The Idiosyncrasies of Project Economics Under PSC Regimes

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Introduction

The title of this paper was originally intended to be "all-encompassing" and broad. However, we deconvolved too many topics of interest for one presentation, as Production Sharing Contract ("PSC") idiosyncrasies could include:

- The inequities of Domestic Market Obligation ("DMO"), which not only rewards non-efficient development by quicker than optimal production in the initial five years, but is actually a government take in disguise (as the oil produced is less then necessarily utilized domestically)
- The common "double-dipping" of reserves reporting by both contractors and host countries
- The limiting of rewards for being cost effective under the PSC fiscal regime (as opposed to a royalty-based regime)
- The importance of sunk costs
- The erosion of PSC terms to the contractor, for example in Indonesia, which is now basically a hybrid royalty ("first tranche")/PSC fiscal regime
- The handling of abandonment of production facilities
- The dichotomy of PSC project economics to that of the financial community, who instead of using the Discounted Cash Flow (DCF) model, where investment are accounted for on a cash basis, are more concerned with historical Financial net Income or "earnings" as a measure of profitability
- The difficulties of developing gas effectively within the confines of a PSC that was originally designed for oil

In the interests of time, we have chosen the last point as the focus for today's discussion.

PRODUCTION SHARING CONTRACTS WERE DESIGNED FOR OIL

Production Sharing Contractors and host Governments have worked within the framework of agreements designed to encourage finding and developing oil. This framework has been shown to be sound, because of:

- The obligations and rights of all parties are clearly set out in PSCs and related documents. The rules are known and adhered to

- Oil is sold at current international prices, whether domestically or for export, and an independent world market determines these prices. This market may be volatile, but it will always absorb all the volume and provides uncontested selling prices, which are accepted by governments for both domestic and export as well as for calculating cost oil.

- Government and PSCs have common objectives to bring commercial oil discoveries into production as soon as possible. Also there are no significant domestic vested interests, which limit the freedom of PSCs and their partners in selecting the optimum development routes. There are therefore no undue delays in development of commercial oil discoveries.

- Contractors provide the funds to deliver oil to a point where it has access to the market; there is no need for government or government companies to provide investment funds for transportation either by borrowing or from their own funds.

PRODUCTION SHARING CONTRACTS HAMPER THE DEVELOPMENT OF DOMESTIC GAS INDUSTRIES

Briefly stated:

- The ingredients that make PSCs appropriate for oil are not appropriate for gas without extra provisions.

- The history, in most countries, of gas developments for domestic use is that supply terms, after discovery costs have been sunk, and essentially imposed by government on the contractors concerned. Often the terms of supply do not reflect the energy value of the gas which is delivered to domestic users and such developments have frequently taken many years to come to fruit.

- As a result Production Sharing Contractors often regard gas discoveries as intrinsically unrewarding and therefore unwelcome; they therefore introduce “gas risk” elements into their exploration decisions and will often abandon gas discoveries as “non commercial” when further drilling might uncover significant marketable reserves.

The degree of success in developing a thriving domestic gas industry will depend on host governments creating an environment for gas development, transport and selling which is sufficiently parallel to the "natural" environment of oil.

THE NEEDS WHICH GAS POLICIES SHOULD ADDRESS

INCENTIVES FOR ALL

An energy chain based on gas will only be complete if all the parties to it secure benefits that satisfy them.

- Contractors often see no potential benefit from exploring with gas as an objective. So long as this view persists, contractors will explore for oil only and shy away from prospects where "gas risk" is high. Their drilling programs will thus often be dominated by oil prospects. They will find some gas, but often in locations, which are inconvenient (and therefore expensive) for domestic gas markets. While this situation continues, many countries will continue to rely on "accidental" gas discoveries.

  If PSCs have suitable incentives they would shift much of their attention to drilling for gas in locations, which are more convenient for the domestic market.

- Investors in the chain, whether producers, pipeliners, power companies, or gas distributors, should receive reasonable profits related to their investment and the risk levels associated with those investments.

- Consumers of gas, or of power generated from gas, should benefit from the energy chain in terms of received value for money, which includes price, reliability, and fuel quality. (Note that a power station should not be contractually treated in the same way as conventional end users as a power generator acts as an end user, rather an "energy converter", similar to a refinery).

- Governments should have net benefit from each new energy chain of this nature.

FAIR PLAY FOR ALL.

