocate investment resources throughout the petroleum sector and the entire economy, due to the wrong signals given by domestic petroleum prices which are not permitted to change with global market forces.

Lets review the major problem areas starting at the highest level - overall Nigerian energy policy and look at each area from a planning and policy making viewpoint.

Overall, energy planning must take place within a national economic model, which even in simplified form must deal with 20 to 30 sectors and 500 to 1,000 variables. The energy sectors would certainly include coal, water, solid fuel and petroleum - which would then break down further into oil, natural gas, and downstream manufactured products. Most of the energy sources would likewise provide inputs into electricity generation and distribution.

Several variables are inherent in energy planning including the extent of energy intensity (consumption per unit of GDP), conservation trends, price elasticity, alternative fuel substitution, and intersectoral linkages. Energy supply/demand forecasts must be closely linked to growth projections for the entire economy as well as planning export markets in line with the global supply/demand situation.

Given the export potential and foreign exchange earning capacity of crude oil (which is a relatively short lived wasting asset in terms of reserves), crude oil should be priced in the domestic market in such a way to encourage conservation (e.g. discourage consumption) and to promote the development of natural gas (where enormous reserves exist) as well as alternative energy sources (coal, water, electricity, etc). This necessity would be evident to the perspective planner taking a 20 year view as well as the strategic planner seeking the funds to maintain, or even enhance, Nigeria's present roughly 20 years crude oil reserves and roughly 2 million bpd production capacity. In actual fact, crude oil is sold to the domestic economy at a fraction of its global market price, thereby subsidizing consumption and creating disincentives for natural gas and other alternative energy sources.

Low priced refined products also cause serious foreign exchange consequences which hold back Nigeria's development. First, it causes smuggling to neighbouring countries where product is resold at up to 10 times the Nigerian pump price. The resulting foreign exchange earnings are lost to Nigeria and the process undercuts the collection of excise taxes by neighbouring governments. Second, the low price of kerosine expands consumption and unfortunately requires kerosine imports at world market prices to fill the demand. National planners should, as a minimum, provide continuous reports to decision makers on the financial impact of such areas of sub-optimization of the nation's economy.

Natural gas also is particularly critical due to large reserve potential, current wasteful flaring of associated gas, and ability to free up crude oil consumption for export. Low petrol prices (e.g. fuel oil) are a major barrier to development of natural gas and cost Nigeria considerable foreign exchange earnings. Initiatives being taken now to establish a natural gas policy will be very positive and national planners should give priority attention to the economic exploitation of this enormously important resource.

To do so, their attention must also focus elsewhere in the energy sector because NEPA will be a major consumer and its ability to pay will largely determine the economics and pace of development of natural gas. Once again, the regulatory system will need attention and, in this case, it will require setting of realistic electricity tariffs in such a way that natural gas development is properly encouraged.

Two further planning issues should be noted in the context of NNPC, NEPA, and other energy related enterprises going commercial. These issues are funding and capital spending, which are inseparable companions in planning for any capital intensive industry.

Capital spending decisions should require comprehensive market studies and be justified based on economic criteria which consider free market prices rather than subsidies which can give false signals. Funding decisions should be firmed up on a multiple year basis so as not to delay completion of approved projects. Moreover, the uncertainty and risks associated with the petroleum sector require a conservative debt/equity structure and avoidance of excessive debt funding. The objective for commercialised public enterprises would be to make them self funding and independent of government guarantees and support except for major new projects (particularly if starting up a new industry such as petrochemicals). Increasingly, project funding tied to project revenues and private equity capital should be considered because they involve increased economic discipline as a by-product of such funding arrangements.

Both national planners and industry strategic planners need to combine forces to make sure appropriate funding and capital spending decisions are taken and properly executed. There is probably no single area where their combined weight can more positively impact the economics of the petroleum sector.

In my view, the overriding issue for perspective planners will be to move the Nigerian petroleum sector towards a free market environment. The potential for proper resource allocation and increased earnings (particularly of foreign exchange) are simply too attractive to ignore, particularly since the challenge is to manage a wasting asset in such a way that permanent earning power is developed as a sustainable replacement.

PETROLEUM SECTOR PLANNING CHARACTERISTICS

Our discussion thus far has focused on the macro issues from a national planners viewpoint, so lets now shift to the still high level planning at the micro level which is accomplished by strategic planners.

Planning must respond, or cope with, the rather unique characteristics of the petroleum sector. Some of these characteristics have been touched on above but a more complete summary is useful before discussing specific tools and techniques.

