Comparison of some Asian Offshore Production Sharing Contracts with respect to Bangladesh.

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Submitted for Partial Fulfillment of the Degree of Master in Petroleum Engineering

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Candidate's Declaration

It is hereby declared that this project or any part of it has not been submitted elsewhere for the award of any degree or diploma

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Recommendation of the Board of Examiners

The project titled **"Comparison of some Asian Offshore Production Sharing Contracts with respect to Bangladesh"** submitted by Md. Moniruzzaman, Roll Number-040513026F; Session: April 2004, has been accepted as satisfactory in partial fulfillment of the requirements for the degree of Master of Petroleum Engineering in July, 2009.

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Dedicated to my beloved father and respected teachers

of Petroleum Engineering Department

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Acknowledgement

It is my pleasure to have the opportunity to submit this thesis on "Comparison of Production Sharing Contracts with some Asian Countries" as an integral part of Master in Petroleum Engineering degree. I acknowledge my heartiest gratefulness to all who have extended their hands of cooperation in preparing this paper.

At first I express my gratitude and acknowledge indebtedness to my supervisor Dr. M. Tamim, Professor, Department of Petroleum Engineering, for his valuable contributions, precious guidance, advice, support and suggestions in preparing this paper.

I am also grateful to Dr. Mohammad Mahbubur Rahman, Assistant Professor & Head of Department for inspiration and valuable suggestions.

I am also grateful to all of my course teachers, for their assistance, fruitful advice and cooperation in gaining my knowledge. I would also like to thank my colleagues of Energy and Mineral Resources Division and Petrobangla for their sincere cooperation in preparing this thesis.

Finally my thankful gratitude goes to the almighty Allah.

Md. Moniruzzaman

Abstract

Model production sharing contract (MPSC)-2008 has been formulated with a view to meeting the present and future energy demand. The comparative study of MPSC- 2008 with some regional countries would answer some of the questions recently.

In Bangladesh, natural gas is the only significant source of commercial energy, and accounts for almost 75% of total commercial energy consumption. Current gas supply capacity is 1,950 mmcfd, whereas demand is about 2200 mmcfd. There is large gap between demand and supply in Bangladesh and it is increasing everyday. The country has no alternative but to explore new gas fields to overcome the gas shortage that has already started. Bangladesh has explored some major gas fields in onshore but the offshore is unexplored yet. For uninterrupted gas supply to the existing customers and to meet the anticipated demand, the model PSC-2008 has been formulated.

To ensure the accountability, transparency and public participation in decision making process, the Government of Bangladesh published the contract document through website at an early time.

There are some confusion regarding this contract for which a thorough comparative study is required. In addition, an overall review was required to understand and evaluate the pros and cons of the contract and to verify whether the people's interest is properly reserved or not.

Based on different aspects the Contract has been compared and examined. To do this comparison some regional countries like India, Malaysia, Pakistan, Vietnam, Turkmenistan and Trinidad & Tobago are chosen. All the countries except Trinidad & Tobago are regional countries. The reason for selecting Trinidad & Tobago is that it is also a developing country like Bangladesh but it is near to USA and has a large petroleum market.

In conclusion, the overall contract was found to be balanced and very much comparable to the regional countries. Moreover, it has conceived important improvement as compared to Model PSC-1997 and other signed blocks by accommodating the experience of these contracts.

Acronyms and abbreviation

APPI	- Asian Petroleum Price Index
BBL	-Barrel
BCF	-Billion Cubic Feet (10^9 Cubic Feet)
BTU	-British Thermal Unit
FOB	-Free On Board
HSFO	- High Sulphur Fuel Oil at 180 Centi Stokes (maximum)
LNG	-Liquefied Natural Gas
LPG	-Liquefied Petroleum Gas
MCF	- Thousand Cubic Feet
MMCF	- Million Cubic Feet
MOEB	-Million Oil Equivalent Barrels
NGL	-Natural Gas Liquids
SCF	-Standard Cubic Feet
SPE	-Society of Petroleum Engineers
TCF	-Trillion Cubic Feet (10_{12} Cubic Feet)

Chapter 1

Introduction

1.1 Overview

Production Sharing Contract (PSC) is a Petroleum Contract typically entered into by the Host Country's (HC) nominee (maybe a Ministry or National Oil Company (NOC)) and the International Oil Companies (IOCs). The concept is based on the philosophy that the ownership of the petroleum always stays with the Host Country, and that the International Oil Companies just as the Contractor to explore and exploit it. In exploring and exploiting these resources there is substantial capital risk involved and the Contractors are to take that the risk. Once the petroleum is produced the Contractors after recovering its initial investments in the exploration and development phase, shares the production with the Host Country in an agreed formula.

The government of Bangladesh owns all mineral resources including petroleum within the territory, continental shelf and economic zone of the country and has the exclusive right and authority to explore, develop, exploit, process, refine and market petroleum resources (The Petroleum Act, 1974). The government has also the exclusive right under the act to enter into petroleum agreements with any person for the purpose of any petroleum operations. On behalf of the government, the Bangladesh Oil, Gas and Mineral Resources Corporation (Petrobangla) exercises the rights and powers to explore, develop, process and market petroleum and also to enter into petroleum agreements with any person/company for these purposes.

1.2 History

In 1973, after a comprehensive policy review, the government started setting up a new legal framework to encourage rapid exploration and development of natural gas and oil and to safeguard the national interest. The government also took initiative for development of national capacity in the oil and gas sector with the assistance of international companies. The idea came from the experience of significant success achieved under PSC of Indonesia, Malaysia, Egypt, China, India and some other countries with international oil companies. From 1974 and onward the international tenders were invited by the Bangladesh Government for petroleum exploration, and a number of PSCs were signed with different IOCs. Those

were not the model PSCs. Bangladesh drafted two model PSCs- those are model PSC-1997 and the model PSC-2008 (PESGB-2006).

In 1974, the government of Bangladesh invited bids from international oil companies for exploration and development of petroleum in the territory of the country. The bids submitted were evaluated on a 40-points grading system, 10 points for each of the four criteria (i) financial capability, (ii) technical capacity, (iii) experience, and (iv) work programme. A selected number of qualified companies were invited to negotiate and finally, seven contracts were concluded for offshore exploration and development. The companies with which the PSCs were signed were Atlantic Richfield, Union Oil of California (later renamed as UNOCAL) and Ashland of the USA, Superior Oil Company of Canada, Dominex and Ina-Napthaline of Europe. UNOCAL discovered an offshore gas reservoir at Kutubdia but due to economic considerations, the company did not start its exploitation (Petrobangla,2008).

The foreign companies started loosing interest in PSC since they found Bangladesh has large reserve of gas, but not of oil. In 1981, Shell Oil signed a PSC for onshore areas. The Bangladesh Petroleum Exploration Company (BAPEX) was established in 1989, for exploration of petroleum in the country. Petrobangla itself made the first discovery of oil in the Bangladesh territory in 1986 at Haripur, Sylhet. In 1987, Petroleum Exploration Promotion Programme organized by World Bank pointed out that there were bright prospects for gas exploration. A PSC was formulated by the ministry of Power, Energy and mineral Resources of Bangladesh in 1988 to encourage exploration for gas and to ensure that the price for gas would have parity with the market price for fuel oil. It was further revised in 1993 commensurate with government policy changes and new incentives to the investors for petroleum exploration (PESGB-2006).

Bangladesh signed a PSC with Cairn Energy and Holland Sea Search, a British-Dutch joint venture for exploration of oil and gas in block 16 and block 15 in May 1994 and June,1995 respectively. These two blocks cover partly Chittagong onshore and adjacent offshore areas. The model PSC was formulated in 1997. In January 1997, Hallibarton Energy of United States joined the Cairn-Holland Sea Search in the Sangu gas field portion of Block 16. Shell Oil purchased Cairn's PSC rights in these two blocks in mid-1999. In 1995, Occidental signed PSCs for blocks 12, 13 and 14 in the Sylhet area (Surma basin) but transferred its PSC rights to UNOCAL in 1999. A low profile US joint venture Rexwood-Oakland signed PSC in January 1997 with Petrobangla for blocks 17 and 18 located in Cox's Bazar-Teknaf region

with 80% offshore exploration areas. Rexwood later merged with Oakland. The United Meridian Corporation (UMC) was another small US oil company that signed PSC in late 1996 for oil and gas exploration and development in block 22 in the Chittagong Hill Tracts area. Later, the UMC transferred its rights to a US company Ocean Energy (Blakeley, 2006).

New discoveries of gas fields were made in the Surma basin by Occidental-Unocal (Bibiyana and Maulavibazaar) and by Cairn Energy at Sangu (offshore). By 1997, both Cairn and Occidental signed gas purchase and sales agreement with Petrobangla for the sale and delivery of the gas into the national gas distribution systems operated by Petrobangla. Bangladesh attracted attention of top international investors in petroleum sector. Bangladesh Government conducted road shows in London and Huston during February 1997 in order to attract IOCs. It was followed by the Second round bidding in 1997 when Bangladesh invited international tenders for petroleum exploration (New Age-2007).