Without defined **"rules of the game",** which cannot be made retroactively more stringent for any of the parties, the contractors will remain reluctant to play. If the rules are known and firm, the PSCs can then judge whether to play on the host countries rules, or go elsewhere to play.

If government remains in the position of being arbiter of the outcome of each gas situation, on a case-by-case basis, there are two major problems:

- The progress to concluding all the arrangements will be unpredictable and probably very slow.
- There will be no identifiable incentives for producers because of the uncertainty about the level of reward that could be attached to a successful search for domestically marketable gas.

In the present situation where governments are in a position to allocate the division of rewards between the various parties to a gas based energy chain, the negotiations and lobbying processes not only take a long time, they also tend to result in reward divisions in which the various parties identify themselves as winners or losers. This outcome makes for brittle relationships that severely weaken the capacity of the (inter-dependent) parties to meet and overcome problems that will arise.

INHERENT PROBLEMS WITH DEVELOPMENT OF A DOMESTIC GAS BUSINESS.

MONOPOLY

Domestic gas industries in developing countries inevitably contain activities, which are “natural monopolies”, whether national or local. It is impossible to simply “let the market rule” without inviting abuse of dominant positions.

There have to be arrangements, which ensure that all parts of the new industry, not the least consumers, are protected. There are two alternative approaches:

Control.

Governments have conventionally exercised **“control”** over local or national monopolies, whether “natural” ones such as gas, power transmission, water, postal services etc., or those which are felt desirable in some countries for national reasons such as airlines, domestic oil companies, fertilizer manufacture etc. In general these monopolies are shielded from competition or subsidized in other ways through ownership and consequent “cost plus” approaches to monopoly organizations charges for products or services. A “monopoly “ signal naturally brings forth a government reaction to place itself in the position of “controller”, and typically using cost plus criteria and limiting the pace of progress because of the time it takes to make the necessary decisions.

Regulation

The alternative is for Government to set guidelines, by legislation, for the behavior of monopolies and how they interact with each other and other companies dealing with them and to appoint identified, preferably independent, bodies to interpret and administer the guidelines. This approach is normally necessary for any public service industry that is in private hands, or to be privatized. Private owners are seldom prepared to invest in enterprises where the rewards can be influenced by governmental decisions after the investments have been made.

This question comes back to "the rules of the game", but also bears on who interprets and applies the rules. The first of the above options, will not entice PSCs to explore for domestically marketable gas, for the reasons outlined in the second option. Many failed gas policies, most of them now revised, assumed that

E & P companies would be attracted to explore for gas on the promise of a guaranteed financial return on development costs. E& P companies will take risks of low returns only when there are chances of high returns.

As with all competitive games, the rules should be set by the governing body (in this case government) and interpreted by independent and impartial **referees**; who need to be appointed under clear and publicly known mandates. There will be times when the rules may need except (and this could be important) where rule modification benefits the game as a whole by increasing its attractiveness to one or more sets of players and is acceptable to them.

Industry regulation (as distinct from health and safety regulation designed to ensure that facilities are designed, built and operated to acceptable standards) is a complex subject and because cultures vary widely between counties, it is not possible to transfer regulatory systems across frontiers without risk of arriving at irrational or inappropriate outcomes. Many countries will need to consider and decide on their own regulatory regime, probably with help from people who understand the implications and can identify the benefits and pitfalls.

There are three important features to bear in mind in considering gas industry regulation:

- For a developing industry, inevitably involving "monopoly" players, it should embodied investment protection for pioneer investors; otherwise there will be a scarcity of pioneer investors.

- It should be designed to accommodate periodic adjustments, for "new games", which move the industry toward maturity where natural competition gradually displaces natural monopoly;

Future transitional problems can be avoided by building in transparency and, unbundling from the outset.

There is also a danger that has to be recognized. Compromises within national companies and ministries will inevitably be needed. If this result is in vague revisions their impact may be inadequate. The success of new arrangements will crucially depend on whether PSCs perceive that the incentives for them and protection of their investments match what is available in other parts of the world.

Existing monopolies can and do severely inhibit development or gas. More particularly if the monopoly (e.g. for building and owning transmission pipelines) depends on obtaining finance within a “rationing system” circumscribed by government borrowing powers). If gas developments may have to wait for years before they can secure the necessary funds, contractors may look elsewhere to invest.

PRICES.

It has already been mentioned that there are problems in respect of gas prices secured by Contractors; of course there are other pricing aspects (e.g. in market sectors), which are of less concern to Production Sharing Contractors.