We have seen that the global industry is driven by dynamic market and technological forces, that petroleum competes with alternative energy sources and is highly interlinked with many sectors of an economy, and that supply/demand and price forecasting are difficult to accomplish thereby introducing considerable uncertainty plus magnifying already substantial risks.

The industry is extremely capital intensive and, due to the wasting asset and changing technology nature of such investments, there is a continuous need to replace and enhance existing investments as well as expand to exploit new demand and markets. While revenues may look high, substantial reinvestment must take place continuously to replace and renew earning power. Projects have long lead times to complete and must be tied closely to market demand. Excess capacity means lost returns on capital while capacity shortages cause lost revenues and markets (much like an empty seat on an airplane). Funding, capital spending, and cash flow management quite logically occupy centre stage in an oil company.

Technicians (market analysts, geologists, petroleum engineers, refining and chemical engineers, etc) must play a dominant role in petroleum industry planning (because there are highly complex elements for most major decisions) but planners with common sense can also contribute enormously by raising basic market, pricing, financial and economic issues.

Exploration and production involves the highest degree of risk as well as return. The planning cycle must be up to 10 years ahead due to the lead time needed to prove up concessions, carry out exploratory drilling, and tailor development drilling to production and reserve requirements. Moreover, good conservation practices would encourage significant workover, recompletion and secondary recovery investments in order to optimize ultimate recovery from every producing zone and field. Planners will find that a balancing of reserve levels and production capacity versus future market demand is needed since investment resources can be committed either too soon or too late thereby causing the losses from excess or short capacity noted above.

Gas investments must typically look 20 years or more ahead with critical elements being the securing of markets based on economic prices which permit the raising of funds to finance major investments in pipelines, processing facilities, LNG tankers, etc. Contrary to conventional wisdom which tends to regard gas as free and readily marketable, the investments in all phases of the gas industry are enormous and very inflexible. The right decisions must be made at the start because subsequent modifications are either impossible to make or very costly to take corrective actions. Gas projects almost always involve long term contracts negotiated before, and supporting, the related funding contracts. When regulatory prices are involved, it is particularly crucial to have firm, pre-determined pricing arrangements agreed to before major gas projects are approved. Depending largely on market and pricing commitments, substantial debt funding can be available for major gas projects. In Nigeria, planners must particularly face the problem of funding imported capital equipment with foreign debt for natural gas to be sold in the domestic market for Naira.

Downstream operations (refining, pipelines, petrochemicals, marketing, etc) are no less complicated but generally somewhat less risky or uncertain depending on market characteristics. Historically, regulated markets have produced both windfall profits and major losers because such markets have periodically been subjected to free market forces. Regulated markets create misallocation of investments and rather uneconomic capital investments. Furthermore, consumers also make related uneconomic

investments (such as low petrol prices leading to gas guzzlers and disincentives for public transport). Deregulation therefore tends to cause a substantial restructuring of both industry and consumer investments, including powerful impetus behind fuel conservation during rising markets.

Perhaps the U.S. provides the best example of energy waste which was caused largely by cheap energy policies particularly for crude oil and natural gas. The growing dependence on imports and the consequent drive towards energy efficiency in the U.S. are particularly relevant to planners analyzing the overall supply/demand/price situation. The by-product of such research (particularly if contrasted to Japan's experience) may well be even more valuable for national planners in terms of charting Nigeria's long term energy and regulatory policies.

Perhaps the petroleum sector's future will still be politically guided by artificially low refined products prices but at least national planners can point out the extent of the losses and misallocated resources involved.

PLANNING TOOLS AND TECHNIQUES

We've mentioned strategic planning several times without providing definitions or discussing it in depth. Since this discussion must remain outside the scope of this paper, I have attached a previous article which should provide the necessary background for the interested reader.

Integrated oil companies (such as SHELL, EXXON or NNPC) must have a clearly defined mission and overall strategic direction if they are to survive and prosper in today's global market environment. Strategic planning fills this requirement and provides the support structure for all capital spending, budgeting, reporting and analytical systems which assist in managing operations within the established strategic direction.

The process starts with clear definition of guiding policies for -

- . required rate of return
- . risk and diversification
- . debt/equity structure
- . degree of integration
- . market penetration
- . pricing guidelines

Strategic plans are typically prepared for five year horizons (with various projects involving up to 20 year horizons) and revised annually. Annual revision keeps the process "evergreen" and lets top management continuously adapt to changing market conditions.

