Connecting for Energy? India's Negotiation for Space in Central Asia

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MY ADORABLE PARENTS

DECLARATION

I declare that the dissertation entitled “Connecting for Energy? India’s Negotiation for Space in Central Asia” has been prepared by me under the guidance of Dr. V.J. Varghese, Assistant Professor, Centre for South & Central Asian Studies, School of Global Relations, Central University of Punjab. No part of this dissertation has formed the basis for the award of any degree or fellowship previously.

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ABSTRACT

Connecting for Energy? India's Negotiation for Space in Central Asia

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The present research aims to examine the role of energy demands in determining the contours of India's new 'Connect Central Asia' policy. In a world of accelerating energy needs, possession and non-possession of energy sources are determining factors of the global economy of energy with significant impact on international relations and global peace. According to Exxon Mobil World Energy Outlook 2013 the world's population will rise by more than 25 percent from 2010 to 2040 which means growing mobility requirements and energy demand. The rising living standards of the people will also impacts energy demands. These dynamic changes demand understanding of political economy of global energy crisis as a whole and how it has become a strong factor in foreign policy initiatives. The plan of the present research is to contextualise India's energy crisis in the political economy of global energy crisis and investigate how far it is factored in its new found interest in Central Asian countries. Though, India accounts 2.49 per cent of world's annual energy production, its consumption accounts for 3.45 per cent of the global consumption. Its increasing population and enormous growth of middle class is posing a challenge to India in this regard. The research presumes that due to the insecure and unstable supply from the Middle East, India's 'Connect Central Asia' policy has a strong energy angle factored into it.

Name and signature of student Name and signature of supervisor

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Sandeep Singh

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List of Abbreviations

Sr. No.	Full Form	Abbreviation
1.	Asian Development Bank	ADB
2.	Bharat Heavy Electricals Limited	BHEL
3.	British Petroleum	BP
4.	Bharat Petroleum Corporation Limited	BPCL
5.	Baku-Tbilisi-Ceyhan	BTC
6.	Central Asian Republics	CARs
7.	Connect Central Asia Policy	CCAP
8.	Confederation of India Industry	CII
9.	China National Offshore Oil Corporation	CNOOC
10.	China National Petroleum Corporation	CNPC
11.	Carbon Dioxide	CO_2
12.	European Economic Community	EEC
13.	Energy Information Administration	EIA
14.	Essar Oil Limited	EOL
15.	Earth System Science Organization	ESSO
16.	Energy Treaty Charter	ETC
17.	European Union	EU
18.	Federation of Indian Chamber of Commerce and Industry	FICCI
19.	Gas Authority of India Limited	GAIL
20.	Gross Domestic Product	GDP
21.	Greater Mekong Sub-region	GMS
22.	Hindustan Petroleum Corporation Ltd.	HPCL
23.	Indo-Burma Petroleum Company limited	IBP
24.	International Energy Agency	IEA
25.	Integrated Energy Policy	IEP
26.	Inter-Governmental Organization	IGO

27.	International Institute for Sustainable Development	IISD
28.	Islamic Jihadists Union	IJU
29.	Islamic Movement of Uzbekistan	IMU
30.	International North South Transport Corridor	INSTC
31.	Indian Oil Company	IOC
32.	International Oil Companies	IOCs
33.	Iran-Pakistan-India Pipeline	IPI
34.	Kaz-Munai-Gaz	KMG
35.	Klynveld Peat Marwick Goerdeler	KPGM
36.	Lashkar-e-Taiba	LeT
37.	Liquefied Natural Gas	LNG
38.	Liquid Petroleum Gas	LPG
39.	Multilateral Development Banks	MDBs
40.	Mittal Energy	ME
41.	North Atlantic Treaty Organization	NATO
42.	New Exploration Licensing Policy	NELP
43.	National Hydro Power Corporation	NHPC
44.	National Mission on Enhance Energy Efficiency	NMEEE
45.	National Oil Companies	NOCs
46.	Organization for Economic Co-operation and Development	OECD

47.	ONGC Videsh and Mittal Energy Limited	OMEL
48.	Oil and Natural Gas Corporation	ONGC
49.	The Organization of Petroleum Exporting Countries	OPEC
50.	ONGC Videsh Limited	OVL
51.	Purchasing Power Parity	PPP
52.	Public Private Partnership	PPP
53.	Renewable Energy and Energy Efficiency Partnership	REEEP
54.	Reliance Industries Limited	RIL
55.	Shanghai Cooperation Organization	SCO
56.	Turkmenistan-Afghanistan-Pakistan-India	TAPI
57.	The Energy and Resources Institute	TERI
58.	United Nations	UN
59.	United States America	USA
60.	Zaranj-Delaral Roadway	ZDR

Chapter 1

Introduction

"Energy is like blood in your veins. It is vital as that to economic growth, if there is a shortage of blood, you cannot function and similarly, if there is a shortage of energy, the economy cannot work" - Rajiv Kumar, Secretary General of the Federation of Indian Chamber of Commerce and Industry (FICCI), told the BBC (Singh 2012). Energy is a basic driver of any economy in the world whether it is energy producer or energy consumer. Contemporary international relations and politics to a great extent are influenced by the 21st century energy game. Today, development of transportation, industrialization and changing living standards of people have compelled the nations to ensure energy security. It is also true that energy provides a base for economic growth and development and thereby the dynamics of international relations. Although, there are a number of alternative energy resources like solar energy, wind energy, hydro-energy, nuclear energy etc. but oil and gas still remain as the main energy resources, significantly impacting the economic and political systems of the world. In other words, the possession and non-possession of these energy sources are largely determining the political economy of global energy. Though the population and technology grows in a very fast pace, the rate of replenishment of natural resources could not match the rate of depletion and as a result nations are in a race around energy, either to acquire it or to preserve and make the best use of the available stock.

India is facing great energy crisis today and is trying to diversify its energy resources as well as energy supply. India currently ranks as the world's seventh largest energy producer, accounting 2.49 percent of world's annual energy production (Kumar 2013: 56) and world's 4th largest energy consumer (PTI 2013c), accounting for about 3.45 percent of the world's total annual energy consumption. Its increasing population and enormous growth of middle class is posing a crisis in India in this regard (Kumar 2013: 56). The emergence of Central Asia with huge amount of natural energy resources has led India to think about diversification of energy supply and envisaging Central Asia as one of the potential suppliers in the future. It requires strongly political and strategic relationship with Central Asian countries, apart from increasing geographical connectivity with its 'extended

neighbourhood'. It is in such a context, the present research is attempting to explore how far energy is a factor in India's new policy of 'Connect Central Asia'.

1.1. Global Energy Context

The parameters of energy security are changing because of rapid revolution in energy trade, supply and transit vulnerabilities, terrorism, economic integration of major economies in the energy development, increasing energy demand in rapidly growing developing economies like India and China, transnati3onalization of venture capital and new technologies, energy diversification and emergence new players in the international energy market (Ahmed 2009: 28). According to Exxon Mobil World Energy Outlook 2013, the world's population will rise by more than 25 percent from 2010 to 2040, which means growing mobility requirements and energy demand (Exxon Mobil 2013). Growth of population would be mostly concentrated in Africa, India, and other developing areas, whereas growth in China and OECD countries remains relatively modest. Urbanization will be playing great role in the growing energy needs through 2040 where living standard of the people impacts energy demand (Ibid 2013). Developing countries like India is witnessing more urbanisation and middle-classisation. Thus demographic change and fast urbanisation has become a big challenge for energy in the world.