A number of companies participated in the second round bidding. These included new entries like Tallow Oil Plc., Hondo Oil and Gas, South Asia Oil and Gas, Nico Resources, Triton and Pangea, Maersk Oil and internationally renowned companies like Texaco, Shell, Mobil, Chevron, Unocal and Enron. Available information indicates that there was no bid for blocks 1, 2 and 23. Of the remaining 12 blocks, number 9 attracted the largest number of bidders, followed by block 10, 11, 6, 5 and 7 (onshore) and there were more than two bids for each of the offshore blocks 19, 20 and 21. No block was kept reserved for the national company BAPEX. Negotiations were in process in 2001 for blocks 5 and 10 with Shell Oil and Cairn, block 8 with Pangea and for blocks 19, 20 with Maersk Oil. Two PSC were concluded, one with Unocal for block 7 and the other with Chevron-Texaco-Tullow for block 9. In this second round bidding, however, different percent of shares by the name of carried over interests for BAPEX were considered (PESGD-2006).

The companies had to indicate their competitive bids with respect to six items: (i) cost recovery ratio, (ii) profit of oil/gas sharing ratio, (iii) work programme, (iv) performance guarantee in support of work programme, (v) discovery bonus, and (vi) production bonus. A large number of international oil companies came up with proposals for petroleum exploration in Bangladesh during that period (New Age-2007).

The first proposal of gas export came from UNOCAL in 2000. The idea created a controversy as to whether the gas reserves in Bangladesh were sufficient to justify pipeline export or, the country itself had a market potential to use its reserves for domestic consumption and

industrial purposes. In 2000 the Government of Bangladesh formed an expert committee to review the gas export proposal. The opinion of the expert committee was against export of gas from the old fields but it recommended export from new discovery if Bangladesh exercised the first right of refusal.

1.3 Model PSC – 2008

The Government of Bangladesh realized that the rising demand of gas would create shortage of gas supply that will ultimately hinder the economic activity and development as suggested in the 2000 Committee report. To encounter the problem, the importance of new gas fields' discovery was strongly felt by the Government. Model PSC-2008 has been developed to explore oil and gas in the shallow and deep sea. Contracts from different regional countries like India, Pakistan, Malaysia, Vietnam and Trinidad and Tobago were reviewed and compared for this model PSC-2008.

1.3.1 Salient features

(i) Exploration and Development period:

Two types of blocks are considered for bidding. Those are

(a) Shallow area (Type-A): The shallow area water blocks situated north of 20^0N latitude. The average sizes of the blocks are 6000 square kilometer and water depth is up to 200 meter.

(b) Deep sea area (Type-B): The shallow area water blocks situated south of 20^0N latitude. The average sizes of the blocks are 3300 square kilometer and water depth is above 200 meter.

For shallow area (Type-A) it is 8 years where

(1) Primary exploration is 4 years

(2) 1st extension period 2 years

(3) 2nd extension period 2 years

For deep sea area (B type) it is 9 years.

Primary exploration period is 5 years

(1) 1st extension period 2 years

(2) 2nd extension period 2 years

Development period: Maximum three years

(ii) Minimum mandatory work obligation:

In initial exploration period, contractor has to accomplish mandatory work programme and period work programme. Main works have to be done are:

(1) Geological Survey

(2) Geophysical Survey

(3) Other Survey (Gravity, magnetic, Geochemical Survey etc.)

(4) 01 (one) Exploration well.

(iii) Bank Guarantee: An irrevocable and unconditional bank Guarantee has to be paid to Petrobangla based on fair market value to secure contractor's timely performance of minimum mandatory work programme and biddable maximum exploration programme.

(iv) Cost recovery: Contractor shall recover all costs and expenses in respect of exploration, appraisal and development related operations. The cost recovery limit shall be maximum 55% per calendar year of all available oil/ gas/ NGL/ condensate from the contract area and the cost recovery will be continued up to the total cost of exploration, appraisal and development related operations has not been recovered.

(v) Profit split: The profit split for "A" type block is from 55% to 80% based on production trenches from 12500 to 100,000 bbl/d for oil and from 75 to 600 mmcf/d for gas. For "B" type block, profit split will be 75% to 90% respectively based on production trenches from 12500 to 100,000 bbl/d for oil and from 75 to 600 mmcf/d for gas.

(vi) Gas price: To determine the gas price High Sulfur Furnace Oil (HSFO) price is taken as standard. The floor price is US$70/MT and ceiling price is US$180/MT. For shallow water, the price will be 25% more than onshore price as the cost of exploration, appraisal and development related operations in offshore is remarkably higher than onshore.

(vii) Oil price: The price of oil, condensate and NGL will be determined based on Asian Petroleum Price Index (APPI) or Platt's oilgram.

(viii) Tax: Contractor has to pay corporate tax, income tax of employee and subcontractors or by any agent on payment or export basis according to the taxation Rule of Bangladesh.

(ix) Arbitration: Arbitration will be done by "Bangladesh Arbitration Act-2001".

(xi) Unitization: The geological structure of one block may be extended to one or more blocks than the total structure be supposed to be treated as unit blocks. In Model PSC

there is a provision for unitization between two adjacent blocks where a geological structure spreads over the both blocks. There is also the provision for international unitization agreement in this Model PSC if there is a single geological structure spreads over the international boundary.

(xii) Abandonment fund: There is a provision to form an "Abandonment fund" from the initial production period to retrieve the gas field into environment friendly position at the time of abandonment and it is cost recoverable.

(xiii) Amendment: Agreement cannot be changed or altered without the consent of both parties by upholding the sovereignty of the country

(xiii) Production: For each area 25 years from the contract effective date for an oil field and 30 years for a gas field, subject to an extension of five years on mutually agreed terms.

(xiv) Relinquishments: 25% of contract area at the end of the third year and an additional 25% at the end of the fifth contract year are to be relinquished. All areas which are not declared production area are to be relinquished at the end of the seventh contract year. First relinquishment will be waived if the contractor has completed an exploratory well within three years of the initial exploration period.

(xv) Repatriation of profit: As per Model PSC provision the contractors will be allowed to send back profit to the country of origin.

(xvi) Export of Gas: Contractor has to offer its share of cost recovery gas and profit gas to Petrobangla. Contractor has the option to sell contractor's share of natural gas in the domestic market, subject to the Petrobangla's first right of refusal and Petrobangla will assist to find out the third party. If the third party is not found, contractor can export 80% of natural gas in the form of LNG where the Petrobangla and IOCs share will be proportional.

1.4 Justification of attracting IOC's in offshore

In Bangladesh, natural gas is the only significant source of commercial energy, and accounts for almost 75% of commercial energy consumption. The largest gas consumers are the power and fertilizer industries, which account for around 70% of daily production. Current supply capacity of 1950 mmcf/d, however, is insufficient to meet the projected growth in demand; gas consumption, currently at 2200 mmcf/d, is expected to grow at a rate of 10% per annum.

There is large gap between demand and supply in Bangladesh and it is increasing everyday. The country has no alternative but to explore new gas fields to overcome the gas shortage that has already started.

The petroleum potential in the offshore in Bangladesh territory, continental shelf and exclusive economic zone has not been properly studied and explored yet. The costs of the equipment for exploration and production of petroleum in the offshore are too high. BAPEX does not have sufficient equipment, logistics and manpower to do exploration and production in offshore. Moreover, it does not have sufficient funds to procure the equipment.

The technology related to offshore exploration and production is considered as next to space technology. Exploration of oil and gas is full of uncertainty and risk. Only a small number of companies can muster that level of technology and financial resources. If the host Government tries to explore and does not find petroleum, it will result into huge wastage of public money. The host Government normally does not take the risk with public money. The IOCs have to bear the total risk of the investment. The host Government has no liability to pay for IOCs investment. If no discovery is made, the total loss will be on the IOCs. If anything is discovered the host country will get the proper share and benefit of that discovery.

Under similar circumstances, developing countries that lack sufficient funds, technology and manpower, normally would try to attract IOCs rather than try to explore and develop assets all by themselves. India and Myanmar have attracted considerable interest from international oil and gas companies (IOCs) in recent years following a number of significant discoveries in the Bay of Bengal.

1.5 Current contract status

Some 23 onshore / offshore exploration blocks were delineated ahead of the First Round Bidding in 1993. Six PSCs were awarded in the round: (i) Cairn Energy-Holland Sea Search (Block 15, Block 16), (ii) Occidental (Block 12, Block 13 & 14), (iii) Okland-Rexwood (Block 17 & 18) and (iv) United Meridian Corporation (Block 22). A highly protracted Second Licensing Round was launched in 1997, and a further four PSCs were eventually awarded to Shell-Cairn Energy-Bapex (Block 5, Block 10), Tullow-Chevron-Texaco-Bapex (Block 9) and Unocal-Bapex (Block 7).

