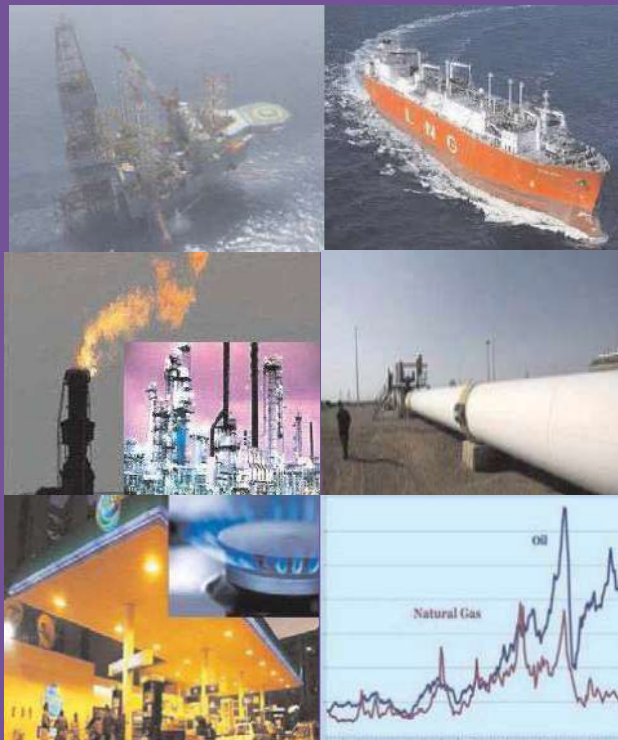




Pricing Mechanisms for Oil and Gas in SAARC Member States



Md. Anwarul Islam
Research Fellow
SAARC Energy Centre
2012



Published by:

SAARC Energy Centre

697, Street 43, NPF, E-11/4, Islamabad, Pakistan

Tel: + (92 51) 222 8802&4; **Fax:** + (92 51) 222 1937

info@saarcenergy.org

www.saarcenergy.org

Pricing Mechanisms for Oil and Gas in SAARC Member States



Md. Anwarul Islam
Research Fellow
SAARC Energy Centre
2012

Author:

Md. Anwarul Islam
Research Fellow
SAARC Energy Centre

Reviewed by:

Mr. Syed Jawad Naseem
General Manager (RA)
Sui Northern Gas Pipelines Limited
and former Senior Executive Director
Oil and Gas Regulatory Authority
Pakistan

Dr. Muhammad Pervaz
Programme Leader
SAARC Energy Centre

Disclaimer:

Findings, interpretation, and conclusions expressed in this report are based on information gathered by SAARC Energy Centre from the Member States and reliable published documents that are available both in printed and online versions. SAARC Energy Centre does not, however, guarantee the accuracy, completeness or usefulness of information in this report, and can not be held responsible for any errors, omissions, or losses which emerge from its use.

**Published by:**

SAARC Energy Centre

697, Street 43, NPF, E-11/4, Islamabad, Pakistan

Tel: + (92 51) 222 8802&4; **Fax:** + (92 51) 222 1937

info@saarcenergy.org

www.saarenergy.org

Contents

<i>Foreword</i>	v
<i>Acknowledgements</i>	vi
<i>List of Tables</i>	vii
<i>List of Figures</i>	viii
<i>Acronyms</i>	ix
<i>Executive Summary</i>	xii
Introduction	1
1.1 Background	1
1.2 Objective	1
1.3 Approach	1
1.4 Limitations.....	2
Natural Gas Pricing	3
1.2 Objective	1
2.1.1 The Role of Natural Gas	3
2.1.2 Natural Gas Price Evolution	5
2.1.3 Current Gas Pricing Mechanism	6
2.1.4 Analyses and Key Findings.....	8
2.2 Natural Gas Pricing in India	9
2.2.1 The Role of Natural Gas	10
2.2.2 Natural Gas Price Evolution	12
2.2.3 Current Producer Gas Pricing Mechanism	13
2.2.4 Liquefied Petroleum Gas Pricing	15
2.2.5 Current Consumer Gas Pricing Mechanism	16
2.2.6 Analyses and Key Findings.....	19
2.3 Natural Gas Pricing in Pakistan	20
2.3.1 The Role of Natural Gas	21
2.3.2 Natural Gas Price Evolution	22
2.3.3 Current Producer Gas Pricing Mechanism	23
2.3.4 Liquefied Natural Gas Pricing.....	24
2.3.5 Liquefied Petroleum Gas Pricing	25
2.3.6 Current Consumer Gas Pricing Mechanism	25
2.3.7 Analyses and Key Findings.....	28

Oil Pricing.....	30
3.1 Oil Pricing in Bangladesh.....	30
2.3.2 Natural Gas Price Evolution	30
3.1.2 Development of Refinery Gate Price	32
3.1.3 Retail Selling Pricing Mechanism.....	33
3.1.4 Analyses and Key Findings.....	35
3.2 Oil Pricing in India	35
2.3.2 Natural Gas Price Evolution	36
3.2.2 Development of Refinery Gate Price	37
3.2.3 Retail Selling Pricing Mechanism.....	39
3.1.4 Analyses and Key Findings.....	41
3.3 Oil Pricing in Nepal.....	42
3.3.1 The Role of Oil	42
3.3.2 Development of Oil Price	43
3.3.3 Analyses and Key Findings.....	46
3.4 Oil Pricing in Pakistan	46
2.3.2 Natural Gas Price Evolution	47
3.4.2 Development of Refinery Gate Price	48
3.4.3 Retail Selling Pricing Mechanism.....	50
3.1.4 Analyses and Key Findings.....	51
3.5 Oil Pricing in Sri Lanka.....	52
2.3.2 Natural Gas Price Evolution	53
3.5.2 Development of Oil Price	55
3.1.4 Analyses and Key Findings.....	56
Institutional, Legal and Regulatory Frameworks	57
4.1 Bangladesh	57
4.2 India.....	61
4.3 Nepal	65
4.4 Pakistan.....	66
4.5 Sri Lanka	69
Concluding Remarks	72
Appendices	78
References.....	90

Foreword

Energy pricing is a part of energy policies for promoting the objectives of improving energy efficiency, protecting the environment and ensuring investment for infrastructure of energy supply. The Third Meeting of the SAARC Energy Ministers decided formation of Expert Groups for different energy commodities and services. Recognizing the importance of energy pricing, the First Meeting of the Experts Group on Oil and Gas recommended undertaking study on sharing experiences in the areas of pricing mechanisms for oil and gas.

Keeping in view the recommendations of the Experts Group, SAARC Energy Centre under its thematic area of Programme on Energy Trade has undertaken the study on “Pricing Mechanisms for Oil and Gas including LNG and LPG” for sharing experiences of Member States with each other and promotion of energy trade in the region. The institutional, legal and regulatory frameworks for oil and gas sector of the Member States have also examined under this study.

This report presents and analyzes the oil and natural gas prices and pricing practices adopted by SAARC Member States. Overall policy perspective on pricing, role of oil and gas in the energy system of each selected country and evolution of pricing mechanisms have also described. The study covers mainly two kinds of energy commodities, namely, petroleum products and natural gas with the perspective of both producer as well as consumer.

My sincere thanks are to the SAARC Secretariat and Member States for facilitating the study and providing study related data and information that made it possible to complete this study. I would like to express my sincere appreciation to my colleague Md. Anwarul Islam (on deputation from Petrobangla, Bangladesh) who has produced this report. I also thank to the reviewers for their valuable contributions. SAARC Energy Centre would welcome comments from readers for improving next edition of this report.

I hope that this study will be a reference document and useful source in respect of sharing experiences on oil and natural gas pricing mechanisms among the SAARC countries.

Ulul A. Raza
Director
SAARC Energy Centre

Acknowledgements

I gratefully acknowledge the cooperation and support received from several individuals, organizations and Member States to complete this study. This study would not have been completed without their contribution.

I deeply appreciate the expert views received from Mr. Syed Jawad Naseem, General Manager, Sui Northern Gas Pipelines Limited and former Senior Executive Director, Oil and Gas Regulatory Authority, Pakistan as a peer reviewer of this study. I also want to give special thanks to Mr. Manzar Naeem Qureshi, Mr. Arshad Sheikh and Mr. Ehsanul Haque from Pakistan, Mr. Zaved Choudhury from Bangladesh, Mr. Raju Maharjan from Nepal for their valuable inputs.

I owe a special debt of gratitude to Dr. Muhammad Pervaz, Programme Leader, SAARC Energy Centre for the many hours that he spent making editorial suggestions and putting up with my many drafts while giving me additional comments and insights.

Finally, I want to thank Mr. Hilal A. Raza Director of SEC for his guidance and strong support, and my colleagues, general service staff for their patience with me during this study.

List of Tables

Table 1: Consumer Gas Prices in Bangladesh.....	8
Table 2: Summary of Natural Gas Price Evolution in India	12
Table 3: Producer Gas Prices in India	15
Table 4: Refinery Gate Price & Retail Selling Price of LPG in India.....	15
Table 5: Consumer Price of APM Gas in India.....	16
Table 6: Priority Order for Natural Gas Consumers in India.....	17
Table 7: Summary of Natural Gas Price Evolution in Pakistan	23
Table 8: Producer Gas Prices in Pakistan	24
Table 9: Priority Order for Natural Gas Consumers in Pakistan	27
Table 10: Consumer Gas Prices in Pakistan.....	27
Table 11: Refinery Gate Price of Petroleum Products in Bangladesh	33
Table 12: Distributors Margin, Dealers Commission, Inland Freight and VAT on Petroleum Products in Bangladesh	54
Table 13: Retail Selling Price of Selected Petroleum Products in Bangladesh.....	34
Table 14: Import Charges and Custom Duty on selected Petroleum Products in India	39
Table 15: Refinery Gate Price of selected Petroleum Products in India.....	39
Table 16: Excise Duty, Dealer Commission and VAT on Petroleum Products in India.....	40
Table 17: Retail Selling Price of Selected Petroleum Products in Delhi, India.....	40
Table 18: Import Price, Taxes, Dealer Commission and Transportation cost on Petroleum Products in Nepal	45
Table 19: Cost and Retail Selling Price of Selected Petroleum Products in Nepal	46
Table 20: Refinery Gate Price of Selected Petroleum Products in Pakistan	49
Table 21: Distributors Margin, Dealers Commission and IFEM on Petroleum Products in Pakistan	50
Table 22: Ex-Depot Sale Prices of Selected Petroleum Products in Pakistan	51
Table 23: Retail Selling Price of Selected Petroleum Products in Sri Lanka.....	55
Table 24: Key Features of the Natural Gas Pricing in selected Member States	74
Table 25: Policy Instruments of Natural Gas Value Chain.....	75
Table 26: Key Features of the Oil Pricing Mechanisms.....	76

List of Figures

Figure 1: Share of Gas in Total Primary & Commercial Energy Supply and Electricity Generation in Bangladesh.....	4
Figure 2: Natural Gas Consumption by Sector in Bangladesh	5
Figure 3: Share of Gas in Total Primary & Commercial Energy Supply and Electricity Generation in India.....	10
Figure 4: Natural Gas Consumption by Sector in India.....	11
Figure 5: Domestic Gas Production by Region in India	11
Figure 6: Share of Gas in total Primary & Commercial Energy Supply and Electricity Generation in Pakistan.....	21
Figure 7: Natural Gas Consumption by Sector in Pakistan	22
Figure 8: Share of Oil in Total Primary & Commercial Energy Supply and Electricity Generation in Bangladesh.....	31
Figure 9: Oil Consumption by Sector in Bangladesh	32
Figure 10: Share of Oil in Total Primary & Commercial Energy Supply and Electricity Generation in India.....	36
Figure 11: Oil Consumption by Sector in India.....	37
Figure 12: Share of Oil in Total Primary & Commercial Energy Supply in Nepal	43
Figure 13: Oil Consumption by Sector in Nepal	43
Figure 14: Share of Oil in Total Primary & Commercial Energy Supply and Electricity Generation in Pakistan.....	47
Figure 15: Oil Consumption by Sector in Pakistan.....	48
Figure 16: Share of Oil in Total Primary & Commercial Energy Supply and Electricity Generation in Sri Lanka.....	54
<i>List of Figures</i>	viii

Acronyms

ADB	Asian Development Bank
AEPC	Alternative Energy Promotion Centre
APM	Administered Pricing Mechanism
BAPEX	Bangladesh Petroleum Exploration & Production Company
BBL	Barrel
BDT	Bangladesh Taka
BERC	Bangladesh Energy Regulatory Commission
BGDCL	Bakhrabad Gas Distribution Company Limited
BGFCL	Bangladesh Gas Fields Company Limited
BPC	Bangladesh Petroleum Corporation
BPDB	Bangladesh Power Development Board
BPI	Bangladesh Petroleum Institute
C & F	Carriage and Freight
CGD	City Gas Distribution
CM	Cubic Meter
CNG	Compressed Natural Gas
CPC	Ceylon Petroleum Corporation
DGH	Directorate General of Hydrocarbon
DWMB	Deficit Wellhead Margin for BAPEX
FOB	Free On Board
E&P	Exploration and Production
EGoM	Empowered Group of Ministers
EMRD	Energy & Mineral Resources Division
ENERCON	National Energy Conservation Centre
ERL	Eastern Refinery Limited
FOB	Freight on Board
GAIL	Gas Authority of India Limited
GDS	Gas Development Surcharge
GIIP	Gas Initially in Place
GoB	Government of Bangladesh
GoI	Government of India
GoP	Government of Pakistan
GSB	Geological Survey of Bangladesh
GWh	Giga Watt Hour
GTCL	Gas Transmission Company Limited
HDIP	Hydrocarbon Development Institute of Pakistan
HOBC	High Octane Blending Component
HSD	High Speed Diesel

HSFO	High Sulphur Fuel Oil
IDCOL	Infrastructure Development Company Limited
IEA	International Energy Agency
IFEFA	Inland Freight Equalization Fund Account
IOCs	International Oil Companies
IOC	Indian Oil Corporation
IPP	Import Parity Pricing
IPPs	Independent Power Producers
JGTDSL	Jalalabad Gas Transmission and Distribution System Limited
KGDCL	Karnaphuli Gas Distribution Company Limited
LC	Letter of Credit
LDO	Light Diesel Oil
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
Mcf	Thousand Cubic Feet
MMbtu	Million British Thermal Unit
MMscm/d	Million Standard Cubic Meter Per Day
Mscm	Thousand Standard Cubic Meter
MoEST	Ministry of Environment, Science and Technology
MoICS	Ministry of Industry, Commerce and Supplies
MoPE	Ministry of Power and Energy
MoPEMR	Ministry of Power, Energy and Mineral Resources
MoPNG	Ministry of Petroleum and Natural Gas
MoPNR	Ministry of Petroleum and Natural Resources
MoU	Memorandum of Understanding
MoWR	Ministry of Water Resources
MS	Motor Spirit
Mtoe	Million Tonnes of Oil Equivalent
NELP	New Exploration Licensing Policy
NEP	National Energy Policy
NOC	Nepal Oil Corporation
NOCs	National Oil Companies
OCAC	Oil Companies Advisory Committee
OGDCL	Oil and Gas Development Company Limited
OGRA	Oil and Gas Regulatory Authority
OIL	Oil India Limited
OMCs	Oil Marketing Companies
ONGC	Oil and Natural Gas Corporation
PCA	Petroleum Concession Agreement
PDF	Price Deficit Fund

PSC	Production Sharing Contract
PSO	Pakistan State Oil
PUCSL	Public Utilities Commission of Sri Lanka
RGP	Refinery Gate Price
RPGCL	Rupantarita Prakritik Gas Company Limited
RTP	Refinery Transfer Price
SAARC	South Asian Association for Regional Cooperation
SCM	Standard Cubic Meter
SD	Supplementary Duty
SEC	SAARC Energy Centre
SGCL	Sundarban Gas Company Limited
SGFL	Sylhet Gas Fields Limited
SNGPL	Sui Northern Gas Pipe Line Company Limited
SREDA	Sustainable and Renewable Energy Development Authority
SSGCL	Sui Southern Gas Company Limited
TGTDCL	Titas Gas Transmission and Distribution Company Limited
TPP	Trade Parity Pricing
UFG	Unaccounted for Gas
USD	US Dollar, also sometimes shown as US\$
VAT	Value Added Tax
WLG	Windfall Levy on Gas

Executive Summary

The first Meeting of the SAARC Experts Group on Oil & Gas (Dhaka, 25-26 July 2011) recommended some activities to be undertaken by SAARC Energy Centre. Recognizing the importance of energy pricing, one of the proposed activities was study on sharing experiences in the areas of pricing mechanisms for oil and gas, operational and technical aspects of LNG terminals, and LPG for household and industrial use. Subsequently, the SAARC Energy Centre proposed a study on Pricing Mechanisms for Oil and Gas which was approved by Governing Board and higher SAARC bodies.

Energy Pricing plays a key role for promoting the three objectives of energy i.e. conservation, environmental protection and investment for infrastructure of energy sector. Energy prices have to cover the costs of production and investments to assure the internal cost of energy suppliers. Energy pricing is influenced by the objectives of government as well as private sector. Government objectives reflect a wide range of economic, social and political goals and, the private sector objectives reflect the financial viability.

Throughout the world, energy sector remains an area of particular interest to governments because of the strong relationship between the sector and the economic and social well-being of an economy. Julius and Mashayekhi (1990) listed the three main objectives of the energy pricing:

- Economic Efficiency;
- Financial Viability, and;
- Social Equity.

Economic efficiency means existing energy resources are put to their best use. Economic efficiency principle looks for to ensure the regulation of prices in such a manner that the prices of energy are set equal to their value. The financial principle suggests that energy supply systems should be able to raise sufficient revenues to remain financially viable. The equity principle relates to welfare and income distribution considerations. This may result in implementing differential pricing systems in spite of the different costs of supply.

Most of the countries in the SAARC region have undertaken, or is in the process of undertaking, reforms in the pricing structure of energy that aim to restructure the energy sector. Energy pricing now becomes a basic component of the restructuring programs.

SAARC Member States have some form of energy price control/regulation. There are subsidies, import tariffs, taxes and levies; all these affect the final end-use energy price.

Chapter 1 provides study background and objective, methodology adopted and limitations for the study. Chapter 2 deals with pricing mechanisms for natural gas in Bangladesh, India and Pakistan. Natural gas pricing mechanism has been furnished country by country. Overall policy perspective is first described on natural gas pricing and role of the natural gas in the energy system of each country. Evolution of pricing mechanisms and prevailing gas pricing for both indigenous and imported as well as consumer gas pricing mechanisms of different economic sectors are described. The pricing mechanisms are then followed by an overview of present gas price build-up and gas allocation policies for various categories of consumer. In addition, this chapter covers the pricing mechanisms of Liquefied Natural Gas (LNG) and Liquefied Petroleum Gas (LPG) for both India and Pakistan.

Chapter 3 presents pricing mechanisms for oil in Bangladesh, India, Nepal, Pakistan and Sri Lanka. It includes country by country analysis of oil pricing mechanisms. This chapter first describes the policy perspective on oil pricing followed by the role of oil in the energy system of each country. Evolution of oil pricing mechanisms and prevailing oil pricing for indigenous, imported and detailed account of consumer oil pricing mechanisms of different economic sectors have been presented. The pricing mechanisms are then followed by an overview of present refinery gate price build-up and retail selling price build-up of petroleum products.

Chapter 4 describes the institutional, legal and regulatory frameworks of each Member State. It discusses in detail on oil and natural gas sector. Finally, chapter 5 summarizes the key findings of this study. First sections of this chapter consider some of the energy pricing objectives and energy pricing approaches from the theoretical point of view. The remaining sections deal with the key findings of natural gas pricing followed by oil pricing.

In determining the natural gas pricing, SAARC Member States adopt some form of price control/regulation. The level of natural gas producers price is linked to competing liquid fuel. The zonal/regional discount policy is also applicable in determining the producers' gas price. The introduction of depletion premium or royalty is being implemented in India and Pakistan only. One of the prominent

common features of the SAARC Member States is the provision to sell gas to third party at market price.

In SAARC Member States, concern over social equity is reflected through government intervention in gas pricing. The selected SAARC economies provide subsidies to gas for strategic industries, for instance fertilizer and household. The lowest sectoral gas price is given for fertilizer production and power generation in Bangladesh. Priority is given to fertilizer production and power generation in India, supplied gas at the lowest rate (Administered Pricing Mechanism) by the state-owned companies. The lowest rate is charged to domestic consumers and fertilizer feedstock in Pakistan. There are private sector participations in production sector of each country. The taxes paid by the different gas consumers have significant variations among the countries.

In determining the prices of petroleum products, SAARC Member States have some form of price control/regulation. The main reasons for the price regulation are the importance of oil to the economy and social policy objectives like the support for low-income groups. In some Member States, oil prices are administered by the government. But they are in various stages of planning to adopt formula based pricing mechanism.

In SAARC Member States, except Nepal, the pricing formula for refinery products is based on the concept of import parity price. India applies both the concept of import parity and trade parity price. The ways and types of taxation on petroleum products are different across the SAARC countries. Taxes imposed on petroleum products have proven to be a reliable source of raising revenue. In fact, countries impose different tax rates for different oil products to achieve social, environmental and economic policy objectives. Most SAARC countries provide subsidy and, charge a relatively lower tax rate on some specific petroleum products.

Chapter 1 Introduction

1.1 Background

The Energy Ministers, during their Third Meeting (Colombo, 29 January 2009), considered and approved a Concept Paper on SAARC Energy Ring, with the observation that it is a dynamic concept and will evolve over time with the experience of the Member States and changing ground realities. The Meeting further decided formation of Expert Groups for different commodities and services. As a follow-up, the Working Group on Energy constituted Expert Groups on (i) Oil and Gas; (ii) Electricity; (iii) Renewable Energy; and (iv) Technology/Knowledge sharing (including energy efficiency, coal, etc.).

The First Meeting of the Experts Group on Oil & Gas was held in Dhaka on 25-26 July 2011 and recommended some activities to be undertaken by SAARC Energy Centre. Recognizing the importance of energy pricing, one of the proposed activities was study on sharing experiences in the areas of pricing mechanisms for oil and gas, operational and technical aspects of LNG terminals, and LPG for household and industrial use.

1.2 Objective

SAARC Energy Centre (SEC), under its thematic area of Programme on Energy

Trade (PENT), has undertaken the study on Pricing Mechanisms for Oil and Gas with the objective of sharing experiences of Member States with each other and promotion of energy trade in the region. The institutional, legal and regulatory frameworks for oil and gas sector of the Member States are also examined under this study.

1.3 Approach

The study is based on review and analyses of related published literature and information that are available in both on-line and printed version. Price data and other energy related information were collected from various sources to provide a brief overview of energy pricing policies. The sources for these data and information were the publications of Member States on energy as well as the publications of credible national, regional and international energy research organizations. The necessary information was also collected directly from concerned officials' of different institutions of SAARC countries. Moreover, discussions on various aspects on energy policy, regulatory frameworks and oil and gas pricing structure of Member States were made with the professionals having knowledge and experience in energy policy and planning to exchange views and ideas.

1.4 Limitations

The study has been completed by in-house efforts of SAARC Energy Centre. Initially the study was designed to cover all SAARC Member States, but due to limitations in the availability of data and relevant pricing information, this study includes Bangladesh, India, Nepal, Pakistan and Sri Lanka. Furthermore, due to the non-availability of data and

pricing information, the level of details varies amongst the SAARC countries. The study incorporates energy price evolution and current pricing policies of oil, gas, LPG and LNG in SAARC countries, including description of the pricing mechanisms both for producers and different consuming sectors, subsidies, taxation and levy systems, and regulatory structures in each Member State.

Chapter 2 Natural Gas Pricing

This chapter deals with pricing mechanisms for natural gas in Bangladesh, India and Pakistan. It corresponds to a country by country analysis of natural gas pricing mechanisms. Overall policy perspective is first described on natural gas pricing and role of the natural gas in the energy system of each country. Evolution of pricing mechanisms and prevailing gas pricing for both indigenous and imported as well as consumer gas pricing mechanisms of different economic sectors are described. The pricing mechanisms are then followed by an overview of present gas price build-up and gas allocation policies for various categories of consumer. In addition, this chapter also explains about the pricing mechanisms of Liquefied Natural Gas (LNG) and Liquefied Petroleum Gas (LPG).

2.1 Natural Gas Pricing in Bangladesh

The energy pricing practices in Bangladesh are controlled by the state as a decision maker. In 1996, Bangladesh initiated its national energy policy, which included the familiar recommendations for sector unbundling, encouragement for private sector participation, supply of energy at affordable price and establishment of an energy regulator. Until 2003, Bangladesh's gas market was controlled

by the government through various entities. In March 2003, the Government of Bangladesh enacted the Bangladesh Energy Regulatory Commission Act. One of the objectives of this Act is to determine tariffs in a transparent way.

The natural gas based energy economy of Bangladesh is in crisis due to a growing gap between supply and demand of natural gas. The government of Bangladesh is well aware of this insecure fuel monopoly and growing deficit of gas supply. The power sector, heavily dependent on gas, is currently looking into the development of coal fired power stations. The government of Bangladesh also has been looking into the importing of LNG for supplementing the domestic natural gas production.