Another projection of Exxon Mobil, residential and commercial energy demand is expected to rise by about 30 percent by 2040 (Exxon Mobil 2013). This increase is being experienced more by developing countries, where prosperity is expanding and more and more people are moving from rural areas into cities. They are also shifting their attention from biomass energy sources like wood and agricultural waste to modern fuels like oil and gas, which is improving their quality of life. At the same time, it should be noticed that while overall demand is growing, the energy use per person in developing countries is actually declining. According to International Energy Agency (IEA) estimates, 2.6 billion people lack access to modern clean and cocking fuel (Ibid 201312). Moreover increase in the transportation, industries and manufacturing, electricity generation, climate change pose a threat to the balance of demand and supply. There is also a change in the supply pattern of natural gas. Shipments of Liquefied Natural Gas (LNG), which is less harmful to the environment, have become more cost competitive with other

energy transportation methods which have accelerated rapidly in recent years and it is expected to grow the consumption more rapidly than either coal or oil (Kolb 2011: 161).

The earthquake-tsunami-nuclear disaster, in March 2011 in Japan and Fukushima-Daiichi disaster clouds the future of nuclear power and it is noted that development of Shale gas and enlargement of nuclear power are subjected to changing assessment of their environmental impact and concerns of security. The changing scenario of demand will have its own price, geopolitical and market volatility consequences (Kolb 2011: 189-90). Thus, these dynamic changes in the energy sector demands understanding of political economy of global energy issues.

1.2. India's Energy Concerns and Central Asia as an Alternative Source

India is an emerging economy and is making a great progress towards moving into the category of great powers. With a population of around 1.2 billion, India ranks second in most populous countries in the world and ranks fourth in the total world's primary energy consumption after China, the United States and Russia (PTI 2013c). As indicated already, the dramatic growth of industrialization and its middle class has entirely changed its energy landscape and demand scenario. Now, India's energy problem has occupied a predominant position in its foreign policy, especially after the end of cold war. Economic growth is another main factor in India's growing energy demand. It needs to sustain its economic growth rate, between 8 percent to 10 percent in the next 25 years to eradicate poverty and to achieve a credible rank in human development index, which requires a huge amount of energy (Bhaskar 2013: 6). Its recoverable crude oil reserves have been estimated at 757.4 Million tonne (Mt) on Apr 1, 2012, which is not sufficient to meet country's growing energy needs, stated the minister of state for petroleum and natural gas Ranjit Pratap Narain Singh (Jayaswal 2012). Insufficiencies in understanding of the seriousness of India's energy security problems have led to various energy crises in Indian energy sector and government response to these challenges is seen as very weak and inadequate (Sreenivas and Dixit 2012: 10). But the question arises is that why the government fails to deal with such a situation and what are the reasons behind this? These

challenges may be spatial, national or international. How Indian government can get out of this situation? What are the strategies government has adopted to meet with energy crisis? Why it still lacks integrated energy policy? How far energy is factored in its foreign policy initiatives? India has been relying mostly on the countries in the Middle East for its external supply of energy resources. In the context of considerable instability and insecurity for more than 25 years in the Middle East due to factors like the eight yearlong Iran-Iraq war in 1980s, Gulf war in 1991, prolonged period of sanctions, fallout of September 11, and US led war in Iraq, counter terrorism activities in Afghanistan etc. all lessened the possibilities of India's import from these countries and compelled the country to diversify its energy partners especially to countries in the Central Asia, Turkey and Africa (Ahmad 2010: 145).

Table 1.1: Reserves and Production of Oil and Gas in Central Asia (at the end of 2012)

Countries	Oil proved reserves (thousand million barrel)	Oil production (Million tonnes)	Gas proved reserves (Trillion cubic metres)	Gas production (Billion cubic metres)
Kazakhstan	30.0	81.3	1.3	19.7
Turkmenistan	0.6	11.0	17.5	64.4
Uzbekistan	0.6	3.2	1.1	56.9
Total	31.2	95.5	19.9	141.0
Share of World percentage	1.86%	2.31%	10.6%	4.2%

Source: British Petroleum Statistical Review, 2013

Note: Kyrgyzstan and Tajikistan are fossil-fuels bereft countries but are rich in hydropower. Kyrgyzstan generates 92.4 percent hydroelectricity and ranks 19th in the world. On the other hand Tajikistan generates 98.1 percent hydroelectricity of its total energy which is more than 6 percent from Kyrgyzstan and ranks 11th in the world.[1]

Notably, India and United States are not in harmony on the issue of Iran but on the other side the US is ready to give support for TAPI project, designed to get oil and gas from Central Asia. The oil and gas reserves in Central Asian countries are estimated about 31.2 thousand million barrel and 19.9 trillion cubic meters

[1] NationMaster.com. *Energy Stats: Kyrgyzstan vs Tajikistan.* Accessed on: January 15, 2014. Available at: http://www.nationmaster.com/compare/Kyrgyzstan/Tajikistan/Energy

respectively (Table 1.1). Emergences of Central Asian countries offer both prospects and challenges for India. Central Asian economies being in an evolving stage, India could benefit from multiple fronts- investments in the construction and the IT industries, the gas and oil reserves which could help India to diversify its energy import, and these countries could offer huge market for Indian goods (Nag 2004: 1). At the same time, it offers enormous challenge for Indian due to unfriendly market conditions, Taliban's regrouping in this region, religious extremism, the presence of three big powers (Russia, US and China) in the region as active players(Ibid. 2004: 1). India also has to take the geopolitical and geostrategic locations of Central Asia into consideration while pursuing its interests in Central Asia.

Map 1.1: Central Asia and its extending border with India

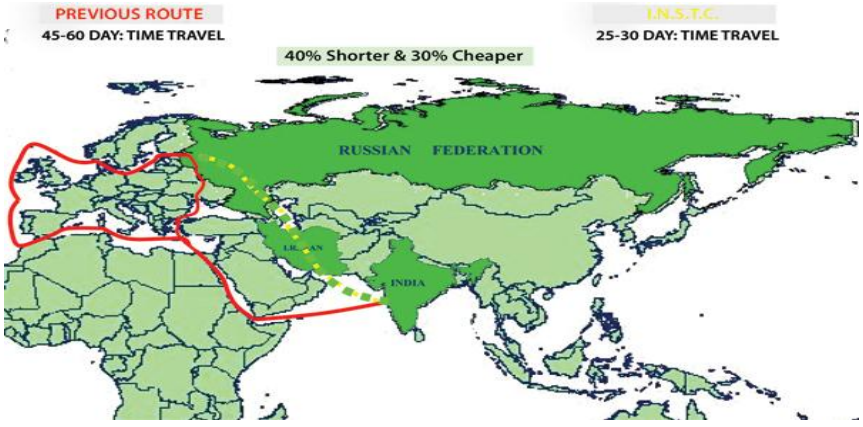
Source: http://mappictures.blogspot.in/2012/06/asia-map.html#.Ua2zE9LQlbE (accessed on June 12, 2013)

The geostrategic location of the Central Asian states has made this region extremely pivotal and challenging. The region is at the crossroads of Russia, the Middle East, South Asia and the Far East. Any geopolitical changes in the region certainly influence several states in the neighbourhood countries. However, nowadays, Central Asia has become crucial area in the foreign policy of the West, South and East Asian countries (Roy 2009). The US, Russia and China are increasing their influence in these countries. Countries like Turkey, Iran, Saudi Arabia, Afghanistan and Pakistan are also making efforts to strengthen footholds in this region (Ibid. 2009). Japan and South Korea are trying to establish economic ties with these Republics. India, as an emerging regional power in South Asia is

concerned with any changes occurring within or near to the region, which could have implications for its energy security (Ibid. 2009).