Due to the nature of the industry, capital spending is an integral part of strategic planning. Capital spending projects must go through a rigorous justification process. In fact, the petroleum industry largely "fathered" the techniques of discounted cash flow, internal rate of return, payback period, etc. which are rather standard capital evaluation techniques used throughout industry today.

Each major capital project typically goes through three steps to obtain final approval. First is to get admitted to the strategic plan which requires rather high level feasibility studies, including indepth market analyses, overall engineering and technical evaluation, and basic financial and funding analyses. Second, further indepth study must be completed in order to progress a project into next year's budget. Third, project approval and final commitment to go ahead is based on detailed plans, including final tenders, and final financial analyses particularly as to required rates of return and assured funding availability. This final step is frequently identified within the industry as AFE approval. AFE stands for Authorization For Expenditure and encompasses the summary form and all supporting documentation required to present a project for final approval. Since funding must be fully assured before AFE signoff occurs, approved projects can typically proceed from start to finish without interruption or delay.

The three step process was developed to cope with the constant changing environment and high uncertainty and risk inherent in the petroleum industry. It provides top management with the opportunity for progressive approval of a given project in the light of current circumstances and market forecasts. It makes sure cash is managed for optimum return and risk balancing by rationing capital spending through making projects compete against each other. This, in fact, is the great strength of an integrated oil company in making sure scarce resources go to the most profitable opportunities. The process then assures the lowest cost project completion by making funding a non-issue once the go ahead on an AFE has been given.

There are two other highly useful techniques to deal with uncertainty. The first is scenario planning (where SHELL has made a particularly strong contribution) and the second is contingency planning.

The attached reference list includes particularly useful material from SHELL. For today's purpose, however, I would like to quote briefly from a useful publication from The Conference Board(2) which describes planning with scenarios as follows:

"An esoteric term a few years ago, a scenario is, very simply, a description of a possible, or probable, future - in other words, a forecast. Frequently used in the plural sense by planners, the concept of scenarios conveys projections or forecasts of the future with various possibilities, rather than a single set of conditions. What is loosely called a scenario today is a far cry from the dictionary definition of "the outline or synopsis of a play; a screenplay; a shooting script." In the late 1960's, Herman Kahn and Anthony Wiener defined scenarios in their book, The Year 2000, as "hypothetical sequences of events constructed for the purpose of focusing attention on causal processes and decision points."

In the world of planning, "scenario" has been defined as a set of events apt to occur in the future that bears on organizational performance. One firm recently defined scenarios as "qualitative descriptions of what the company might be at some specified time in the future. They enable an organization's management to reach consensus on the kinds of business it would like to be in and the way (style) in which it would like to conduct [this business]."

(2) Planning Under Uncertainty: Multiple Scenarios and Contingency Planning, The Conference Board, 1978.

"Purpose of Scenarios

Multiple scenarios offer ranges of the future that would be otherwise circumscribed by a single set of assumptions. The latter, a standard element of corporate planning, makes small allowance for unexpected or less probable futures that may seriously affect plans. The scenarios written for the modern corporation's planning exercise extend these assumptions to include other possible - although less probable - futures.

They thus allow an examination of several options or risks that might not have been considered in a picture of a single future environment. And modern technology stands ready to aid in utilizing this new development. A number of planners participating in this study commented on the ease of making "runs" on the computer that can quickly assess the results of many different kinds of possible strategies and actions."

"Despite the purported intent of furnishing alternative assumptions for planning, the importance of scenarios in management lies principally in their ability to answer other needs that uncertainty creates, many planning executives state. Specifically, scenarios are intended to raise awareness in managers and to avoid surprise. Alternate scenarios broaden the outlook of managers to the external forces that shape the future of the company and sensitize them to their vulnerabilities and to the opportunities that lie within other possible futures. In some cases, scenarios serve as a springboard for contingency planning."

Contingency planning, on the other hand, has a different and supplemental purpose. Again quoting The Conference Board publication -

"Corporate planning is conventionally based on an expected set of events or circumstances. These so-called assumptions regarding the environment - economic, social, political, market and competition - plus the appraisal of the company and its position vis-a-vis the environment, are the foundation upon which corporate strategies are built. Generally, however, provision is not made in the traditional planning process for unexpected events or conditions - the remote possibilities, not the likelihoods. These are the assumptions on which contingency plans are developed.