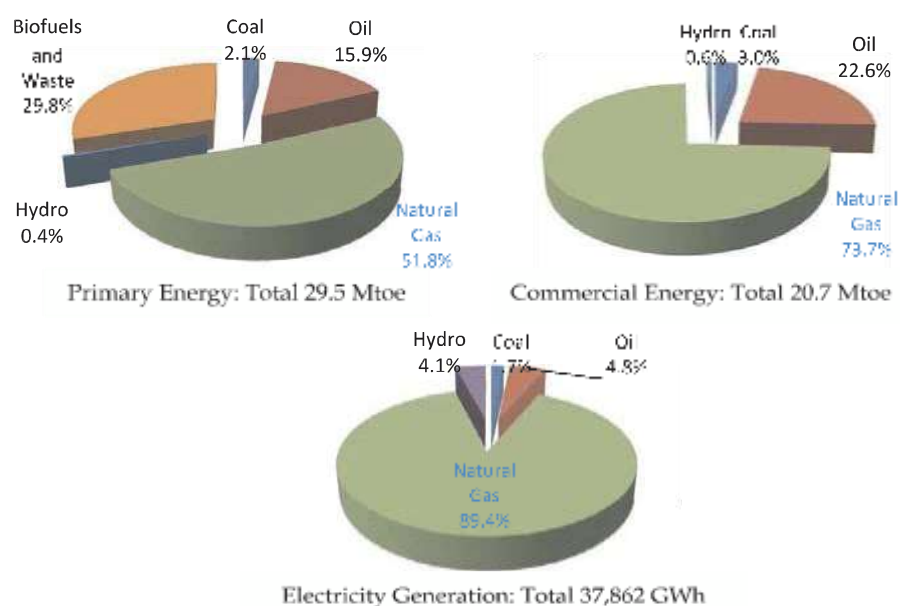
2.1.1 The Role of Natural Gas

Bangladesh gas sector started its journey in the 60s, but its speedy development and integration started to go faster in the early 70s, stimulated by the rising oil prices. Bangladesh is heavily dependent on natural gas, which in year 2009 accounted for around 89% of its power generation and over 73% of its commercial energy supply (IEA, 2009). The country's gas production is already insufficient and the gas reserves are depleting due to over increasing

demand. According to Petrobangla¹, as on June 2010, the gas initially in place (GIIP) has been estimated as 29.23 trillion cubic feet, out of which estimated recoverable reserve (proven & probable) is 21.05 trillion cubic feet. Up to June 2010, as much as 8.54 trillion cubic feet gas has been consumed (BOGMC-Annual Report 2010). Presently, daily demand for gas reaches at about 2500 million cubic feet whereas the daily supply of gas is around 2200 million cubic feet (BOGMC-Daily Production Report, 2012). At current demand growth rates, averaging 8% a year since 2004, Bangladesh may not have many years of known domestic reserve left.

According to the International Energy Agency, in 2009 Bangladesh's total primary energy supply was 29.5 million tons of oil equivalents, of which 51.8% came from natural gas, 15.9% from oil, 2.1% from coal, and less than 1% from hydropower. The remaining 29.8% of primary energy supply comes from combustible renewable and waste. The share of natural gas in total commercial energy supply is 73.7%. And the share of pricing information, the level of details is 89.4%. The government of Bangladesh is well conscious of this insecure fuel monopoly of gas and the power sector is currently looking into the development of coal fired power stations.

Figure 1: Share of Gas in Total Primary & Commercial Energy Supply and Electricity Generation in Bangladesh



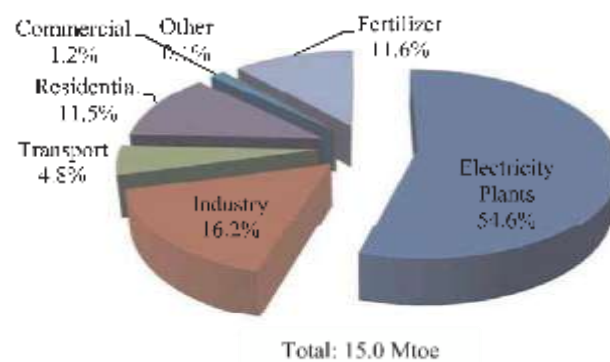
Source: IEA, Energy Balance, 2009.

¹ The Bangladesh Oil, Gas and Mineral Corporation (Petrobangla) coordinates the gas sector in Bangladesh through operating companies.

As seen in Figure 2, power sector is the single largest user with 54.6% of the total gas consumption. The other sectors receiving the natural gas are industry (16.2%), residential (11.5%) and non-energy uses in the form of petro-

chemical feedstock mainly being fertilizer production (11.6%). Commercial and public services usage account for 1.2%, while transport sector (CNG) accounts for 4.8% of gas usage.

Figure 2: Natural Gas Consumption by Sector in Bangladesh



Source: IEA, Energy Balance, 2009.

2.1.2 Natural Gas Price Evolution

Historically, the Government of Bangladesh determined gas tariff and margins for each of the operating companies involved in gas industry including the margin for the Government itself in the form of taxes. In determining these, different socio-economic aspects of the country were considered by the Government. In general, the Government stake was 55% and the Petrobangla stake was 45% on the end users price. The Petrobangla share was again distributed among the operating companies. The fertilizer and power sectors were equally privileged by having the lowest gas tariff until

1988. Afterward, fertilizer sector continued to enjoy the lowest tariff while power sector was put on the second place.

In April 2003, the Government of Bangladesh approved a new gas pricing formula which was similar to Production Sharing Contract (PSC) gas where the price of gas produced by the state owned company will be indexed with the high sulphur fuel oil (HSFO) price of freight on board (FOB) Singapore. On the other hand, the Government's margins in the form of supplementary duty (SD) and value added tax (VAT) will be based on "units of gas sold" and "selling price of gas"

respectively. Therefore, the end users price was determined under the following formula:

End Users Price = Cost of gas + transmission and distribution (T&D) cost + supplementary duty (SD) + value added tax (VAT).

Where,

Cost of gas:

Production sharing contract (PSC) gas = 75-93% of high sulphur fuel oil (HSFO).

Petrobangla gas = 7% of HSFO.

T & D cost = T&D operating cost + return on revenue (15% on net fixed asset);

SD= Fixed charge based on volume of gas entered into the network;

VAT= 15% of total cost of gas sold.

It is to be mentioned here that, Petrobangla buys gas from the production sharing contractors at prices fixed under the Petroleum Policy 1993, which stipulates that the price of onshore gas will be 75% of the high sulphur fuel oil (HSFO) price of freight on board (FOB) Singapore, on a heating value parity basis, and the offshore gas price will be 25% higher than that of the onshore gas price. However, the price of PSC gas is limited under a boundary condition. Based on the above pricing formula, the Government of Bangladesh has fixed gas tariffs twice, on 1 July 2004 and 1 January 2005 (ADB, 2007).

As seen in the Appendix A, the history of gas pricing from 1968 to 2009, there

was little change in the tariff model for the past 40 years. After the year 1988, the unit rates were changed from Bangladeshi Taka (BDT) per Mcf to Bangladeshi Taka (BDT) per Standard Cubic Meter (SCM). And a tariff for Captive Power and Compressed Natural Gas (CNG) was introduced in year 1998 and 2002 respectively. In 2002, CNG started to receive gas at a cheaper rate than power sector. In addition, small changes in the administration of unmetered- residential (domestic) gas pricing were introduced in 1977, 1980 and 1986. It is to be mentioned here that the only significant change during the last two years was the price of CNG that went up from BDT 9.97 per SCM in 2009 to BDT 23.00 per SCM in 2011. And the tariffs of the other sectors remained unchanged.

2.1.3 Current Gas Pricing Mechanism

The current gas pricing policy in Bangladesh is based on price control concept where Government sets the prices and effectively takes responsibility for the impact on the economy. The natural gas consumer (or end user) price in Bangladesh comprises of mainly two broad components; the Government of Bangladesh Margin and Gas Industry Margin (or Petrobangla² Margin/ Production Costs). The Government of Bangladesh Margin is in the form of taxes and, the current taxes are a combination of Value Added Tax (VAT) and Supplementary Duty (SD).

² Petrobangla is a state owned corporation, representing the gas industry of Bangladesh.

The gas industry margin (or total petrobangla margin/production costs) equals the sum of the margins allocated to gas industry operating companies, including exploration, production (state owned and international oil companies), transmission and distribution companies. Bangladesh Energy Regulatory Commission (BERC) determines the retail prices/end user prices for various categories of consumers on the basis of Government guidelines as regards taxation, price applications by Petrobangla and socially acceptable price levels as observed by BERC. According to the existing pricing framework, as of September 2011, the end user gas price of Bangladesh for various consumer segments comprises of the following elements:

- Value Added Tax (VAT);
- Supplementary Duty (SD);
- Price Deficit Fund (PDF);
- BAPEx³ Margin;
- Deficit Wellhead Margin (DWM);
- Wellhead Margin;
- Transmission & Distribution Margin; and
- Gas Development Fund.

Under the existing gas pricing formula of Bangladesh, taxes are calculated as a percentage of the end user prices (inclusive tax). Current taxes are 13% for VAT (value added Tax) and 42% for SD (supplementary duty) being a total of 55% of the retail or end user prices.

Petrobangla distributes its margin, 45% of the retail or end use prices, to various operating companies on the basis of historic costs, funding applications and negotiated contracts in the case of the international oil companies. Price Deficit Fund (PDF) is reserved to generate a fund for paying to the international oil companies for their production which is determined according to the negotiated contracts. BAPEx Margin is a “profit margin” of state-owned gas production and Deficit Wellhead Margin (DWM) is for BAPEx to cover additional costs of local production. Wellhead Margin is a local production costs for ongoing operation & maintenance costs.

The transmission margin is for transmission system which is operated by one state owned company-Gas Transmission Company Limited. The margin reflects the cost of transportation, from gas fields to city gate stations or bulk customers such as power stations. The transmission price is charged as a fixed price based on quantity and without a distance component. The distribution margin is for gas distribution by the gas distribution franchise companies which reflects the cost of distribution, downstream of city gate stations. Finally, gas development fund is allocated for research and development for the entire gas industry both upstream and downstream. The detail of existing pricing structure of

³ State-owned Exploration & Production Company.

Bangladesh is shown in Appendix B. According to the existing pricing structure, the Table 1 summarizes the

current consumer prices of gas for the various economic sectors of Bangladesh.

Table 1: Consumer Gas Prices in Bangladesh ⁴

Category of Consumers	BDT/SCM
I. Power	2.82
II. Fertilizer	2.58
III. Feed Gas for CNG	23.00
IV. Captive Power	4.18
V. Industry	5.86
VI. Tea-Estate	5.86
VII. Commercial	9.47
VIII. Domestic	5.16

Source: BERC.

2.1.4 Analyses and Key Findings

The current natural gas pricing policy in Bangladesh is based on price control concept where government is in charge of the gas production margins, while regulator- BERC is in charge of the transmission and distribution margins as well as for the end user price. The natural gas consumer (or end user) price in Bangladesh comprises of mainly two broad components; the Government of Bangladesh Margin and Gas Industry Margin (or Petrobangla Margin). In general, the Government stake was 55% and the Petrobangla stake was 45% on the end users price. The Government of Bangladesh Margin is in the form of taxes, combination of value added tax and supplementary duty, which are calculated as a percentage of the end users prices. Petrobangla distributes its

margin to various operating companies on the basis of historic costs, funding applications and negotiated contracts in the case of international oil companies.

In the existing pricing structure, the wellhead gas margins are well below the market prices and the prices of alternative fuels. These prices are too low to generate sufficient capital for exploration, production and transportation. According to the Asian Development Bank report titled Proposed Loans for Peoples Republic of Bangladesh: Natural Gas Access Improvement Project, published 2010, combined gas from state-owned companies and international oil companies (price linked to world market price), with an average wellhead price of about one-tenth of the world market

⁴ With effect from September 19, 2012.

price, provides the basis for downstream gas prices. Another report of Asian Development Bank titled Bangladesh Gas Sector: Issues, Options and the Way Forward, published in 2007, states that Bangladesh consumes its gas at a price five-fold lower than the equivalent liquid fuel cost in Bangladesh.

It is well known that proper pricing prevents wasteful use of the resource. The policy of making gas available to users at a lower cost has caused inefficient gas use. The efficient pricing mechanism will promote the efficiency of resource use. The Government and Regulatory Commission may consider the introduction of efficient pricing mechanism by reviewing the existing pricing structure to reflect cost of gas supply and its operations.

In pricing structure, Government of Bangladesh may introduce a royalty to reflect the value of the gas, being a depleting resource that belongs to the country. The introduction of royalties is a common practice in many countries and is often used to maintain the sustainability of the energy supply. Basically, it is a tribute by those people utilizing the gas to those people not yet having the benefit of this resource. With regards to LNG import initiatives for supplementing domestic production, at a price of USD 8 to 12 per MMBtu LNG could be five to six times more expensive than the domestic gas. Despite the fact that LNG imports may

help to improve constant supply shortage and initiate some economic activity, sustained and increasing reliance on LNG will have a negative impact on the country's balance of payment.

2.2 Natural Gas Pricing in India

In India, natural gas began to attract increased attention after the discovery of the offshore Bombay High fields by ONGC, from which production began in 1974. Decision makers started to take an pricing information, the level of details 1984, the Gas Authority of India Limited (GAIL), a state-owned company, was established to manage the development of a real gas market. At that time, sufficient gas was allocated to priority consumers namely the fertilizer industry and the power sector at administered prices that were far lower than the costs of production.

pricing information, the level of details one of the fastest growing in the world over the next two decades. The International Energy Agency forecasts gas demand to increase at 5.4% per annum over 2007-30. The Indian of PSC gas is limited under a boundary condition. Based on the above, encourage domestic production and the construction of Liquefied Natural Gas (LNG) terminals. In particular, the New Exploration Licensing Policy (NELP) opened exploration & production to private and foreign companies. At

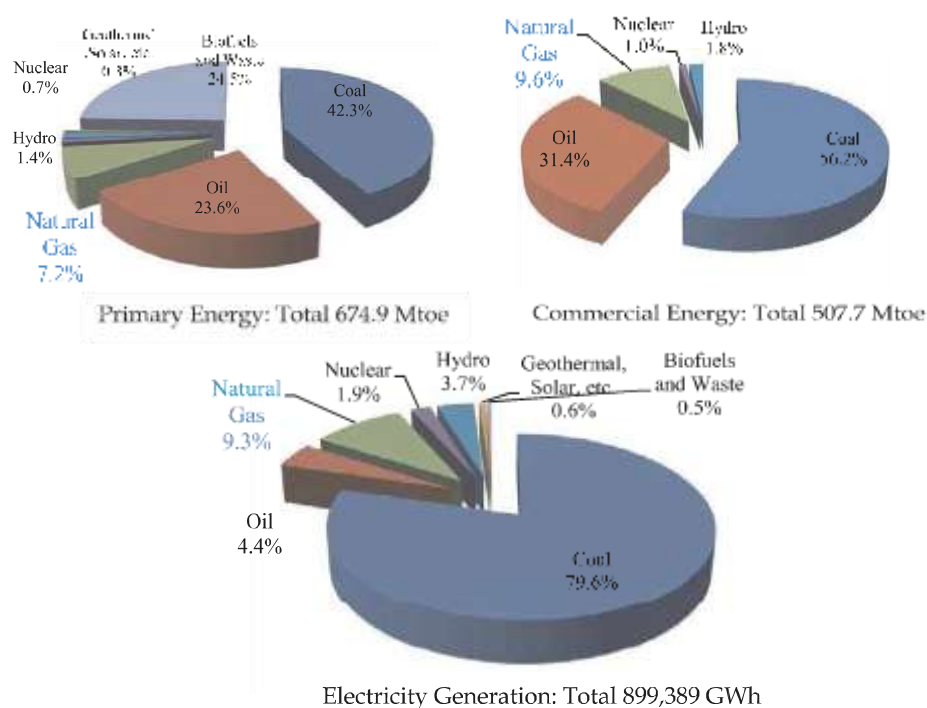
present, there are broadly two pricing regimes for gas in the country - gas priced under Administered Pricing Mechanism (APM) and non-APM or free market gas. The price of APM gas is set by the Government.

2.2.1 The Role of Natural Gas

India has total natural gas reserves (proved & indicated) of 1,241 billion

cubic meters as on April 01, 2011 and gross production of natural gas in the country at 52.22 billion cubic meters during 2010-11 (MoPNG, 2011). According to the International Energy Agency (IEA, 2009), the share of natural gas in total primary energy supply is 7.2% while the share in total commercial energy supply is 9.6%. And the share of natural gas in total electricity generation is 9.3%.

Figure 3: Share of Gas in Total Primary & Commercial Energy Supply and Electricity Generation in India



Source: IEA, Energy Balance, 2009.

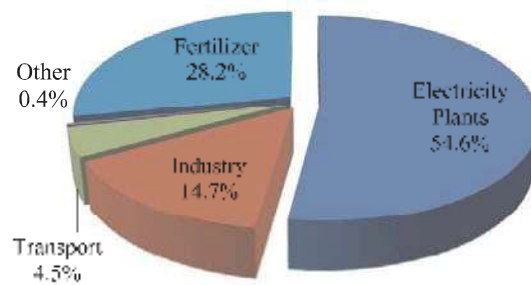
In India, natural gas demand is expected to grow considerably, mostly driven by

demand in the power sector. The power and fertilizer sectors account for nearly

80% of total natural gas consumption. Natural gas is expected to be an increasingly important component of energy consumption as the country pursues energy resource diversification

and overall energy security. Even though the steady increase in India's natural gas production, there is a gap in demand & supply and the country has been an importer of LNG since 2004.

Figure 4: Natural Gas Consumption by Sector in India



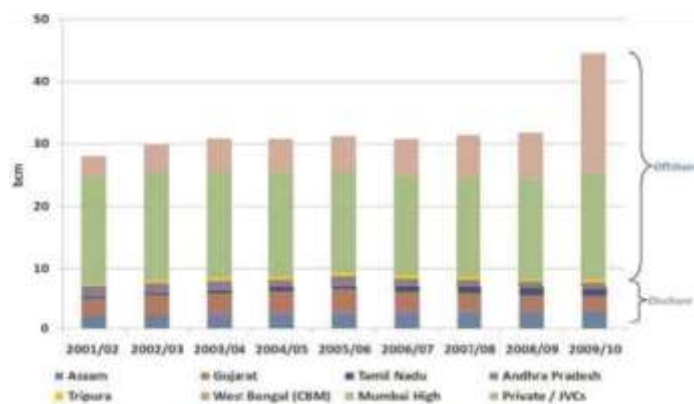
Total: 44.4 Mtoe

Source: IEA, Energy Balance, 2009.

Domestic gas production in India is concentrated in offshore, with Mumbai High field and Krishna-Godavari (KG) basin as the primary domestic

production region. The production of onshore gas is mostly in Gujarat, Andhra Pradesh and Assam.

Figure 5: Domestic Gas Production by Region in India



Source: MoPNG.

2.2.2 Natural Gas Price Evolution

India had three fiscal regimes for oil and gas exploration; (i) Nominated fields (ii) Discovered fields and (iii) New Exploration Licensing Policy. The nominated fields regime was the earliest, where National Oil Companies (NOCs) could formally express interest in an exploration block, which was then awarded to them on a royalty-based scheme. This regime was stopped in the late 1990s. The discovered fields

regime began after liberalisation in the 1990s. Under this, private companies could form joint ventures with NOCs, and bid for former nominated fields that were being auctioned. Private companies were also paid a market price by the government. The New Exploration Licensing Policy (NELP) regime was launched in 1998 to increase domestic and international private investment in oil and gas. The historical gas price regimes in India are summarized in Table 2 below:

Table 2: Summary of Natural Gas Price Evolution in India

Year	Pricing Mechanisms
Prior 1970	Prices were fixed by an expert committee
1970 to 1986	Prices were negotiated between public companies and large gas users
1987	Administered Pricing Mechanism (APM)-Cost plus pricing (0.86 US \$/MMbtu)
1992	APM- Cost plus pricing, Gas Pool Account
1997	APM- Import parity pricing (1.75 US \$/MMbtu), Gas Pool Account, PSC/Pre-NELP
2004	APM, Gas Pool Account, Re-gasified LNG
2008	APM, Gas Pool Account, Re-gasified LNG, NELP (New Exploration Licensing Policy)
2010	APM (4.2 US\$/MMbtu), Gas Pool Account, Re-gasified LNG, NELP (New Exploration Licensing Policy)

Source: IEA (2010), Rajpal (2009), Joshi, S., Jung, N. (2008).

Prior to the 1970s, when gas production was low, gas prices were fixed by an expert committee. The government of India decided to fix the price on cost plus methodology in 1986 and accordingly it was fixed with effect from January 30, 1987. In APM, initially, producers were allowed a specified 1974. Decision makers started to take an production and only gas to consumers

in the north-eastern states was subsidized. The Empowered Group of Ministers (EGoM) was put in charge of determining gas prices. Later on, Gas Pool Account was established to compensate ONGC and OIL for selling gas below their costs of production in the north east. In year 1997, the government decided to change the gas pricing methodology from cost plus

basis to import parity pricing and link to the cheapest fuel oil basket. A floor and a ceiling were also introduced. From year 1992 to 2005, the administered prices were increased only some times, particularly in year 1997 and 2005, pricing information, the level of details cost of production. In India, LNG supplies commenced from the year 2004. The price for LNG had been linked to JCC⁵ crude oil under an agreed formula. However, the FOB price for the period up to December 2008 was agreed at a constant price. In 2008, Empowered Group of Ministers (EGoM) had been constituted to examine the issues relating to pricing and commercial utilization of gas under New Exploration Licensing Policy (NELP). In May 2010, the MoPNG increased APM gas prices from USD 1.79/MMbtu to USD 4.2/MMbtu.

2.2.3 Current Producer Gas Pricing Mechanism

The price at which the upstream companies sell to the midstream company for transportation and marketing of gas is known as the producer price. The natural gas pricing scenario in India is complex. There are three supply sources of natural gas; (i) public sector (ii) public private joint ventures & private ventures and (iii) Import of liquefied natural gas. There are wide varieties of gas price in the country. The prevailing producer gas

pricing mechanisms in India are divided into the below three segments:

- i. Under the first mechanism, prices of APM (Administered Pricing Mechanism) gas and gas produced from Joint Ventures under the discovered fields exploration policy are set by the government (for NOCs), or according to a fixed formula (for private companies in the Joint Venture);
- ii. The second mechanism covers re-gasified LNG, where prices are determined on the basis of long term and short term contracts, and spot purchases; and
- iii. The third mechanism covers NELP (New Exploration Licensing Policy) gas, under which gas producers can discover the price of gas themselves, but are required to get its value approved by the government.

As per the daily production of APM and non-APM gas concerned, as of April 2009, around 57 MMscm/d is APM gas and 46 MMscm/d is non-APM gas (which includes 20 MMscm/d produced by Joint Ventures between ONGC and the private sector under Production Sharing Contracts and 26 MMscm/d LNG). The pricing mechanisms of above three producer segments are briefly described below:

⁵ The Japan Customs-cleared Crude (JCC) is the average price of customs-cleared crude oil imports into Japan as reported in customs statistics; nicknamed the "Japanese Crude Cocktail". It is a commonly used index in long term LNG contracts in Japan, Korea and Taiwan, and replaced the Government Selling Price of crude oil as the standard index.

I. Pricing under the APM and Discovered Fields:

Administrative Pricing Mechanisms (APM) gas refers to gas produced by entities awarded gas fields prior to the PSC regime. APM gas is mainly used to supply the gas to main consuming sectors. The prices of gas from these fields are administered by Government of India. In pricing this APM gas to final consumers; gas prices are lowest for the power, urea, and city gas sectors, and higher for other non-APM consumers.

NOCs were originally paid for their gas on a *cost-plus basis*. However, policymakers failed to review and update this basis, and therefore the level of under-recoveries rapidly grew. In May 2010, the Government of India raised the APM price to match the price of NELP Krishna Godavari D-6 gas.

II. Pricing of LNG:

LNG prices are determined on international markets. In India, 80 per cent of the market share of LNG is controlled by Petronet LNG Ltd., a private company promoted by a consortium of public sector organizations. However, prices to consumers, especially in public sectors, have not been completely free of government influence. Petronet has a long term contract with the Qatari LNG company, RasGas, and also supplies gas on spot and short term basis.

However, in order to moderate the price of gas, Petronet LNG Ltd was asked by the government to pool the cheaper priced long-term contracted supply with the higher priced short term supply.

III. Pricing under NELP Provisions:

The third NELP mechanism is still evolving. The underlying formula for determining the price under this mechanism is:

$$\text{Sale Price (in US \$/MMbtu)} = 2.5 + (\text{CP} - 25)^{0.15} + C$$

US\$ 2.5 is the constant in the formula, representing the base price of gas. CP is the crude oil price with cap of US\$ 65 /barrel and a floor of US\$ 25, and C share of natural gas in total commercial formula was considered by the government, which revised the ceiling downwards to US\$ 60 and assigned a value of C to 0, arriving at a price of US\$ 4.2 per MMBtu. The exponent in the formula, 0.15, gives rise to an S type curve, which results in an relatively demand of natural gas. The government price) at the upper and lower ends of the curve; the floor is typically meant to work in favor of the seller of gas, and the ceiling in favor of the buyer. The price basis/formula for the purpose of valuation of natural gas has been approved by the Government in case of KG-D6 Block of RIL/Niko.

The producer gas prices in India under the above three gas producer segments are summarized in Table 3 below:

Table 3: Producer Gas Prices in India

Source	Regime	US\$/MMBtu
APM Gas	APM	4.20
Panna-Mukta-Tapti Fields	Discovered Fields	4.60 5.65
Ravva Field	Discovered Fields	3.50 4.30
Lakshmi and Gauri Fields	Discovered Fields	4.60 4.75
Hazira Field	NELP	4.65
Krishna Godavari KG-D6	NELP	4.20
LNG (Spot Prices)	Imported Gas	7.00 10.00

Source: MoPNG & GAIL, 2010.