To pursue its interests, India adopted Connect Central Asia Policy (CCAP) in the first meeting of India-Central Asia dialogue in Bishkek on 12-13 June, 2012 to strengthen the India's relationship with the Central Asian Republics (CARs), both bilaterally and multilaterally. The policy advocates for setting up universities, hospitals, information technology (IT) centers, and e-network in telemedicine connecting India to the Central Asia, joint commercial ventures, improving air connectivity to boost trade and tourism, joint scientific research and strategic partnerships in defence and security affairs and so on (Das 2012). The resource-rich CARs, which are called the underbelly of Eurasia, on the Old Silk Road connecting China and South Asia to West Asia and Europe has been connected to India historically. The new policy of CCAP has been significantly determined by the energy concerns of India and is seen as a major step towards building stable energy relations with the region (Ibid. 2012).

Map 1.2: North-South Transport Corridor



Source: http://www.railwaypro.com/wp/?p=5513 (Accessed on June 12, 2013)

Through this policy India also wants to connect with Central Asia via North-South transport corridor, which India has reactivated and bypasses India's dependence on Pakistan to link up with Central Asia (Das 2012). However, there are several obstacles, yet to be cleared for bringing it into operation. Nevertheless, it could boost India's trade with CARs as well as Russia. This corridor is 40 percent shorter and 30 percent cheaper than the previous North South Transport Corridor as displayed in the map (Mohan 2004). It was also part of India's Look

West policy, which was adopted after the Look East policy. This policy aims at getting connected with the far corner of Northern Africa and the newly independent countries of post Soviet such as Central Asia and Caucasus (Ibid. 2004). Like the South East Asian Countries, this region has also historical links with India and is a potential source of India's ever expanding needs of energy (Ibid. 2004).

The NATO withdrawal from Afghanistan in 2014 could arguably pose a grave security threat to India not only in its neighbourhood but also at its doorstep, if Taliban regime comes into existence over there (Das 2012). There is a pessimistic view that India will find it difficult to stay engaged until Pakistan's continuing ties with the Taliban and its resolve to disallow space for India in Afghanistan after 2014 (Gupta, et al 2012: 7). Thus, there may be threat to India's engagement in Afghanistan which has an important geopolitical location to connect India with Central Asia. India has to improve its relations with neighbouring countries for achieving interests in Central Asia, because peace, security and stability in Afghanistan and Central Asian Countries will be crucial for achieving India's energy security and ensuring strong trade relations.

In the energy sector, India has been making many efforts to get access to energy resources in Central Asia. India's public sector International arm energy company, Oil and Natural Gas Corporation Videsh (ONGC Videsh Ltd.), has a 15 percent ownership in Kazakhstan's Alibekmola oil field and has announced 1.5 billion $ investments in the joint Russian-Kazakhstan Kurmangazy oil field in the Caspian Sea (CSIS 2007). ONGC Videsh has also expressed its interest in investing in Uzbekistan's oil and natural gas fields (Ibid 2007). But it is still unclear that how India can transport oil and gas from Central Asian countries to India. India's attempt to overcome this problem through the TAPI gas pipeline project continues to remain uncertain. Moreover, even export of electricity from Kyrgyzstan and Tajikistan to India has been under discussion (Ibid 2007). Indian leadership is working on strengthening the relationship through official visits and bilateral agreements. Recently, India's Vice President Mahammad Hamid Ansari paid a visit to Tajikistan from 14 to 17 April, 2013 and on 22, 23 May in Uzbekistan for strengthening its relations with these countries on security issues, cross-border

terrorism, energy security etc.[2] It is thus clear that Central Asia's geopolitical location, historical links, its huge amount of energy resources and growing demand of energy in India has made India to pay attention to Central Asia in a big way as the region has huge future prospects in India's energy security.

1.3. Justification, Relevance and Scope of the study

There are ample literatures on energy issues confronting the world; same is the case with the energy concerns of India. The present research alongside understanding the political economy of global energy crisis would explore how energy is factored in India's foreign policy with Central Asian countries. Firstly, it contextualises India's energy problems in the global context. Secondly, it deals with energy crisis in India since 1990, when the economy of India has shifted from a command and regulated economy to an open and liberalised economy, propelling economic growth, living standard of the people and increased industrialisation and electrification, all leading to India thinking about energy crisis and energy security. It will study the strategies of India to deal with the energy crisis broadly with regard to the energy policy in India. Thirdly, the study would make an attempt to understand India's openness to Central Asia by situating it in its increasing concerns for energy security. The study is important as it can potentially help government in reconceptualising it policies and energy priorities.

1.4. Research Plan

The plan is to contextualise India's energy crisis in the political economy of global energy crisis. It would explore India's options and priorities as existing today and the new directions it is initiating. Currently, India is importing two-third of its energy from the Middle East countries which are vulnerable to political volatility and economic sanctions and are not much secure for sustainable energy supply to India. More specifically, the research would look at India's concerns for securing energy in the future from Central Asian countries through its CCAP. It is presumed here that for this, India must take into account the investment climate, regional conflicts, terrorism and disruption, geographical environment and

[2] Available at… http://bestcurrentaffairs.com/w/2013/04/20/vice-presidents-visit-to-tajakistan/ and http://bestcurrentaffairs.com/w/2013/05/23/vice-president-mohammad-hamid-ansari-visit-to-uzbekistan/ (Accessed on 31-05-2013)

geopolitics of pipelines, dilemma of Central Asian countries, energy infrastructure and policy, regional and international relations, demographic changes and actions to improve her energy security.

Objectives

1. To explore the political economy of global energy crisis by the way of mapping the changing sources, concerns and geographies over time and to make an assessment about the present scenario.
2. To explore the energy crisis of India and its strategies to deal with these problems from the1990s.
3. To find out, how far India's Connect Central Asia policy is determined by energy concerns of India, by exploring India's foreign policy achievements in Central Asia in the post-Soviet era and assessing the future prospects of this connection from the perspective of energy trade and security.

1.5. Methodology and Sources:

The research has used empirical, descriptive and analytical approach, side by side with descriptive statistical methods. It used primary data such as white papers, interview reports, agencies' working papers, reports, foreign policy papers, bilateral agreements, trade statistics etc. and secondary data like journal articles, books, news articles, magazines, scholarly journals and electronic resources etc.

1.6. Chapterisation

The dissertation will unfold in six chapters. This introductory chapter will be followed by a literature review in an attempt to identify the knowledge gap in the previous researches, in justification of the present study. The third chapter will focus on the political economy of global energy crisis. It would focus on the problems of global energy like shortage of primary energy resources, shift in energy consumption from developed to developing countries and how these countries can contribute to energy security, demographic change and their geopolitical competition, new discoveries of shale gas which increased the future of natural gas. The political and economic compulsions of the crisis would also be explored to understand how it impacts international politics.

The fourth chapter discusses the current energy scenario of India and the challenges confronting it in this regard both internally and externally. It is pointed out that internally, it is facing problems related to Infrastructure, delay in the decision-making and policy implementation processes, spatial problems in the way of installing energy project and impacts of environmentalist's lobbying on energy policies, demographic changes, corruption and population burden etc. It also discusses external challenges like hurdles like that of Pakistan in IPI (Iran-Pakistan-India) and TAPI projects, the US involvement in these projects, emergence of China as a competitor etc. The chapter also gives insights into its energy policies and strategies and their successes and failures.

The fifth chapter discusses how far India's energy concerns are factored in its CCAP. It is argued that India's growing population and energy demand compelled it to move beyond Middle East to Central Asia and South Africa which are considered as more stable than Middle East countries. This chapter discusses India's relations with Central Asia in the post-Soviet phase and to what extent energy concerns determines its foreign policy priorities towards CARs. The last chapter provides the summary and conclusions of the study. It also ventures some policy directives and recommendations.