This underlying truth about pricing gas from the producer is that if he does not know how gas prices are to be set he is totally unable to make any evaluation of the potential reward from investing risk money in exploration aimed at gas. Without such knowledge the downside of dry holes, which is always clear, dominates. Companies in the E&P business only survive if their good bets pay for the many more bad ones and if success is to be rewarded only on cost plus criteria then success will not carry the necessary economic uplift to pay for other failures. The companies will just not place exploration bets unless they have hopes of really good outcomes from each and every bet; they know that many will be losers. They have duties to their shareholders to try to remain profitable.

This means that there needs to be a pre-determined price regime for producer gas prices.

While a gas-pricing regime can follow any form selected by government there is obvious logic and consumer interest in relating producer gas prices to competing fuels and/or the producers’ alternative, usually oil. Most successful international examples of gas pricing regimes in developing market adopt oil related pricing which involves indexation, an important value protection.

Delivery points for any product, and for gas in particular, carry their own values. Contractors would not expect wellhead prices to be independent of the location of the reserves, indeed a more equitable would be when a gas pricing regime be firmly based on delivery points into the pipeline or market, not on well head prices.

The questions of producer prices for gas are motive. They really should not be. The essence of a PSC is that there is a defined sharing of profit gas. The actual shares will certainly depend on price (indeed the higher the price the larger the share of the host government because cost gas volumes will be lower), for PSCs the real question in their evaluations is not price, it is "reward" for success; a bottom line figure which is a matter of both price and profit share (and of course volumes and costs). If both profit share and price are pre-determined the rewards can be assessed and the arguments are muted.

A producer, knowing his profit share, will want freedom to negotiate a commercially competitive deal with available buyers; this is possible in developed gas markets (e.g. Europe and N America) but not as easy in developing markets, such as in Asia, where the only alternative is for a defined and guaranteed price regime.

The producer, either because of the PSC terms or more traditional royalty/taxation provisions, receives only apportion of the sales proceeds of the full volumes. This allows the government concerned (or the regulator, as happens in some countries,) to subsidize prices in the market if that is the government wish. Also the producer prices are not always at full market value, in which case government can also increase its own revenue (as also happens) by taking some of the difference between the regulated price and actual value for itself.

These subsidy arrangements are for government; producers should not be asked or required to charge less than is warranted in the price regime but there may be cases for upward adjustment of price (or the contractors share of profit gas) in order to bring difficult individual projects into acceptable profitability.

Haggling (often called "negotiation") over prices when there is no predetermined system can lead to delays that are costly for consumers, government and producers. More good reasons for a legislated price regime, modified and kept relevant by independent regulation.

ACCESS TO MARKETS AND INVESTMENT FREEDOMS.

A producer will need to know that he can gain quick and economical access to the market. Delay is wasteful in itself and if delay is compounded by an increase in costs there is a double blow to the economics of the project. If, as is conventional, the price is established in the market the burdens of delay and/or high costs fall mainly on the producer.

Causes of delay need to be removed. Unless this can be done they will remain severe disincentives to drilling for gas.

Because of the integrated nature of gas supply chains the most effective arrangements for pipelines in a developing market will involve producers and buyers in joint planning. Implementation according to plan is more assured if pipelines can be owned by the producers and/or buyers who have freedom to invest with the full support of local and central government agencies of securing necessary permits, wayleaves etc.

A possible solution, employed elsewhere, would be to entitle contractors to include pipelines in the costs to be recovered through cost gas, whether or not the pipelines cross the borders of their contract areas. This has the twin benefits of ensuring national ownership and placing the investment onus on contractors. Pipelines are commonly not addressed by contractors – in fact transportation of gas may even be controlled by other Ministries!

SECURITY OF MARKETS.

Until the host country gas industry reaches a level of sophistication where natural competition can begin to replace regulation, a producer will be reluctant to make heavy investments if there is any likelihood of a rival gas supplier being allowed to "take over" any part of the supply until exploration and development costs have been fully recovered from revenue, often discounted at more than 20%.

This will call for full sanctity of contracts (with associated Government guarantees that are difficult to uphold in these days of privatisation) of longer duration (12+ years). Such arrangements are neither abnormal nor should they inhibit supply growth to meet market demands. Prospective producers will assess the available market before committing to expenditure designed to meet it.