Simply stated, contingency planning is the preparation, in advance, of a course of action to meet a situation that is not expected, but that, if it transpires, will have a significant impact on the firm. A contingency plan has also been defined as one that is devised or put into effect when an unforeseen event actually occurs. It is not, in the words of one planner, a "means of second guessing predetermined objectives ... an escape clause" for not meeting planned objectives.

Purpose and Benefits of Contingency Planning

Contingency planning attempts to avoid surprise - the hobgoblin of planning. When crises and emergencies do arise, when swift decisions and actions are demanded, a plan prepared in advance - when time is not critical - eliminates scrambling for response."

My experience in Nigeria leads me to suggest that perspective planning and annual federal budgeting could both benefit from these two tools. Scenarios would provide the overall perspective on future oil markets while contingency plans would provide the ability to manage the economy effectively under inevitable conditions of uncertainty.

It would be particularly useful at the national level to make revenue forecasts of crude oil exports on a conservative basis with any excess or shortfall going into a contingency, or residual, fund which is maintained and invested in foreign exchange.

The last area of tools and techniques to discuss is modeling. We have previously introduced the topic by dealing with the need for an overall national economic model, with particular emphasis on the linkages within the energy sector.

A similar model should be prepared for the entire petroleum sector with two major segments being (1) the joint venture production segment (roughly corresponding to NAPIMS - the National Petroleum Investment Management Services responsibility within NNPC) which covers the upstream industry aimed at crude oil exports and (2) the remainder of NNPC which operates in both the domestic and export markets.

Both of these "macro" models for NAPIMS and the rest of NNPC can in turn be supplemented by additional models and linear programs (LP's). The petroleum industry lends itself to simulation (through models and LP's) because it is a process industry in which production, transport, processing, and marketing options must be continually adapted to marginal costs and prices which are continually shifting with market changes. The entire process is generally handled by strategic planners and staff planners in charge of "supply and distribution" as well as planners within the individual operations (e.g. business units).

There is considerable scope for national planners to link up with planners throughout the Nigerian petroleum sector. The process of modelling and the analyses of supply/demand/pricing are continuous in nature. The major global and domestic market shifts create opportunities as well as needs for such linkage and updating of the information bases which support major energy and petroleum policies and decisions. The key role of planning tools and techniques is, in fact, to provide objective and useful information to assist the decision process at all levels of government and petroleum industry management.

PETROLEUM POLICY ISSUES TO ADDRESS

Lets now briefly recap and add to the key issues previously raised along with organizing them under the following categories:

- . national energy policy
- . petroleum sector policy
- . exploration and production
- . natural gas
- . downstream manufacturing and marketing
- . private sector

National energy policy must consider the relative development of alternative energy sources in light of both the domestic economy and exports (e.g. foreign exchange earnings). Key issues from the petroleum sector viewpoint would include -

- . degree of conservation of crude oil (in order to optimize reserves and foreign exchange earnings) relative to development of natural gas and alternative fuels to serve domestic market demand.
- . tradeoff between regulatory and free market pricing systems in light of the significant misallocation of resources which takes place when free markets are not operative.
- . electricity tariff policies in light of the need for NEPA to be able to pay economic prices for natural gas; thereby stimulating gas development and use and in turn freeing up crude oil for export.
- . extent of foreign exchange leakage (through smuggling) which is to be absorbed due to policies favouring low petrol prices and unofficial cross border trade.

- . energy incentives (other than prices) which would permit Nigeria to build its industrial base by attracting industries for which energy would provide a competitive advantage.
- . establishment of rate of return criteria for commercial public enterprises in the energy sector, including terms and conditions which would guide availability of additional equity or government guarantees.

Petroleum sector policy must address a number of issues related to Nigeria's global market position including -

- . protection of crude oil markets, particularly in the face of downstream integration investments being made by other OPEC countries.
- . strategy for improving netbacks either through onshore processing or offshore processing/marketing arrangements.
- . pricing and production strategies including policy towards OPEC membership.

Exploration and Production issues are closely linked to the above and would include -

- . incentives to continue funding and developing new reserves in line with national objectives and forecasted market demand.
- . definition of interest in extending present joint venture relationships to include processing and marketing of Nigeria's share of crude oil.
- . startup and funding of NNPC exploration and production activities independently from joint venture arrangements.
- . strategies as to proving up additional concessions and involving Nigerian private sector in exploration and production.

Natural gas issues are particularly critical due to the enormous potential and would focus primarily on three issues -

- . natural gas pricing at levels high enough to encourage production and development of a national transmission and distribution network.
- . mobilization of public and private sector funding to develop the above national network, particularly as to local distribution to final consumers.
- . definition of the role of gas in attracting new investment to energy intensive industries where Nigeria would have a competitive advantage.