2.2.4 Liquefied Petroleum Gas Pricing

In India, LPG was introduced as a domestic fuel in the 1960s. Until the economic reform programs were put into operation, state owned companies handled the entire production and marketing of LPG. The government decided to throw open the LPG business to private entrepreneurs in 1993, which has enabled private marketers to import, store, bottle and market LPG at market-determined prices. The three sources of supplies are refineries, fractionation of associated gas from oil fields and imports. According to the Indian Petroleum & Natural Gas Statistics (2010-11), about 78% of domestic LPG production is based on crude oil and the rest comes from natural gas. The imports constitute about 21% of the total supplies.

Import Parity Pricing is applied in determining the refinery gate price of LPG that includes FOB price and the elements of ocean freight, insurance charges, ocean loss, LC charges, port dues and custom duty. In determining of Retail Selling Prices of LPG, this refinery gate price is further added up with inland freight & delivery charges, marketing cost, marketing margin, bottling charges and distributor commission. However, there is subsidy and under recovery for oil marketing companies applied in determining the Retail Selling Prices of LPG. The refinery gate price and retail selling price of LPG at Delhi are summarized in Table 4 below:

Table 4: Refinery Gate Price & Retail Selling Price of LPG in India ⁶

(Rs./Cylinder)	
Refinery Gate Price	Retail Selling Price
777.15	399.25

Source: MoPNG.

⁶ 14.2 kg cylinder & with effect from May 01, 2012.

2.2.5 Current Consumer Gas Pricing Mechanism

In India, the consumer pricing policy for natural gas differs depending upon whether it comes from Public Sector Utilities (PSUs) or Joint Ventures (JVs) or accounted for around 89% of its power those sources, there are mainly two mechanisms in determining the consumer gas pricing:

- Administered Pricing Mechanisms (APM); and
- Non-Administered Pricing Mechanisms (Non-APM).

APM refers to the gas produced from nominated fields of ONGC and OIL. The Government determines the consumer price at landfall of natural gas for various categories of consumers for gas produced from these nominated fields.

On the other hand, non-APM gas prices for consumers at landfall are market driven and not determined by the government. But, the government prescribes an upper limit beyond which the gas cannot be priced. There are currently three different sources of gas production under this mechanism which

are: Joint Ventures, imported LNG and NELP. However, for both APM and Non-APM consumers, the final price to end consumers comprise of the *Retail Selling Price*

- Consumer Price at landfall price;
- Transmission Charges;
- Marketing Margin;
- Applicable Taxes to be paid by the consumers; and
- Any applicable Royalty charges.

According to the Indian Petroleum & Natural Gas Statistics (2010-11), the sales tax varies in different states and ranges from 4% to 15% while in some states it is not applicable even. And the rate of royalty is usually 10% on the basic price. However, central government may amend the schedule so as to enhance or reduce the rate of royalty. In case of NELP, royalty for deepwater offshore share of natural gas in total commercial at the rate of 5% for the first seven years of commercial production and thereafter at the rate of 10% (DGH, 2011). The Marketing margin typically ranges between USD 0.1/ MMbtu to USD 0.2/MMbtu (IEA, 2010).

Table 5: Consumer Price of APM Gas in India⁷

Off-shore (landfall Point) & On-shore	For North Eastern States
US \$ 4.2/MMbtu	US \$ 2.52/MMbtu

Source: Indian Petroleum & Natural Gas Statistics (2010-11).

⁷ With effect from May 2010.

The above consumer price of APM gas is exclusive of royalty, sales tax and other statutory levies. Above price is also effective for City Gas Distribution (CGD) entities from June 08, 2010 and for all other customers from June 01, 2010. Price in Rs./Mscm shall be calculated based on above prices in US \$/MMbtu and previous months average Reserve Bank of India's reference rates.

Regarding the sectoral allocation of gas in India, historically, gas has been allocated in priority to end-users such as fertilizer producers and power plants. In 2007, the GoI started working on a new "Gas Utilisation Policy". In 2008, the government introduced new guidelines called the "Gas Utilisation Policy", which effectively took away gas producers' rights to sell the gas they

discover on the open market. These guidelines would be applicable for the next five years and be reviewed afterwards (IEA, 2010). The Gas Utilisation Policy has distributional objectives and its main functions are; (i) to manage shortages in the gas availability, (ii) to provide gas at subsidised prices to the consuming sectors, and (iii) to play an integral part in the planning process. Currently, the rules of the General Policy for the gas market imply that gas will be allocated according to sectoral priorities set up by the government. This does not imply that the gas is reserved: if one customer is not in a position to take the gas, the next one on the list becomes eligible. Existing users have priority over Greenfield users. The gas is allocated as follows:

Table 6: Priority Order for Natural Gas Consumers in India

<i>Category of Consumers</i>	<i>Priority</i>
<i>For existing consumers:</i>	
Fertiliser producers	First
LPG and petrochemicals	Second
Power plants	Third
City Gas Distribution (CGD)	Fourth
Refineries	Fifth
Others	Sixth
<i>For Greenfield Consumers:</i>	
Fertiliser producers	First
Petrochemicals	Second
City Gas Distribution (CGD)	Third
Refineries	Fourth
Power plants	Fifth

Source: EIA (2010).

The Table 6 clearly shows the preference for fertilizer producers, petrochemicals and power plants as first category customers. CGD usually comes in second position. GoI gave priority to power generators and fertilizer producers, making them the major customers supplied at the lowest rate (APM prices decided by the government) by the state-owned oil and gas companies. Industrial users, which are interested in switching to gas, do not have access to low-priced gas resources and have to pay higher prices to private companies and LNG importers.

Pricing in the Power & Fertilizer Sector

Government of India gave priority to power generators and fertilizer producers, making them the major customers supplied at the lowest rate (Administered Pricing Mechanism-prices decided by the government) by the state-owned oil and gas companies. The fertilizers sector is a politically sensitive area of policymaking, as around 70 per cent of India's population is employed in the agricultural sector. If India is to meet its requirements for urea entirely through indigenous supply, it needs 76 MMscm/d of gas, against current gas consumption in urea of around 30 MMscm/d. Urea is the most extensively used agricultural feedstock, and its price is also controlled by the government.

There are two potential areas of gas demand in the power sector: grid-

connected power generation, and captive power generation. Share of Natural gas in total installed power generation capacity is around 9.3% (IEA, 2009). In 2009, there was 16,385 MW of gas-based power generation capacity which required 76 MMscm/d of gas, of which 33% was unmet. The share of natural gas in total captive power generation is about 13.32%.

For power and fertilizer sectors, existing capacity will be governed by the price of APM gas (which is now equivalent to demand of natural gas. The government will be governed by NELP gas prices (subject to five-yearly revisions). However, in order to promote demand of natural gas. The government North-East, the price of natural gas for customers in the North-East has been kept at 60% of the price in the rest of the country.

Pricing in the City Gas Distribution (CGD)

City gas distributors are responsible to sale gas to transport, household, commercial and industry sectors. City gas distributors receive gas from three sources such as APM gas at subsidized prices, LNG at market prices, and most recently, NELP gas. The price charged by distributors varies across different users or sectors.

The domestic Piped Natural Gas (PNG) price has so far been indexed to the administered retail selling price of a

domestic LPG (14.2 Kg) cylinder, based on the heating values of natural gas and LPG. For small commercial consumers, of the retail or end use prices, to various which is not subsidised. For large commercial consumers, the price is indexed to Light Diesel Oil (LDO) and bulk LPG prices, with different prices pricing information, the level of details consumed.

2.2.6 Analyses and Key Findings

The natural gas sector of India presents a more optimistic story compared to the oil sector though, at present, it remains a small part of the total primary energy supply. The International Energy Agency forecasted gas demand to increase at 5.4% per annum over 2007-30. The power and fertilizer sectors are of PSC gas is limited under a boundary supply. Based on the of natural gas consumption would provide the benefits of a more environment friendly and flexible fuel in a country which is dominated by coal and biomass.

There are three supply sources of natural gas in India, namely, public share of natural gas in total commercial private ventures and import of liquefied natural gas. The prevailing producer gas pricing mechanisms vary according to these supply sources. The prices of APM gas and gas produced from JVs are Table 1: Consumer Gas Prices in Bangladesh a fixed formula. LNG prices are determined on international markets demand of natural gas. The government

the price of gas themselves by a formula. In view of these supply sources, there are mainly two mechanisms in determining the consumer gas pricing, namely, administered pricing mechanisms and non administered pricing mechanisms.

The natural gas pricing system in India is relatively complex due to the existence of a dual pricing mechanism. In a single market, gas produced by state-owned companies is allocated to specific customers, sold under the Administrative Pricing Mechanism (APM) decided by the government. And pricing information, the level of details (60% of APM price) as a part of regional support policy. On the other hand, gas produced by private companies or Joint Ventures is sold at prices agreed according to the Production Sharing Contracts. The re-gasified imported LNG is sold at prices set on a cost plus basis and subject to government approval. Many efforts were undertaken by Indian government to liberalise/revise this dual pricing mechanism until the pricing reform decision was taken in May 2010. The government of India has reduced the gap between very cheap APM gas and more expensive other supplies. Under the APM, the price of gas was increased to US\$ 4.2 per MMBtu in May 2010 that was expected because of the three main reasons which are: (i) Sustainability of the state owned companies due to the losses on underpriced gas; (ii) APM gas

production has been declining, while the quantity of gas that is not under the APM system is increasing; and (iii) encouragement of exploration and development activities for the potential investors. Low energy prices were not only a disincentive for upstream investment, but also discourage energy efficiency on the demand side. According to this pricing reforms, ONGC and OIL were also allowed to sale gas discovered in new fields allocated to them at market prices.

In accordance with the present sectoral priority set up, the preference for fertilizer producers, petrochemicals and power plants as first category customers while CGD comes in second. The existing capacity of power and fertilizer is governed by the APM gas price and new capacity will be governed by NELP gas prices. Under CGD, the domestic consumers, small commercial and large commercial consumers prices are indexed to the administered retail selling price of a domestic LPG, commercial LPG and light diesel oil (and bulk LPG) respectively.

In fact, the current APM gas pricing system is a result of the contractual provisions within the NELP fiscal regime. According to the report published by The Oxford Institute for Energy Studies on *Natural Gas in India: An Analysis of Policy*, it is based on a general set of guidelines highlighted by a ministerial Committee, but no

formal long-term government policy or position on the price system exists. Hence, the gas producers require more clarity and definition on it. The NELP gas pricing regime, it is still evolving, and there is considerable uncertainty over how the price discovery process will operate in the future.

local production. Wellhead Margin is a local production for ongoing the basis of competitive market. And it is possible to introduce a new, reformed pricing system along with an older system, with the ultimate goal of prices converging to international levels (Jain, 2011). However, it is understood that the recent transition in the gas sector of India is part of the improved movement of the economy from a centrally planned and administered system to a market oriented system.

2.3 Natural Gas Pricing in Pakistan

Government of Pakistan is paying attention on securing its energy future not only through gas imports at international prices, but also minimizing the energy import bill through maximizing the development of its indigenous resources. Presently, gas supply fails to meet the demand of different consuming sectors. Moreover, gas supply may rapidly become inadequate due to increasing demand as well as depletion of the present reserves. local production. Wellhead Margin is a local production for ongoing

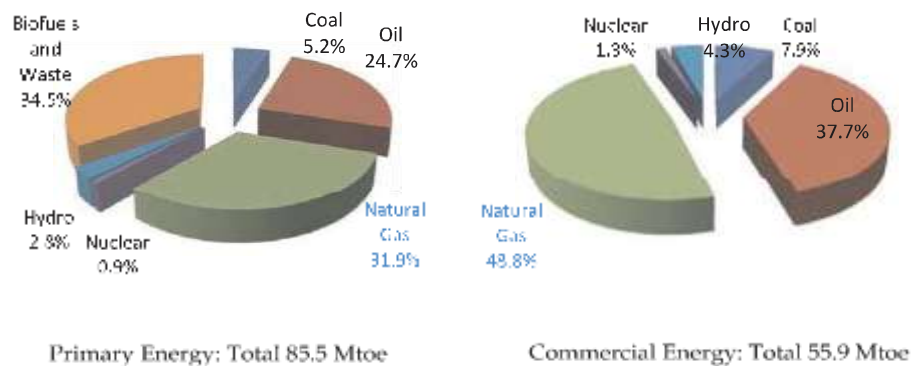
gas pricing compared to the alternate fuels.

GoP is aware about the dramatic changes in the crude oil prices in the international market, which has changed the pace of the exploration and production industry that requires radical changes in the present approach toward these sectors. GoP also recognizes the operating challenges and considerations for the exploration and production industry. Therefore, GoP has amended the Petroleum Policy 2009 and introduced a new Petroleum Exploration and Production Policy 2012. The purpose of the new Petroleum Exploration and Production Policy 2012 is to establish the policies, procedures, tax and pricing regimes.

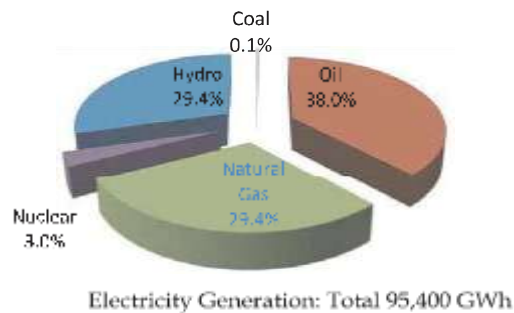
2.3.1 The Role of Natural Gas

Pakistan heavily relies on indigenous natural gas for its energy requirements. As per Pakistan Energy Yearbook 2011, Pakistan has total recoverable natural gas reserves (Non-associated & associated) of 56.11 trillion cubic feet as on June 30, 2011, out of which 28.68 trillion cubic feet have already been produced. Production of natural gas in the country was 1.47 trillion cubic feet during 2010-11. According to the International Energy Agency (IEA, 2009), the share of natural gas in total primary energy supply is 31.9% while the share in total commercial energy supply is 48.8%, which is the largest source of commercial energy supply. The share of natural gas in total electricity generation is 29.4%.

Figure 6: Share of Gas in total Primary & Commercial Energy Supply and Electricity Generation in Pakistan



Continued.....

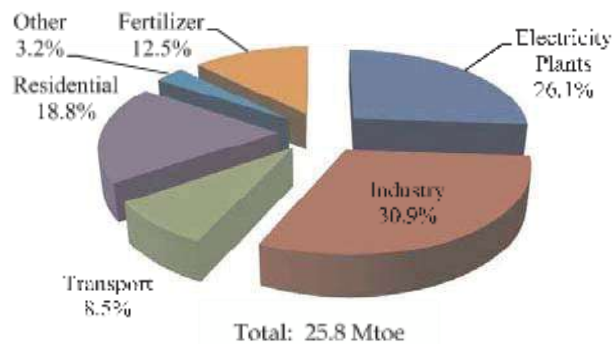


Source: IEA, Energy Balance, 2009.

In Pakistan, natural gas is being supplied to various categories of consumers that are either connected to the pipeline system or independent pipeline network directly from Exploration and Production (E&P)

demand of natural gas. The government natural gas has grown rapidly in all sectors of the economy. Industry sector is the largest consumer, accounts for 30.9%, followed by power, residential, fertilizer and transport sector.

Figure 7: Natural Gas Consumption by Sector in Pakistan



Source: IEA, Energy Balance, 2009.

2.3.2 Natural Gas Price Evolution

amend the schedule so as to enhance or first Petroleum Policy in 1991. This was then followed by successive Petroleum Policies of 1993, 1994, 1997, 2001, 2007 and 2009. The Policy of 2009 is recently amended by *Petroleum Exploration and Production Policy 2012*. In Pakistan, Producers' gas prices

(wellhead prices) differ for different gas fields, based on their starting time of commercial production. Producers' prices are determined through a pricing formula that links the wellhead prices to international fuel oil or crude oil prices, and also based on when a field sufficient gas was allocated priority consumers namely the fertilizer industry

in Pakistan are summarized in Table 7 below:

Table 7: Summary of Natural Gas Price Evolution in Pakistan

<i>Policy Year</i>	<i>Pricing Mechanism</i>
Before 1985	Cost-plus basis
1985 to 1993	Linked with the fuel oil price
1994	Linked with the crude oil price and applied proportional discount rates for the three zones
1997	Preserves the provisions of the 1994 policy with respect to onshore areas and introduced a new offshore package
2001	Linked with the crude price with a cap and progressive discount rates
2007	Linked with the crude price with an increased cap and progressive discount rates
2009	Linked with the crude price with further increase of cap and progressive discount rates

The wellhead price of fields that announced commercial production before the year 1985 is set on a “cost-plus” basis. Those started commercial production between 1985 and 1993 have their gas prices linked with the international fuel oil price. The Petroleum Policy 1994 links the gas price with the international crude oil and applied proportional discount rates for the three zones⁸. The Policy 1997 preserves the provisions of the 1994 policy with respect to onshore areas and introduced a new offshore package of terms based on production sharing arrangements (PSA). Petroleum Policy 2001 introduced another pricing

mechanism where crude price was capped at US \$ 36/bbl and progressive discount rates. It was then followed by 2007 and 2009 policies with the increased cap of US \$ 45/bbl and US \$ 100/bbl respectively.

2.3.3 Current Producer Gas Pricing Mechanism

Ministry of Petroleum and Natural Resources announced *Petroleum Exploration & Production Policy 2012* that sets well-head gas producer prices in the country by indexing it with the international crude oil price with the following discounts.

⁸ Based on geological prospects and available gas transmission infrastructure network, the country was divided into three prospective zones. Producer prices were linked to 77.5%, 72.5% and 67.5% of the price of imported crude oil for discoveries in Zones I, II and III respectively.

Table 8: Producer Gas Prices in Pakistan

Reference Crude Oil Price, US \$/bbl	Applicable % of C&F Price	US\$/bbl
(A) 0 to 30	100%	30
(B) Above 30 to 50	Plus 50% of incremental increase	10
(C) Above 50 to 70	Plus 30% of incremental increase	6
(D) Above 70 to 110	Plus 30% of incremental increase	8
Applicable C&F Price in US \$/bbl (A+B+C+D)		54
Applicable C&F Price in US \$/MMBtu		9.47
(1) Price, Onshore (Zone I)	69.66% of applicable C&F Price	6.6 US \$/ MMBtu
(2) Price, Offshore-Shallow	73.88% of applicable C&F Price	7 US \$/ MMBtu
(3) Price, Offshore-Deep	84.44% of applicable C&F Price	8 US \$/ MMBtu
(4) Price, Offshore-Ultra Deep	95% of applicable C&F Price	9 US \$/ MMBtu

Source: MoPNR (2012).

According to Policy 2012, the reference crude oil price ceiling of US 110/bbl would be reviewed after every five years or as and when the pricing dynamics significantly change in the international market.

2.3.4 Liquefied Natural Gas Pricing

Currently, Pakistan is facing a gas shortage. To deal with the shortage, strong importance is being laid on importing gas from neighboring gas-producing countries through cross-border gas pipelines and also in the form of liquefied natural gas (LNG). Necessary legal framework is now in place for installation of LNG receiving, storage, re-gasification facilities. Currently a number of players are active in the private sector, out of which four players have also been able to obtain pipeline capacity allocation but firm

arrangements are yet to be made for supply of gas while the financial closure is still some time ahead, primarily because import price of LNG as well as transportation tariff are yet to be finalized by the regulator/GoP. The Government is also striving hard to go for a state to state transaction with Qatar for direct import of LNG at spot rate on urgent basis. The *LNG Policy 2006* has been modified in year 2011 to facilitate quick execution of the LNG Projects. Ministry of Petroleum and Natural Resources local production for ongoing LNG (RLNG) in the following manner:

- With an integrated or an unbundled approach, RLNG will be procured by gas utilities/RLNG Buyer(s) in the Public/Private sector for Medium/Long Term from a LNG

Developer or RLNG Seller who offers the lowest price at a designated point of delivery;

- In case LNG/RLNG is procured by the public sector, the price of RLNG will be determined by the Oil and Gas Regulatory Authority at the terminal flange based on (i) the LNG purchase price; (ii) the direct and indirect costs of transportation, storage, and regasification incurred by the LNG Developer /Terminal Owner/Operator, and (iii) a reasonable return on the investment made by the LNG Developer/Terminal Owner/Operator.
- RLNG can also be procured by private sector, by public sector or in public-private partnership based on lowest price demonstrable to the regulator.

2.3.5 Liquefied Petroleum Gas Pricing

sufficient gas was allocated priority consumers namely the fertilizer industry produced domestically contributing less than 1% to the total primary commercial energy supply mix (MoPNR, 2011). About 12% of total LPG supply is coming from import. Because of its characteristics, LPG is fast becoming a fuel of choice in the areas, where natural gas distribution network is not available. Currently, out of 27 million

households in Pakistan, 6.1 million are connected to natural gas network (MoPNR, 2011).

Ministry of Petroleum and Natural Resources announced LPG (Production & Distribution) Policy 2011 that sets producers base stock price of LPG at par with landed cost of imported LPG (FOB Saudi Aramco Contract Price plus marine freight and import incidentals). The differential between the landed cost and FOB Saudi Aramco Contract Price shall be paid by LPG producers as Petroleum Levy on LPG and would be deposited in the government treasury. However, based on commercial considerations the producers may sell LPG at a lower price without having any impact on the Petroleum Levy. The maximum base stock price and the amount of Petroleum levy will be determined and notified by OGRA on monthly basis.

According to *LPG Policy 2011*, OGRA will determine the rationality of consumer price of LPG by keeping in view the import parity price of LPG, producer price and audited accounts of LPG marketing companies for the last two years.

2.3.6 Current Consumer Gas Pricing Mechanism

The natural gas consumer price in Pakistan comprises of two components; the prescribed price and a Gas

Development Surcharge (GDS). The prescribed prices are determined by OGRA for the gas utilities for various consumer categories. Pursuant to the provision of the OGRA Ordinance, the Government of Pakistan advises the sale prices for various categories of consumers, after adjustment of GDS in of PSC gas is limited under a boundary condition. Based on the above prescribed price for various consumer segments comprises of the following elements:

- Producer gas prices, which are linked with international price of crude oil and high-sulphur fuel oil (HSFO);
- Excise Duty;
- Allowance for unaccounted for gas (UFG);
- Transmission and distribution costs;
- Depreciation; and
- Minimum return to the gas companies.

The unaccounted-for-gas (UFG) is a loss incurred during transmission and distribution of natural gas which is valued at the average wellhead price. Usually, the utilities are given a UFG target; say certain percentage of the volume of gas purchased from E&P companies. If the utilities are able to stay within this target, they retain the savings (the difference between the target and actual losses), whereas if the actual losses exceed the UFG target, the

1974. Decision makers started to take an 2011, it was targeted to 5.0% of the volume of gas purchased from E&P companies.

The transmission and distribution costs comprise the expenses such as salaries, wages and benefits of the employees, repairs and maintenance of transmission networks, security expenses, and gas bill distribution and collection charges.

Minimum return to the gas companies is subject to efficiency related benchmarks imposed from time to time. For FY2011, it was 17.5% and 17% for SNGPL and SSGCL respectively per loan covenants agreed with the World Bank and the Asian Development Bank. The total revenue requirement of the utilities is determined to make sure that the utilities can operate carefully and achieve a certain return on their average net operating fixed assets.

To ensure optimal utilization of natural gas for the best socio-economic development of the country, gas is supplied to the various categories of consumers under the *Natural Gas Allocation and Management Policy 2005*. Natural gas is being supplied to various categories of consumers that are either connected to the pipeline system or independent pipeline network directly from Exploration and Production Companies. In line with this policy, natural gas demand on the system during high demand and/or short

supplied periods are met as per the management practices outlined in Table 9 below.

Table 9: Priority Order for Natural Gas Consumers in Pakistan

<i>Category of Consumers</i>	<i>Priority</i>
<i>1. Connected to the System:</i>	
Domestic and Commercial Sectors	First
i) Fertiliser Sector; and	Second
ii) Industrial Sector to the extent of their process gas	
Independent Power Plants as well as WAPDA and KESCs Power Plants having firm gas supply commitments under GSAs	Third
General Industrial and CNG Sectors	Fourth
i) WAPDAs and KESC Power Plants other than those listed above; and	Fifth
ii) Captive Power Sector	
Cement Sector	Sixth
<i>2. Independent Network:</i>	
Fertilizer Plants	First
Power Sector including WAPDA, KESC and IPPs having firm gas supply commitments under GSAs	Second
Power Sector other than those listed above	Third

Source: Natural Gas Allocation and Management Policy 2005.

In Pakistan, consumer gas prices vary across different economic sectors in the country. The domestic consumer gas prices are maintained at a uniform level throughout the country. However, there is pricing slabs for different gas

consumption levels within the same category of consumer. The Table 10 summarizes the current consumer prices of gas for the various economic sectors of Pakistan.

Table 10: Consumer Gas Prices in Pakistan⁹

<i>Category of Consumers</i>	<i>Rs/MMbIn</i>
I. Domestic	
Up to 100 M ³ per month	122.95
Over 100 – up to 300 M ³ per month	245.89
Over 300 – up to 500 M ³ per month	1,035.34
Over 500 M ³ per month	1,302.46

Continued.....

⁹ With effect from January 01, 2012.