Chapter 2
Literature Review

The chapter is devoted to surveying the literature regarding energy studies. However, there are ample literatures available on global energy crisis and Indo-Central Asia energy engagement problems. But, considering the importance of the arguments for this study, it is essential to go through the concerned literature. This chapter divides the literature review into three parts. First part envisages the situation of global energy problems in International political economy and second part is concerned with India's energy crisis and its foreign energy policy. The third part considers India's energy engagement with Central Asian countries and its Connect Central Asia Policy and its implications.

2.1. Global Energy Situation

Deniel Yergin in his famous work "Ensuring Energy Security" has described the historical analysis of energy security in which Winston Chirchil's decision to shift the navy power from coal to oil made the energy security as the number one topic on the agenda of G-8 countries that were supposed to be initial steps to ensuring energy security. However, several changes took place in the energy policy perspectives of energy exporting and importing nations which influence the balance of power. In addition, several new frameworks were made in response to 1973 oil crisis which was experienced first time at large. Moreover, the future of growing energy demand was supposed to be determined by growing importance of gas. It concludes that energy security can be achieved through relations between countries with each other, both bilaterally and within multilaterally frameworks (Yergin 2006). Another view on global energy by Girijesh Pant in his famous article "The Future of Energy Security through Global Restructuring" described that energy has become a global question which can be addressed through global approach. He said that changes in the global energy system since 1970 moved the world from unipolarity to multipolarity with the emergence the Asian economies as a part of global phenomenon. It concludes that energy security needs to be addressed within the global framework (Pant 2010). However, the writer has presented the Global framework as an extended framework of Yergin's bilateral and multilateral framework to achieve energy security in the

world. Another strand of literature, which mainly focuses on the changing context of geopolitics in the world energy markets, described by Bashir Ahmed in a chapter named ‘Energy: The Changing Context of Geopolitics’ in his famous book “Energy Security: Emerging Issues in The world Energy Markets”. Energy markets are experiencing various changes as the patterns of supply and demand and production and consumption are changing which are marked by changing geopolitics of energy markets particularly in emerging consumer countries in Asia like China, India and resurgence of Russia. The volatility of crude oil and product prices, increased instability and terrorist threat to energy market etc brought many changes in the role energy markets (Ahmed 2009). Next view of literature on global energy issues by Robert W. Kolb in his famous work ‘Geopolitical Threats to World Energy Markets’ pointed out that in a multipolar world increasing energy demand would give birth to geopolitical tensions which would continue to have dramatic effects on world energy markets. Increase in the International Oil Companies and National Oil Companies came with major changes in the world energy markets. He also touched the increasing importance of gas and shale gas technologies, threats to nuclear energy and its environmental implications after the nuclear disaster in Japan in 2011 which decrease the future of nuclear energy (Kolb 2011). However both authors focused on geopolitical changes in world energy markets. Bashir admitted that changing pattern in demand and supply in world energy markets emergence of Asian economies are main reason behind this and Kolb stressed on increasing role of IOCs and NOCs, increasing importance of gas and growing energy demand led to geopolitical changes in the world energy markets. Similarly, Igor Matutinocic in his work ‘Oil and Political Economy of Energy’ added that over crude oil related issues like exploitation, price volatility and its impacts on world economy and consumer behavior are related with two theoretical views of geologists and political-economists and after giving alternative to the geologist view of Hubbert’s model, he reached the conclusion that the role markets, public policy, technology and the government can contribute to long titled supply curve scenario. In other words, he advocates positive merge of politics and economics into the world energy markets can bring new prospects in the energy fieldb (Matutinovic 2009). Another strand of literature in which S. Mohapatra and Norottan Gann in their article ‘Energy Crisis: Security Implications’ expressed his concern world energy crisis through envisaging asymmetries between

geographical distribution of resources energy consumers and integration of energy security in the international theories. He attached the energy security with political economy through illustrating theories of security like liberal and realist. He also used three approaches such as first is institutional approach which is meant for laws, norms, stability and security of economic relations. Second is New Energy Economy approach which is meant for vulnerability within market economy as energy is key input for an economic system. Thirdly, Critical approach also analyzes energy security from both political and economic angles, side by side represents a particular view of structural approach to international political economy changes in oil supplies since first half of 21st century. Thus, energy security is still firmly rooted in political science and related disciplines like public policy, security theories, international relations, global governance studies. In the context of deregulation of energy supply, it looks energy as market commodity rather than a public good that increases the relevance of economics which took place in many countries in 80s and 90s. But markets mostly rely on Governments to provide insurance for non-quantifiable uncertain risks. So, ultimately political and economic aspects cannot be detached or isolated from each others. He also provided an analysis on energy problems in context of regional security complex theory that, combination of oil income and a revolutionary govt. poses threat to international peace. In the context of climate change, it considers renewable sources as substitute. Finally, he concluded that energy dependency is seen as serious challenge to the state sovereignty which can be overcome through developing a notion of interdisciplinary field of energy security studies (Mohapatra and Gaan 2013). However both authors Matutinovic and Mohapatra gave stress on political and economic aspects of global energy. Another study conducted by Catherine W., Orie S. and Paul G in their valuable work 'How Will Energy Demand Develop in Developing World' expressed their views that in the changing context of global energy supply and demand trends, mostly energy demand is expected to be coming from developing countries such as China, India and Brazil which would consume more energy than developed countries. They gave reason behind this growth in energy demand in developed world, increases in the income level of people due to dramatic economic growth and urbanization in the developing world gave boost to middle class which requires more energy to consume for their better living standard. However, to meet energy requirements of middle class became

burden for energy poor countries like India (Wolfram 2012). Another strand of literature on the role of middle class in increasing consumption was described by Homi Kharas and Geoffrey Gertz in their important work 'The New Global Middle Class: A Cross-Over from West to East'. They explored the dynamic shift in the expansion of New Global Middle Class from west to east at the global level in general and in China in particularly through defining it as daily expenditure between $10 and $100 per person in purchasing power parity taking data of 145 countries. However, Asian economies are supposed to be experiencing much growth of middle class which would be the critical factor in the government policy to meet energy needs of these countries particularly of India and China (Kharas & Gertz 2010). In short, authors of these two articles observed that fast econmoic growth in developing countries raise the income level of the people which gave birth to the middle class which is pressurising the natural resources of these countries thereby increasing energy demand. Apart from this, there are number of energy chllanges in the world and addressing energy challenges world system requires global energy governance. Regading this strand of literature, Florin A. and Sovacool Benjamin gave provided insghts into the concept of global energy governance in their work 'Who governs energy? The challenges facing global energy governance'. They outlined the framwork for understanding the needs and possibilities of global energy governance. For this purpose, they analysed four selected institutions like International Energy Agency, The Group of Eight (G-8), The Asian Development Bank, and The Renewable Energy and Energy Efficiency Partnership and reach the conclusion that there are a handful of global institutions which are currently influencing energy policies and practices around the world and argued that how various approaches to global governance differ in their applicability to address the conundrums of global energy problems because none of existing forms of global governance adequately match the nature and scope of global energy challenges (Florini and Sovacool 2009). Another strand of literature in the work of Bernhard May in his article 'Energy Security and Climate Change: Global Challenges and National Responsibilities' described that the relationship between energy security and climate change and highlights the responsibilities of national governments and international community through envisaging the important role of global leaders to run global energy crisis (May 2010). Another related work advocated the reforms in global energy governance in which Neil

Hirst in his working report ‘The Reforms of Global Energy Governance’ discussed the international cooperation on energy policies. He advocated for reforms in global energy governance such as domestic energy policy to share all governments broadly, technology advancement, global market and international energy security, emergency planning, an inclusive global organization, a pragmatic approach to enhance the role of existing institutions etc. and made some recommendations for reforms that how area of international cooperation on energy can be extended (Hirst 2012). However, these all authors gave stress on the need of better global governance for better energy secure world. Cooperation between developing countries and developed countries on energy issues can help in this direction. While developing countries are growing fast, so they have their own energy security concerns and India is one of them. In addition, to address energy issues more reliable framework of political economy of global energy requires deep study and understanding.