Downstream manufacturing and marketing would primarily relate to the regulatory issues, as follows -

- . definition of national pricing strategy and to what extent free market prices are to be permitted so as to properly allocate resources in the long term. This would extend to evaluation of the present system of uniform retail prices and attend to the smuggling/official export situation noted earlier.

Private sector issues would relate to two primary areas -

- . policy as to private sector participation - both Nigerian and foreign - in the petroleum sector.
- . incentives to encourage private sector funding (both debt and equity) for petroleum sector investments and for industrial consumption of natural gas.

LINKAGE OF PLANNING

Previous comments have made clear the need for linkage between national planners and industry strategic planners. The approach to fostering such linkage should consider the following -

- (1) Timing - needs to be both at the time long range plans are developed and when annual revisions of strategic plans are made. Moreover there is a need for continuous dialogue due to constant change in markets and industry environment which necessitate replanning.
- (2) Content - needs to go beyond perspective, development and strategic plans to also deal with scenario and contingency planning. Moreover, major funding and capital spending decisions need to be reviewed in the light of such longer term planning tools and techniques. Lastly, modeling can be an effective means of analyzing and communicating between planners because it focuses attention on key variables and assumptions.

- (3) Players - the key participants would be national planners, industry planners in the Ministry of Petroleum Resources, and strategic planners at NNPC. Steps should also be taken to involve industry planners within NNPC business units and private sector companies. Moreover, planners should not lose sight of their ultimate purpose which is to help "management" (at all levels of government and petroleum industry) to improve policy and operating decisions. Lastly, consideration may need to be given to inputs from the public - particularly due to the needs to "educate" public opinion, to develop a rational regulatory system, and to build public support for government policies.

- (4) Procedure - while present planning systems would continue, there should be steps taken to present relevant plans and major decisions effectively between the major players. For example, at least NNPC strategic plans should be reviewed annually by government planners along with major capital and funding decisions. Priority should also be given to updating "management" on industry/market developments and on the financial results (including losses) from major policy and operating decisions. Lastly, systematic inputs into a monthly rolling forecast of crude oil earnings (e.g. foreign exchange) would prove useful for management of the national economy.

The major challenges for planners are (1) reaching effective decisions which set the proper strategic direction for the nation's economy, (2) adapting and coping with continuously changing industry and market forces, (3) building objectivity and professionalism into the decision process, and (4) supporting "management" in reaching sound decisions and implementing them effectively. Effective linkage and continuous dialogue between planners will help them meet today's challenges successfully.

CONCLUSION

Today's topic has concentrated on four messages -

- (1) planning for the petroleum sector is an important and complex task since it is a dynamic environment in which market and technological forces are constantly at work.
- (2) tools and techniques have been developed to cope with petroleum sector characteristics and deal with uncertainty.
- (3) the highly regulated Nigerian environment can be better planned by use of proven tools and techniques, particularly in terms of analyzing areas where industry economics can be improved and presenting information to "management" which assists in better policy formulation and decision making.
- (4) the planning process can be made more effective by better and more continuous linkage between national planners and industry strategic planners.

Let me simply close by wishing planners the best of luck in getting perspective planning launched and in linking it with the planning systems which help the petroleum sector survive and thrive under conditions of uncertainty and great opportunity.

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ARTHUR ANDERSEN & CO.
LAGOS, NIGERIA
OCTOBER 18, 1988

REFERENCE LIST

- (1) World Oil Trends, 1988-89 Edition by Arthur Andersen & Co. and Cambridge Energy Research Associates.
 - Useful industry data and charts together with commentary on global market forces at work.

- (2) The Future of Oil Prices: The Perils of Prophecy by Arthur Andersen & Co. and Cambridge Energy Research Associates, 1984.
 - Useful study on problems with oil price forecasts and the underlying factors involved.

- (3) Planning Under Uncertainty: Multiple Scenarios and Contingency Planning, The Conference Board, 1978.
 - Basic description of two valuable planning tools.

- (4) Harvard Business Review articles by SHELL executives -
 - . "Scenarios: Uncharted Waters Ahead" by Pierre Wack (September/October 1985)
 - . "Scenarios: Shooting the Rapids" by Pierre Wack (November/December 1985)
 - . "Planning as Learning" by Arie P. De Geus (March/April 1988)
 - Excellent and practical articles on scenario planning