II. Commercial	600.19
III. Special Commercial	
Up to 100 M ³ per month	122.95
Over 100 – up to 300 M ³ per month	245.89
Over 300 M ³ per month	600.19
IV. Industrial	494.86
V. Compressed Natural Gas (CNG)	651.80
VI. Cement	694.22
VII. Fertilizer	
<i>On SNGPL System</i>	
Pak American, Feedstock	116.27
Pak American, Fuel	494.86
Daud Hercules, Feedstock	116.27
Daud Hercules, Fuel	494.86
Pak Arab, Feedstock	116.27
Pak Arab, Fuel	494.86
Pak China, Feedstock	116.27
Pak China, Fuel	494.86
Hazara, Feedstock	116.27
Hazara, Fuel	494.86
Engro Fertilizer, Feedstock	60.67
Engro Fertilizer, Fuel	494.86
<i>On SSGCL System</i>	
Fauji Fertilizer, Feedstock	116.27
Fauji Fertilizer Additional, Feedstock	60.67
Fauji Fertilizer, Fuel	494.86
VIII. Power Stations	
On SNGPL & SSGCL Systems	480.86
Liberty Power Limited	1450.85
IX. Independent Power Producers (IPPs)	437.86
X. Captive Power	494.86

Source: OGRA (2012).

2.3.7 Analyses and Key Findings

Indigenous natural gas is the largest source of commercial energy supply in Pakistan contributing 48.8% (IEA, 2009).

Consumption of natural gas had been grown rapidly in all sectors of the economy, motivated by growing availability of gas and a low gas price as compared with liquid fuel prices. It may

be difficult to change consumption patterns toward more efficient usage unless the gas sector is opened to market-based pricing.

In Pakistan, Producer gas prices (wellhead prices) differ for different gas fields, based on their starting time of commercial production. Producers' prices are determined through a pricing formula that links the wellhead prices to international fuel oil or crude oil prices, and also based on when a field commenced its commercial production. Exploration and Production sector is allowed to sell new natural gas discoveries at market-based pricing and also to sell gas directly to third party (E & P Policy, 2012).

In an attempt to attract much needed fresh investment and plug the growing gap between supply and demand, the government announced a new petroleum policy 2012. According to the policy, the producers price will be indexed to the C & F price of crude oil import in Pakistan. In the new policy, wellhead gas price has been increased by 60%, an encouragement for exploration companies to step up their activities in the country. The wellhead gas prices have been set at US \$6, \$6.3 and \$6.6 per MMBtu for Zone-III, Zone-

II and Zone-I respectively. And in case of offshore projects, these are set at US \$8 and \$9 per MMBtu for deep and ultra deep respectively. However, the revised wellhead gas prices will be applicable on new wells not the existing ones. In addition, under the policy 2012, E & P companies will have the right to sell 10% of production to third party whereas state-owned gas distribution companies will have right over 90% production. For sale of natural gas to parties other than GoP, Windfall Levy on Gas (WLG) will be applicable.

The natural gas consumer price in Pakistan comprises of a prescribed price and a Gas Development Surcharge (GDS). The prescribed prices are determined by the regulator for the gas utilities for various consumer categories. The Government of Pakistan advises the sale prices for various categories of consumers after adjustment of GDS. Consumer gas prices vary across different economic sectors. In accordance with the order of priority and demand management practices, domestic, commercial and fertilizer sectors are preferred as first category customers and, for the independent network,¹⁰ power sector having firm gas supply commitment is preferred as first category customer.

¹⁰ Pipeline network directly from E & P companies.

Chapter 3

Oil Pricing

The chapter corresponds to a country-by-country analysis of oil pricing mechanisms. It first describes the policy perspective on oil pricing followed by the role of oil in the energy system of each country. Evolution of pricing mechanisms and prevailing oil pricing for both indigenous and imported as well as consumer oil pricing mechanisms of different economic sectors are described. The pricing mechanisms are then followed by an overview of present refinery gate price build-up and retail selling price build-up of petroleum products.

3.1 Oil Pricing in Bangladesh

Bangladesh is meeting oil demand by importing about 95% of its total oil consumption. The imported oil is playing an increasingly important role in meeting the country's power requirements. The cost of these imports places a significant burden on Government balance sheet. The Government's 2008 "National Strategy for Accelerated Poverty Reduction II" recommended a range of measures to address country's rising oil demand including expansion of storage capacity, improvement of oil distribution system and increase of the refining capacity.

Prices of petroleum products in the domestic market of Bangladesh are

administratively fixed by the government. The country adjusted local oil prices through executive orders from the government on an ad-hoc basis. The Government of Bangladesh has repeatedly expressed its wish to rationalize petroleum prices to promote an efficient and sustainable development process. Bangladesh is, however, yet to implement the policy. Although price adjustments to energy products are done by the Bangladesh Energy Regulatory Commission (BERC), a statutory body formed in 2003 and effective since April 2004, it does so mostly on an ad hoc basis.

Government of Bangladesh has decided to liberalize fuel prices in line with the international market. Accordingly, a comprehensive reform program covering various aspects of the policy framework has been undertaken by the Government. The reform program specifies that an automatic adjustment formula for fuel prices will be adopted that will ensure full pass-through of changes in international prices. Currently, in Bangladesh, the refinery gate price is based on the concept of Import Parity Pricing.

3.1.1 The Role of Oil

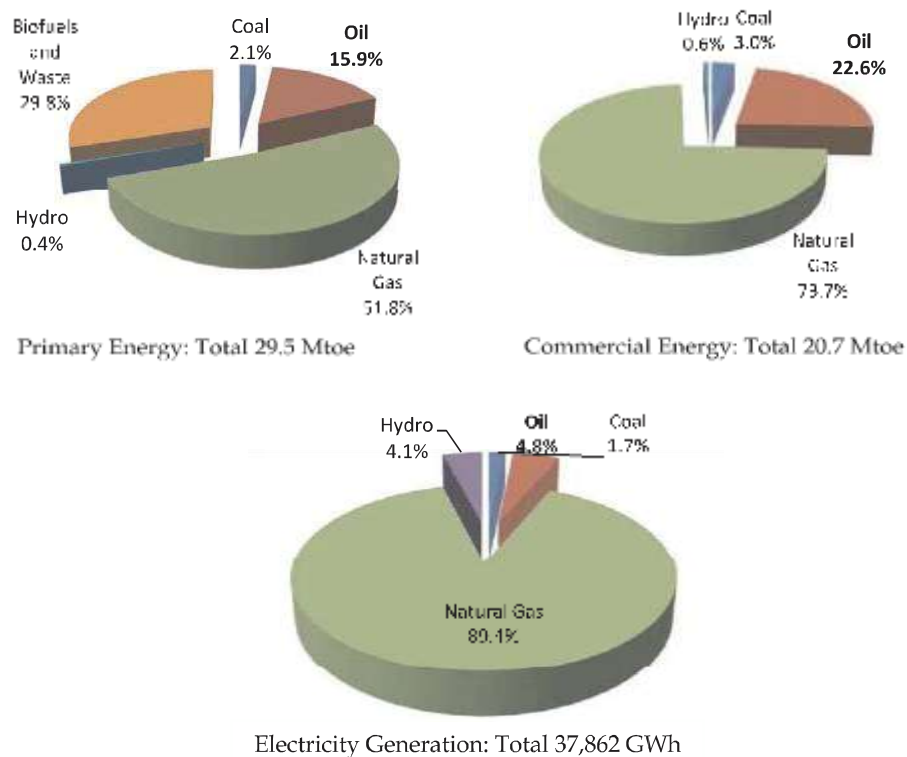
In Bangladesh economy, oil plays a growing role, accounting for about 16%

of the country's primary energy supply and 5% in electricity generation in year 2009. Bangladesh has small proven oil reserves producing nearly 7000 barrels a day, and thus imports much of its oil products. However, very recently, Bangladesh has discovered 137 million barrels of oil reserves in two abandoned gas fields. According to primary estimates, about 55 million barrels can be extracted from the two fields. With the inadequate domestic production, the refining capacity is equally limited. The country's sole state-owned oil refinery

has the capacity to refine about 1.5 million tonnes of crude oil a year which is around 40% of the current petroleum demand.

According to the International Energy Agency (IEA, 2009), the share of oil in total primary energy supply is 15.9% while the share in total commercial energy supply is 22.6% which is the second largest source after the natural gas. The share of oil in total electricity generation is 4.9%.

Figure 8: Share of Oil in Total Primary & Commercial Energy Supply and Electricity Generation in Bangladesh

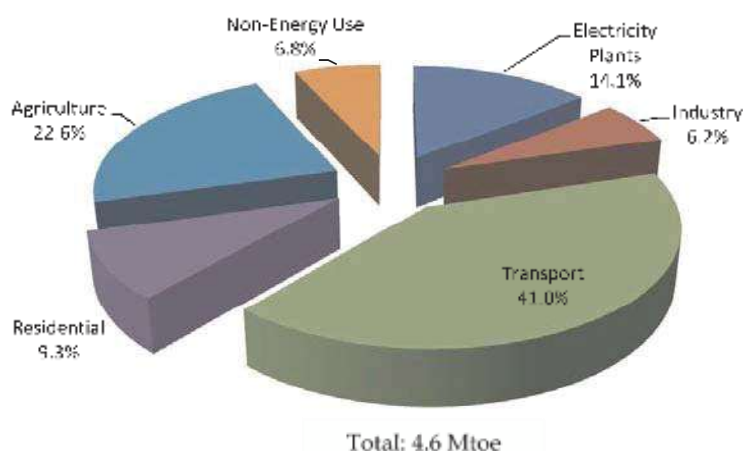


Source: IEA, Energy Balance, 2009.

In Bangladesh, petroleum products are being supplied to various economic sectors. The sectoral consumption of oil in year 2009 is shown in the figure 9 where transport sector is the largest consumer, accounts for 41.0%, followed

by agriculture, power and residential. In residential sector, kerosene is used for lighting and cooking and in agriculture sector diesel is used for irrigation pump sets in Bangladesh.

Figure 9: Oil Consumption by Sector in Bangladesh



Source: IEA, Energy Balance, 2009.

3.1.2 Development of Refinery Gate Price

Bangladesh Petroleum Corporation (BPC), a government-owned monopoly in Bangladesh, and its subsidiary companies are dealing in importation of crude oil and refined oil, lubricant, refining of crude oil, and distribution and marketing of fuel oils, lubricants and other petroleum products in the country. Eastern Refinery Limited (ERL), a subsidiary of Bangladesh Petroleum Corporation, processes crude oil imported by BPC and delivers the finished petroleum products to the other

subsidiaries of BPC for marketing and distribution. ERL plays a vital role in meeting around 40% of the country's current petroleum products demand.

According to the *National Energy Policy of Bangladesh*, along with the petroleum products all forms of non-renewable energy are to be priced at their economic cost of supply. Currently, in Bangladesh, the pricing formula for refinery products is based on import parity prices. Import parity price basically means the price that the actual importer would pay for the products in case it would have actually imported the same

at the respective ports of Bangladesh. The refinery gate prices (post-tax price) for the petroleum products are made up of the following elements:

- FOB (free on board) price of products;
- Ocean freight to respective Bangladeshi ports;
- Tax at applicable rates;
- Marine Insurance charges; and
- Ocean Loss and LC charges.

The FOB price of a product is based on monthly average of the daily Platts¹¹ Oil gram prices for the preceding month as

there is a significant change in the daily Platts prices. The Carriage and Freight (C & F) price is calculated by adding the premium (combination of freight, insurance, LC charges and ocean loss) to the freight on board (FOB) price. A 15% tax (value added) on C & F price is currently applicable. Generally, in Bangladesh, the premium would be in the range of 2.5% to 5.5% on C & F price, depending on the types of petroleum products. According to the pricing formula of Import Parity Pricing, the price build-up, as Refinery Gate Price, of four petroleum products of Bangladesh are summarized in Table 11 below:

Table 11: Refinery Gate Price of Petroleum Products in Bangladesh¹²

<i>Petroleum Product</i>	<i>Taka/Litre</i>
Petrol	85.90
Diesel	57.72
Kerosene	58.46
Furnace Oil	58.4

Source: BLRL.

3.1.3 Retail Selling Pricing Mechanism

In Bangladesh, oil marketing companies source the petroleum products from refinery. and Bangladesh Petroleum Corporation, in case of directly imported products, at refinery gate price and sell the products to consumers via the dealers at retail selling price as determined by the Government. The retail selling price buildup elements,

including refinery gate price, of petroleum products in Bangladesh are as follows:

- Refinery Gate Price;
- Inland Freight Equalization Fund Account (IFEFA);
- Marketing Margin;
- Local Distribution Cost of Dealers;¹³
- Dealer/Agent Commission with technical losses¹⁴;

¹¹ Platts, a division of the McGraw-Hill Companies based in the US, is a leading global provider of energy, petrochemical and metals information, and it is a premier source of benchmark price assessments for those commodity markets.

¹² With effect from December 30, 2011.

¹³ Within 40 kilometers of a depot.

¹⁴ Technical loss means evaporation, operation, handling and other losses.

- Depreciation Cost of Dealer/ Agents; and
- VAT.

Inland Freight Equalization Fund Account is used to equate the prices of petroleum products at different major oil depots that are spread throughout the country. The local distribution cost from depots to retail outlets, which are

located within 40 kilometers of a particular depot, (a secondary transportation cost) is also applicable at fixed rate except furnace oil. In addition, dealers/agents have been allowed to recover a distribution cost those are located beyond 40 kilometer from main/nearest depots at the rate of Taka 2/kilometer.

Table 12: Distributors Margin, Dealers Commission, Inland Freight and VAT on Petroleum Products¹⁵ in Bangladesh

	Taka/Litre			
	<i>Petrol</i>	<i>Diesel</i>	<i>Kerosene</i>	<i>Furnace Oil</i>
Distributor Margin	0.27	0.20	0.20	0.25
Dealer Commission ¹⁶	2.64	1.34	0.60	Nil
Inland Freight Equalization Fund	0.39	0.39	0.39	0.45
VAT	1.36	0.91	0.91	0.90

Source: BERC.

Marketing margin and dealer commission have been fixed that varies from product to product. VAT (Sales Tax) considers at applicable rate which varies from product to product.

According to the retail selling pricing formula of petroleum products, the retail selling prices at consumer level of Petrol, Diesel, Kerosene and Furnace Oil are given in Table 13 below:

Table 13: Retail Selling Price of Selected Petroleum Products¹⁷ in Bangladesh

	Taka/Litre			
	<i>Petrol</i>	<i>Diesel</i>	<i>Kerosene</i>	<i>Furnace Oil</i>
	91.00	61.00	61.00	60.00

Source: BERC.

¹⁵ With effect from December 30, 2012.

¹⁶ Includes technical losses.

¹⁷ Within 40 kilometer of all depots and, with effect from December 30, 2012.

3.1.4 Analyses and Key Findings

Oil plays a growing role, accounting for about 16% of the country's primary energy supply and 5% in electricity generation in year 2009. Bangladesh is meeting oil demand by importing about 95% of its total oil consumption. According to the National Energy Policy of Bangladesh, all forms of non-renewable energy along with the petroleum products are to be priced at their economic cost of supply. Currently, in Bangladesh, the pricing formula for refinery products is based on the concept of import parity pricing. In addition to the FOB price, import parity price includes other components namely ocean freight, tax, insurance and LC charges etc. The retail selling prices include VAT among other major components such as inland freight, marketing margin and dealer commission. In retail price build-up mechanism, different levels of VAT are considered for different products. Marketing margin and dealer accounted for around 89% of its power product.

Prices of petroleum products in the domestic market of Bangladesh are adjusted through executive orders from the government on an ad-hoc basis. Proper pricing of primary energy is important to conserve energy and to attract domestic and foreign investments in the energy sector. The retail price build-up mechanism of oil may follow

the actual cost of import in order to cost recovery of the existing assets and also to help in the long term adjustment to the reality of higher international prices. Government of Bangladesh has decided to liberalize fuel prices in line with the international market. To do so, a reform programme for automatic adjustment formula of fuel prices will be adopted that will ensure full pass-through of changes in international prices.

3.2 Oil Pricing in India

India's remarkable economic growth has intensified the country's need for oil, which rose by more than 5% a year over the last decade, compared with 1% annual growth in global oil demand. India, a net importer of oil, is meeting this demand by importing about 70% of its total oil consumption (Ebinger, 2011). The cost of these imports places a significant burden on Government balance sheet. Government of India announced the dismantling of the Administered Pricing Mechanism (APM) effective from the year 2002. Though, it was decided to continue to subsidize kerosene and domestic LPG on the ground that these were fuels of mass consumption largely consumed by economically weaker sections of society.

Prices of petroleum products in the Indian domestic market are decided at two levels, first for sale transactions from refineries to marketing companies

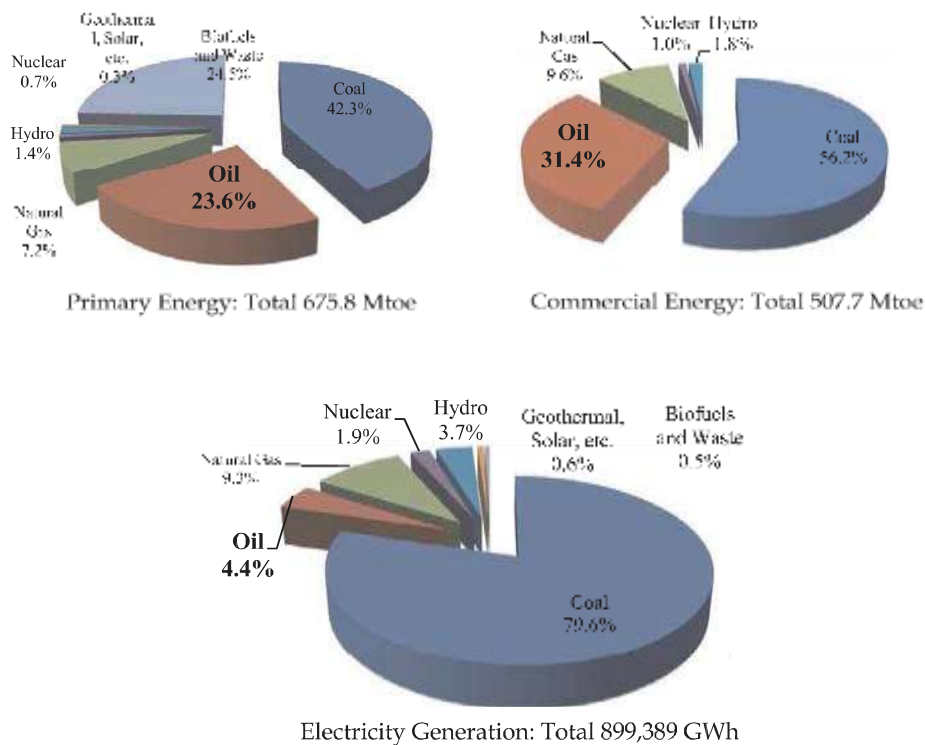
and second for sale transactions from marketing companies to the end consumers. The refinery gate price is the price at which the refineries sell products to the marketing companies and retail selling price is the price at which oil marketing companies sell petroleum product to the consumers. Currently, in India, the refinery gate price is based on the concept of Import Parity and Trade Parity.

3.2.1 The Role of Oil

India has total reserves (proved &

indicated) of 757 million tonnes of crude oil as on April 01, 2011 and domestic production of crude oil in the country is at 37.71 million tonnes during 2010-11 (MoPNG, 2011). According to the International Energy Agency (IEA, 2009), the share of oil in total primary energy supply is 23.6% while the share in total commercial energy supply is 31.4% which is the second largest source after the coal. The share of oil in total electricity generation is 4.4%.

Figure 10: Share of Oil in Total Primary & Commercial Energy Supply and Electricity Generation in India

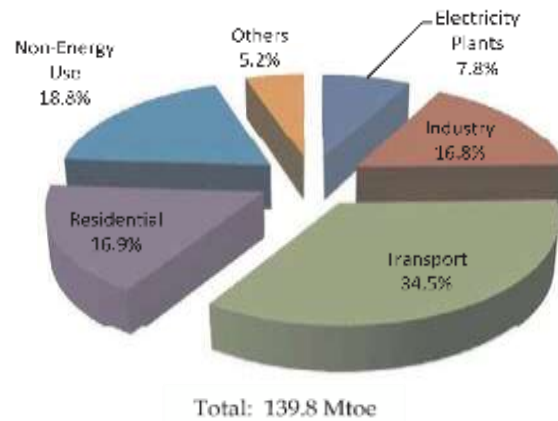


Source: IEA, Energy Balance, 2009.

The consumption of petroleum products during 2010-2011 was 141.78 million tonnes (including sales through private imports) which is 3.6% higher than the previous year (MoPNG, 2011). The combination of rising oil consumption and relatively flat production has left India increasingly dependent on imports to meet its petroleum demand. In 2010, India was the world's fifth largest net

importer of oil, importing about 70% percent of total consumption. The sectoral consumption of oil is shown in the Figure 11 where transport sector is the largest consumer, accounts for 34.5%, followed by non-energy use, residential, industry and power. The share of public sector refineries is 36% of total refining capacity of India (MoPNG, 2011).

Figure 11: Oil Consumption by Sector in India



Source: IEA, Energy Balance, 2009.

3.2.2 Development of Refinery Gate Price

local production. Wellhead Margin is a local production for ongoing Mechanism (APM) for the oil sector, including refining. Under the APM, prices in the hydrocarbon sector were controlled at four stages namely production, refining, distribution and marketing on the principle of compensating normative cost and allowing a pre-determined return on

investments. The Cost of crude oil processed by refineries was fixed taking into account:

- Delivered cost of crude oil;
- Normative refining cost; and
- 12% post-tax return.

The total cost of crude oil processed was allocated to individual products based on a set of indices. Oil Marketing Companies (OMCs) were also allowed

normative marketing and distribution costs and 12% post-tax return.

However, as APM was found to be increasingly unsuitable for the long term growth and efficiency of oil industry, the Government decided to abolish APM with effect from 1st April 2002 and replace cost-plus retention pricing of petroleum products produced by domestic refineries with Import Parity Pricing (IPP). According to the “Standing Committee Report (Ninth) on Challenges of Under-Recoveries of Petroleum Products” of Ministry of Petroleum & Natural Gas (MoPNG), more than 90% of the cost of production of a refining company is due to the cost of crude oil and around 83% of the country's crude oil requirement is met through imports. Moreover, price of indigenously produced crude oil is also based on the price of crude oil in the international oil market. Therefore, since the cost of production of an Indian refining company is based on imports, the prices for the finished products at the Refinery Gate Prices (RGP) are also required to be determined on the principles of import parity, with linkage of PSC gas is limited under a boundary condition. Based on the above market. According to IPP, the landed cost of a product at port is sum of the below mentioned elements:

- FOB (free on board) price of product at Arab Gulf;

- Ocean freight from Arab Gulf to respective Indian ports;
- Customs Duty at applicable rates;
- Insurance charges; and
- Ocean Loss, LC charges, Port dues and wharfage.

Again in June 2006, the Government advised oil companies to determine RGPs of only Petrol and Diesel on the basis of Trade Parity Principle instead of the Import Parity Principle. In order to provide relief to consumer and also to rationalize pricing in the context of exports of the order of 20% of production of these products by the refineries, a more appropriate pricing model for Petrol and Diesel would be the trade parity price. Trade Parity Price consists of 80% Import Parity and 20% Export Parity Price. Export Parity Price consists of FOB at Arab Gulf and Advance License Benefit¹⁸ (i.e. Customs Duty on Crude).

In general, Import Parity Pricing is applied to those products in which the country is a net importer. Likewise, Export Parity Pricing is applied for products in which the country is a net exporter. India has been a net importer of LPG and Kerosene¹⁹; hence, IPP for Domestic LPG and Kerosene is rational. The impact of the elements of ocean freight, insurance charges, ocean loss, LC charges and port dues etc. along with the custom duty included in RGPs applicable for selected major petroleum products is given in Table 14 below:

¹⁸ Benefit of duty free import of crude oil normally known as Advance License Benefit.

¹⁹ LPGS & Kerosene-Kerosene sold through Public Distribution System of the Government.

Table 14: Import Charges and Custom Duty on selected Petroleum Products in India

<i>Petroleum Product</i>	<i>Import Charges with Freight²⁰</i> (Rs./Ltr. & Rs./Cyl.)	<i>Custom Duty²¹</i>
Petrol	0.55	2.58%
Diesel	0.60	2.58%
Kerosene	0.68	Nil

Source: MoPNG (2011).

According to the pricing formula of Trade Parity Pricing (for Diesel & Petrol) and Import Parity Pricing (for Kerosene) comprise the expenses such as salaries,

Refinery Gate Price, of three petroleum products of India are summarized below:

Table 15: Refinery Gate Price of selected Petroleum Products in India

<i>Petroleum Product</i>	<i>Refinery Gate Price²²</i> Rs./Litre
Petrol	42.57
Diesel	44.81
Kerosene	43.66

Source: MoPNG (2012).

3.2.3 Retail Selling Pricing Mechanism

Oil Marketing companies source the petroleum products from refineries at refinery gate price and sell the petroleum products to consumers at retail selling price as determined by the Government. The retail selling prices include taxes and duties by Central and State Government, among other components. The retail selling price build-up elements²³ of petroleum products are given below:

- Refinery Gate Price;
- Inland freight & delivery charges;

- Marketing cost;
- Marketing Margin;
- Under recovery for oil marketing companies (less);
- Excise Duty;
- Dealer/Distributor Commission; and
- Value Added Tax.

Inland freight & delivery charges comprise of average freight from ports to inland locations and delivery charges up to Retail Outlet/Distributor. As per the "Marketing Cost Study Report" (November 2006) by Cost Accounts Branch, Ministry of Finance, Marketing

²⁰ At Mumbai Port and, with effect from October 1, 2011.

²¹ 2.5% + 3% Education cess.

²² Weighted average of all Indian Ports (fortnightly for Petrol & Diesel and, monthly for Kerosene & Diesel).