2.2. India’s Energy Concerns

However, India is a subcontinent in the South Asia but after partition it remained as an isolated land due its weak relationships with neighbouring countries which are creating obstacles in the way of its foreign energy policy which is big challenge to its energy security. A work done by A.B.R. Chaudhury in his article ‘The Energy Crisis and South Asian Security’ expressed concern over contemporary security in relation with energy crisis such as vulnerable trans-border electricity trade and passive path of gas pipeline which look into South Asia in general and India in particular. Thus, it attempts to revaluate the question of common security as a part of human security in South Asia in the context of growing energy crisis. In conclusion it gives emphasis on the need to understand the national security. He expands the concept of security into four strands such as downwards, upwards, horizontally and politically responsibility (Chaudhury 2009). In another strand of literature, Rahul Panday in his famous article ‘How can India achieve Energy Security’ envisaged the policy of India for securing energy security. Though, natural gas in the energy sector is increasing but India cannot rely on one energy commodity which requires energy sources diversification. He made some future observations on the basis of which India can secure its sustainable energy security for its future generation. However, India has still not

made much progress to adopt such policies in the fast changing world (Panday 2006). Another view of India's energy crisis in which J. Carl, V. Rai and G. Victor in their valuable work 'Energy and India's Foreign Policy' explored the role of energy in the Indian foreign policy and strategy and explains the growing gap between its energy vision and energy reality keeping its implications in Indian foreign policy in mind as India is lacking integrated energy policy. It also scrutinizes the relationship between India's energy policy and foreign policy by offering both Vignettes and political decisions in different sectors of energy system such as Oil and Gas, Coal and Electric Power. it concludes that domestic political coalition system, policy fragmentation combined with weak administrative capacity of the Indian states are dominating the energy landscape which in turn, are weakening the foreign policy aspects of energy and its international commitments in the energy sectors (Carl, Rai, and Victor 2008). Ashok Sreenivas and Shantan Dixit in their article 'Are we serious about our Energy Security?' said India's Government remained fail due to its negative response to address its energy efficiency and issues. Thus, they emphasize on the need of systematic approach and understanding on the seriousness of energy security problems (Sreenivas and Dixit 2012). However, these three literatures targeted the government inefficiency and its fragmented energy policy to address energy issues in different aspects. Another strand of literature in India's energy security and policy, Bala Bhaskar in his famous work 'Energy Security and Economic Development in India' observed the concept of energy security in the context of both World and India. He gave insights into the energy scenario of India and evolution of energy policies determining the positive correlation between economic growth and energy consumption. He also evaluated some energy efficiency policies of the country and gave some suggestion to improve them. He also expressed his concerned over environmental degradation in India due to the use of conventional energy resources and highlighted the importance of water to achieve energy security. It included energy pricing in the strategy to gain energy security and observed India's changing dynamics of geopolitics and diplomacy in energy supplies and thereafter, he stressed on the need of a holistic approach to attain energy security (Bhaskar 2013). Another related literature on India's energy policies, Chanchal Kumar in his article 'India's Energy Security Challenges, Policies and Strategies' observed the current energy scenario of India and challenges such as demographic change, population burden,

urbanization and increasing energy imports and focused on energy policies like enhancing energy security and energy efficiency and the use of renewable resources to take on given challenges. He also expressed his concern over environmental protection and indicated towards long term strategy (Kumar 2013). Thus, increase in urbanization would have great impact on growing energy demand. However, in the context to determine the foreign energy policy, the role of Gulf region has been very important in its most of energy import from the region. A.K. Pasha described the role and strategic importance of energy rich region in his article 'The Role of Gulf Region in India's Energy Security'. He explained the US strategies and its presence in the region. Apart from this, he added that the region is vulnerable to various problems like oil price hike, disruption of supplies, Israel-Arab conflicts, terrorism and autocratic regime in the region and concluded that the US domination in the region under the notion of terrorism is restricting the role of India as a result of which it has to think about another option to secure its energy imports (Pasha 2013). This, article indicated India to extend its energy suppliers to bring energy in the homeland. However, Government of India's energy policies could not target their desired goals in energy sector in home as well as outside and they need to be reworked to deal energy crisis.

2.3. India's CCAP and its implications

Proximity to Central Asia and their richness in natural resources have made place in the foreign energy policy of India to pursue its strategy to diversify energy imports. In this direction, one view of Mahmoud Balooch, said in his famous article 'Iran and India's Cooperation in Central Asia' that geopolitical and trade relations between India and Iran to create North-South corridor to connect Central Asia is a need of hour. India-Iran-Central Asia relations can provide a new link which could transform the face of trade in the region and may affect the Chinese and Pakistani planning at Pakistan's Gwadar port. India is also investing in road and railway links via Afghanistan. Gaining these benefits, India can get access to Central Asia, European markets and Russia for its variety of energy resources. But as we know, that India and the USA are not in harmony on Iran issues which is big challenge for India (Balooch 2009). Another view Amresh Chandra described the growing importance of Central Asia as an emerging energy region in the world in his famous work, 'Geopolitics of Central Asian Energy Resources and Indian Interest'.

Growing energy hungry economies like China and India are taking interests likely both need to double the energy requirements by 2030. Thus, India is making warm relationships for achieving the goal of energy security and seeking to establish IPI and TAPI pipelines but all is dependent on international support and participation (Chandra 2009). However, both gave different views to connect Central Asia, one is of NSTC and other is TAPI but both need international support and participation and India's comprehensive strategy. However, this strand of literature extended India's energy option towards Central Asia from Gulf region. One of the views on India's role in Central Asia by Ivan Campbell in his work on 'India 's Role and Interest in Central Asia' described India's engagement in Central Asia is inspired by energy security and national security. He gave a brief history of their relations and observed changes shifts in India's foreign policy after the collapse of Soviet Union from ideological alliance to more pragmatic approach which helped to develop relations with CARs. He gave deep insights into the India's energy security, national security, commercial relations and geopolitical interests. Geopolitically, he observed that India would continue to be thwarted by China's energy interests, Russia's military security and Pakistan' resistance. On security issues India and the USA would have good relations, yet it is energy rival to India in the region. Author also appreciated India's 'Connect Central Asia Policy' which signaled towards its political, strategic and security cooperation with Central Asia. In the end he concluded that India is not at present among the great powers involved in the region and would continue to be thwarted by them. He advocated for translating CCAP into strategic and sustained policy actions (Campbell 2013). Another strand of literature on India and Central Asia cooperation in the combined study of Hemant S., Persis Taraporevala, Kailash K. Prasad and Rani D. Mullen in their research paper 'India Central Asia Backgrounder' highlighted Indo-Central Asia cooperation in the framework of their historical, cultural and trade relations. They highlighted the India-Central Asia relations in the post Soviet period, particularly after the demise of Taliban in Afghanistan. Nevertheless, the region continued to be suffered by the potentiality of instability which slowed down the building of mutually beneficial of economic, strategic and development ties between them. However, India's growing energy interest in the region is reflected in the engagement of its international arm ONGC Videsh and its investment in energy sectors and private sectors in the region. Moreover India is giving financial

assistance to the region through several grants as its soft power initiatives to enhance cooperation. Even, both are increasing cooperation in IT sector too. However, their trade relations remained limited but now are gradually growing. In addition, the study gave the brief of 'Connect Central Asia Policy' of India to enhance strategic and energy cooperation. However, study observed that china is a big competitor to India in the energy race within the region. China has been capitalizing its border connectivity with Central Asia but India is not enjoying this due to the absence of direct land connectivity. So, they recommended India to cooperate China rather competing her to enhance the cooperation in the region. Finally, their, study concludes that Indo-Central Asia relations are likely to grow because they can benefit from each other and 'Connect Central Asia Policy could be a good indication in this direction (Taraporevala, et al 2014).