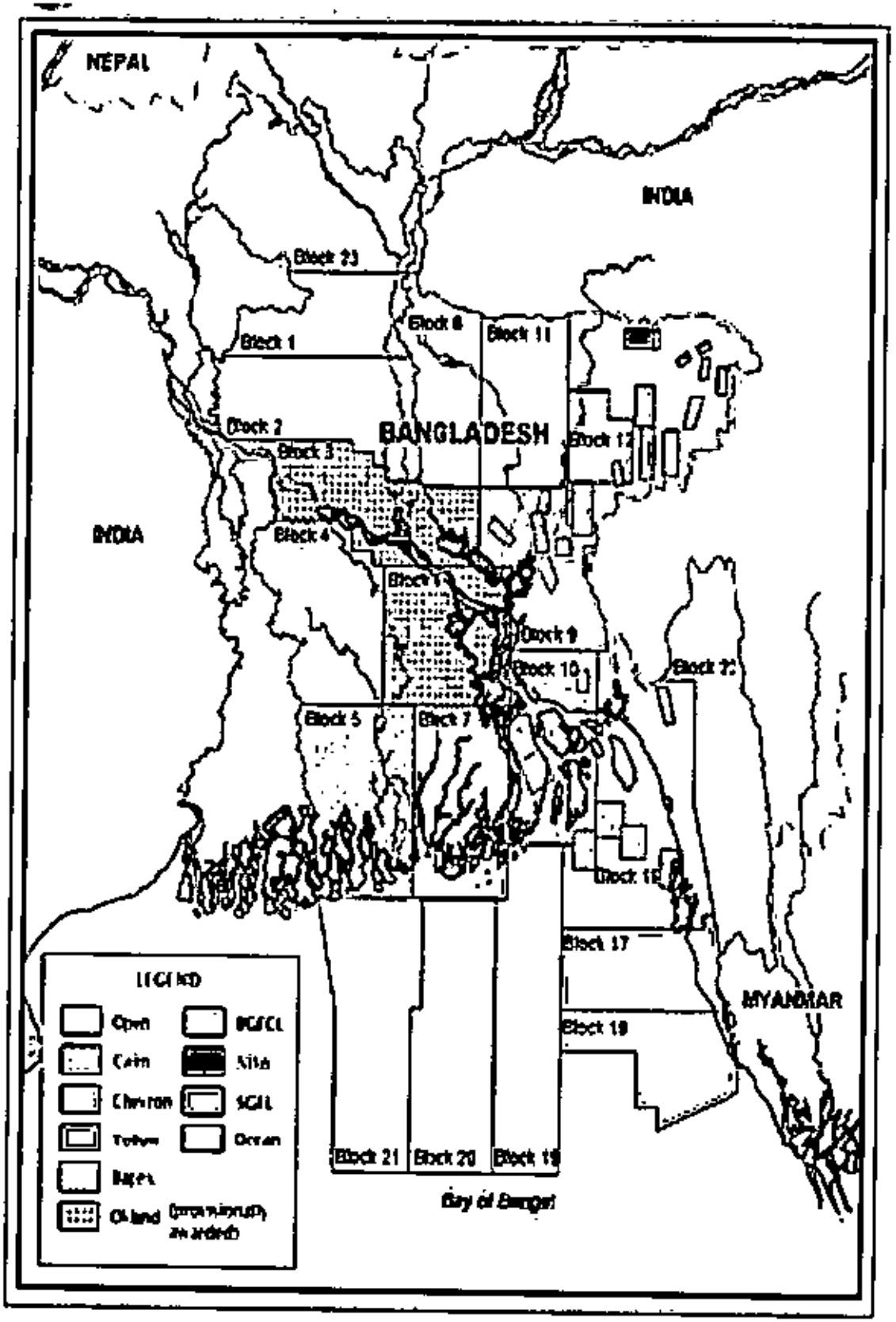

Fig 1.1 Production Sharing Contracts (PSCs) with IOCs

Fig 1.1 shows PSCs with IOCs. Many of these companies have subsequently left, following a number of asset swaps and company acquisitions in recent years, IOCs present today are Cairn Energy, Chevron, HBR Energy, Niko Resources, Okland-Rexwood, Tullow and Total.

Table 1.1, Table 1.2 and Table 1.3 shows the list of the blocks, the name of the IOCs that has been awarded and the signing date and the time period.

Table 1.1 Bidding (1994-'95)

Blocks	Signing date	Name of IOC and % of share of the block
Block # 12	11-01-1995	Occidental (presently Chevron)
Block # 13 & 14	11-01-1995	Occidental (presently Chevron)
Block # 15	12-06-1995	Shell (50%)/ Cairn (37.5%)
Block #16	05-05-1994	Shell (50%)/ Cairn(37.5%)/ Halliburton (25%)

Table 1.2 1st Round Bidding (1997)

Blocks	Signing date	Name of IOC and % of share of the block
Block: 17 & 18	18-01-1997	Tullow(80%)/Oakland (10%)/ Rexod(10%)
Block: 22	16-02-1997	Ocean Bangladesh Ltd.

Table 1.3 2nd Round Bidding (2000-'01)

Blocks	Signing date	Name of IOC and % of share of the block
Block: 05	04-07-2001	Shell (45%)/ Cairn (45%)/ BAPEX (10%)
Block: 07	02-04-2000	Unocal (90%)/BAPEX (10%)
Block: 09	11-04-2001	Tullow (30%)/ Chevron (30%)/ Texaco (30%)/ BAPEX(10%)
Block: 10	04-07-2001	Shell (45%)/Cairn(45%)/ BAPEX(10%)

Exploration activity has predominantly been conducted in the eastern onshore, with the west and the offshore remaining highly under-explored. Bangladesh is home to the largest fluvio-deltaic-slope fan complex in the world – the Bengal Fan – and interest in the offshore has effectively been resurrected by Daewoo Petroleum's significant Shwe I gas discovery on the A-1 Block of Myanmar in 2003.

1.6 Current / Future Production

Bangladesh is currently producing 1,870-1900 mmcf/d. Oil production from the Sylhet Field ceased in 1994. The three state-owned companies (Bapex, BGFCL and SGFL) – are producing around 920 mmcf/d from eleven fields. Three IOCs (Cairn Energy, Chevron and Niko Resources) are producing 970 mmcf/d from six fields. It is to be noted that almost 52% of total gas production of Bangladesh depends on IOCs.

Gas is used in power production (grid 700-733 mmcf/d and non-grid 20 mmcf/d) excluding captive power. For fertilizer and other (industry, household, CNG, commercial and tea estate) the consumption of gas is 940 mmcf/d.

Besides the gas production, Petrobangla produces condensate of 6700 bbl/d. The annual production of gas in 2006-2007 was 562.22bcf, and in 2007-2008 was 600.72 bcf. The annual production of gas in 2007-2008 was increased by 6.85%. Bangladesh cannot keep pace with the rising demand especially for the sharply increasing demand of power and industry.

The Government of Bangladesh made a study for gas reserves and future consumption. The project is known Gas Sector Master Plan (GSMP). That report was submitted by the consulting firm Wood and Mackenzie. This report states that there will be a shortfall of gas supply against proven reserve P1 in 2011. The National Committee in 2000 predicted gas shortage by 2010. Bangladesh has already experienced gas shortage from 2008 and new connection for industry has been discouraged by the Government.

A look at the projection of GSMP reveals that in 2030 the annual demand will be 3379 mmcf/d and according to Petrobangla's projection this demand will be 3600 mmcf/d.

1.7 Gas Reserve / Undiscovered Resource Potential

A number of studies conducted in recent years on natural gas reserve and undiscovered resource potential have all concluded that Bangladesh has a mean undiscovered gas resource of at least 32 Tcf. The two most widely recognized studies are the United States Geological Survey (USGS) / Petrobangla Study (2001), which declared the mean undiscovered resource potential to be 32.1 Tcf, and the Hydrocarbon Unit / Norwegian Petroleum Directorate (NPD)

potential to be 32.1 Tcf, and the Hydrocarbon Unit / Norwegian Petroleum Directorate (NPD) Study (2001), which declared the mean undiscovered resource potential to be 41.6 Tcf. Both of these studies, however, only took into account offshore acreage out to a water depth of 200m.

According to Gas Sector Master Plan (GSMP), the Figure 1.2 states the Gas demand/ supply scenario 2000-2030.