A further problem can arise, if a state-owned company being supplied with gas by a private company has failed to meet the terms of the contract. (Contract breaches are generally in the take-or-pay area.) A private company has natural inhibitions to default with government companies and a significant uncertainty would be removed if government were to guarantee contracts for nationally owned companies.

GAS POLICY MONITORING AND COMMUNICATION BETWEEN THOSE AFFECTED.

The host Government aims are consistent with the interests of all the parties involved, from producer through to final consumer, whether the final consumer is a gas or a power user. Because of this common interest government can rely on full support for a gas policy, which aims at fair play for all.

But if there is any certainty about the future it is that it will not be what we expect today. Any policy, gas or otherwise, is unlikely to match the aims for which it is designed unless the policy and its aims are continuously effectiveness.

We therefore strongly recommend that the available talents and insights of all those who wish to see aims achieved be recruited to help ensure that gas policies are effective. An executive government body to implement policy and a multi-component, non-executive, advisory body thus seem necessary if policies are to be kept effective.

These thoughts are advanced simply because of the general PSC perception of relationships between government and national companies on one hand and PSCs on the other. This perception is that while relationships and understanding are excellent at the working level, policy statements by senior people in government and government companies often appear to discourage change.

RECOMMENDATIONS

Through a combination of legislation and introduction of gas clauses into Production Sharing Contracts, the following measures should be introduced.

a) A country wide and uniformly defined and indexed price regime for gas delivered to markets; this should be precisely related to a formula using publicly available oil prices, (probably crude oil) and the load factor of the gas *which is delivered.*

Because many of the new gas prospects are in deep water and/or distant from domestic markets and the PSCs' shares of profit gas are relatively low in international terms, the reward incentive may be insufficient if the defined price regime provides for market prices below international crude oil prices for 100% load factor gas. Because of the significant influence offload factor on both production costs and transmission (and tariffs) there should be a sliding scale or multi-part tariff for delivered gas aimed at neutralizing the adverse economic effects of low load factors.

The incentive effectiveness of such a pricing regime in attracting investment for gas exploration will be function of its relative attraction compared with other opportunities open to international E & P companies

b) Elimination of all monopoly rights in respect of construction and ownership of transmission pipelines together with elective and pre-emotive rights of PSCs to build an operate gas transmission pipelines as part of their investment to be recovered from cost gas and cost oil.

There should also be positive legislation or administrative guidance designed to facilitate wayleaves, alienation of land etc. so that pipelines and other necessary gas facilities may be planned and constructed with minimum delay.

c) Establishment, by legislative procedure, of a gas industry regulatory body to be totally independent of government and provided with a publicly known mandate to protect the interests of all sectors of the gas industry within the envelope of current legislation and to prevent abuse of monopoly positions.

The draft mandate of this body should be discussed by the consultative group mentioned in f) below who would make recommendations to Ministers concerned before the mandate is finalized.

From the point of view of contractors a vitally important area is the setting of transportation tariffs for any third party pipelines, these tariffs should be based on reasonable investment costs and costs of service and consistent with international practice to ensure that revenue netbacks to production do not suffer from inadequately regulated transportation.

d) Providing effective assurances of contract security for gas supply contracts including government performance guarantees in respect of gas purchases by government owned entities or companies.

e) Creating a permanent Government Gas Policy Committee to monitor the progress and effectiveness of gas policy and the instruments used to support it.

An energy policy committee could embrace this committee; if so a sub committee should cover the special needs of gas specifically charged with considering the gas aspects.

f) Establishing a mixed (government, government companies, private companies and PSCs) consultative group with a mandate to offer frank and honest recommendations about gas policies and their implementation to the Government Gas Policy committee and the regulatory body.

This consultative group will be an important source of information and views from the people actively involved in the gas business; apart from the importance of its potential input it will ensure that the normally opaque window between government and the private sector will be clarified and help to induce co-operative attitudes which are so important in gas chains.

CONCLUDING COMMENTARY

There is, in some quarters, an implicit assumption that gas discovery rates will not be improved by making explicit terms for gas. i.e. that the criteria for oil exploration applies also to gas exploration. This is not so, both on grounds of geology and logistic.

Countries that are highly gas prone and positive incentives to find marketable gas will ensure that known gas prone basins that can yield marketable gas, i.e. suitably close to markets, will be drilled. There are already many gas finds that have been regarded as uncommercial for lack of profitable market opportunities and therefore not appraised. The industry already knows where to look.