Finally, after surveying the literature it concludes that though there are plenty of studies on global energy crisis and India's energy security and CCAP, but there are not much studies about how energy is one of the major concerns of India's recent foreign policy initiatives like CCAP and Look West policy. There is not much study especially carried out in an organized framework recognizing the importance of India's foreign policy initiative towards Central Asia through 'Connect Central Asia Policy'. This research explores into that largely unexplored area.

Chapter 3

Political Economy of Global Energy Crisis

3.1. Introduction

The world is apparently undergoing severe energy crisis and the global energy crisis is also changing the global balance of power. The preservation/acquisition and selling/buying of energy resources and safeguarding national interests against each other are making contemporary international politics turbulent. It is argued that the geographical shift in global energy consumption has already taken place as production and consumption trends are shifting from the West to the East (Peter 2013). New discoveries of natural energy resources worldwide are shaping the international political economy as it plays a pivotal role in building up any economy and acquiring respectable position in the current international politics which is largely driven by economic interests. It became thus imperative to closely follow the complexities of global energy dynamics to understand the twists and turns in international politics and relations (Zawya 2013). In fact, energy crisis mainly comes from three major energy commodities (Oil, Gas and Coal). The recent 22nd World Energy Council 2013 in South Korea said in a statement that CO2 emission will continue to grow because we are unable to halt the use of these resources or to replace them completely (World Energy Council 2013a).

Demand for energy has continued to grow since the industrial revolution in 18^{th} century that extended the fossil fuels shortages in present causing energy crisis. Energy crisis is a situation in which a nation experiences a shock from the disruption of its supply, come with rapidly growing energy prices that jeopardizes economic and national security. In other words, energy crisis is mostly clubbed with political instability, concerned policies and economic downturn (Williams and Alhajji 2003). The world is seen as increasingly marching towards a serious energy crisis. These crises are generating energy's key geological divide; first, below ground, plentiful reserves of easy to get conventional oil, natural gas and coal are drying up and second, above the ground; human miscalculation and geopolitics are containing the availability and production of specific energy supplies (Klare 2011). On the top of it, energy resources are asymmetrically

distributed on the planet, making its access a critical issue (World Energy Council 2013b).

Moreover, we are living in a globalizing world wherein energy is identified as a fundamental requirement for modern living, which calls for global solidarity on energy supply. However, “we are not there, where we want to be,” instead it unleashed a scramble for energy among the nations (May 2010: 20). In addition, world is facing growing population challenge and approximately 1.2 billion people are living without any access to energy service that is fundamental pre-condition for modern life and a key instrument annihilating extreme poverty around the world (World Energy Council 2013b). The urbanization and the expansion of middle class also added pressure on the global energy stocks and supply chain. In addition to this, the growing gap between developed and developing countries would add more pressure because emerging nations like China and India seek to access electricity and other energy sources in order to raise the living standard of their people (Kharas and Gertz 2010: 7). The crucial capabilities to have access to required energy resources as seen today are its possession, purchasing capacity and political and economic maneuverability to ensure access. This chapter explores into these fundamental issues and tries to look into solutions through the mirror of political economy of global energy and the existing global energy institutions.

3.2. Historical Background of Global Energy Crisis

The demand for energy which was started with industrial revolution and modern life has grown into a global energy crisis from the 1970 onwards. The Arab oil embargo of 1973 moved the world towards a great change in new energy scenario that lingered throughout the decade. In fact, the energy crisis of the 1970s was a result of newly independent state of Israel in 1948, claiming land from British-controlled territory known as “Palestine”, a move supported by western countries like Britain, France and Netherlands and opposed by Arab countries. The Arabs displeasure with this culminated in a revolt against western powers in 1973 in the form of an oil embargo, leading to the energy crisis (Pasha 2013: 14). One of the consequences of the crisis was the creation of the current energy system to ensure the coordination among the industrialized nations in view of

disruption of supply, to encourage collaboration on energy policies, to avoid tough scrambles of supplies, and to deter any future use “oil as weapon” by exporters (Yergin 2006: 75). According to World Energy Council, the current energy system will remain dominant by oil, gas and natural gas for which world is trying to set up reliable global energy governance in which it is still unable and fighting with environmental externalities (Zawya 2013). It also led to high fuel shortages and high price hikes throughout the decade, reorienting the politics and economy of the world (Yergin 2006: 75). After recovering from the Arab embargo, oil supplies were again disrupted due to the 1979 Iranian revolution for about six months that caused a loss of 3.7 million barrel per day and the subsequent eight years long Iran-Iraq war disrupted not only oil supply from these major oil producers but also raised oil prices from $14 to $35 per barrel in 1981 (Pasha 2013: 14). This has changed the global energy scenario and resulted in undue price fluctuation in energy markets that had impacts on other commodities too. Moreover, rise of Iran as a Shia republic strained its relations with Sunni-dominated Iraq (Worldology 2009) and resulted in deep distrust on each other and abrogation of Algiers Treaty in 1975 for maintaining good relations with each other (Pike 2011). Their relations further strained by an assassination attempt against an Iraqi Foreign Minister in Southern Iraq in March of 1980 for which Iraqi Government blamed Iran in doing so and used it as a pretext of war as Iraq invaded Iran in September 1980 which lasted for eight years (Worldology 2009). The war was also marked by indiscriminate ballistic-missile attacks, extensive use of chemical weapons and attacks on third-country oil tankers in the Persian Gulf which was ended in July 1988 with the acceptance of UN Resolution 598 (Cowley and Parker 2009). However, war events between Iran and Iraq led to another round of increases in the crude oil prices (Williams 2011).

Following this, another major energy crisis occurred in 1990 as a result of Iraqi invasion of Kuwait in August 1990 which lasted for only nine months. The resultant rise in the prices and weak infrastructure has aggravated the crisis. For several months, before the invasion, Iraqi President Saddam Hussein too had been asserting that Kuwait was engaged in economic war with Iraq, stealing oil from the disputed Rumaila field and producing in excess of its OPEC quota. Iraq thus felt that Kuwait was overproducing the oil and increasing the financial stress