²³ With effect from October 2011.

cost & margin for Diesel are Rs. 0.67/Litre and Rs. 0.73/Litre production has been declining, while the quantity of gas that is as specified in the "PDS Kerosene and LPG (Domestic) Subsidy Scheme, 2002." The Difference between Desired Price and Actual selling price (excluding Excise Duty, VAT and dealer commission), represents under-recoveries to Oil Marketing Companies.

Excise duties are different for petrol and diesel and the excise duty is higher on petrol compared to diesel. Dealer/Distributor commission is fixed by the State Government/District sufficient gas was allocated priority is being given to the fertilizer industry. Governments on an ad-valorem basis and levied on applicable rates in respective States which vary from state to state and also product to product.

Table 16: Excise Duty, Dealer Commission and VAT on Petroleum Products in India²⁴

	Rs./Litre		
	Petrol	Diesel	Kerosene
Excise Duty	14.78 (Rs.14.35/Litre + 3% Education cess)	2.06 (Rs.2.00/Litre + 3% Education cess)	Nil
Dealer Commission	1.50	0.91	1.13
VAT	12.20 (@20%)	4.46 (@12.5% and Air Ambience Charge@Rs.250/KL less Rebate of Rs.375/KL)	0.71

Source: MoPNG (2012).

Government of India does not allow public sector oil marketing companies to pass the full cost of imports on to domestic consumers of major oil products. So, oil marketing companies have shown large under-recoveries in their account. The burden of under-recoveries is presently shared equitably by (i) Government-through Issue of Oil Bonds, (ii) Public Sector upstream oil

companies (ONGC & OIL)- through price discounts on crude oil and products to OMCs; (iii) OMCs-bearing a portion of the under-recoveries²⁵, and (iv) Consumers-through minimal price increase. According to the retail selling pricing formula of petroleum products, the retail selling price of Petrol, Diesel and Kerosene at Delhi is given in Table 17 below:

Table 17: Retail Selling Price of Selected Petroleum Products²⁶ in Delhi, India

	Petrol	Diesel	Kerosene
Rs./Litre	73.19	40.91	14.83

Source: MoPNG (2012).

²⁴ At Delhi and, with effect from May 24, 2012.

²⁵ The term "under-recovery" has been used by the Government of India for "losses" experienced by the public sector oil marketing companies due to incomplete cost recovery on selling of petroleum product in the market.

²⁶ At Delhi and, with effect from May 24, 2012.

3.2.4 Analyses and Key Findings

India's oil demand increased by more than 5% a year over the last decade. This growing demand is expected to continue: the International Energy Agency forecasts a demand increase of nearly 4% a year over the next several decades. India is meeting this demand by importing about 70% of its total oil consumption. Increasing dependence on imports coupled with the volatility of international oil prices demand to reflect the international oil prices in determining domestic prices of petroleum products.

In India, refinery gate prices of local production. Wellhead Margin is a local production for ongoing price (diesel & petrol only) which includes other components namely ocean freight, custom duty, insurance etc. in addition to the FOB price in case of IPP. To rationalize the pricing in the context of exports of the order of 20% of production of Petrol and Diesel from quantity of gas that is these products with weightage of 80% IPP and 20% of export parity price (EPP).

The retail selling prices in India include taxes and duties among other components such as inland freight, marketing and distribution margin, under recovery for oil marketing companies. In retail price build-up

mechanism, different levels of excise duties are considered for petrol and diesel and these fuels are used in cars, including sports utility vehicles. The government has reduced excise duty on diesel effective from June 2011, but the higher excise duty on petrol compared to diesel encourages use of diesel cars. The better fuel efficiency of a diesel engine has to be taken into account for around 89% of its power way out may be found to put the same level of excise duty that petrol car users pay from those who use a diesel vehicle for passenger transport.

State level VAT/Sales Taxes form a sufficient gas was allocated priority consumers namely the fertilizer industry diesel these are 20% and 12.5% respectively. These taxes are being levied by State Governments on an ad-valorem basis, i.e., as a percentage of the price of the product. Therefore, at a time of rising prices, ad-valorem taxes have a cascading impact on the retail price of petroleum products. Furthermore, due to the different state level sales taxes, the retail selling prices of different petroleum products vary across the country.

Government of India does not allow public sector oil marketing companies to pass the full cost of imports on to the consumers of major oil products (MoPNG, 2011). So, oil marketing companies have shown large under-

recoveries in their account. On the other hand, high profits²⁷ are being earned by the upstream national companies (ONGC and OIL). So, it is recommended by the Ninth 2011 Standing Committee Report of MoPNG that the contribution of upstream companies can be increased in burden sharing of under-recoveries of public sector oil marketing companies.

3.3 Oil Pricing in Nepal

Nepal is a land locked country bordering three sides by India and the northern part of snow fed Himalayas by Tibet/China. Nepal does not produce any oil and depends totally on imports in the refined form, as it does not have any oil refinery. Nepal Oil Corporation²⁸ (NOC) is the sole organization responsible for the import, transportation, storage and distribution of all petroleum products in the country. All the petroleum products consumed in Nepal are procured and imported from Government of India (GoI) undertaking national oil company, i.e. Indian Oil Corporation Ltd (IOC) under a 5 years' Contract Agreement signed on 31st March 2007. To meet the increasing demand, a MoU between IOC and NOC for construction of cross border Petroleum Product Pipeline from IOC's depot (Raxaul) to NOC's depot (Amlekhgunj) has been signed.

The petroleum sector in Nepal has long been operating under the monopoly of the government. The pricing of major

petroleum products are administered by the Government. There is a plan to open the petroleum sector to the private sector, adopt an automatic pricing system, and set up an independent authority to supervise and monitor the sector.

There is no specific national policy in Nepal to govern petroleum downstream sector (SAWTEE, 2007). The government enacted Petroleum Act 1983, but it only deals with upstream activities such as exploration, mining and distribution of crude oil from oil wells.

3.3.1 The Role of Oil

Nepal is becoming more dependent on petroleum products for meeting its energy requirement. Nepal imports 100% of its oil requirements at present. But, there is a little prospect for domestic oil production. During the 1980s, the Nepalese government ordered a seismic survey resulting in the proposed lease of ten blocks (Ebinger, 2011). The Department of Mining and Geology remains optimistic; according to the department, the possibility of finding oil in some of these blocks appears fairly high.

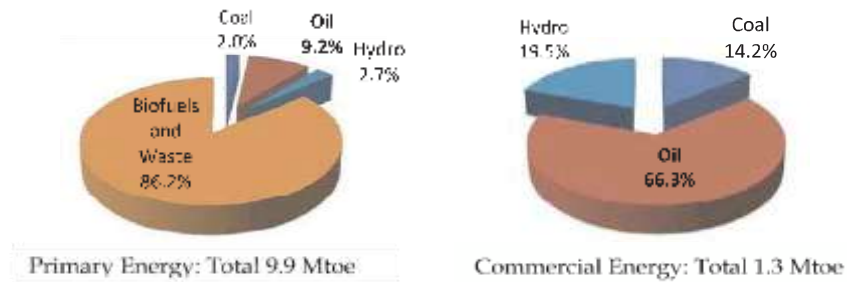
According to the International Energy Agency (IEA, 2009), the share of oil in total primary energy supply is around 9.2% while the share in total commercial energy supply is around 66.3% which is the largest source. The share of oil in

²⁷ Against the cost of production of crude oil of ONGC US \$37.87, the net price realized is US\$53.77 per barrel (Standing Committee Report, MoPNG).

²⁸ NOC is a state-owned trading enterprise established in 1970 under Company Act, 1964.

total electricity generation is very insignificant which is around 0.42%.

Figure 12: Share of Oil in Total Primary & Commercial Energy Supply in Nepal

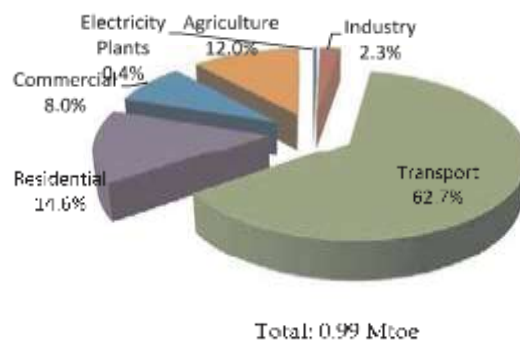


Source: IEA, Energy Balance, 2009.

In Nepal, petroleum products are being sufficient to various economic priorities. consumers namely the fertilizer industry 2009 is shown in the Figure 13 where transport sector is the largest consumer, accounts for 62.7%, followed by

residential, accounts for 14.6%, and agriculture sector. In residential sector, kerosene is used for lighting and cooking purposes and, in agriculture sector diesel is used for irrigation pump sets.

Figure 13: Oil Consumption by Sector in Nepal



Source: IEA, Energy Balance, 2009.

3.3.2 Development of Oil Price

In 1974, Nepal signed a “Memorandum of Understanding (MoU) on Petroleum Supply” with India. According to the

comprise the expenses such as salaries, of Nepal has to procure crude oil from amend the schedule so as to enhance or the same to Indian Oil Corporation Ltd (IOC). IOC would then

supply NOC with an equivalent volume of petroleum products in different forms such as petrol, diesel, kerosene, aviation fuel and furnace oil. The MoU has also local production. Wellhead Margin is a ~~possible product~~ (i.e. for ongoing for Nepal) every six months on the basis of NOCs actual import prices.

However, these provisions of product exchange and pricing have changed since 28 March 2002, when NOC and IOC signed a new agreement for five years. The agreement requires NOC to provide crude oil to IOC from the international market for acquiring an equivalent value of refined petroleum Products. However, Nepal has not been able to supply crude oil to IOC from the selected (by India) international markets so far because of the financial crisis of NOC and a lack of expertise to carry out international procurement. The 2002 agreement introduced an import parity pricing system, under which IOC fixes oil prices for Nepal as per international spot prices (of refined petroleum products). IOC reviews export prices of petrol and diesel every 15 days and adjusts prices for other products on a monthly basis. The agreement has stipulated the Haldiya Refinery Transfer Price (RTP) as the basis for IOC to fix prices for exports to Nepal. Nepal imports petroleum products from various IOC refineries and depots. Raxaul, Barauni, Allahabad, Assam, Beitalpur, Mugalsaray, Gonda and Banthara are the major depots from

which NOC receives petroleum products.

accounted for around 89% of its power the government; NOC has no authority to fix prices on its own. NOC proposes adjustments in prices as and when necessary to Ministry of Industry, Commerce and Supplies (MoICS). However, in 2005, by the recommendations of high-level committees on petroleum products, the government took a decision to allow NOC to decide oil prices. But, it also directed NOC not to change the prices without the Cabinets approval. This condition ensured the government's continued control over pricing decisions.

The Government of Nepal has been undertaking some reform measures in the petroleum sector since 2004. In 2006, the government adopted a wholesale pricing system. Under the system, NOC is required to announce wholesale prices, while retail-level dealers are allowed to fix retail prices for petrol, diesel and kerosene. But that has not local production. Wellhead Margin is a local production for ongoing fixed by them are realistic. Moreover, no policy and institutional arrangements have been made to monitor possible deviations in pricing components, leading to the earning of undue profits by dealers. At present, the landed price/cost price²⁹ build-up elements of

²⁹ NOC, *w.e.f* October 16, 2012.

petroleum products in Nepal are as follows:

- Import Price;
- Customs duty;
- VAT;
- Other taxes;
- Loan expenses;
- Transportation & insurance cost;
- Administrative expenses;
- Technical losses;
- Dealer Commission; and
- Dealer/Udhyog Expenses.

Import price is the purchase price at which NOC buys oil from IOC. In fact, it

local production. Wellhead Margin is a local production for onpetrol import prices³⁰ made up 79.04% and 61.85% of NOCs total landed/cost prices. The customs duty is fixed and varied product to product and, for the case of petrol, duty amount is the highest compared to other products. The other taxes include custom service charge, local development tax, special duty and road maintenance tax. Value added tax is also varied by product types. These three components in total make the second largest component of total cost price.

Table 18: Import Price, Taxes, Dealer Commission and Transportation cost on Petroleum Products in Nepal³¹

	NRs./Litre		
	Petrol	Diesel	Kerosene
Import Price	71.65	76.67	80.53
Taxes ³²	34.12	15.70	2.04
Transportation Cost	2.20	2.20	2.20
Dealer Commission	2.47	1.75	1.97

Source: Nepal Oil Corporation.

Loan expenses component includes the NOC interest and loan repayment, which is 2.67 NRs./litre for petrol, diesel and kerosene. The transportation cost is incurred at two levels; importing oil from IOC depots to NOC depots and transporting it from NOC depots to dealers refilling stations. This transportation cost is fixed to 2.20 NRs./litre for all petroleum products. The administrative cost accounts for about 0.4% to 0.5% of landed cost prices.

Temperature losses, pipeline leakages, spills and evaporation losses are collectively called as technical losses which accounts for 0.58% to 0.82% of the total landed price. At present dealer commission accounts for about 1.7% to 2.1% of the total landed price. According to the pricing formula of petroleum products, the cost as well as retail selling India had three fiscal regimes for oil and gas exploration; (i) Nominated fields (ii)

³⁰ With effect from October 16, 2012.

³¹ With effect from October 16, 2012.

³² Includes custom duty, VAT and other taxes.

Table 19: Cost and Retail Selling Price of Selected Petroleum Products³³ in Nepal

	NRs./Litre		
	<i>Petrol</i>	<i>Diesel</i>	<i>Kerosene</i>
Total cost	115.8	100.93	91.46
Retail Selling Price	125.00	97.00	97.00

Source: Nepal Oil Corporation.

3.3.3 Analyses and Key Findings

All the petroleum products consumed in Nepal are procured and imported from Government of India undertaking national oil company, i.e Indian Oil Corporation (IOC) Ltd. under a Contract Agreement (NOC, 2012). According to the agreement, National Oil Corporation (NOC) of Nepal has to provide crude oil 1974. Decision makers started to take an acquiring an equivalent value of refined petroleum Products. But, Nepal has not been able to supply crude oil to IOC. Nepal may avoid the monopoly export rights of IOC for the liberalization and promotion of competition in the oil sector. Moreover, Nepal may build the necessary capacity and start delivering crude oil from multiple sourcing to IOC for raising its bargaining capacity.

The petroleum sector in Nepal has long been operating under the monopoly of the government. The pricing of petroleum products are administered by the Government; NOC has no authority to fix prices on its own. In addition to the import price, the landed/cost prices in Nepal include taxes and duties among other components such as

transportation cost, dealer margin, administrative expense, loan expenses. Petroleum products prices may be adjusted in line with the international oil prices. Autonomous Petroleum Authority or Regulatory body may be constituted to look after the every aspects of petroleum sector independently.

3.4 Oil Pricing in Pakistan

Pakistan heavily depends upon imported crude oil and petroleum products due to which country's oil import bill is a huge burden on economy. The government is pursuing policies of encouraging foreign investment in energy sector and to replace the imported furnace and diesel oil with alternative fuels at competitive prices to minimize the oil import bill.

As a part of deregulation process of oil industry which started from year 2000, the government introduced Import Parity Pricing in determining the refinery gate price. In addition, the government made a committee and afterward a regulatory authority to review, fix and announce the prices of petroleum products. However,

³³ With effect from October 16, 2012.

regardless of deregulation in the oil sector, some elements of regulation have still remained due to the volatile international prices of crude oil which has significant influence on oil import burden on the economy. To protect the consumer from the impact of high prices, government has, to some extent, controlled the domestic sale prices of petroleum products. Recently, Ministry of Petroleum and Natural Resources announced *Petroleum Exploration & Production Policy 2012* that sets the Producer Price for crude oil delivered at local production. Wellhead Margin is a local production for ongoing

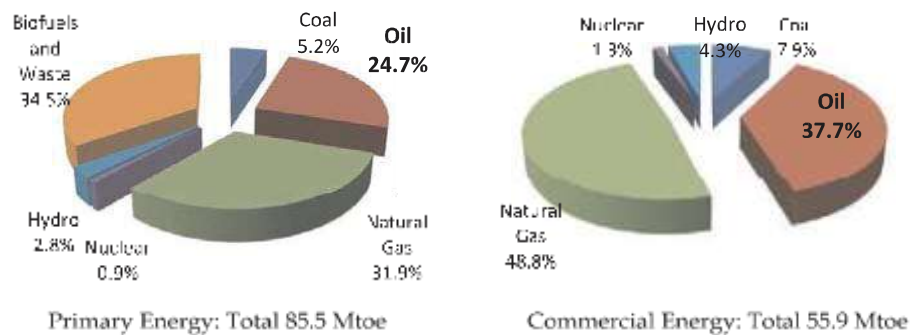
3.4.1 The Role of Oil

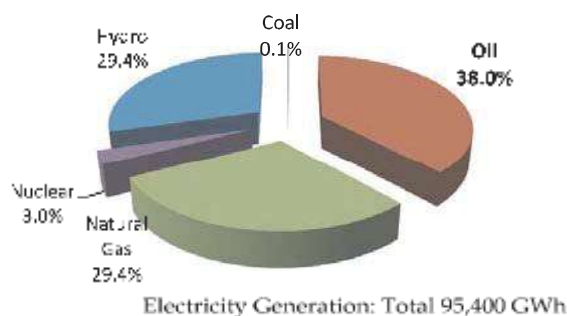
Pakistan has balance recoverable oil reserves of around 264.01 million barrels as on June 2011 (MoPNR, 2011). As per Pakistan Energy Yearbook 2011, average daily production of crude oil in 2010-2011 was 65, 866 barrels. Locally produced crude oil constitutes 31% of

the total crude oil refined in the country. At present, Pakistan also imports refined petroleum products. In year 2010-2011, the country imported about 85% of its total oil supply. Demand for petroleum products is increasing at such a rate that the country will need either to increase its refinery output or to import significant quantity of petroleum products. However, in either case, countrys oil import bill will put an increasingly huge burden on the economy unless Pakistan is able to find new domestic oil reserves.

According to the International Energy Agency (IEA, 2009), the share of oil in total primary energy supply is 24.7% while the share in total commercial energy supply is 37.7%, which is the second largest source of commercial energy supply. The share of oil in total electricity generation is 38.0%, which is the largest source among other fuel options.

Figure 14: Share of Oil in Total Primary & Commercial Energy Supply and Electricity Generation in Pakistan



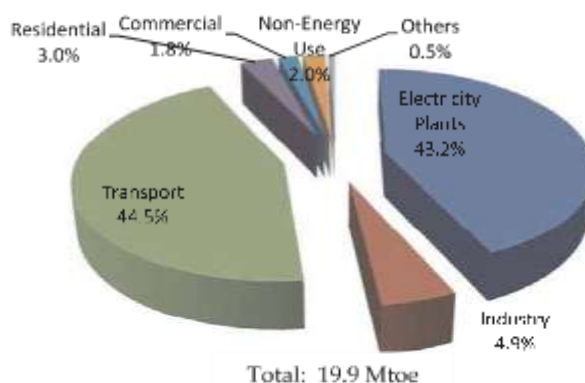


Source: IEA, Energy Balance, 2009.

In Pakistan, petroleum products are being supplied to various categories of consumers. The transport and power sectors account for nearly 87.7% of total

oil consumption. Transport sector is the largest consumer, accounts for 44.5%, followed by power, industry residential and commercial sector.

Figure 15: Oil Consumption by Sector in Pakistan



Source: IEA, Energy Balance, 2009.

3.4.2 Development of Refinery Gate Price

The government of Pakistan had a local production for ongoing 1999. Petroleum product prices were determined under government regulation (Malik, 2008). Since 2000, the government has initiated a market based

reform programme to limit the government role to only policy related issues; pricing and regulatory responsibilities passing to an independent regulatory authority. Moreover, the government also changed the guaranteed return formula³⁴ of the refineries to an Import Parity Price (IPP) formula. As a part of deregulation

³⁴ Previously, the refineries were working under a fixed return formula where the return was capped in the range of 10-40% of their equity. Thus, government was liable to meet any loss in the profitability of the refineries.

policy, in 2001, the government authorized the Oil Companies Advisory sufficient gas was allocated priority consumers namely the fertilizer industry products in accordance with the approved pricing formula. Afterward, the function of price fixation was transferred to Oil and Gas Regulatory Authority (OGRA). Federal Government mandated OGRA on March 2006 to fix prices of petroleum products.

Currently, In Pakistan, refinery gate price is based on the concept of Import Parity. The refinery gate price of a product, which is paid to domestic refineries, equates to the landed cost of the product. In other words it relates to the Import Parity Pricing of the product if the same were to be imported. The determining factor for the petroleum namely, administered pricing mechanisms and non administered

- Ocean Loss, L/C charges, Port dues.

The FOB price is based on monthly average of the daily Platts³⁵ prices for the preceding month. Carriage and freight (C&F) price is computed by adding the premium and ocean transportation cost to the freight on board (FOB) price. Generally, a 7.5% custom/deemed duty (tariff) of CIF price is considered to protect a minimum level of return to oil refineries. This duty is applicable only on HSD for both imported and local. The import incidentals such as marine insurance, ocean losses, bank charges and wharfage etc. would be around 1% of the C&F price. However, sometimes local production for ongoing price. Actual import price/landed cost is worked out on cargo to cargo basis and then a weighted average landed cost/import price of all cargoes discharged during the fortnight is determined and is applied as ex-refinery price. According to the pricing formula of Import Parity Pricing, Refinery Gate Price/Ex-refinery Price of selected petroleum products is summarized in Table 20 below:

Table 20: Refinery Gate Price³⁶ of Selected Petroleum Products in Pakistan

	Rs./Litre
<i>Product</i>	<i>Refinery Gate Price</i>
Motor Gasoline	64.06
Kerosene Oil	68.62
HSD	74.12

Source: Pakistan Energy Yearbook 2011.

³⁵ Platts, a division of the McGraw-Hill Companies based in the US, is a leading global provider of energy, petrochemical and metals information, and it is a premier source of benchmark price assessments for those commodity markets.

³⁶ With effect from June 1, 2011.

3.4.3 Retail Selling Pricing Mechanism

Oil & Gas Regulatory Authority is mandated to fix prices of petroleum products in accordance with a prescribed formula of the OGRA ordinance 2002. GoP has also issued policy guidelines to OGRA from time to time in respect of parameters for computing the prices of petroleum products. Oil marketing companies source the petroleum products from refineries at refinery gate price and sell the products to consumers at retail selling price as determined by the OGRA. Consumer prices in Pakistan are made of the following parameters:

- Refinery Gate price;
- Inland Freight Equalization margin (IFEM);
- Distribution Margin;
- Dealer Commission;
- Government Levies (excise duty & petroleum development levy); and
- Sales Tax.

According to the Annual Report (2010-2011) of OGRA, Inland freight equalization Margin (IFEM) mechanism is used to equate the prices of petroleum products at all depots that are spread throughout the country despite disparity in transportation costs. Secondary transportation cost from depot to retail outlets is deregulated and the dealers have been allowed to recover it from the retail customer by including it in the retail price. In addition, secondary freight in special area is also picked up through IFEM mechanism to provide relief to the consumers of those areas. Previously, except HSD, the distributor margin and dealer commission were set at 4% and 5% of the ex-refinery price (with upper & lower limits of the average price of petroleum products) respectively. However, distributor and dealer margins have been fixed at absolute values starting from December 01, 2010.

Table 21: Distributors Margin, Dealers Commission and IFEM on Petroleum Products in Pakistan

	Rs./Litre					
	<i>Motor Gasoline</i>	<i>HSD</i>	<i>Kerosene</i>	<i>HOBC</i>	<i>LDO</i>	<i>E-10 Gasoline</i>
Distributors Margin	1.50	1.35	1.58	1.72	1.61	2.20
Dealer Commission	1.87	1.50	-	2.15	-	1.87
IFEM	2.87	1.79	1.64	4.49	2.52	0.50

Source: OGRA (Annual Report 2010-2011, IFEM Notification w.e.f June 01, 2012).

Government Levies, comprises of excise duty and petroleum development levy, is fixed and notified by Ministry of

Petroleum and Natural Resources. Government levies are the right of the Government and, are fixed in

accordance with the needs of the repairs and maintenance of transmission networks, security expenses, and gas bill distribution and collection charges.

General sales tax is set at 17% of depot price. The Federal Government decides to increase/decrease/maintain the consumer prices by making adjustment in Petroleum Levy through its notification issued under Petroleum Products (Petroleum Levy) Ordinance, 1961. Since June 01, 2011, OGRA has been notifying ex-refinery price of HSD, ex-refinery and ex-depot price of Kerosene, and ex-depot price of E-10. The Federal Government has

deregulated petroleum products prices and allowed refineries/oil marketing companies to fix and announce ex-refinery and ex-depot prices of MS, HOCB, LDO and aviation fuels from June 01, 2011 (OGRA-Annual Report 2010-2011). The price calculation of FO has been completely deregulated by the Government of Pakistan; oil marketing companies are allowed to import it directly and fix its sale price based on the average cost of import. According to the pricing formula, the Ex-Depot Sale Prices of selected petroleum products is summarized in Table 22 below:

Table 22: Ex-Depot Sale Prices³⁷ of Selected Petroleum Products in Pakistan

Rs./Litre	
Product	Ex-Depot Sale Price
Motor Gasoline	86.71
Kerosene Oil	84.65
HSD	94.11

Source: Pakistan Energy Yearbook 2011.

Finally, retail prices of products are worked out by adding secondary freight, depending upon distance of outlet/pump from the storage depots, in their ex-depot sale prices.