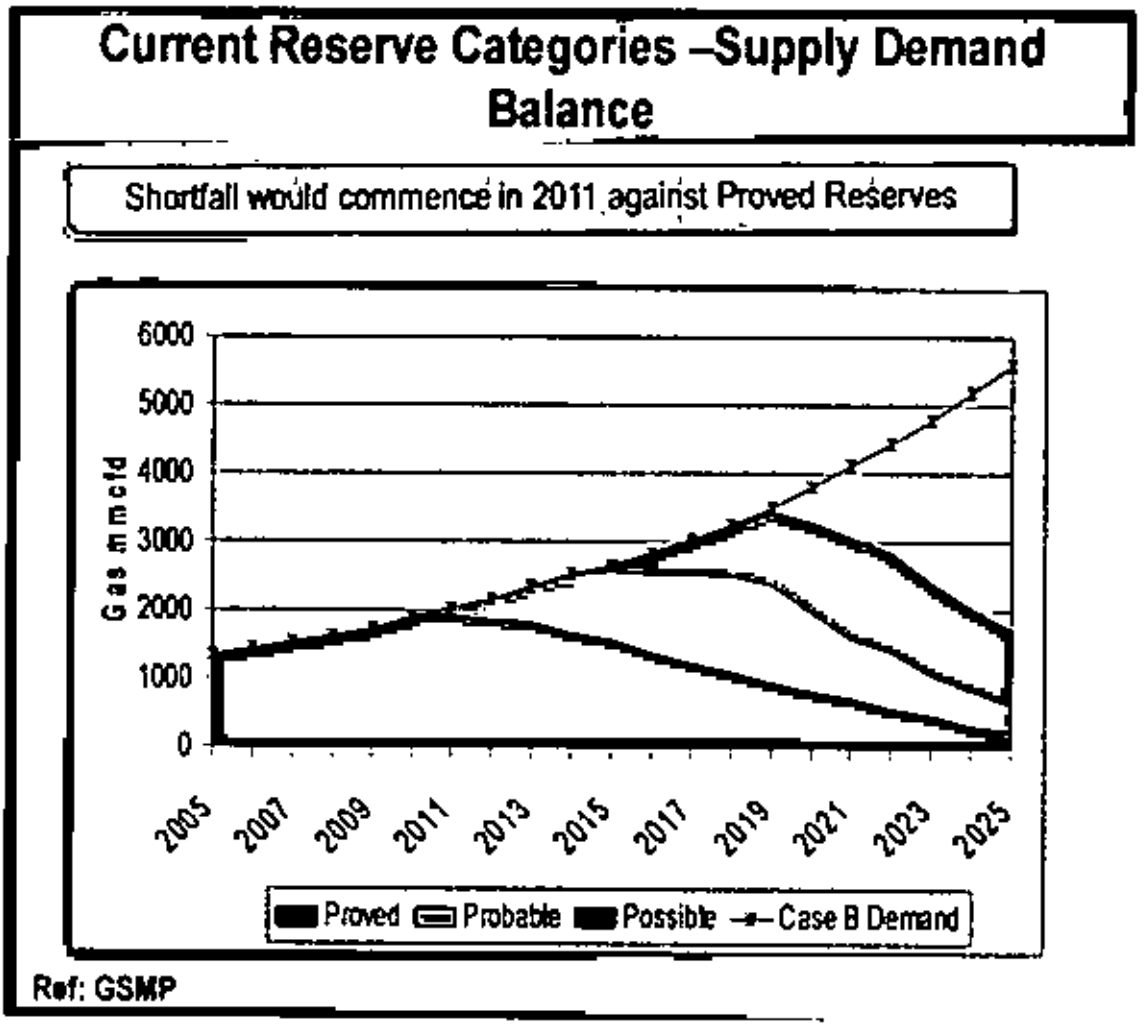

Figure 1.2 Gas demand/ supply scenario 2000-2030

The figure represents that the shortage of supply against P1 reserve will be in 2011. The shortage of supply has already started. Bangladesh has a P2 reserve of 5.5 TCF. If P2 can be converted to P1, the demand up to 2015 can be met. Present gas supply situation shows that GSMP has a very optimistic prediction that is already found unworkable.

Although the recoverable 2P gas reserve is estimated to be 5.5 Tcf, it is understood that there is significant field growth potential, as most of the state-owned gas fields have not yet been fully appraised.

For uninterrupted gas supply to the existing customers and to meet the anticipated demand the model PSC-2008 has been formulated. The purpose of the study is to assess the effectiveness, attractiveness, limitation and drawbacks of the Model PSC-2008 by comparing with some other regional and developing countries PSCs and with this comparison recommend in which area the model PSC should improve in the future.

1.8 Objective with specific aims and possible outcome

The objective of the study has been subdivided as follows:

1. Review the effectiveness of existing Production Sharing Contracts (PSC) of Bangladesh.
2. Detail assessment of the model PSC-2008.
3. Assess some Asian Offshore Production Sharing Contract with the model PSC.
4. Recommend the important issues those should be incorporated in the model PSC.

1.9 Methodology Outline

To achieve the above objectives the following methods are adopted:

1. Study of existing Production Sharing Contracts (PSC) of Bangladesh.
2. Study of model offshore PSC-2008.
3. Compare the model PSC-2008with the offshore PSC of India, Pakistan, Malaysia, Vietnam, Turkmenistan, and Trinidad & Tobago.

Chapter 2

Laws of Maritime Boundary

2.1 The Bay of Bengal

The Bay of Bengal is a bay that forms the northeastern part of the Indian Ocean. It resembles a triangle in shape, and is bordered by India and Sri Lanka to the West, Bangladesh and the Indian state of West Bengal to the North, and Myanmar and the Andaman and Nicobar Islands to the East. Its southern boundary extends as an imaginary line from Dondra Head at the southern end of Sri Lanka to the northern tip of Sumatra.

Figure 2.1 depicts the Bidding area for shallow and deep sea blocks of the Bay of Bengal (Model PSC-2008)

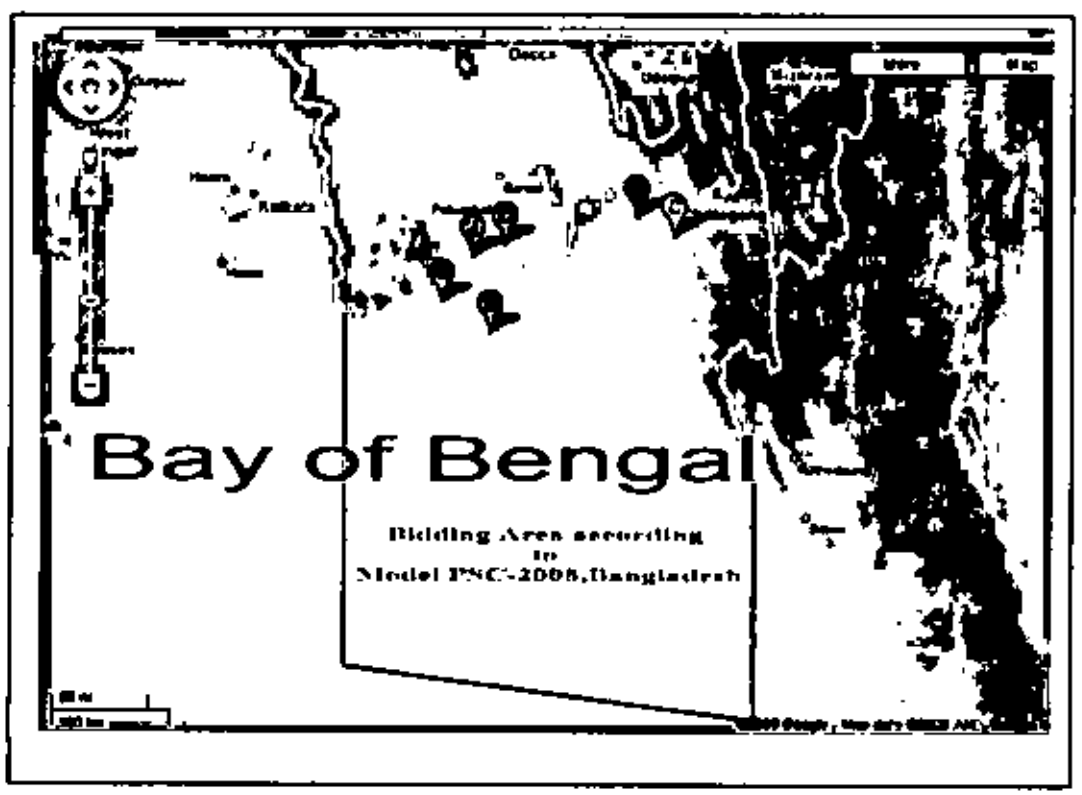

Figure 2.1 Bidding area for shallow and deep sea block of Bay of Bengal (Model PSC-2008)

The height of water above the sea bottom is increased gently as one goes seaward from the shoreline up to a depth of about 200m. The area from shore to 200m depth is called Continental Shelf. Continental shelf off Bangladesh coast varies considerably. It is less than 100km off the south coast between Hiron Point and the Swatch of No Ground in Sundarban and more than 250km off the coast of Cox's Bazar. Beyond the continental shelf the depth suddenly increases and in a short distance reaches from 200m to 500m -1000m.

The deep sea is generally referred to the area with depths in the range of 500m to 3000 m or more. Petroleum exploration in the deep sea is technologically and economically far more challenging than it is in the shallow sea.

The United Nations Convention on Law of the Sea also referred to as UNCLOS-1982, is an international agreement that provides the guidelines on the rights and responsibilities of the nations in their use of the World's oceans. It is the outcome of negotiation among states from 1973 through 1982. UNCLOS was adopted on 10 December 1982 in Montego Bay, Jamaica. This convention was the culmination of over 14 years of negotiation to establish a new legal order for ocean space. After signing of the Final Act, the convention was opened for signature of the member states. Bangladesh ratified this important convention on 27 July, 2001 as 138th member states (Foreign ministry, 2008).