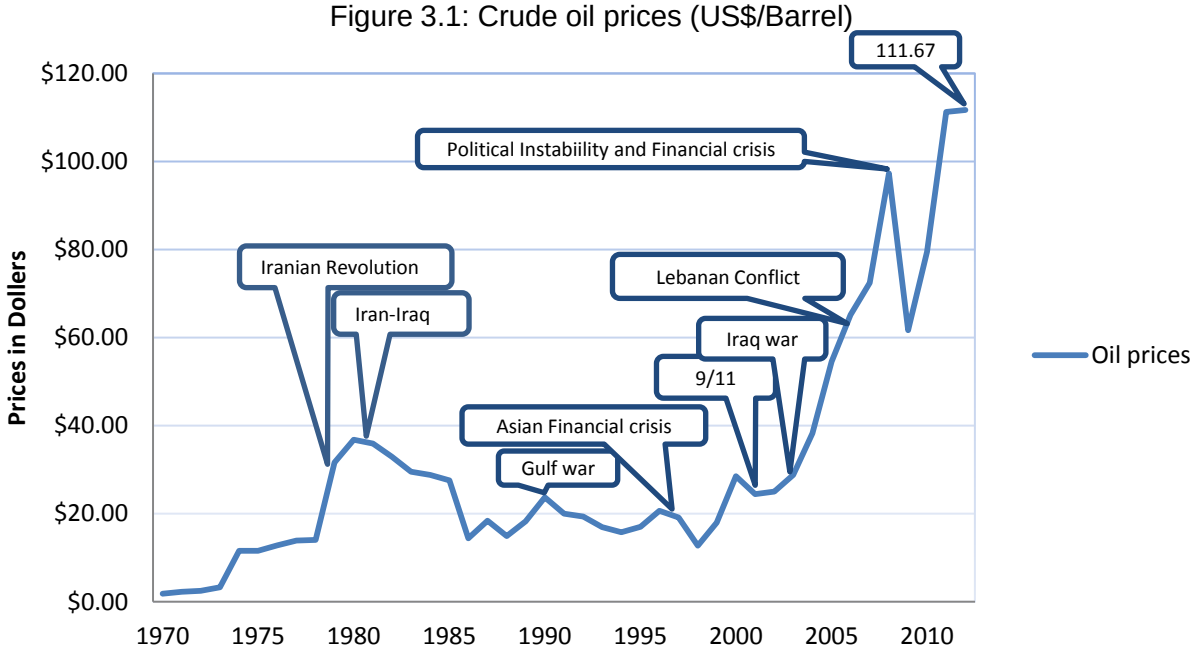
of Iraq (Verlege and Jr 1990: 15-16) while attempting to recover from the long war with Iran (Cooper 2003). Although, Kuwait had managed itself to resume its oil supply after its liberation in early 1991, but war consequences and UN sanctions over them had pushed oil prices at record level (Pasha 2013: 14). However, political instability in the Gulf countries remained a main cause in world energy crisis and inflation of prices. And these events reduced percent of net world productions from 4 to 7 per cent which resulted in increases in oil prices from 25 to 70 percent (Yglesias 2012).

The late 1990s witnessed the so called Asian financial crisis from 1997, which halted the rapid growth in nine Asian economies (China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, and Taiwan, known as Asian Tigers) under liberalization and globalization (Vallorani 2009). The crisis led to lower consumption of oil, which was coincided with OPEC's increasing production at the same time. The combination of both situations sent prices plummeting down till December 1998. Oil prices continued to suffer downturn as Russian oil production increased and USA economy went into decline in 2001 (BBC News 2008a). In the same year, the Gulf countries experienced large scale violence not only due to 'Palestinian Intifada' but also due to the emergence of Taliban regime in Afghanistan and the US, Israel and their Arab allies opposition to it. All these troubles gave way to the 9/11 events in the US, which brought violence to the region that sent oil prices plummeting again (Pasha 2013: 12). Prices were down by 35 per cent in the middle of November, 2001 but oil price began to increase again due to OPEC's delay of cutting production. The American-led invasion of Iraq in 2003 resulted in to the decline of oil production in the Gulf and surge in the prices. The oil production capacity had dropped from over six million barrel per day in mid 2002 to below two million by mid 2003, which continued further in 2004-05. Even in 2006, the Israel-Lebanon conflict had increased the tension in the Middle East and oil prices arrived at the new peak of $78 per barrel (BBC News 2008a).

The oil prices continue to surge even afterwards. By 2008, violence in Nigeria and Algeria, two major oil exporters, instability in Pakistan due to the assassination of the former Pakistani Prime Minister Benazir Bhutto, which not only posed a threat to the US policy in the Middle East but also weakened dollar,

and rising energy demand from emerging economies in Asia like China and India - all these factors were responsible for increases in oil prices. It hit a record high at near-about $100 a barrel, which was also a result of the global recession started in 2008 (BBCNews 2008b). In the same year, the oil prices jumped to another record level of $147 a barrel as a result of supply disruption in major oil producing countries like Nigeria and Brazil, growing threat of Iran as nuclear power and falling US dollar (Read and Business Writer 2008). Though the prices came down subsequently, it continues to be over $100 per barrel of crude oil. According to EIA (Energy Information Administration) the Brent crude oil spot price averaged $112 per barrel in 2012, and the July 2013 Short-Term Energy Outlook forecasts that it will fell to the average $105 per barrel in 2013 and $100 per barrel in 2014 (Energy Information Administration 2013).

Figure 3.1: Crude oil prices (US$/Barrel)



Source: British Petroleum Statistical Review, 2013

What we see that these crises are all about political crisis leading infrastructure disruptions, economic and financial crisis and the random process of global economy remains vulnerable to many financial, political and economic crisis due to its shocks on oil pricings. It is thus clear that political instability, wars and UN sanctions in energy producing countries, rising demands from emerging economies lacking pace with supplies, over production and consumption, aging

infrastructures, oil supply disruptions and global recessions, significantly remained responsible for energy crisis.

It is also true that the interests of economically powerful countries like the US in oil producing countries to safeguard their interests with regard to oil supply have brought significant unpeace in the world (D'Amato 2001). President Roosevelt had have relationship with King Ibn Saud of Saudi Arabia at the end of World War II and ensured its continue access to Saudi Arabian oil supplies to USA and the Western partners at reasonable prices in the wake of providing security to Saudi Arabia (Yergin 1991: 404-5). Therefore, its aim was mainly inspired by securing world's important energy resource-oil in the region for which it relied on brutal and oppressive regimes such as Iran under Shah, Saudi Arabia and Israel and misused the CIA (Central Intelligence Agency) to pursue its interests in the Middle East (D'Amato 2001). However, Roosevelt deal of relationship with Middle East countries began to decline for Saudi Arabia after 1990 as a result of various developments such as 9/11 attack, the Iraq war, Iraq's Shia majority government, US-Israel policy etc. which the US a sources of insecurity rather than insecurity in the region (Ottway 2009: 121-22). The US punished those regimes in the region through its military intervention who challenged its dominance, for example, its intervention in Iraq in 1991. Moreover, to meet its objectives in the Middle East, the US spent billions dollars annually for maintaining its military presence in the region and provided billions in assisting military warheads to its friendly states like Egypt, Saudi Arabia and Israel (D'Amato 2001). Due to the steep decline in Alaskan oil fields, the imports of US increased and their composition is changing this is why the US displaced OPEC oil with Mexico and the North Sea during the first half of 1980s and Gulf producers are accounted for 28 percent of all the US import in 1990, up from 7 percent in 1985 (Aarts and Renner 1990). Nevertheless, US imperialism and its interventions in the Middle East have been wicked and brutal (D'Amato 2001). It is doubtless that during the Bush administration Persian Gulf was main focus of US but after the 9/11 terrorist attack in 2001 and weakening relationship with Saudi Arabia over the US policy towards Israel, it started seeking other deployments in other gulf states and Caspian's huge on and off shore oil fields. Russia is also being seen as future energy supplier and as the replacement of Saudi Arabia (Vermani 2009: 258). Iraq war in 2003 and

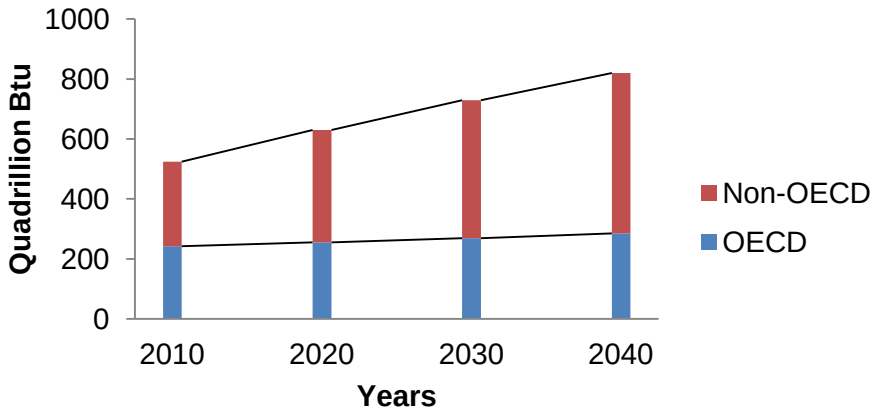
replacement of Saddam Hessian was inspired by the US energy needs as oil was main driving force behind its military confrontation during the first Gulf war. However, it is doubtful that US policy of military confrontation to control the Middle East oil will be successful because it is producing antagonism between oil rich Islamic countries and oil importing Western countries. Nevertheless, US geopolitics of Energy has been driving force behind its military confrontation in the region (Vermani 2009: 257-58). Thus, US military confrontation and sanctions policies in the Gulf countries are one of reasons envisaging the energy supply disruptions within and outside the region.