3.4.4 Analyses and Key Findings

production of crude oil in the country is total 7.01 million tonnes during 2010-11 (MoPNG, 2011). According to the petroleum products. It has also issued policy guidelines from time to time in respect of parameters for determining the prices. The refinery gate prices of

petroleum products are based on the concept of import parity. The import parity price includes other components such as ocean freight, custom duty, insurance etc. in addition to FOB price. In determination of present refinery gate price, most duties have been abolished and duty on Diesel reduced to 7.5% from 10% (MoPNR, 2012). The refining sector argues that given the current pricing structure, refineries earn a margin which covers operating costs, but does not provide any return on investment (HB, 2012).

³⁷ With effect from June 01, 2011.

Oil & Gas Regulatory Authority has been notifying ex-refinery price of HSD, ex-refinery and ex-depot price of kerosene oil since June 1, 2011. The Federal Government allowed refineries/oil marketing companies to fix and announce ex-refinery and ex-depot prices of MS, HOB, LDO and aviation fuels from June 01, 2011 sufficient gas was allocated priority consumers namely the fertilizer industry been completely deregulated. The retail selling prices of petroleum products in Pakistan include taxes and Government price monthly average of the daily Platts³⁵ prices for the preceding Carriage freight (C&F) price is computed by adding the premium and ocean transportation cost mechanism. According to the Integrated Energy Plan: 2009-2022 of Pakistan, the Energy Expert Group recommended that OMCs/Dealers margin should be fixed at a level that provides reasonable return to encourage investment in infrastructure. In view of the volatility in international oil prices, it would be prudent to have a floor and a ceiling on the margins. The inland freight equalization margin is used to equate the prices of products at all depots across the country.

local production. Wellhead Margin is a local product to protect for ongoing and to provide incentives to investors. To attract investment, pricing mechanisms can be simplified. The right pricing policy can also lead to

conservation and the more efficient use of available resources.

3.5 Oil Pricing in Sri Lanka

National Energy Policy & Strategies of Sri Lanka (2008) spells out the implementing strategies, specific targets and milestones through which the Government of Sri Lanka and its people would endeavor to develop and manage the energy sector in the coming years. This policy recommended the adaptation for an appropriate pricing policy for the energy sector considering important factors such as cost reflectivity, need for targeted subsidies, and competitiveness of locally produced goods and services in the regional and world markets.

Oil pricing policies adopted over the past decades have been influenced by welfare oriented political economy considerations rather than market factors. Until 2002, domestic prices of petroleum products were strictly administered. A new pricing formula was introduced in January 2002, updating prices monthly and following international prices. However, ultimately, this pricing mechanism was not implemented properly and was suspended in early 2004.

With the enactment of the Petroleum Products (Special Provisions) Act No. 23 of 2002, the import and sale of petroleum products were liberalized

and, invited the Government of India to enter into the downstream retail marketing of petroleum products. The Government withdrew fuel subsidies on July 2006, following which the Ceylon Petroleum Corporation (CPC), a State-owned entity, was obliged to set domestic fuel prices with the concurrence of the Ministry of Petroleum and Petroleum Resources Development (CPC-Annual Report, 2007).

Public Utilities Commission of Sri Lanka (PUCSL)³⁸ does not have any legal mandate for regulating the price of petroleum products. However, recently, in 2012, the amendments to the Petroleum Products (Special Provision)

Act 2002 have been finalized; by which PUCSL have been appointed as the shadow regulator for the petroleum industry of Sri Lanka.

3.5.1 The Role of Oil

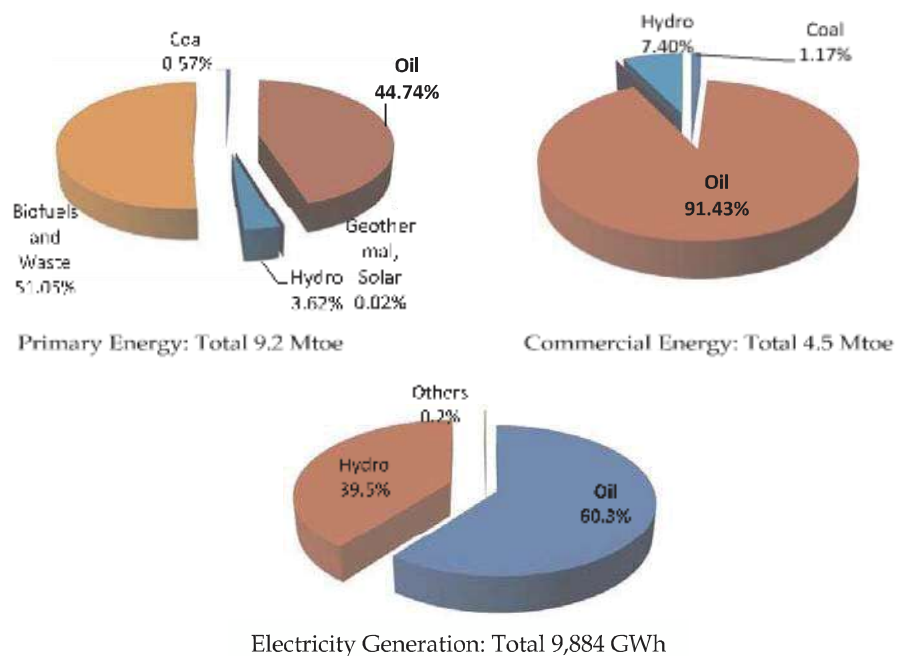
local production. Wellhead Margin is a its crude production for ongoing the country imports 50% of its petroleum products requirements, a total of around 4.8 million tonnes per year. Due to this full import dependency, a large amount of foreign exchange is required for crude oil and

petroleum products imports. Over the last 15 years or so, the demand for petroleum products has increased at an annual average rate of about 5%. Ceylon Petroleum Corporation, a State-owned entity, carried out some petroleum exploration activities in 1970s without any success. At that time, seven wildcat wells were drilled both on shore and off-shore, and all were found to be dry. There are two sedimentary basins, which may bear oil and gas, off coast of Sri Lanka. Recently carried out seismic and magnetic gravity surveys confirm the presence of reservoir rocks of good quality and oil bearing structures. However, the type of oil whether light or heavy oil is not confirmed yet (Ariyadasa, 2006). Renewed interest has now been shown in exploration activities, as the import cost of oil becoming a major burden on the economy.

According to the International Energy Agency (IEA, 2009), the share of oil in total primary energy supply is around 45% while the share in total commercial energy supply is around 91% which is the largest source. The share of oil in total electricity generation is about 60.3%.

³⁸ A regulatory body established under the Parliamentary Act, No. 35 of 2002 for the regulation of several physical infrastructure sectors in Sri Lanka.

Figure 16: Share of Oil in Total Primary & Commercial Energy Supply and Electricity Generation in Sri Lanka

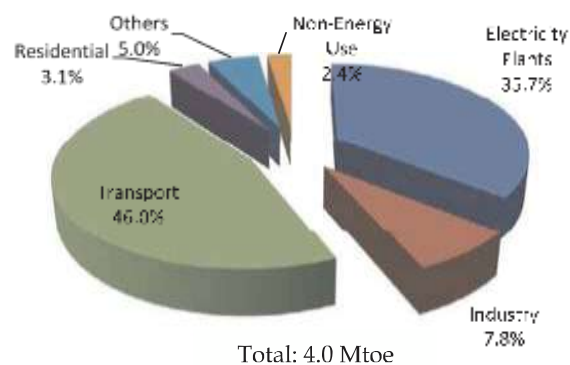


Source: IEA, Energy Balance, 2009.

In Sri Lanka, maintenance of production and distribution networks, security to various and gas bill distribution and collection charges. in year 2009 is shown in the Figure 17

where transport sector is the largest consumer, accounts for 46.0%, followed by power, accounts for 35.7%, and industry.

Figure 17: Oil Consumption by Sector in Sri Lanka



Source: IEA, Energy Balance, 2009.

3.5.2 Development of Oil Price

Sri Lanka imports all its petroleum requirements, and up to 2002, the Ceylon Petroleum Corporation, a State-owned entity, continued as the sole importer and distributor of oil. At present, there are only two major fuel distribution companies in Sri Lanka: Ceylon Petroleum Company (CPC) and Lanka IOC, a subsidiary of Indian Oil Company.

Until 2002, domestic prices of petroleum products were strictly administered and for most of the time were below the cost even when the international prices local production. Wellhead Margin in new local production for ongoing January 2002 was designed to absorb fluctuations in international fuel prices, movements in exchange rates, duties and taxes and production and distribution costs on monthly basis with a cap on increase of price. This mechanism was not implemented properly and was suspended in early 2004. Again, in 2007, the government

decided to re-install a fuel price formula. However, this formula also did not last long, being rejected through Sri Lankans Supreme Court in late 2008.³⁹ The failure to adopt this pricing strategy has resulted in provision of heavy subsidies to petroleum companies. In spite of positive impact of new pricing system, policy makers face new challenges due to the frequent fluctuations of domestic petroleum prices which is beyond their control.

As of May 2011, still no fuel price formula came into effect again (EnergyPedia, 2012). Domestic fuel prices are set by CPC with the concurrence of the Ministry of Petroleum and Petroleum Resources Development (CPC-Annual Report, 2007), changing only a few times a year. CPC's pricing policy is to achieve break-even profitability. Wellhead Margin is a local production for ongoing present, the retail selling price⁴⁰ of Petrol, Diesel, Kerosene and Furnace Oil at consumer level is given in Table 23 below:

Table 23: Retail Selling Price of Selected Petroleum Products⁴¹ in Sri Lanka

Rs. /Litre			
Petrol	Diesel	Kerosene	Furnace Oil
149	115	106	90

Source: Ceylon Petroleum Corporation.

According to the Lanka Business Online (April 2012), Sri Lanka is now selling

both diesel and petrol above the cost. Petrol is sold at 149 rupees a litre when

³⁹ Source: https://energypedia.info/index.php/Fuel_Prices_Sri_Lanka#Fuel_Price_Composition.

⁴⁰ With effect from February 2012.

⁴¹ Petrol-Lanka petrol 90 Octane; Diesel-Lanka auto diesel; Kerosene-Lanka kerosene; Furnace Oil-Lanka Furnace Oil 3500.

the refined product costs about 106 rupees in Singapore (129 US dollars a barrel) and diesel is sold at 115 rupees, barely above the refined price of 107 rupees in Singapore (132 US dollars a barrel).

3.4.4 Analyses and Key Findings

Sri Lanka is entirely dependent on import to meet its petroleum products requirements. With the enactment of the Petroleum Products (Special Provisions) Act No. 23 of 2002, the import and sale of petroleum products were liberalized and, invited the Government of India to enter into the downstream retail marketing of petroleum products.

An automatic pricing formula was introduced in 2002, but was abandoned a few years later. The Ceylon Petroleum Corporation sets the domestic fuel prices with the concurrence of the

Ministry of Petroleum and Petroleum of petroleum products in different forms such as petrol, diesel, kerosene, aviation kerosene, etc. After the introduction of the automatic pricing formula again to prevent oil companies from having losses and also the customers from the in-transparent randomness of fuel pricing (Energypedia, 2012).

The Ceylon Petroleum Corporation is the sole producer of oil in the country, the production of crude oil is at 37.71 million tonnes during 2010-11 (MoPNG, 2011). According to the of international oil prices⁴². Government of Sri Lanka could develop a long term pricing formula to provide adjustment of duties, levies and exchange rates and revision in prices from time to time based on the international prices. The formula may be such that it would provide reasonable margins to the oil companies to invest in energy related infrastructure and to insulate the consumers wherever required.

⁴² Source: http://www.sundaytimes.lk/120226/News/nws_01.html.

Chapter 4

Institutional, Legal and Regulatory Frameworks

This chapter discusses about the energy sectors institutional, legal and regulatory frameworks existing in SAARC Member States. This chapter discusses in detail on oil and natural gas sector of Bangladesh, India, Nepal, Pakistan and Sri Lanka.

4.1 Bangladesh

4.1.1 Institutional Framework

The principal energy institution of Bangladesh is Ministry of Power, Energy and Mineral Resources (MoPEMR), which is split between the Power Division and the Energy and Mineral Resources Division. The MoPEMR is accountable for the overall planning, development and management of different types of commercial energy resources and power. The Power Division is organized in accordance with its three main responsibilities: generation, transmission and distribution. The biggest organization under the Power Division is the Bangladesh Power Development Board, which originally had complete responsibility for the power sector. It has since been relieved of some of its duties by the creation of other entities. Power Cell, an agency within the Power Division, has the task of enacting the power sector reform program, along with the review of tariffs

and performance monitoring of the utilities. The Energy and Mineral Resources Division (EMRD) manages all energy and mineral resources of Bangladesh.

In the field of renewable and alternative energy, the Infrastructure Development Company Limited (IDCOL), established in 1997, is the principal state-owned entity involved in the development of renewable energy projects. Recently, in June 18, 2012, the draft of Sustainable and Renewable Energy Development Authority (SREDA) Act 2012 was approved at a regular Cabinet meeting chaired by Prime Minister. The SREDA will be a core central organization to promote, develop and monitor the renewable energy activities in the country.

local production. Wellhead Margin is a local production for ongoing both upstream and downstream activity. Petrobangla, on behalf of EMRD, holds the shares of the companies dealing in oil, gas and minerals exploration and development. Its core activities - hydrocarbon exploration and production (E&P), transmission, distribution, compressed natural gas (CNG) conversion, and coal and mineral production of crude oil in the country is of 37.71 million tonnes during 2010-11 (MoPNG, 2011). According to the

contracts with the international oil companies (IOCs) on behalf of the government. The Hydrocarbon Unit serves as a support wing of the EMRD.

In the gas E&P sector, the three major Petrobangla entities are Bangladesh Petroleum Exploration & Production Company Limited (BAPEX), focused on drilling and seismic surveys; Sylhet Gas Fields limited (SGFL) and Bangladesh Gas Fields Company Limited (BGFCL) responsible for the gas production. BAPEX is also the Bangladeshi Government's company of choice for joint exploration and production ventures with international oil companies. Four international oil companies are engaged in gas exploration and production activities. In the gas transmission sector, Gas Transmission Company Limited (GTCL) was formed to centralize control and operation of all the country's gas transmission pipelines. Five gas distribution and marketing companies; Titas Gas Transmission and Distribution Company (TGTDC), Jalalabad Gas Transmission and Distribution System Limited (JGTDSL), Paschimanchal Gas Company Limited, and Sundarban Gas Company Limited (SGCL); and one compressed natural gas conversion company, Rupantarita Prakritik Gas Company Limited, are engaged in gas distribution activities.

Bangladesh Petroleum Corporation (BPC), a government-owned monopoly

in Bangladesh, and its subsidiary companies are dealing in importation of crude oil and refined oil, lubricant, refining of crude oil, and distribution and marketing of fuel oils, lubricants and other petroleum products in the country. The Ministry of Environment & Forests and the Ministry of Fisheries are responsible for planning of Biomass Fuels and animal power respectively. Two other agencies under EMRD - sufficient gas was allocated priority is responsible for the fertilizer industry mapping, exploration minerals while Bangladesh Petroleum Institute (BPI) is accountable for research, training on oil & gas.

4.4.2 Legal and Regulatory Framework

The constitution of Bangladesh, article 143 illustrates that all natural resources on land and underground minerals and other things of value underlying the ocean within the territorial waters, or the ocean over the continental shelf of Bangladesh, are the properties of Bangladesh. In general, natural resources include oil and gas, minerals and metals, forests, fish, land and water.

The *Bangladesh Petroleum Act, 1974* defines the fundamental legal framework in the petroleum sector. It is expedient to provide for the exploration, development, exploitation, production, processing, refining and marketing of petroleum. The act provides that the government may enter into a petroleum

agreement with any person for the purpose of any petroleum operation. And no person shall undertake or carry on any petroleum operation except under a petroleum agreement. Petrobangla, the national holding corporation, is authorized to enter into such agreement (s) on behalf of the government.

The Bangladesh Energy Regulatory Commission was established on March 13, 2003 through a legislative Act of the Government of Bangladesh. The commission became effective on April 27, 2004 with the appointment of two members including the chairman. The Commission has been established with the vision to make provisions for the establishment of an independent and impartial regulatory commission for the energy sector. The commission has the mandate to regulate Electricity, Gas and Petroleum products for the whole of Bangladesh. The functions of BERC (Mandated by Law) are as follows:

- Issue, cancel, amend and determine conditions of licenses, exemption of licenses and determine the conditions to be followed by such exempted persons;
- Help ensure efficient use, quality services, determine tariff and safety enhancement of electricity generation and transmission, marketing, supply, storage and distribution of energy;
- Approve schemes on the basis of overall program of the licensee and take decision taking into consideration the load forecast and financial status;
- Extend co-operation and advice to the Government, if necessary, regarding electricity generation, transmission, marketing, supply, distribution and storage of energy;
- Encourage to create a congenial atmosphere to promote competition amongst the licensees;
- Ensure control of environmental standard of energy under existing laws;
- Ensure appropriate remedy for consumer disputes, dishonest business practices or monopoly;
- Resolve disputes between licensees and between licensees and consumers, and refer to arbitration, if necessary;
- Develop uniform methodology of accounting for all licensees to help ensure performance rating on a fair platform;
- Collect, review, maintain & publish statistics of energy;
- Frame codes and standards and make enforcement of those compulsory to ensure quality of services;
- Determine efficiency and standard of the machinery & appliances using energy and ensure through energy audit the verification, monitoring, analysis of the energy data and economic use and

enhancement of efficiency on use of energy; and

- Perform any incidental functions if considered appropriate by the Commission for fulfilling objectives of the Act.

The Government of Bangladesh formulated and announced the first *National Energy Policy* (NEP) of the country in 1996 to ensure proper exploration, production, distribution and rational use of energy sources to meet the growing energy demand of different zones, consuming sectors and consumers groups on a sustainable basis. With rapid change of global as well as domestic situation it has been decided to update this NEP. The revised draft National Energy Policy 2004 covers country's non-renewable energy policy, petroleum policy, marginal gas field development policy, renewable and rural energy policy, power policy and rural electrification policy. The objectives of the revised draft National Energy Policy (NEP 2004) are outlined as follows:

- To provide energy for sustainable economic growth so that the economic development activities of different sectors are not constrained due to shortage of energy;
- To meet the energy needs of different zones of the country and socio-economic groups;

- To ensure optimum development of all the indigenous energy sources;
- To ensure sustainable operation of the energy utilities;
- To ensure rational use of total energy sources;
- To ensure environmentally sound sustainable energy development programmes causing minimum damage to environment;
- To encourage public and private sector participation in the development and management of the energy sector;
- To bring entire country under electrification by the year 2020;
- To ensure reliable supply of energy to the people at reasonable and affordable price;
- To develop a regional energy market for rational exchange of commercial energy to ensure energy security.

The National Energy Policy of Bangladesh focuses the pricing policy for non renewable energy as follows:

- All forms of non-renewable energy are to be priced at their economic cost of supply;
- The present price of natural gas is to be raised in phases to reach its economic cost of supply;
- The price of PSC gas is to be linked to the price of high sulfur furnace oil as recommended in the Petroleum Policy;

- The present subsidy on gas price for power and fertilizer is to be removed gradually; Subsidy, if required, is to be given at the end-user level and the related liabilities cannot be passed on to the utilities;
- Differential tariff is to be applied for use of gas by the bulk user (e.g. power and fertilizer) for the off-peak and peak hours;
- While fixing up price for Diesel, MS, Kerosene, LPG etc., adequate care has to be taken to prevent adulteration of one product by the other or to discourage smuggling of the product outside the country;
- The price of coal is to be set at its economic cost of production and supply;
- The pricing formula for refinery products will be based on import parity prices with a negotiated discount.

4.2 India

4.2.1 Institutional Framework

Energy sector of India is characterized by a complex network of ministries, advisory agencies, and regulatory bodies. Until 1992, the country's entire energy system operated under the purview of the Ministry of Energy Sources. Subsequent restructuring of the energy sector led to the formation of the Ministry of Power (responsible for electricity); the Ministry of Petroleum and Natural Gas; the Ministry of Coal;

and the Ministry of New and Renewable Energy. Nuclear power is administered through the department of Atomic Energy. A brief description of the institutional framework of oil and sufficient gas was allocated priority consumers namely the fertilizer industry

The Ministry of Petroleum and Natural Gas is a cabinet-level organization in the Indian central government whose primary responsibility is the exploration and exploitation of oil and natural gas. The transport, refining, distribution and marketing of petroleum products as well as the import, export and conservation of petroleum also falls within its responsibilities. Critically, the ministry is also responsible for pricing of oil and natural gas and with the supervision, production, and marketing of biofuels. With the enactment of the Petroleum and Natural Gas Regulatory Board Act in 2006, the regulator for oil and gas downstream sector was established. The objective of the act is to regulate refining, processing, storage, transport, distribution, marketing, and sale of petroleum products and natural gas to protect interests of the consumers and entities engaged in specific activities, to ensure uninterrupted and adequate supply of petroleum products and natural gas in all parts of the country, and to promote competitive markets. The ministry is associated with more than a dozen of oil and gas public sector undertakings, including some major private sector companies. The

details of the most important of these undertakings are discussed below.

– The Oil and Natural Gas Corporation (ONGC) is India's largest state-owned oil and gas company, mostly involved in upstream sector. It is engaged in refining and retailing as well as its traditional exploration and production business. ONGC accounts for more than 80% of India's oil and gas local production. Wellhead Margin is a local production for ongoing owns and operates pipelines across the country. Moreover, ONGC has a subsidiary company, ONGC Videsh Limited (OVL), to pursue overseas exploration and production opportunities. Currently, OVL is involved in forty projects in fifteen countries. ONGC Mital Energy Limited is another overseas venture where ONGC is involved as 50-50 public private partnership with Indian billionaire Lakshmi Mital.

– The Indian Oil Corporation Limited (Indian Oil) is the largest company in the India's refinery business through its ownership and operation of ten of India's twenty refineries. Its pipeline network for transportation of crude oil and petroleum products and largest retail network make the company's position as the dominant player in the transportation and marketing of petroleum products in India.

– Bharat Petroleum Corporation Limited is India's second largest downstream company. It controls 15% of the nation's refining capacity with the three refineries. The company also controls about 24% of the petroleum marketing sector through the sale of branded fuels, compressed natural gas (CNG), liquefied petroleum gas (LPG) and lubricants. Recently, Bharat Petroleum Corporation pursues exploration and production opportunities also with three domestic E&P blocks.

– The Hindustan Petroleum Corporation Limited is India's another state-owned downstream company. It controls 6% of the country's refining capacity with the two refineries. The company also controls about 24% of India's retail market.

– Oil India Limited (OIL) is one of nation's largest upstream companies, with a dominant presence in the northeastern India in oil sector. The company is engaged in exploration, production and transportation of oil. Oil India Limited is also involved in the sufficient gas was allocated priority consumers namely the fertilizer industry

– The Gas Authority of India Limited (GAIL) is a state-owned company responsible for transporting, distributing and marketing of natural gas produced by ONGC and several other consortiums. The company holds about 78% market share in natural gas

transmission and around 70% market share in natural gas marketing of India. It is composed of GAIL India, mainly responsible for natural gas transmission, and GAIL GAS, responsible for the distribution and marketing of the actual cost of natural gas for vehicles, recovery of the existing gas fields and to help in the long term adjustment to the reality of higher international prices. Government of Bangladesh has decided methane blocks. GAIL India is also a major stakeholder in the liquefied natural gas (LNG) industry of India.

The Directorate General of Hydrocarbon (DGH) has been set up to look after the interests of the Government of India as it is the owner of all hydrocarbon resources of the country and the operators are the leaseholders. The DGH also maintains a repository of data pertaining to oil fields and promotes participation of oil companies in the rounds of bidding and administers the award of concessions after make sure prices are determined through a pricing formula that links the wellhead prices to international fuel oil or crude oil prices, and also based on when a field hydrocarbons.

4.2.2 Legal and Regulatory Framework

The Indian government passed some reforms at the end of the 1990s to sufficient gas was allocated priority consumers namely the fertilizer industry (LNG) terminals. In 1997, the

government announced the New Exploration Licensing Policy (NELP) to provide a more attractive framework for sufficient gas was allocated priority consumers namely the fertilizer industry

The Government announced the dismantling of the Administered Pricing Mechanism (APM) for all petroleum products except kerosene and liquefied petroleum gas (LPG), effective from 2002. Oil marketing companies were allowed to set the price of petroleum products for a while, but continued its control on diesel and petrol due to the oil price hike in the international market. Private sector participation in building oil product pipelines has been allowed since 2002. The private sector is also free to invest in gas pipeline infrastructures. The Government decided to open the LPG business to private entrepreneurs in 1993, which has enabled private marketers to import, store, bottle and market LPG at market-determined prices.

The Indian government has enacted the Petroleum and Natural Gas Regulatory Board Act, 2006. Its aim is to:

- promote competition among entities;
- avoid infructuous investment;
- maintain or increase supplies;
- secure equitable distribution; and
- ensure adequate availability of petroleum, petroleum products and natural gas nationwide.