Some important terms and definitions of UNCLOS are as follows:

2.2 Maritime Boundary and Exclusive Economic Zone

Territorial Sea Baseline refers to the line from which the seawards limit of any country is measured. These include the breadth of the territorial sea, the seaward limits of the contiguous zone, the exclusive economic zone and, in some cases, the continental shelf.

The territorial sea baseline may be of various types depending upon the shape of the coastline in any given locality.

The Normal baseline corresponds with low waterline along the coast, including the coasts of islands. Under the Convention, normal baseline can be drawn around low tide elevations which are defined as naturally formed areas of land surrounded by and above water at low tide but submerged by high tide, provided they are wholly or partly within 12 nautical miles of the cost.

Straight baselines are system of straight lines joining specified or discrete points on the low-water line, usually known as straight baseline end points. These may be used in localities

where the coastline is deeply indented and cut into, or where there is a fringe of islands along the coast in its immediate vicinity.

Bay or river closing lines are straight lines drawn between the respective low-water marks of the natural entrance points of bays or rivers.

Waters on the landward side of the baseline are internal waters for the purposes of international law.

2.2.1 Territorial Sea (12 NM Limit)

The Territorial Sea is a belt of water not exceeding 12 nautical miles in width measured from the territorial sea baseline. Bangladesh's sovereignty extends to the territorial sea, its seabed, subsoil, and to the airspace above it. The sovereignty is to be exercised in accordance with international law as reflected in the convention.

2.2.2 Contiguous Zone (24 NM Limit)

The Contiguous Zone is a belt of water contiguous to the territorial sea, the outer limit of which does not exceed 24 nautical miles from the territorial sea baseline. In this Zone Bangladesh may exercise control necessary to prevent and punish infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea.

2.2.3 Exclusive Economic Zone (200NM Limit)

The Exclusive Economic Zone is an area beyond and adjacent to the territorial sea. The outer limit of the exclusive economic zone cannot exceed 200 nautical miles from the baseline from which the breadth of the territorial sea is measured. In the EEZ, Bangladesh will have sovereign rights for the purpose of exploring and exploiting, conserving and managing all natural resources of waters super adjacent to the seabed and of the seabed and its subsoil together with other activities such as production of energy from water, currents and wind. Jurisdiction also extends to the establishment and use of artificial islands, installations and structures, marine the establishment and use of artificial islands, installations and structures, marine scientific research, the protection and preservation of the marine environment, and other rights and duties.

2.3 Status of Bangladesh

The Maritime Boundary and EEZ of Bangladesh, India and Myanmar have not been established as yet. Bangladesh Government invited bids February-2008 for offshore exploration and bid documents were examined by the Energy and Mineral Resources Division. It is expected that Government will make decision about the allocation of the blocks. Now it is urgent for Bangladesh to establish the boundaries and EEZ to avoid imminent disputes.

Once the boundaries and limits are demarcated and agreed as per UNCLOS then the exploration activities will not have much complicacy.

The continental shelf of Bangladesh was the primary target for the petroleum exploration in 1970's. Six exploration companies in 7 blocks conducted seismic survey in hundreds of kilometers. From 8 exploratory wells Kutubdia field was discovered but at that time it was considered too small to be economic. The reasons behind the companies to leave were primarily that oil was the prime target but geology dictated that the area was more possibility to have gas. Natural gas was not the fuel of choice at that time.

India has a continental area of 3.28 square kilo meter and, an EEZ stretching 200 nautical miles from the coastal spread over 2.2 square kilo meter of the ocean. Under UNCLOS-111 protocol, India can claim to a further 0.5 m sq km or more of the continental shelf 20-350 nautical miles from the coastal baseline within a given deadline. Four fifths of the claim lies in the Bay of Bengal.

Myanmar has divided offshore area into 25 blocks. It covers an area of about 270,000 square kilo meters. Among the 25 blocks, seven blocks (A1 - A7) are located to the west of Rakhine coast in the north of the Bay of Bengal. Another eleven blocks(M1-M11) are placed in the Gulf of Martaban (also known as Gulf of Moattama) which are in the northern sector of the Andaman Sea. The rest seven blocks (M12-M18) are along Tanintharyi coastline which is southwest of Mergui Archipelago. In Myanmar, there are 17 deep water blocks in the EEZ. Those are: six blocks (A-2-A-7),in the Rakhine coast, five blocks in Moattama(M-2, M-5, M-6, M-8, and M-11) Tanintharyi (M-12, M-14 , M-15, M-16 , M-17 and M-18) in the . Myanmar considers these blocks as EEZ. These blocks may overlap and encroach Bangladesh EEZ (U Khin Maung Maw, 2008).

The southern offshore blocks of Bangladesh, the Teknaf – St. Martins Island coast is close to Myanmar offshore discoveries. The geological condition of the Arakan offshore and that of

Tekhnaf –Saint-Martin offshore areas are expected to be similar. The anticline structure of Teknaf- Saint-Martin area continued to that area where Myanmar already made discoveries. Geologists believe that there is a strong likelihood that gas deposits similar to Myanmar discoveries could be found in that area.

Chapter 3

Compare with the offshore PSCs of different Countries:

The comparative study of the model PSC-2008 with some regional countries is done to find out the strength and weakness of this model PSC-2008 and identify the area where it could be improved. The countries have been selected to compare with the Model PSC-2008 are India, Malaysia, Pakistan, Vietnam, Turkmenistan and Trinidad & Tobago. All countries except Trinidad & Tobago are regional countries. The reason for selecting Trinidad & Tobago is that it is also a developing country like Bangladesh but it is near to USA and there is a large petroleum market.

In this study, the Model PSC-2008 is also compared with model PSC-1997 and other signed PSCs to observe the similarities and dissimilarities and show the area where improvement is made or degradation has happened. Through comparison, three things are tried to be determined. Those are in which area the model PSC-2008 is similar to other PSCs, where it is better or worse and which area it could be improved.

The flexibility in the terms and conditions in a contract imposed by Host Government is not sufficient to attract the IOCs. The Probability of discovery of reservoir and volume of recoverable reserve are also very important determinants for investment decision. In order to maintain uninterrupted work activity to get safe return from investment IOCs are conscious about the political and economic stability of the Host Country. Malaysia is the pioneer among the comparing countries in context of PSC activities. This country has already proved its reserve potential and attractiveness of oil and gas business. IOCs are more interested to work in Malaysia though it has the stringent terms and conditions than comparing countries.

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs

CONTRACT FEATURES	BANGLADESH		INDIA NELP-VI-2006	MALAYSIA	PAKISTAN	VIETNAM 2004	TURKMENISTAN 1997	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008						Onshore & Shallow Marine	Deep Water
1. Contract term Exploration Period	7 years (3+2+2)	Shallow Water: 8 years (4+2+2) Deep Water: 9 years (5+2+2)	Shallow Water. 7 years (4+3) Deep Water. 8 years (5+3)=	5 years	7 years (2+2+2+1)	7 years (3+2+2)	10 years (6+2+2)	6 years	9 years
2. Mandatory work Program	N/A	Shallow Water: Seismic + Drilling Deep Water: Seismic only	Seismic	N/A	N/A	N/A	N/A	Geology, Geophysics & Drilling	Geology, Geophysics & Drilling
3. Biddable work Program	Geology, Seismic, Drilling, Other Surveys	Geology, Seismic, Drilling, Other Surveys	Seismic, Drilling	Geology, Seismic, Drilling, Reprocessing			Geology, Geophysics & Drilling	Geology, Geophysics & Drilling	Geology, Geophysics & Drilling
4. Royalty	N/A	N/A	Deep Offshore - 5% of oil & gas Offshore-10% of oil & gas Onshore- 10% of gas & 12.5% of oil	10%	Max 12.5%	For gas-Max 6% For oil-Biddable	Biddable	Biddable	Biddable

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs (Contd.)

CONTRACT FEATURES	BANGLADESH		INDIA NELP-VI-2006	MALAYSIA	PAKISTAN	VIETNAM 2004	TURKMENISTAN 1997	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008						Onshore & Shallow Marine	Deep Water
5. Cost Recovery	Biddable & negotiable Max 50% for oil per calendar year & Max 55% for gas per calendar year	Max 55% for oil/ gas/ NGL/ Condensate per calendar year	100% per annum	Determined based on Contractors' Revenue-over-Cost on a quarterly basis (Non negotiable)	Max 85% for oil & gas per month	Biddable	Biddable (per quarter)	Biddable	Biddable

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs (Contd.)