The act is to provide for the establishment of the Petroleum and Natural Gas Regulatory Board in order to regulate the refining, processing, storage, transportation, distribution, marketing and sale of petroleum, petroleum products and natural gas, excluding production of crude oil and natural gas. This is to protect the interests of consumers and entities engaged in specified activities relating to petroleum, petroleum products and natural gas, and to ensure uninterrupted and adequate supply of petroleum, petroleum products and natural gas in all parts of the country whilst promoting competitive markets. The functions of the board are as follows:

The Board shall:-

- (a) protect the interest of consumers by fostering fair trade and competition amongst the entities;
- (b) register entities to-
 - (i) market notified petroleum and petroleum products and, subject to the contractual obligations of the Central Government, natural gas;
 - (ii) establish and operate liquefied natural gas terminals;
 - (iii) establish storage facilities for petroleum, petroleum products or natural gas exceeding such capacity as may be specified by regulations;
- (c) authorise entities to-
 - (i) lay, build, operate or expand a

common carrier or contract carrier;

(ii) lay, build, operate or expand city or local natural gas distribution network;

(d) declare pipelines as common carrier or contract carrier;

(e) regulate, by regulations,-

(i) access to common carrier or contract carrier so as to ensure fair trade and competition amongst entities and for that purpose specify pipeline access code;

(ii) transportation rates for common carrier or contract carrier;

(i) lay, build, operate or expand a gas distribution network so as to ensure fair trade and competition amongst entities as per pipeline access code;

(f) in respect of notified petroleum, petroleum products and natural gas-

(i) ensure adequate availability;

(ii) ensure display of information about the maximum retail prices fixed by the entity for consumers at retail outlets;

(iii) monitor prices and take corrective measures to prevent restrictive trade practice by the entities;

(iv) secure equitable distribution for petroleum and petroleum products;

- (v) provide, by regulations, and enforce, retail service obligations for retail outlets and marketing service obligations for entities;
- (vi) monitor transportation rates and take corrective action to prevent restrictive trade practice by the entities;
- (g) levy fees and other charges as determined by regulations;
- (h) maintain a data bank of information on activities relating to petroleum, petroleum products and natural gas;
- (i) lay down, by regulations, the technical standards and specifications including safety standards in activities relating to petroleum, petroleum products and natural gas, including the construction and operation of pipeline and infrastructure projects related to downstream petroleum and natural gas sector;
- (j) perform such other functions as may be entrusted to it by the Central Government to carry out the provisions of this Act.

4.3 Nepal

4.3.1 Institutional Framework

Historically, Nepal's energy institutions focused on water and electricity. In 2009, the country took a major step toward institutional reform with the division of the Ministry of Water Resources

(MoWR). Right now, the energy sector of Nepal is supervised by three ministries, namely, the Ministry of Energy (MoEN), the Ministry of Commerce and Supplies (MoCS) and the Ministry of Science, Technology and Environment (MoSTE). Further, there are two commissions, namely, Water and Energy Commission and Nepal Electricity Tariff Fixation Commission.

The power sector and the utilization & management of water resources of Nepal are under the jurisdiction of the MoEN. The MoSTE and the Alternative Energy Promotion Centre (AEPD) under this ministry are the main entities for the promotion and development of renewable energy technologies. The AEPD provides the financial and technical support to local organizations for promoting and developing decentralized rural energy through technology transfer and research and development activities.

Nepal Oil Corporation (NOC) is under the jurisdiction of The MoCS. NOC is primarily responsible for the import of petroleum and oil products and their storage and distribution throughout the country. It provides policy recommendations to MoCS as and when necessary. Thus, NOC functions as the production has been declining, while the quantity of gas that is

The Department of Mines and Geology (DMG) is the sole government

organization which is responsible for all types of geological survey, mineral exploration and administration of Mining Rules and Regulations in Nepal. It is the one and only government organization of Nepal that deals with systematic geo-scientific studies, investigation of mineral resources and their development activities in the country.

4.3.2 Legal and Regulatory Framework

The Government of Nepal is responsible for developing the statutory, legal, and policy framework for the energy sector. Various acts and regulations constitute the statutory framework, under which public and private energy supply activities take place. With regard to Petroleum Legislation, there are two sets of enabling legislation which govern the negotiation, the conduct of petroleum related operations and the fiscal treatment of these activities. These are: (1) Nepal Petroleum Act, 1983; (2) Petroleum Regulation, 1985 (First Amendment, 1986 and Second Amendment, 1994).

Nepal Petroleum Act, 1983 is the broad enabling legislation which permits Government to enter into Petroleum Exploration and Production Agreements. The Department of Mines and Geology is designated to administer the application for and negotiation of Petroleum Agreements. Petroleum Regulation, 1985 with amendments

expand on the Nepal Petroleum Act, established the procedure for bidding, evaluation of bids, negotiations and granting of Petroleum Agreements. It specifies the Department of Mines and Geology as the responsible agency for negotiation of Petroleum Agreements and their administration subject to the Petroleum Act. However, in Nepal, there is no regulator to govern petroleum downstream sector.

4.4 Pakistan

4.4.1 Institutional Framework

Mainly two government ministries are responsible for Pakistans energy sector: the Ministry of Water and Power; the Ministry of Petroleum and Natural Resources. The ministry of Water and Power is primarily responsible for the power sector and the Ministry of Petroleum and Natural Resources is responsible for dealing with all matter relating to oil, gas, coal and mineral affairs in Pakistan. Two other institutions-the Pakistan Atomic Energy Commission (PAEC) and Private Power Infrastructure Board (PPIB) also help to shape national energy policy. The National Energy Conservation Centre raised the APM price to match the price of NELP Krishna National Program on energy conservation/energy efficiency activities.

In Renewable energy Sector, the Alternative Energy Development Board

is responsible to develop national strategy, policies and plans for utilization of alternative and renewable energy resources to achieve the targets approved by the Federal Government in consultation with the Board. It also acts as a forum for evaluating, monitoring and certification of alternative or renewable energy projects and products, and to facilitate power generation through alternative or renewable energy resources.

The Ministry of Petroleum and Natural Resources operates with Directorates of Gas, Oil, Petroleum Concessions, LNG the form of taxes and, the current taxes the concerned sub-sectors. A brief description of the institutions under this ministry, which is scope of this study, is summarized below.

Oil and Gas Development Company Limited (OGDCL) is the largest Exploration and Production (E&P) company in the Pakistan oil and gas sector. It is currently about 75% owned by the Government. It holds the largest share of oil and gas reserves in the country. OGDCL carries out exploration and development activities on its own as well as in joint ventures with other oil companies.

Sui Northern Gas Pipe Line Company Limited (SNGPL) is the largest integrated gas company through an extensive network in Punjab and Khyber Pakhtunkhwa of Pakistan. It

has experience in operation and maintenance of high pressure transmission and low-pressure distribution systems. It has also expanded its activities to undertake the planning, designing and construction of pipelines both for itself and other organizations.

Sui Southern Gas Company Limited (SSGCL) is also engaged in the business of transmission and distribution of natural gas for Sindh and Balochistan provinces in the south of Pakistan. It has also experience in construction, operation and maintenance allocated priority consumers namely the fertilizer industry distribution systems.

Pakistan State Oil Company Limited (PSO) is the oil market leader in Pakistan holding over 79% share of the Black Oil market and 58% share of the White Oil market. It is engaged in import, storage, distribution and sufficient gas was allocated priority consumers namely the fertilizer industry

Hydrocarbon Development Institute of Pakistan (HDIP) is a national Petroleum Research and Development organization. It is an autonomous body under the ministry. HDIP carries out applied research, provides consultancy and laboratory services to the petroleum industry and renders technical advice to the Government on matters referred to it and technical support to the regulator.

4.4.2 Legal and Regulatory Framework

The oil and gas regime in Pakistan is local production. Wellhead Margin is a local production for ongoing and supplement the Regulation of Mines and Oilfields and Mineral Development (Government Control) Act 1948 (as amended by the Oilfields (Regulation and Development) Amendment Acts 1969, 1976 and 1984). Some of the acts, ordinances, rules and regulations on oil and gas are:

- Amendment in LPG (P&D) Rules, 2001;
- CNG Rules, 1992;
- Complaint Regulations, 2003;
- Licensing Rules, 2002;
- LPG Rules, 2001;
- Marketing of Petroleum Products (Federal Control) Act, 1974;
- Mines Act, 1923;
- Natural Gas (Development Surcharge) Rules, 1967;
- Natural Gas (Price For Supplies By Producers) Rules, 1976;
- Offshore Petroleum (Exploration & Production) Rules 2003;
- OGRA Ordinance, 2002;
- Oil & Gas (Safety in Drilling & Production) Regulations, 1974 Dated 7 January 1974;
- Pakistan Petroleum (Refining, Blending and Marketing) Rules, 1971
- Petroleum Exploration and Production Policy 2012;
- Tariff Rules, 2002.

These acts, ordinances, rules and regulations are in turn supplemented by conditions set forth by the Government of Pakistan and issued in the form of a policy which is subject to revision from time to time. In addition, the Onshore Rules provide for a licensing system on the basis of a model Petroleum Concession Agreement (PCA). The Offshore Rules set out a licensing system on the basis of a model Production Sharing Agreement (PSA).

Pakistan has separate regulatory authorities for power, nuclear and oil and gas sectors. Oil and Gas Regulatory Authority (OGRA) oversees the oil and natural gas sector, the National Electric Power Regulatory Authority (NEPRA) oversees the electric power sector and the Pakistan Nuclear Regulatory Authority oversees the nuclear sector.

Oil and Gas Regulatory Authority (OGRA) is responsible for regulating refineries, oil storage, oil pipe lines, oil marketing companies, and CNG and LPG supply, transmission, distribution and sale, including determination of gas tariffs and fixation of petroleum product prices. Since its inception, the OGRA has laid down performance and service standards as part of license conditions to improve the quality of service to the consumers. A number of regulatory measures have been introduced to ensure the provision of safe, efficient,

and satisfactory service to CNG and LPG consumers.

4.5 Sri Lanka

4.5.1 Institutional Framework

The energy sector of Sri Lanka is overseen by mainly three ministries, the Ministry of Power and Energy (MoPE), the Ministry of Petroleum Industries and the Ministry of Environment and Renewable Energy. The Ministry of Power and Energy is concerned mainly with the implementation of the local production. Wellhead related to local production for ongoing wings under the purview of the Ministry of Power & Energy are:

- Ceylon Electricity Board is the owner and operator of the national electricity grid. It owns all large hydropower stations and 50% of the thermal power generation capacity in Sri Lanka. The remainder of the thermal-based power generation is owned by private players. CEB caters to 85% of the consumers connected to the national grid.

- Lanka Electricity Company (Pvt.) is a private limited liability Company registered under the Companies Act No.17 of Sri Lanka for Distribution of Electricity.

- LTL Holdings (Pvt.) Ltd. is the largest power sector engineering company

in Sri Lanka. LTL is a dynamic engineering enterprise engaged in Manufacturing, Construction & Service industries spanning across Electrical, Mechanical and Civil engineering fields.

The Ceylon Petroleum Corporation (CPC) under the Ministry of Petroleum Industries was set up as a state enterprise. The state-owned CPC is the only player in the petroleum refining business. It handles all crude oil imports in the country. For the import of finished petroleum products, CPC competes with the privately owned Lanka IOC (a subsidiary of Indian Oil Corporation). The import and distribution of LPG is completely owned by the private sector, with CPC contributing 15% of the total LPG supply through its own refinery output. Ceylon Petroleum Storage Terminals Limited (CPSTL) is the common user facility company established to facilitate the petroleum storage & distribution activities in Sri Lanka.

Sri Lanka Sustainable Energy Authority, under the Ministry of Environment and Renewable Energy, was established to realise the necessity of having an apex institution to drive Sri Lanka towards a new level of sustainability in energy generation and usage, through increasing indigenous energy and improving energy efficiency within the country.

The Atomic Energy Authority (AEA) of Sri Lanka is a Statutory Body functioning under the Ministry of Technology and Research. The Atomic Energy Authority (AEA) has the responsibility of facilitating the utilization of this technology in the medical, agricultural, industrial, energy and environmental sectors in Sri Lanka and ensuring that all uses of radiation and radioisotopes are carried out according to the internationally accepted safety standards.

4.5.2 Legal and Regulatory Framework

In 1961, the Government of Sri Lanka under the *Ceylon Petroleum Corporation Act* No.28 of 1961 established the Petroleum Corporation with the general objectives: "To carry on business as an importer, exporter, seller, Supplier or distributor of petroleum; to carry on the business of exploring for, the exploiting, producing and refining of petroleum; to carry on any such business as may be incidental or conducive to the attainment of these objectives. In addition, Petroleum Products (Special Provisions) Act, No, 33 of 2002 (Certified local production. Wellhead Margin is a local production to for doing an alternative for the import, export, sale, supply and distribution of petroleum; to vest certain powers in the energy supply committee; and to provide for the matters connected therewith or incidental thereto. With the enactment of the Petroleum Products (Special

Provisions) Act No. 23 of 2002, the import and sale of petroleum products were liberalized.

National Energy Policy and Strategies 2008 of Sri Lanka consists of (a) Energy Policy Elements- state the fundamental principles that guide the development and future direction of Energy Sector ;(b) Implementing Strategies- state the implementation framework to achieve each policy element; (c) Specific Targets, Milestones and Institutional Responsibilities- state the national targets, and the planning and institutional responsibilities to implement the strategies. The major guiding policy elements are the following:

- Providing basic energy needs;
- Ensuring energy security;
- Promoting energy efficiency and conservation;
- Promoting indigenous resources;
- Adopting an appropriate pricing policy;
- Enhancing energy sector management capacity;
- Consumer protection and ensuring a level playing field;
- Enhancing the quality of energy services; and
- Protection from adverse environmental impacts of energy facilities.

of PNG gas is limited under a bound the condition. Based on the above

production has been declining, while the quantity of gas that is Ministry of Petroleum and Petroleum Resources Development on policy and regulatory issues, and a shadow regulatory function in the lubricants market, within the industry. PUCSL does not have any legal mandate for

regulating the price of petroleum products. However, recently, 2012, the amendments to the Petroleum Products (Special Provision) Act 2002 have been finalized; by which PUCSL have been appointed as the shadow regulator for the petroleum industry of Sri Lanka.

Chapter 5

Concluding Remarks

This study focuses on the prevailing energy pricing practices in the selected SAARC Member States with regard to price determination methodologies, related institutional and regulatory setups, tax, subsidy, and so on. The theoretical aspects of energy pricing are also described in this study. The study covers mainly two kinds of energy commodities, namely, petroleum products and natural gas with the perspective of both producer as well as consumer. Under the natural gas pricing mechanism, Bangladesh, India and Pakistan are considered. And under the oil pricing mechanism Member States namely Bangladesh, India, Nepal, Pakistan and Sri Lanka are considered. The major findings in this study are summarized below.

Natural Gas

The price of natural gas is mainly based on the volume of gas delivered to the consumers and consists of three main parts: (i) Commodity costs; (ii) Transmission costs and (iii) Distribution costs. In general, natural gas pricing policy can't be separated from the country's overall energy policy. According to the Julius and Mashayekhi (1990), there are three main objectives of the gas pricing; (i) Economic Efficiency; (ii) Financial Viability and (iii) Social Equity. However, sometimes these

objectives are conflicting; for instance, economic efficiency may imply to charge high rate to low volume users while the social equity could require subsidized rates to small users.

The price of natural gas is determined on mainly two approaches: (i) Cost based pricing and (ii) Market value based pricing. The determination of domestic natural gas prices differs in SAARC Member States, reflecting cost of supply (locally and internationally), prices of competing fuels and the concerns for social welfare in particular economic sector. In determining the natural gas pricing, selected SAARC Member States have some form of price control/regulation; however, in most cases, the level of natural gas price is linked to competitive fuels like petroleum products.

The wellhead natural gas price affects the profitability of the E & P companies and becomes a factor in determining the producer price. In Pakistan, meeting its entire gas demand from indigenous source, the producers' gas price is indexed to the international oil price. Besides, the sliding scale discount and zonal discount is applicable in determining the producers' gas price. Likewise, in India, meeting its gas demand by three supply sources (public, JVs and imported LNG) from both

indigenous and import, the producers' gas price is indexed to the international oil price, except the re-gasified imported LNG which is determined on the cost plus basis. The gas produced by state-owned companies is sold under the administrative pricing mechanism, decided by the government, while the gas produced by private & JVs is sold at price according to production sharing contract. The NELP gas producer can discover the price of gas themselves by a formula. And as a part of the regional support policy, the public producers' price (only ONGC) is reduced for the north eastern region. On other hand, Bangladesh does not have any distinct pricing mechanism for the determination of producers gas price that is linked with international oil price. According to the existing pricing structure, the government stake is 55% and gas industry stake is 45% on the end users price. This Petrobangla stake or the gas industry margin or total Petrobangla margin equals the sum of the margins allocated to gas industry operating companies, including exploration, production, transmission and distribution. The state owned gas companies get paid on the basis of their ongoing operation and maintenance costs and have no risk of making loss due to their operating in-efficiency. But, in Pakistan, operating efficiency related benchmark is imposed in determination of gas price.

Natural gas is a depletable resource. In

economic terms, the value of the foregone consumption is called depletion premium, royalty, user cost, net price or resource rent. The depletion premium has to be added to the economic production cost of natural gas. The introduction of this depletion premium or royalty is a common practice in many countries and is being implemented in India, Pakistan, except Bangladesh. Bangladesh may introduce a depletion premium or royalty in natural gas pricing structure to reflect the value of gas. One of the prominent common features of the SAARC Member States is the provision to sell gas to third party at market price. According to the recent policy reforms, E & P companies of Bangladesh (only IOCs), India and Pakistan will have the right to sell of their production in the domestic market to third party.

In determining the consumer gas price, transportation costs, distribution costs, government regulations and interventions, and the structure of the gas industry are among the factors in addition to the producers' price. In all selected SAARC Member States economies, concern over social equity is reflected through government intervention in consumer gas pricing. The intervention aims to meet social objectives by subsidizing gas prices. Cross subsidies differentiate consumer groups in these economies. Selected SAARC countries provide subsidies to

support the use of gas for strategic industries; for instance fertilizer, and small users. The application of subsidy demonstrates the government intervention on the gas price setting. India's consumer price setting structure has a distinct feature compared to other countries; to promote commercial and industrial activity in the northeast, the price for consumers in northeast has been kept at 60% of the price in the rest of the country. The lowest sectoral gas price is given for fertilizer production and power generation in Bangladesh. Priority is given to fertilizer production

and power generation in India, supplied gas at the lowest rate (Administered sufficient gas was allocated priority consumers namely the fertilizer industry household consumers and fertilizer feedstock in Pakistan.

There are significant distinctions in taxes to be paid by the customers among the SAARC countries. In case of Bangladesh, taxes (VAT & SD) are calculated as a percentage of the end user's price. In case of India, it varies India had three fiscal regimes for oil and gas exploration; (i) Nominated fields (ii)

Table 24: Key Features of the Natural Gas Pricing in selected Member States

Country	Regulator	Royalty	Third Party Sale	Subsidy	Unbundling of Utilities	Private Sector Participation
Bangladesh	Yes	No	Yes	Yes	Yes	Yes (Only Production Sector)
India	Yes (Central level)	Yes	Yes	Yes (APM gas)	Yes	Yes
Pakistan	Yes	Yes	Yes	Yes	Yes (Partially)	Yes (Only Production Sector)

Determination of gas pricing basically depends on various aspects of a particular country. The country specific factors are the nature of domestic gas resources, the mix of demand segments, the availability of alternatives fuels, the population and the level of economic development, and the political system. According to Thurber and Chang (2011),

policies to develop gas and bring it to market in a country can be broadly divided into two types: centrally planned and market-oriented. The Table energy category can be applied in the different parts of the gas value chain of a country.

Table 3.5. Policy Instruments of Natural Gas Value Chain

<i>Policy</i>	<i>Upstream</i>	<i>Midstream</i>	<i>Downstream</i>
Centrally-planned	-Non-competitive hydrocarbon licensing -Fixed wellhead prices -Domestic market obligation -Export restrictions	-Government builds infrastructure itself -Regulated transport tariffs -Restricted pipeline access	-Planned prices by end use segment -Mandates for particular end uses -Low cost of capital for favored industries
Market-oriented	-Competitive hydrocarbon licensing -Favorable tax and royalty terms for gas development -Unrestricted access to international or domestic gas markets	-Open bidding for infrastructure contracts -Utilization ensured through long-term contracts for gas -Government may offer incentives/guarantees to reduce risk -Open pipeline access	-Open pipeline access on supply and demand -Put environmental or other externalities into price

Source: Thurber and Chang (2011).

The countries have natural gas are making a gradual shift from centrally planned pricing to market-based pricing in particular in upstream sector. Specifically, the recent transition in the gas sector of India and the recently introduced Petroleum Exploration and Production Policy 2012 of Pakistan is part of the improved movement of the economy from a centrally planned and administered system to a market oriented system.

Oil

The prices of petroleum products are calculated by various components accounting for costs, taxes and profit margins of oil companies and retailers. The components include cost of crude oil procurement, refinery cost and

margins, transportation costs, retailer margins, taxes and levies, and subsidies. Moreover, the components, namely, under recovery for oil marketing companies and loan expenses are considered in price build up process of India and Nepal respectively. In local production the Wellhead Margin is a local production for ongoing some form of price control/regulation. In some Member States, oil prices are administered by the government. But they are planning to adopt formula based pricing mechanism. There is also subsidy on oil and, use of fuel tax as a source of revenue. In SAARC Member States, except Nepal, the pricing formula for refinery products is based on the import parity price. However, in India, refinery gate prices of petroleum products are being governed by both

import parity price and trade parity price (diesel & petrol only).

Table 76: Key Features of the Oil Pricing Mechanisms

Country	Regulator	Oil Pricing Mechanism	Refinery Gate Price	Subsidy	Private Sector Participation
Bangladesh	Yes	Controlled/Regulated	Import Parity	Yes	No
India	Yes (Central level)	Controlled/Regulated	Import and Trade Parity	Yes	Yes (Refinery & Marketing Sector)
Nepal	No	Controlled/Regulated	-	Yes	No
Pakistan	Yes	Controlled/Regulated	Import Parity	Yes	Yes (Refinery & Marketing Sector)
Sri Lanka	Yes	Controlled/Regulated	Import Parity	Yes	Yes (Marketing Sector)

The taxation on petroleum products is different across the SAARC countries. Generally, petroleum products are taxed in several ways and types of taxes. The taxes imposed on petroleum products are import duty, excise duty, value-added taxes or sales tax, and other surcharges and levies for particular purposes. Taxes imposed on petroleum products have proven to be a reliable source of raising revenue. There is a wide variation of petroleum tax rate levels and structures across the SAARC countries. In fact, countries impose different tax rates for different oil products as well as for different states, case of India, to achieve social, environmental and economic policy objectives. Most SAARC countries provide subsidy and charge a relatively lower tax rate on some petroleum products such as kerosene, fuel oil, LPG and diesel.

Cost and taxation are the two important

factors in determining the prices of petroleum products. In general, pricing mechanism for the petroleum products are mainly influenced by the market players (refineries), the market size, and the government regulation and policy. In selected SAARC countries economies, some governments are controlling/regulating the prices of petroleum products. The main reasons for the price regulation are the importance of oil to the economy and social policy objectives like the support for low-income groups.

Selected SAARC countries are net importers of oil and some governments do not pass world market prices on to domestic markets to the same level. Hence, giving stability to oil prices, SAARC Member States may consider the future price trends at the international market in determining their petroleum products prices. Some

governments already are in the various stages of planning the move from ad-hoc to a formula based pricing. The complete liberalization is a factor for introducing market based pricing mechanisms. But, the introduction of the market pricing mechanism seems only possible in a mature oil market and with

an established investment environment.

In reality, the liberalization of energy prices will not take place too quickly. The SAARC countries may establish their own pace for appropriate pricing that balances the state financial condition with the economic needs of low in-come groups.

Appendices

Appendix A: Historic Gas Tariff Development in Bangladesh

Historic Gas Tariff Structure
(in terms of unit price)

[illegible][illegible]

Source: Annual Report 2009-2010, TGTDCCL.