CONTRACT FEATURES	BANGLADESH		INDIA NELP-VI-2006	MALAYSIA	PAKISTAN	VIETNAM 2004	TURKMENISTAN 1997	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008						Onshore & Shallow Marine	Deep Water
6. Profit Split (Govt. Share)	Biddable on the basis of Production trenches	Biddable on the basis of Production trenches (For oil/NGL/ Condensate Slabs 12500 bbl/d 12500-25000 bbl 25000-40000 bbl 40000-65000 bbl 65000-1lac bbl >1 lac bbl) (For Gas 75 mmcfd 75-150 mmcfd 150-250 mmcfd 250-4oo mmcfd 400-600 mmcfd > 600 mmcfd)	Biddable on the basis of investment multiple	Determined based on Contractors' Revenue-over-Cost on a quarterly basis (Non negotiable)	Shallow (<400 m below sea level): Oil//LPG/Cond : 20-80% Gas : 10-80% Deep (>400 m below sea level): Oil/LPG/Cond : 5-70% Gas : 5-70% Ultra Deep: Oil/LPG/Cond : 5-60% Gas : 5-60%	After allocation of Royalty Tax on Crude oil/natural gas and cost recovery oil/natural gas remainder of net production Biddable basis	Biddable on the basis of revenue-over-expenses	Biddable on the basis of production tranches	Biddable on the basis of productio n tranches

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs (Contd.)

CONTRACT FEATURES	BANGLADESH		INDIA NELP-VI-2006	MALAYSIA	PAKISTAN	VIETNAM 2004	TURKMENISTAN 1997	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008						Onshore & Shallow Marine	Deep Water
7.Carried Interest	No provision for carried interest. During negotiation 10% carried interest for BAPEX were achieved.	10% carried interest for Govt.	N/A	Negotiable carried interest for CARIGALI	N/A	Negotiable carried interest for Perto Vietnam	N/A	N/A	N/A
8. Import duty on Equipment	N/A	No duty	No duty	Duty imposed	No duty	No duty	No duty	Duty imposed	Duty imposed
9. Personal Income	No tax	Tax imposed	Tax imposed	Tax imposed	Tax imposed	Tax imposed	Tax imposed	Tax imposed	Tax imposed
10. Corporate Tax	No tax	Tax imposed	Tax imposed	Tax imposed	Tax imposed	Tax imposed	Tax imposed	Tax imposed	Tax imposed

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs (Contd.)

CONTRACT FEATURES	BANGLADESH		INDIA NELP-VI-2006	MALAYSIA	PAKISTAN	VIETNAM 2004	TURKMENISTAN 1997	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008						Onshore & Shallow Marine	Deep Water
11. Fees and Bonus a) Commercial Discovery Oil & Gas in Contract Block b) Production Bonus c) Research & Development (Not cost recoverable) d) Contract Service Fee (Not cost recoverable)	a) One million US$ b) Five hundred thousand US$ c) US$0.003 per bbl profit of Oil/NGL/Condensate and US$0.004 per MCF profit of Natural gas d) One hundred thousand US$ on each anniversary	a) US$ 3 Million for each discovery b) From 0.5 to 4.0 Million US$ on the basis of Production c) US$0.003 per bbl profit of Oil/NGL/Condensate and US$0.004 per MCF profit of Natural gas d) US$ 200,000/year during Expl. & Dev. Period US$ 300,000/year during production period	No Signature, Discovery & Production Bonus.	N/A	a) 1(One) million US$ to be paid after 90 days b) i) For 200 mmcfd or 33,000 BOE : 2 (Two) million US$ ii) For 600 mmscfd or 100,000 BOE: 5 (five) million US$	Biddable Signature & Commercial Discovery Bonus. Production Bonus is biddable on the basis of production tranches.	Biddable Signature & Production Bonus	a) N/A b) Negotiable based on production trenches c) Negotiable. The amount will increase @ 6% annually. d) US$ 300,000 for 1st year The amount will increase @ 6% annually. e) Signature Bonus- Biddable	a) N/A b) Negotiable based on production trenches c) Negotiable. The amount will increase @ 6% annually. c) US$ 300,000 for 1st year. The amount will increase @ 6% annually. d) Signature Bonus- Biddable

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs (Contd.)

CONTRACT FEATURES	BANGLADESH		INDIA	MALAYSIA	PAKISTAN	VIETNAM	TURKMENISTAN	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008	NELP-VI-2006			2004	1997	Onshore & Shallow Marine	Deep Water
12. Training Training of Bangladeshi Personnel (not cost recoverable)	One hundred thousand US$ on each anniversary	US$ 150,000/year during Expl. & Dev. Period US$ 200,000/year during production period	N/A	N/A	Minimum amount of US$20,00/ year during Expl. period and US$100,000/ year during Dev. and Production period which Shall be equal to the product of US $10,000 and Work Units	Biddable	Negotiable	Negotiable. The amount will increase @ 6% annually.	Negotiable. The amount will increase @ 6% annually.

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs (Contd.)

CONTRACT FEATURES	BANGLADESH		INDIA NELP-VI-2006	MALAYSIA	PAKISTAN	VIETNAM 2004	TURKMENISTAN 1997	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008						Onshore & Shallow Marine	Deep Water
13. Guarantees a) Initial Exploration Period b) First Extension Exploration Period c) Second Extension Exploration Period d) Third Extension Exploration Period	Biddable	Biddable	Shall be an amount equal to thirty five percent (35%) expenditure in respect of the minimum work programme to be undertaken by the Contractor	Contractor shall pay to Petronas an amount of one half of one percent (0.5%) of Cost of Oil and Natural gas portion of Profit	Biddable	Biddable	Biddable	Biddable	Biddable

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs (Contd.)

CONTRACT FEATURES	BANGLADESH		INDIA NELP-VI-2006	MALAYSIA	PAKISTAN	VIETNAM 2004	TURKMENISTAN 1997	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008						Onshore & Shallow Marine	Deep Water
14. Payment & Currency	US Dollars or any other Currency acceptable to Contractor	US Dollars or any other Currency acceptable to Contractor and Petrobangla	US Dollars or any other freely convertible currency acceptable to the Government and Foreign Company	Contract shall be made in Ringgit Malaysia or any other currency agreed by the Parties	Petroleum Operation in foreign exchange and Pakistani Ruppes	US Dollars or such other freely convertible currency or currencies as may be acceptable from time to time to the Parties	US Dollars	US Dollars	US Dollars

Table 3.1 Comparative study of Model PSC-2008, Model PSC-1997 and different foreign PSCs (Contd.)

CONTRACT FEATURES	BANGLADESH		INDIA NELP-VI-2006	MALAYSIA	PAKISTAN	VIETNAM 2004	TURKMENISTAN 1997	TRINIDAD & TOBAGO	
	MODEL PSC - 1997	MODEL PSC - 2008						Onshore & Shallow Marine	Deep Water
15. Gas Price	Floor Price – US$ 70/MT Ceiling Price – US$ 140/MT Onshore – 70% of HSFO	Floor Price – US$ 70/MT Ceiling Price – US$ 180/MT Onshore – 70% of HSFO <u>Type A Block:</u> 25% higher than the onshore gas price <u>Type B Block:</u> 100% of Market Price	Gas which is sold to the Government or any other Government Nominee shall be valued on the terms and conditions actually obtained including pricing formula and delivery (Explanation: However, It is clarified that this provision would apply only when the sale is made to the Government or Government Nominee under the provision of the contract)	The base gas price shall be United States Dollars one and cent eighty (US$1.80) per MM BTU. The base price shall be increased by four percent (4%) each year commencing on the first anniversary of the effective date.	The base price of US$ 2.50/MM BTU which will be increased at each contract year anniversary by US$ 0.10 per MM BTU	Natural gas sales pursuant to arms length Transaction the market price shall be actual price in US Dollars	At arms length reflecting international market price	At arms length reflecting international market price	At arms length reflecting international market price

Table 3.1 depicts the comparison of Bangladesh model PSC-2008 with the earlier model PSC-1997 and the PSCs of some selected countries. The comparison is based on some important factors those are significant determinants to evaluate the quality, economy and attractiveness of a PSC to the IOCs. Those also display whether Bangladesh national interest are properly protected or not.

01. **Contract term exploration period:** It is similar to comparing countries.

02. **Mandatory work programme:** In context of this factor, model PSC-2008 is in better position, because most of the comparing countries have no mandatory work option. In deep water, drilling option could be introduced like Trinidad.

03. **Biddable work programme:** Model PSC-2008 is the best in context of this factor as it conceives all the works that contain in comparing countries PSCs.

04. **Royalty:** Royalty refers to payments that are due to the host government or mineral owner (Lessor) in return for depletion of the reservoirs and the producer (Lessee/contractor) for having access to the petroleum resources (SPE, 2007). It means royalty is the amount has to be paid by the IOCs to the Host Governments to get the right to use the property.

In context of royalty, MPSC-2008 is in the worst position Bangladesh has not introduced the royalty option in MPSC-2008 that was not in MPSC-1997. All the comparing countries have the royalty option except MPSC-2008. This area could be improved.

05. **Cost recovery:** Under a typical production sharing agreement, the contractor is responsible for field development and all exploration and development expenses. In return, the contractor recovers costs (Investment and operating expenses) out of the gross production system. The contractor normally receives payment in oil or gas production and is exposed to with technical and market risk (SPE, 2001).

Cost recovery in MPSC-2008 can be considered as moderate option. There are three types of cost recovery system prevailing in the comparing countries. One is based on the ceiling (maximum percentage of production volume), another is biddable and the other is revenue over cost.

The maximum cost recovery allowed in Model PSC-2008 is 55%. In Pakistan and India it is 85% and 100% respectively. The disadvantage of high cost recovery percentage is that host countries don't get almost anything in the early year and no interest will be received

at the time of cost recovery. So, in context of cost recovery, the MPSC-2008 is in advantage position.

06. **Profit split:** Under a typical production sharing agreement, the contractor is responsible for the field development and all exploration and development expenses. In return the contractor is entitled to a share of the remaining profit oil or gas. The contractor receives payment in oil or gas production and is exposed to both technical and market risks (SPE, 2001).

It is observed that three methods are used in determining the profit split in comparing countries. One is determined on the basis of revenue over expenses. Another is production trenches. The third proposition is that it depends on the size of investment. If the size of investment is higher, the amount of return should be higher.

In risk free business environment revenue over expenses is the best option. But no method can be absolutely being considered as the best as Petroleum business has huge risk and uncertainly. Normally, profit should be increased with the increase in production. In MPSC-2008, Profit split is biddable and it increases with the increase in production and for maximum slab of production 600 or more mmcf/d it is 80% .So, it is a good option.

07. **Carried interest:** MPSC-2008 holds the best option among the comparing countries. In MPSC-1997, there is no provision of carried interest. It is an improvement in MPSC-2008. Most of the comparing countries there is no carried interest option other than Malaysia and Vietnam. These two countries have negotiable option.

08. **Import duty:** Most of the comparing countries except India and Pakistan have import duty option. MPSC-2008 has no import duty option. This area has an opportunity of improvement.

09. **Personal income:** It is a good option where MPSC-2008 holds the personal income is taxable like all comparing countries. This is an improvement in MPSC-2008, as MPSC-1997 has no personal income tax provision.

10. **Corporate Tax:** MPSC-2008 incorporates corporate tax, which was not in MPSC-1997. This is an improvement of MPSC-2008 as the comparing countries have corporate tax option.

11. **Fees and bonus:** It is the better option in MPSC-2008 as it conceives all options which is only available in Trinidad &Tobago among the comparing countries.

12. **Training:** In MPSC-2008c there is an option for training that can be considered as good option.

13. **Guarantees:** It is beddable and can be considered as a good option.

14. **Payment and Currency:** This condition is comparable to other countries.

15. **Gas Price:** In MPSC-2008, the gas price is determined based on volume. It is to be noted that in all comparing countries, gas price is determined on the basis of the heating value. Gas can be sold based on heating value of fuel like comparing countries. In Model PSC-2008, gas price is determined on the basis of the volume/ weight. The presence of higher hydrocarbon in the same volume of gas it will give higher heating value per unit volume. Moreover, IOCs are selling their portion of gas on the basis of heating value.

Overall discussion: It is observed that in any contract there is always a balance of economic and technical parameters. In some important parameters the host country (HC) gets the advantage and in some conditions HC has to negotiate with the IOCs. Moreover, in every contract there must be a risk-return trade off. The higher the investment risk, the chance of higher return provision has to be introduced in a contract. Contractors are always interested to work in the known geological structure region where discovery has already been made even though with stringent condition. As no data/ geological information are available in the frontier area, there is a huge investment risk as compared to explored region. Considering the reality, more incentives are usually given in frontier areas to attract the contractors. For example, in Indonesia there are three types of Model PSC. In onshore, the country has stated third generation contract where the terms and conditions are very stringent. Besides, conditions are more relaxed in offshore frontier area where 100% cost recovery is allowed from the first year to protect the investment risk. If the Government of Bangladesh decides to prepare the PSC for the frontier area like northwest region, the contract should be more relaxed than the explored area like Sylhet as because the region is less attractive. It is to be noted that Bangladesh spelled out Model PSC-2008 in its offshore frontier area that is unexplored yet.

Financial gain of a country depends on some parameters. Those are royalty, cost recovery, profit split, carried interest, personal income, corporate tax, fees and bonus, guarantees and gas price. No country can get all the best of mentioned parameters in a contract. The contractors ultimate goal is to get profit so there should be some prospect of business in the contract. It can be inferred that there should be a fine line and contract should be nearest to the fine line. Though royalty provision is not included in MPSC-2008, this contract is in advantageous position in terms of carried interest and cost recovery. Bangladesh has 10% carried interest and it is the best option among the comparing countries because only Malaysia and Vietnam has the similar types of option where this option is negotiable. In addition, the cost recovery in MPSC-2008 is maximum 50% whereas in Pakistan and India it is 85% and 100% respectively. It is to be mentioned here that higher cost recovery has disadvantage to HC as the country will get nothing in the early years and no interest will be received from the IOCs for cost recovery money. Moreover, all types of bonus option is inserted which is only available in Trinidad and Tobago. Furthermore, corporate tax and personal income tax are introduced like comparing countries.

In addition, for minimum mandatory work programme and biddable work progrmme it is the best among the comparing countries because it includes all the terms prevailing in the different contracts.

In conclusion, it can be stated that MPSC-2008 is a balanced contract.

Table 3.2 shows the comparative study Model PSC-2008 with signed PSCs in Bangladesh.

Table 3.2: Comparative study of signed PSCs

ITEMS	BLOCK-5		BLOCK-7		BLOCK-9		BLOCK-10		BLOCK-12		BLOCL-13&14		BLOCK-16		BLOCK-17&18	
Contractors name, and signed date	Shell/Cairn/ BAPEX, 04-07-2000		Chevron/BAPEX 02-04-2001		Tullow/Chevron/ Texaco/ BAPEX 2/4/2001,		Shell/Cairn/ BAPEX, 04-07-2000		Chevron, 11-01-1995		Chevron, 11-01-1995		Shell/Cairn/ Halliburton 12-06-1995		Shell/Cairn/ Halliburton 05-05-1994	
Initial Exploration Period	3 years		3 years		3 years		3 years		3 years		3 years		3 years		2 years	
1st Extension	2 years		2 years		2 years		2 years		2 years		2 years		2 years		2 years	
2nd Extension	2 years		2 years		2 years		2 years		2 years		2 years		2 years		3 years	
Contract Service Fee (Cost recoverable)	US$ 150,000/ year		US$ 100,000/year		US$ 150,000/ year		US$ 150,000/ year		US$ 100,000/year		US$ 100,000/year		US$50,000 / year		US$ 100,000/year	
Training grant (Non cost recoverable)	US$100,000 / year		US$100,000 / year		US$ 150,000/ year		US$100.000 / year		US$100,000 / year		US$100,000 / year		US$100,000 / year		US$ 100,000/year	
Discovery Bonus (Non cost recoverable)	US$ 2.5 Million for each discovery		US$ 1 Million for each discovery		US$ 2 Million for each discovery		US$ 2 Million for 1st , 3 Million for 2nd and 4 Million for subsequent discoveries		US$ 250,000 for each discovery		US$ 250,000 for each discovery		US$ 1 Million for each discovery		US$ 1 Million for each discovery	
Production Bonus (Non cost recoverable)	mmscf/d	Million USD	mmscf /d	Million USD	mmscf/d	Million USD	mmscf/d	Million USD	mmsc f/d	Million USD	mmscf /d	Million USD	mmsc f/d	Million USD	mmsc f/d	Million USD
	75	1.0	75	1.0	75	1.0	75	1.0	>75	0.5	75 - 150	0.5	137.5	1 0	75	0.5
	150	2 0	150	1.25	150	1.0	150	2.0	> 150	1.0	> 150	1.0	275	2.0	150	1.0
	225	2.5	225	1.5	225	1 0	225	2.5	> 300	2.0	> 300	2.0	412.5	3.0	300	2.0
	300	3.0	300	2.0	300	2 0	300	3.0	>600	3.0	> 600	3.0	550	4.0	450	3.0
	375	3.5	375	3 0	375	2.5	375	3.5								
	600	4 0	600	5 0	600	5.0	600	4 0								

Table 3.2: Comparative study of signed PSCs (Contd.)