Appendix B: Current Natural Gas Pricing Framework in Bangladesh

GAS PRICE DISTRIBUTION AMONGST GOB & PB GROUP *With effect from 19-09-2011 (after 12.00 PM)*

Tk / CM														
SLNo.	Customer Category	End Users Price (Tk / cm)	GOB Margin 55%			PB Margin 46%								End Users Price
			VAT	SD	Total	PDF Margin	Bapes Margin	DWMB	Wellhead Margin	Trans. Margin	Distr. Margin	Gas Development Fund	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Power	2.82	0.3678	1.1832	1.5510	0.3170	0.0480	0.0400	0.2250	0.3200	0.2250	0.0940	1.2690	2.82
2	Fertilizer	2.58	0.3365	1.0825	1.4190	0.2680	-	0.0400	0.2250	0.3200	0.1350	0.1530	1.1610	2.58
3	Feed Gas for CNG	23.00	3.0000	9.6500	12.65	6.1000	0.1100	0.2000	0.3000	0.3200	0.1560	3.1640	10.3500	23.00
4	Captive Power	4.18	0.5452	1.7538	2.2990	0.4560	0.0480	0.0400	0.2250	0.3200	0.5910	0.2010	1.8810	4.18
5	Industry	5.86	0.7643	2.4387	3.2230	0.7660	0.0480	0.0400	0.2250	0.3200	0.9550	0.2830	2.6370	5.86
6	Tea-Estate	5.86	0.7643	2.4387	3.2230	0.7660	0.0480	0.0400	0.2250	0.3200	0.9550	0.2830	2.6370	5.86
7	Commercial	9.47	1.2352	3.9733	5.2085	1.3355	0.0480	0.0400	0.2250	0.3200	1.7350	0.5580	4.2615	9.47
8	Domestic	5.16	0.6750	2.1650	2.8400	0.5990	0.0480	0.0400	0.2250	0.3200	0.7740	0.2440	1.3550	5.16

DWMB: Deficit Wellhead Margin for Bapes

Appendix C: Current Petroleum Products Pricing Framework in Bangladesh

Sl. No.	Pricing Framework	BDT/Litre			
		Diesel	Kerosene	Petrol	Furnace Oil
1	Ex-Refinery Price (pre-tax)	50.19	50.84	74.7	50.78
2	VAT@15%	7.53	7.62	11.20	7.62
3	Ex-Refinery Price (post-tax)	57.72	58.46	85.90	58.40
4	Distributor Margin	0.2	0.2	0.27	0.25
5	Inland freight equalization fund account	0.39	0.39	0.39	0.45
6	Main Depot Price	59.22	59.96	87.92	60.00
7	Local transport cost for dealers (within 40 kilometers)	0.40	0.40	0.40	-
8	Dealer/agents depreciation cost	0.04	0.04	0.04	-
9	Dealer/agents commission & losses	1.34	0.60	2.64	-
10	Retail price within 40 kilometer of depot	61.00	61.00	91.00	60.00

Source: IMRCL

Appendix D: Historical Producer and Consumer Prices of Natural Gas in India

(All price in foo' cubic metre)

Effective Date	Consumer Prices		Transportation charges along HVJ pipeline	Producer Prices			Calorific Value (K, Cal / SCM)
	Off-shore (Landfall point) and On-shore	For North-Eastern States		ONGC	ONGC (NE states)	OIL (NE states)	
1	2	3	4	5	6	7	8
01.01.2004	2850	1700	1150	2224	1700	1900	10000
01.03.2004	2850	1700	1150	2224	1700	1900	10000
01.04.2004	2850	1700	1150	2137	1700	1900	10000
01.07.2004	2850	1700	1150	2176	1700	1900	10000
01.09.2004	2850	1700	1150	2194	1700	1900	10000
01.10.2004	2850	1700	1150	2120	1700	1900	10000
01.01.2005	2850	1700	1150	2143	1700	1900	10000
01.04.2005	2850	1700	1150	2384	1700	1900	10000
01.07.2005	3200	1920	1150	3168	1920	3168	10000
01.10.2005	3200	1920	1150	3137	1920	3137	10000
01.01.2006	3200	1920	1150	3118	1920	3118	10000
01.04.2006	3200	1920	1150	3200	1920	3200	10000
01.04.2007	3200	1920	1150	3200	1920	3200	10000
01.04.2008	3200	1920	1150	3200	1920	3200	10000
01.04.2009	3200	1920	1089	3200	1920	3200	10000
01.04.2010	3200	1920	NA	3200	1920	NA	10000

Notes:

1. The consumer prices are exclusive of Royalty, Sales Tax and other Statutory Levies & Producer prices are exclusive of Royalty.
2. MoP&NG vide order dated 03.Jun'10 has fixed the price of APM natural gas produced by National Oil Companies (NOCs) at US\$ 4.2 /mmbtu less royalty. Above price is effective for City Gas Distribution (CGD) entities from 08.Jun'10 and for all other customers from 01.Jun'10. Price in Rs./MSCM shall be calculated based on above prices in US\$/mmbtu and previous month's average RBI reference rate.
3. W.o.f 6.6.2006 MoP&NG has revised the price of Natural Gas having allocation upto 0.05 MMSCMD & city gas distribution projects vide order dated 6.6.2006. The revised price is Rs 3840/MSCM.
4. As per the Govt. order dated 03.Jun'10, the difference of APM gas consumer price in other than North East and in North East would be paid to ONGC through Government Budget.

Source: Petroleum Planning & Analysis Cell.

Appendix E: Sales Tax on Crude Oil, Gas and Major Petroleum Products in India

STATE	Crude Oil	Natural Gas	MS	HSD	SKO POSX	LPG Dem./ Indus.	FO	LDO	Lubes/ Greases	Naphta	ATF	Asphalt/ Bitumen
	2	3	4	5	6	7	8	9	11	10	11	12
Andhra Pradesh	4	14.5	33	22.25	4/14.5	4/14.5	14.5	22.25	14.5	14.5	16	4
Arunachal Pradesh	NA	NA	20	12.5	4/12.5	4/12.5	12.5	12.5	12.5	12.5	20	4
Assam	5	12	27.5	18.5	2/12.5	4/9	4	16.5	13.5	13.5	22	4
Bihar			24.5	19.36	5/5	1/13.5	13.5	18.36	12.5	12.5	29	4
Chandigarh			20 or 22.5	12.5	5/12.5	0/12.5	12.5	12.5	12.5	5	20	5
Chhattisgarh			25	25	4/14	0/14	5	25	14	14	25	5
Delhi			20	12.5	5/12.5	0/5	20	12.5	20	20	20	5
Goa			22	20	5/12.5	4/12.5	12.5	22	12.5	20	22	5
Gujarat	4	12.5-14.5	23	21	0/25	0/12.5	4	12.5	17.5	16	30	4
Haryana			20+5%	8.8+5%	5/12.5	0/12.5	12.5+5%	8.8+5%	12.5+5%	20+5	20+5%	5+5%
Himachal Pradesh			25	14	0/13.75	4/13.75	13.75	14	13.75	5	25	5
Jammu & Kashmir			20	12	5/13.5	4/13.5	13.5	13.5	13.5	13.5	20+5%	5
Jharkhand		12.5	20	18	4/12.5	4/12.5	12.5	18	12.5	12.5	20	4
Karnataka			25	18	5/14	1/14	14	14	14	14	28	5
Kerala			29.3	24.93	4.04/12.63	4/12.63	12.63	47.62	12.63	4.04	28.04	4.04
Madhya Pradesh			28.75	23	5/13	5/13	13	13	13	13	28.75	5
Maharashtra	4	12.5	26.8	26	5/12.5	0/12.5	12.5	12.5	12.5	12.5	25	12.5
Manipur			20	13.5	5/5	4/13.5	13.5	13.5	13.5	NA	20	5
Meghalaya			20	12.5	5/13.5	4/13.5	13.5	12.5	13.5	NA	20	NA
Mizoram			18	10	0/0	2/8	20	10	10	NA	20	NA
Nagaland			20	12	5/15	4/12.5	12	12	12	12	20	12
Orissa			18	18	4/13.5	4/13.5	20	13.5	20	13.5	20	4
Punjab			27.5+10%	9.9 or 12.5+10%	12.5/10	4	5+10%	8.8+10%	12.5+10%	5+10%	20+10%	5+10%
Pondicherry			15	14	0/12.5	1/12.5	12.5	12.5	12.5	12.5	12.5	1
Rajasthan		5	28+5%	19+5%	5/14	0/14	5	18	14	5	20	14
Sikkim			15	7.5	0/12.5	4/12.5	12.5	7.5	12.5	12.5	12.5	4
Silvassa			20	20	4/20	4/12.5	20	20	12.5	20	20	4
Tamil Nadu	4	4	27	21.43	4/25	4/12.5	4	25	12.5	4	29	4
Tripura		12.5	15	10	0/12.5	15/12.5	12.5	10	12.5	12.5	20	4
Uttar Pradesh			26.53	17.23	5/13.5	0/12.5	21	17.23	13.5	21	21	13.5
Uttarakhand			25	21	4.5/4.5	4/13.5	12.5	21	20	12.5	20	4.5
West Bengal			25	17	0/13.5	4/4	4	17	13.5	4	25	4

Notes: Above taxes exclude other taxes payable / recoverable as on 1.4.2011.

Source: Public Sector Undertakings and Petroleum Planning and Analysis Cell.

Appendix F: Price Build-up of Diesel in India (at Delhi)

Sr. No.	Elements	Unit	Effective 16th May'12
1*	FOB Price at Arab Gulf of Gasoil (Diesel) BS III equivalent	\$/bbl	130.12
2*	Add: Ocean Freight from AG to Indian Ports	\$/bbl	2.22
3	C&F (Cost & Freight) Price	\$/bbl	132.34
	OR	Rs./Litre	43.73
4*	Import Charges (Insurance/Ocean Loss/ LC Charge/Port Dues)	Rs./Litre	0.41
5*	Customs Duty @2.58% (2.50% + 3% Education cess)	Rs./Litre	1.14
6*	Import Parity Price (at 29.5° C) (Sum of 3 to 5)	Rs./Litre	45.27
7*	Export Parity Price (at 29.5° C)	Rs./Litre	42.99
8*	Trade Parity Price (80% of (6)+20% of (7))	Rs./Litre	44.81
9*	Refinery Transfer Price (RTP) for BS-III Diesel (Price Paid by the Oil Marketing Companies to Refineries)	Rs./Litre	44.81
10	Add: Premium recovered for BS-IV Grade over BS-III	Rs./Litre	0.04
11*	Add : Inland Freight and Delivery Charges	Rs./Litre	0.87
12*	Add : Marketing Cost of OMCs	Rs./Litre	0.67
13*	Add : Marketing Margin of OMCs	Rs./Litre	0.73
14	Total Desired Price (Sum of 9 to 13) -Before Excise Duty, VAT and Dealer Commission	Rs./Litre	47.11
15*	Less: Under-recovery to Oil Marketing Companies	Rs./Litre	13.64
16	Price Charged to Dealers (Depot Price) (14-15) - Excluding Excise Duty & VAT	Rs./Litre	33.47
17*	Add : Specific Excise Duty @ Rs.2.06/Litre (Rs.2.00/Litre+ 3% Education cess)	Rs./Litre	2.06
18*	Add : Dealer Commission	Rs./Litre	0.91
19*	Add : VAT (including VAT on Dealer Commission) applicable for Delhi @ 12.50% and Air Ambience Charges @ Rs.250/KL less rebate of Rs.375/KL	Rs./Litre	4.46
20	Retail Selling Price at Delhi (Sum of 16 to 19)	Rs./Litre	40.91

*The explanatory notes are given in the attachment.

**Fortnightly RTP is weighted average of all Indian Pricing Ports.

Appendix G: Price Build-up of PDS Kerosene in India (at Delhi)

Sr. No.	Elements	Unit	Effective 1st May'12
1*	FOB Price at Arab Gulf of Jet / Kero (Kerosene)	\$/bbl	132.69
2*	Add: Ocean Freight from AG to Indian Ports	\$/bbl	2.68
3	C&F (Cost & Freight) Price	\$/bbl	135.37
	OR Rs./Litre		43.37
4*	Import Charges (Insurance/Ocean Loss/ LC Charge/Port Dues)	Rs./Litre	0.29
5*	Customs Duty	Rs./Litre	NIL
6*	Import Parity Price (at 29.5° C) (Sum of 3 to 5)	Rs./Litre	43.66
7*	Refinery Transfer Price (RTP) for PDS Kerosene (Price Paid by the Oil Marketing Companies to Refineries)	Rs./Litre	43.66
8*	Add : Inland Freight and Delivery Charges	Rs./Litre	0.79
9*	Add : Marketing Cost of OMCs	Rs./Litre	0.41
10*	Add : Marketing Margin of OMCs	Rs./Litre	0.42
11	Total Desired Price (Sum of 7 to 10) -Before Excise Duty, VAT and Wholesale & Retailer Commission	Rs./Litre	45.28
12*	Less : Subsidy by Central Government	Rs./Litre	0.82
13*	Less: Under-recovery to Oil Marketing Companies	Rs./Litre	31.48
14	Price Charged to Dealers (Depot Price) (11-12-13) - Excluding Excise Duty & VAT	Rs./Litre	12.99
15*	Add : Excise Duty (Including Education Cess)	Rs./Litre	0.00
16*	Add : Wholesale & Retailer Commission and Other charges fixed by State Government	Rs./Litre	1.13
17*	Add : VAT (including VAT on Wholesale & Retailer Commission) applicable for Delhi	Rs./Litre	0.71
18	Retail Selling Price at Delhi (Sum of 14 to 17)	Rs./Litre	14.83

* The explanatory notes are given in the attachment.

**Monthly RTP is weighted average of all Indian Pricing Ports.

Appendix H: Price Build-up of Petrol at HPCL-Retail Pump Outlets India (at Delhi)

Sr. No.	Elements	Unit	Effective 24th May '2012
1	C&F (Cost & Freight) Price of Gasoline (Petrol) BS III equivalent	\$/bbl	124.37
2	Average Exchange Rate	₹/\$	53.17
3	Refinery Transfer Price (RTP) on landed cost basis for BS-IV Petrol (Price Paid by the Oil Marketing Companies to Refineries)	₹/Litre	42.57
4	Price Charged to Dealers (excluding Excise Duty & VAT)	₹/Litre	44.71
5	Add : Specific Excise Duty @ Rs.14.78/Litre (₹14.35/Litre+ 3% Education cess)	₹/Litre	14.78
6	Add : Dealer Commission	₹/Litre	1.50
7	Add : VAT (including VAT on Dealer Commission) applicable for Delhi @ 20%	₹/Litre	12.20
8	Retail Selling Price at Delhi (Rounded Off)	₹/Litre	73.19

Appendix I: Current Petroleum Products Pricing Framework in Nepal

IOC Price (Eff 16th November 2012), Raxaul, IRs/KL	67.99	75.49	76.16
NOC Interest Expenses & Loan Repayment	1.80	1.80	1.80
NOC's Admin Expenses	0.50	0.50	0.50
NOC'S Dealer Commission/Profit to Gas Company & Dealers	2.47	1.75	1.97
Total Cost Price/ Landed Price	111.31	98.91	86.23

With effect from October 16, 2012.

Appendix J: Historical Selected Petroleum Products Selling Price in Nepal

2012/06/19	120.00	93.00	93.00
2012/02/24	116.00	85.00	85.00
2012/01/18	115.00	85.00	85.00
2011/08/26	102.00	75.00	75.00
2011/06/11	102.00	68.50	68.50
2011/03/12	97.00	68.50	68.50
2010/12/06	88.00	68.50	68.50
2010/2/6	77.50	58.00	58.00
2009/11/17	77.50	58.00	58.00
2009/09/01	77.50	57.50	57.50
2007/12/26	80.00	56.25	51.20
2007/04/10	67.25	53.15	47.65

Appendix K: Field-wise Well Head Gas Prices in Pakistan

Sr. No	Field Name	Units	Price Effective 01-07-2011
1	Adhi	Rs.per MMBTU	126.54
2	Bhit	\$ per MMBTU	4.6291
3	Badin Deep fields	\$ per MMBTU	4.2136
4	Badin (HoA)	\$ per MMBTU	4.2136
5	Badin Compression	Rs.per MMBTU	180.88
6	Badin Golarchi Non-Associated	Rs.per MMBTU	5
7	Bhadra	\$ per MMBTU	4.6291
8	BOBI	Rs.per MMBTU	499.45
9	Chachar	\$ per MMBTU	2.1068
10	Chanda	\$ per MMBTU	2.7429
11	Dakhani	Rs.per MMBTU	126.60
12	Dhodak	Rs.per MMBTU	252.94
13	Dhurnal	Rs.per MMBTU	22.26
14	Hala (Adam X-1)	\$ per MMBTU	2.6501
15	Kandkot	Rs.per MMBTU	181.040
16	Kadanwari	\$ per MMBTU	8.5004
17	Khipro Mirpurkhas Block	\$ per MMBTU	2.6501
18	Koonj-1A	\$ per MMBTU	3.1982
19	Loti	Rs.per MMBTU	118.95
20	Makori	\$ per MMBTU	2.7429
21	Mamikhel	\$ per MMBTU	2.6929
22	Meyal / Dhullan	Rs.per MMBTU	111.30
23	Miano	\$ per MMBTU	4.3100
24	Mari	Rs.per MMBTU	48.30
25	Maramzai	\$ per MMBTU	2.6929
26	Manzalai	\$ per MMBTU	2.8464
27	Nandpur Panjpir	Rs.per MMBTU	320.40
28	Nashpa	\$ per MMBTU	2.6729
29	Pakhro	\$ per MMBTU	2.2984
30	Pariwali	\$ per MMBTU	4.6292
31	Pindori	\$ per MMBTU	4.6292
32	Pirkoh	Rs.per MMBTU	118.9500
33	Qadir Pur	Rs per MMBTU	231.97
34	Ratana	Rs.per MMBTU	333.97
35	Sadkal	Rs.per MMBTU	689.07
36	Sari Hundi	Rs.per MMBTU	707.56
37	Sawan	\$ per MMBTU	4.3100
38	Sul	Rs.per MMBTU	181.040
39	UCH	\$ per MMBTU	3.9223
40	Zamzama SSGCL	\$ per MMBTU	4.2200
41	Zamzama SNGPL	\$ per MMBTU	4.2225
42	Zamzama Wapda/Guddu	\$ per MMBTU	4.2630
43	Zamzama - Phase - II	\$ per MMBTU	4.3100

Source: CX, KA.

Appendix L: Computation of Ex-Depot Sale Price of Oil Products in Pakistan

[illegible]

doi:10.1371/journal.pone.0141111.g001

^a Amounts of 75% including cost items incurred in the report of 182 during the month have been estimated per the TCT document dated August 18, 2011.

Appendix M: Historic Petroleum Products Pricing Development in Sri Lanka

Date of Effective	LP 95	LP 90	LAD	LSD	LK	LIK
17.02.1994	37.50	35.00	12.30	15.10	11.80	11.80
28.06.1994	37.50	35.00	11.40	14.20	9.50	11.80
26.01.1995	42.50	40.00	11.40	14.20	9.50	11.80
09.02.1995	42.50	40.00	12.40	15.20	9.50	11.80
28.09.1996	55.00	50.00	13.20	18.50	10.40	12.70
26.05.1999	53.00	50.00	13.20	18.50	10.40	12.70
07.02.2000	53.00	50.00	16.20	21.50	15.40	17.70
27.12.2000	53.00	50.00	24.50	29.80	18.40	20.70
15.04.2001	53.00	50.00	27.50	32.80	19.40	21.70
28.12.2001	53.00	50.00	26.50	31.80	17.40	19.70
25.02.2002	52.00	49.00	26.00	31.30	17.40	19.70
16.12.2002	52.00	49.00	30.00	35.30	24.00	26.30
16.01.2003	52.00	49.00	30.00	35.30	24.00	26.30
04.12.2003	56.00	53.00	32.00	37.30	25.50	27.80
25.01.2004	58.00	55.00	32.00	37.30	25.50	27.80
25.09.2004	73.00	70.00	44.00	49.30	25.50	27.80
05.05.2005	77.00	74.00	46.00	51.30	28.50	30.80
06.05.2005	83.00	80.00	50.00	55.30	30.50	32.80
16.04.2006	91.00	88.00	58.00	63.30	38.50	40.80
27.12.2006	95.00	92.00	60.00	65.30	48.00	58.30
01.01.2007	95.00	92.00	60.00	65.30	48.00	58.30
29.07.2007	120.00	117.00	75.00	80.30	68.00	69.00
30.12.2008	133.00	120.00	70.00	85.30	50.00	55.00
02.01.2009	148.00	130.00	73.00	88.30	51.00	56.00
29.12.2009	133.00	115.00	73.00	88.30	51.00	56.00
01.09.2010	133.00	115.00	73.00	88.30	51.00	56.00
01.04.2011	143.00	125.00	76.00	98.30	61.00	66.00
30.10.2011	155.00	137.00	84.00	106.30	71.00	76.00
12.02.2012	167.00	149.00	115.00	142.00	106.00	111.00

Source: Ceylon Petroleum Corporation.

References

- Ariyadasa L., 2006, *A Current Status of the Energy Situation in Sri Lanka*, Colombo, Sri Lanka.
- Asian Development Bank (ADB), 2007, *Bangladesh Gas Sector: Issues, Options and the Way Forward*, Manila, Philippines.
- Asian Development Bank (ADB), 2010, *Proposed Loans Peoples Republic of Bangladesh: Natural Gas Access Improvement Project*, Manila, Philippines.
- Bangladesh Oil, Gas and Mineral Corporation (BOGMC), 2006, *Preparing the Gas Sector Development Project*, Dhaka, Bangladesh.
- Bangladesh Oil, Gas and Mineral Corporation (BOGMC), 2010, *Petrobangla Annual Report 2010*, Dhaka, Bangladesh.
- Bangladesh Oil, Gas and Mineral Corporation (BOGMC), 2012, *Daily Production Report*, Dhaka, Bangladesh.
- Ceylon Petroleum Corporation (CPC), 2007, *Annual Report-2007*, Colombo, Sri Lanka.
- Ceylon Petroleum Corporation (CPC), 2012, *Current Products Price*, Colombo, Sri Lanka. <http://www.ceypetco.gov.lk/Marketing.htm> (Accessed on October, 2012).
- Directorate General of Hydrocarbons (DGH), 2011, *Hydrocarbon Exploration and Production Activities*, Noida, India.
- Ebinger, Charles K. (2011), *Energy and Security in South Asia: Cooperation or Conflict?* Brookings Institution Press, Washington, D.C, USA.
- Energypedia, 2012, *Fuel Price Sri Lanka*, Colombo, Sri Lanka.
https://energypedia.info/index.php/Fuel_Prices_Sri_Lanka#Fuel_Price_Composition. (Accessed on October, 2012).
- Government of Nepal, *Nepal Petroleum Act, 1983*, Kathmandu, Nepal.
- Hagler Baily (HB), 2012, *Discussion Paper on Tax Incentives and Other Economic Instruments to Promote Upgradation of Vehicular Fuel Quality in Pakistan*, Islamabad, Pakistan.
- International Energy Agency (IEA), 2010, *Natural Gas in India*, Paris, France.
- International Institute for Sustainable Development's Global Subsidies Initiative, 2012, *A Citizens Guide to Energy Subsidies In Bangladesh*, Geneva, Switzerland.
- Jain Anil, Sen Anupama, 2011, *Natural Gas in India: An Analysis of Policy*, The Oxford Institute for Energy Studies, Oxford OX2 6FA, United Kingdom.
- Joshi, S., Jung, N. (2008), *Natural Gas in India in Stern, J. (ed) Natural Gas in Asia: The Challenges of Growth in China, India, Japan and Korea* **Ex-Depot Sale Price** Press, UK.

- Malik, Afia (2008), *How Pakistan is coping with the Challenge of High Oil Prices*, Unpublished, Pakistan Institute of Development Economics, Islamabad, Pakistan.
- Ministry of Finance (MoF), 2009, *Integrated Energy Plan: 2009-2022- Report of The Energy Expert Group*, Islamabad, Pakistan.
- Ministry of Petroleum & Natural Gas (MoPNG), 2011, *Basic Statistics on Indian Petroleum & Natural Gas*, New Delhi, India.
- Ministry of Petroleum & Natural Gas (MoPNG), 2011, *Standing Committee Report (Ninth) on Challenges of Under-Recoveries of Petroleum Products*, New Delhi, India.
- Ministry of Petroleum & Natural Resources (MoPNR), 2005, *Natural Gas Allocation and Management Policy*, Islamabad, Pakistan.
- Ministry of Petroleum & Natural Resources (MoPNR), 2011, *Liquefied Petroleum Gas (Production & Distribution) Policy*, Islamabad, Pakistan.
- Ministry of Petroleum & Natural Resources (MoPNR), 2011, *Liquefied Natural Gas (LNG) Policy*, Islamabad, Pakistan.
- Ministry of Petroleum & Natural Resources (MoPNR), 2011, *Pakistan Energy Yearbook*, Islamabad, Pakistan.
- Ministry of Petroleum & Natural Resources (MoPNR), 2012, *Petroleum Exploration and Production Policy*, Islamabad, Pakistan.
- Ministry of Petroleum & Natural Resources (MoPNR), 2012, *Oil Pricing Formula*, Islamabad, Pakistan. http://www.mpnr.gov.pk/oil_prices.asp; (Accessed on May 25, 2012).
- Ministry of Power and Energy (MoPE), 2008, *National Energy Policy & Strategies of Sri Lanka*, Colombo, Sri Lanka.
- National Planning Commission, 2011, *National Status Paper-United Nations Conference on Sustainable Development 2012 (Rio+20)*, Kathmandu, Nepal.
- Nepal Oil Corporation (NOC), 2012, *Selling Price*, Kathmandu, Nepal. <http://www.nepaloil.com.np/main/?opt1=sellingprice&opt2=profitloss>
- City Gas Distribution (CGD)
- Nepal Oil Corporation (NOC), 2012, *About Nepal Oil Corporation*, Kathmandu, Nepal. <http://www.nepaloil.com.np/main/?opt1=sellingprice&opt2=profitloss> (Accessed on October, 2012).
- Oil & Gas Regulatory Authority (OGRA), 2011, *Annual Report 2010-2011*, Islamabad, Pakistan.
- Oil and Gas Regulatory Authority (OGRA), 2012, *Notified Oil Prices*, Islamabad, Pakistan. http://www.ogra.org.pk/cats_disp.php?cat=80; (Accessed on May 25, 2012).

- Oil Companies Advisory Committee (OCAC), 2012, *Pricing Formula*, Islamabad, Pakistan. http://www.ocac.org.pk/ex_refinery5.asp; (Accessed on May 25, 2012).
- Parliament of the Democratic Socialist Republic of Sri Lanka, 2002, *Petroleum Products (Special Provisions) Act No. 33 of 2002*, Colombo, Sri Lanka.
- Perera, W.I.K., 2005, *The Impact of Petroleum Prices on Inflation in Sri Lanka-Staff Studies, Volume 35*, Central Bank of Sri Lanka, Colombo, Sri Lanka.
- Planning Commission, 2008, *Moving Ahead-National Strategy for Accelerated Poverty Reduction II*, Dhaka, Bangladesh.
- Public Utilities Commission of Sri Lanka (PUCSL), 2011, *Annual Report 2011*, Colombo, Sri Lanka.
- Rajpal S. Deo., 2009, *Issues and Marketing Strategies of Natural Gas in India*, University of Petroleum and Energy Studies, Dehradun, India.
- South Asia Watch on Trade, Economics & Environment (SAWTEE), 2007, *Anti-Competitive Practices in Nepal's Petroleum Sector*, Kathmandu, Nepal.