ITEMS	BLOCK-5	BLOCK-7	BLOCK-9	BLOCK-10	BLOCK-12	BLOCL-13&14	BLOCK-16	BLOCK-17&18
Contractors name and signed date	Shell/Cairn/ BAPEX, 04-07-2000	Chevron/BAPEX 02-04-2001	Tullow/Chevron/ Texaco/ BAPEX 2/4/2001,	Shell/Cairn/ BAPEX, 04-07-2000	Chevron, 11-01-1995	Chevron, 11-01-1995	Shell/Cairn/ Halliburton 12-06-1995	Shell/Cairn/ Halliburton 05-05-1994
Gas Price	Onshore: 75% of HSFO Ceiling- $ 120 Floor-$ 70 Discount- 0.5%	Onshore : 75% of HSFO Ceiling- $ 120 Floor-$ 70 Discount- 1% Offshore : 25% higher that onshore Discount-10%	Onshore: 75% of HSFO Ceiling- $ 120 Floor-$ 70 Discount- 1 0%	Onshore : 75% of HSFO Ceiling- $ 120 Floor-$ 70 Discount- 1% Offshore : 25% higher that onshore Discount-10%	Onshore: 75% of HSFO Ceiling- $ 140 Floor-$ 70	Onshore: 75% of HSFO Ceiling- $ 140 Floor-$ 70	Onshore : 75% of HSFO Ceiling- $ 120 Floor-$ 70 Offshore : 25% higher that onshore	Onshore : 75% of HSFO Ceiling- $ 125 Floor-$ 70 Discount- 6% Offshore : 25% higher that onshore Discount-6%
Local currency payment	Equivalent to local expenses	Equivalent to local expenses	Equivalent to local expenses	Equivalent to local expenses	No such provision	No such provision	No such provision	No such provision
Cost Recovery	Gas/Con/NGL: 52.5% Oil: 47.5%	Gas/Con/NGL: 52.5% Oil: 50%	Gas/Con/NGL: 45% Oil : 40%	Gas/Con/NGL: 45% Oil: 40%	Gas/ NGL: 55% Oil : 50%	Gas/ NGL: 55% Oil : 50%	Onshore Gas: 55% Offshore Gas: 60% Oil : 40% NGL-30%	Onshore Gas: 55% Offshore Gas: 60% Oil : 50% NGL-50%

Table 3.2: Comparative study of signed PSCs (Contd.)

ITEMS	BLOCK-5			BLOCK-7			BLOCK-9			BLOCK-10			BLOCK-12			BLOCL-13&14			BLOCK-16			BLOCK-17&18		
Contractors name and signed date	Shell/Cairn/ BAPEX, 04-07-2000			Chevron/BAPEX 02-04-2001			Tullow/Chevron/ Texaco/ BAPEX 2/4/2001,			Shell/Cairn/ BAPEX, 04-07-2000			Chevron, 11-01-1995			Chevron, 11-01-1995			Shell/Cairn/ Halliburton 12-06-1995			Shell/Cairn/ Halliburton 05-05-1994		
Profit Share	mmscf/d	PB Share	Cont. Share	mmscf/d	PB Share	Cont. Share	mmscf/d	PB Share	Cont. Share	mmscf/d	PB Share	Cont. Share	mmscf/d	PB Share	Cont. Share	mmscf/d	PB Share	Cont. Share	mmscf/d	PB Share	Cont. Share	mmscf/d	PB Share	Cont. Share
	Up to150	52.5	47 5	Up to150	65	35	Up to150	66	34	Up to150	67 5	32.5	Up to150	62 5	37.5	Up to 150	62.5	37 5	Up to100	50	50	Up to150	52 5	47.5
	150-300	57.5	42 5	150 - 300	68	32	150 - 300	72 5	27.5	150 - 300	73	27	150 - 300	65	35	150 -300	65	35	100 - 150	55	45	150 - 250	62.5	37 5
	300-450	67 5	32.5	300-450	70	30	300 - 450	78	22	300 - 450	78	22	More than 300	67. 5	32 5	Mor e than 300	67.5	32 5	150 - 250	65	35	250 - 430	72 5	27 5
	450-600	72.5	27 5	450 - 600	75	25	450 - 600	82 5	17 5	450 - 600	80 5	19.5							250 - 350	75	25	350 - 450	82.5	17 5
	More than 600	77 5	22,5	More than 600	80	20	More than 600	85	15	More than 600	80 5	19 5							350 - 450	85	15	450 - 600	85	15
																			More than 450	87.5	12 5	> 600	90	10

Table 3.2 depicts that most of the factors among signed blocks are the same. The major differences are in gas ceiling price, export and tax provision.

In MPSC-2008 has conceived important improvement as compared to MPSC-1997 and other signed blocks by accommodating the experience of the earlier PSC and signed blocks. The remarkable improvements are listed below:

(i) **Minimum mandatory work obligation:** In MPSC-2008, for initial exploration period, contractor has to accomplish mandatory work programme and period work programme. Main works have to be done are geological Survey, geophysical Survey, other Survey (Gravity, magnetic, Geo-chemical Survey etc.) and 01 Exploration well. This was not in the previous contracts but there was a biddable minimum work obligation in MPSC-1997.

(ii) **Cost recovery:** In MPSC-2008, the cost recovery is maximum 55% of investment for each year. Previously in MPSC-1997, it was biddable. In existing signed PSCs, the cost recovery for onshore gas is minimum 45%-55% and in case of offshore gas it is minimum 60%.

(iii) **Profit split:** There is a ceiling in profit split for every slab of production and within that ceiling it is biddable in MPSC-2008 but in earlier it was negotiable. Profit split of Petrobangla will be based on production and the of profit split ranges from the production of 150 mmcf/d to 600 mmcf/d and above. For the maximum ceiling of production 600 mmcf/d or above, the profit share of petrobangla will be 80%. In case of block-12, Block 13&14, the ceiling for profit share is calculated only on the basis of maximum 300 mmcf/d and the profit share of Petrobangla is maximum 67.5% which is really bad.

(iv) **Gas price:** In model PSC-2008, price is determined based on HSFO The floor price is US$ 70/MT and ceiling price is US$180/MT where in MPSC-1997, ceiling price is US$120/MT-US$140/MT but the corporate tax is paid by Petrobangla. The ceiling prices for block 5, block 7, block 9, block 10 and block 16 is US$ 120/MT and in block 17 & 18, it is & US$ 125/MT.

(v) **Export of Gas:** Contractor has to offer its share of cost recovery gas and profit gas to Petrobangla. Contractor has the option to sell contractor's share of natural gas in the domestic market, subject to the Petrobangla's first right of refusal. In that case Petrobangla will assist to find out the third party. If the third party is not found, contractor can export 80% of natural gas in the form of LNG where the Petrobangla and IOCs share will be proportional. Mainly export option is inserted to protect the investment if the large discovery is made and Bangladesh has no capacity to use this excess amount of gas. In MPSC-1997 the same condition was introduced, moreover the amount of export was allowed up to 100%.

(vi) **Corporate tax:** According to MPSC-2008, the corporate tax will be paid by IOCs but in the existing contracts it has to be paid by Petrobangla.

(vii) **Abandonment fund:** In MPSC-2008, there is a provision to form an "Abandonment fund" from the initial production period to retrieve the gas field into environment friendly position at the time of abandonment and it is cost recoverable. This provision was not in MPSC-1997 and signed contracts.

(viii) **Arbitration:** According to MPSC-2008, "Bangladesh Arbitration Act-2001" will do arbitration but in MPSC-1997, it follows ICSID arbitration rule.

(ix) **Unitization:** In MPSC-2008, there is a provision for unitization between two adjacent blocks where a geological structure spreads over the both blocks. There is also the provision for international unitization agreement if there is a single geological structure spreads over the international boundary. This option was not in MPSC-1997 and other signed contracts.

(x) **Assignment agreement and transfer of share:** According to MPSC-2008, contractor has to take prior permission to assign its title and responsibility to another company. Without the prior permission of Petrobangla, contractor cannot transfer more than 50% of its share. This option is introduced to crutinize whether the new company is competent and experienced in exploration and production. In MPSC-1997, no permission is required to transfer the share.

Chapter 4
Conclusion and Recommendation

4.1 Conclusion

- All countries have royalty options in their contracts except MPSC-2008 of Bangladesh. Though royalty provision is not included in MPSC-2008, the contract is in advantageous position in terms of carried interest and cost recovery. Bangladesh has 10% carried interest and it is the best option among the comparing countries because only Malaysia and Vietnam has the similar types of option where this option is negotiable. In addition, the cost recovery in MPSC-2008 is maximum 50% whereas in Pakistan and India it is 85% and 100% respectively.
- All types of bonus option are inserted which is only available in Trinidad and Tobago.
- In MPSC-2008, Gas price is determined on the basis of the volume/ weight. If the presence of higher hydrocarbon (C_3, C_4 etc.) in the same volume of gas it contains higher heating value. Moreover, IOCs are selling their portion of gas on the basis of heating value. As a result Petrobangla receives the lower price by selling natural gas in volume. It is to be noted that in all comparing countries, gas price is determined on the basis of the heating that gas price could be determined on the basis of heating value (per BTU) of fuel was Petrobangla proposed earlier to the Ministry of Power, Energy and Mineral Resources. At that time the concerned ministry considered that the new formula could create difficulty in tax calculation and collection. Besides the ministry also considered the unavailability of enough measuring facilities and trained manpower.
- The maritime boundary complicacy with India and Myanmar has already jeopardize the oil and gas exploration process

4.2 Recommendations:

(1) Royalty option can be examined.

(2) Gas price should be based on the heating value (per BTU) of fuel.

(3) The maritime boundary complicacy with India and Myanmar has to be resolved as quick as possible.

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