3.3. Global Energy Panorama in the 21st century

Energy is recognized as central to development and economic growth and both in turn is seen as significantly contributing to enhance global energy use (World Energy Council 2013a). According to the EIA International energy outlook 2013 projections, energy consumption increases from 524 quadrillion British thermal unit (Btu) in 2010 to 630 Quadrillion Btu in 2020, and to 820 quadrillion Btu in 2040 (Energy Information Administration 2013). This represents a 56 per cent increase in energy consumption from 2010 to 2040. The world is thus becoming more energy dependent in 21st century and many geopolitical-economic circumstances regarding energy supply adds greater pressures and uncertainties in the global energy markets.

As Figure 3.2 shows that more than 86 per cent global energy demand will be coming from developing nations outside the Organization for Economic Cooperation and Development (Non-OECD) from 2010 to 2040, which is motivated by expanding population and strong economic growth. In contrast, OECD countries, already full grown energy consumers with slower anticipated economic growth and population, well-established infrastructures moving away from energy intensive industries towards services, their energy consumption moderately increases from 242 quadrillion Btu in 2010 to 285 quadrillion Btu in 2040.This is cited as reflecting that OECD countries will preserve considerably more energy efficient status than that of Non-OECD countries (Figure 3.2).

Figure 3.2: World energy consumption by Countries grouping (2010-2040)



Source: US Energy Information Administration (EIA), International Energy Outlook 2013

It is worth mentioning that, OECD is an international economic organization of 34 most developed countries which came into existence in 14 December 1960 with signing the Convention on Organization for Economic Co-operation and Development. According to OECD factbook 2013, OECD countries have 1.2 billion populations in 2010 which accounted for 18 percent of the world's total population of 6.9 billion. On the other hand, non-OECD countries like China accounted for 19 percent and India for 18 percent. Non-OECD countries are outside the orbit of OECD countries with 5.7 billion populations in 2010. United States constitute 25 percent of total OECD's population followed by Japan (10 percent), Mexico (9 percent), Germany (7 percent) and Turkey (6 percent) (OECD 2013). OECD countries cover 36,137, 803 sq km of 507.072 million sq km geographical area of the world and rest is covered by non-OECD countries (Infoplease 2010). Thus, there are significant differences between OECD and non-OECD countries in terms of geographies, populations and their consumption of energy resources.

Apart from this, population and demographics changes too will remain key factors in energy demand, particularly in developing non-OECD countries, especially in China, India and Africa. Exxon Mobil estimates that population will increase over 300 million in India and about 800 million in Africa between 2010 and 2040, coupled with more prosperity and better living standards which results into more energy demand (Exxon Mobil 2013). It anticipates that urbanization would have significant role in growing energy requirements in the course of 2040,

especially in China where half of its 1.3 billion people are residing in cities, a remarkable increase from the situation three decades ago, then comprised only about 20 percent of urban population. This represents approximately 75 percent rise between 1980 and 2040 in the case of China (Ibid. 2013). With the introduction of family-size policies, working-age group of China is projected to peak, coupled with growing elderly population, likely within next ten years, that will likely to have long-term prospects for its economic growth and energy demands. As far as India is concerned, considering its current population growth rate, it will be the world most populous country after 2030 and its working-age population will continue to expand, boosting its economic prospects (Ibid. 2013: 5-6). Thus, India and China are seen as leading countries contributing to the accelerating world energy demands. At the same time, though energy demand is growing due to the population growth and economic and development growths, according to International Energy Agency (IEA) around 1.3 billion people don't have access to even electricity so far, which is posing a big challenge (Exxon Mobil 2013).[3]

Table 3.1: Total World Populations by Decade, 1950-2050 (Historical and Projected)

Years	Total World Population (Mid years figures)	Ten-years growth rate (%)
1950	2,557,628,654	-
1960	3,042,828,380	19.0
1970	3,712,338,708	22.0
1980	4,450,924,299	19.9
1990	5,287,166,778	18.8
2000	6,089,810,661	15.2
2010	6,863,770,931	12.7
2020	7,628,361,509	11.1
2030	8,314,556,118	8.1
2040	8,898,921,851	7.0
2050	9,383,147,855	5.4

Source: U.S. Census Bureau, International Data Base, December 2013

[3] This has been taken from report of Exxon Mobil published in 2013 under title "A Outlook for Energy: A view to 2040".

Table 3.1 shows the population growth in percentage by ten year growth rate upto 2010 and further projects that the world will see population growth by more than 25 percent from 2010 to 2040, approximately upto 9 billion. Although, there is a slow decline in percentage growth of population comparatively as it was in 1950s but it can't halt growing energy demand because rapid economic growth with more industrialization from the 1990s (Table 3.1). On the whole, population growth mixed with more urbanization and high living standard require more energy to meet their needs and put immense pressure on energy supply. The next section reviews the current global energy scenario with regard to conventional and non-conventional energy resources.

3.3.1. Conventional energy resources and its Consumption Pattern

Oil, coal, gas and water are believed to be conventional energy sources and all are exhaustible except water. This means that these commodities cannot be replicated after using once and also very expensive to pile up and maintain like renewable, and as the recently held 22nd World Energy Council in South Korea stated renewable can't replace fossil fuels with the growing demand.[4] The Table 3.2 reflects the dramatic changes occurred in production and consumption trends of conventional energy resources from 1990 to 2012, in both OECD and non-OECD countries.

The total production of oil, natural gas and coal in the world has increased around 29.7 percent, 69.4 percent and 70.9 percent respectively between 1990 and 2012. The growth in the total world consumption of oil, gas and coal was around 30.7 percent, 68.9 percent and 68.7 percent respectively during the same time (Table 3.2). Along with this, there is also a dramatic growth in hydroelectricity consumption as it covers approximately 69.6 percent growth rate in the total world's hydro power consumption during 1990-2012 (Table 3.2). Moreover, the trends in consumption and production vary across developed and developing countries. The OECD countries possess less fossil fuel than non-OECD countries. Most of countries outside OECD are moving towards greater change as their

[4] "World Energy Council emphasizes continuing role of fossil fuels". Access on November 08, 2013, available at: http://www.solarserver.com/solar-magazine/solar-news/current/2013/kw42/world-energy-council-emphasizes-continuing-role-of-fossil-fuels.html

production and consumption increased dramatically from 1990 onwards (Energy Information Administration 2013).

Oil and gas production increased respectively 1.0 percent and 41.5 percent in OECD domain from 1990 to 2012, but they have reduced their coal production by 10.5 percent in the same period due to its frightening effects on atmosphere (Table 3.2).

Table 3.2: Productions and Consumptions Trends of Conventional Energy Resources by countries grouping, 1990-2012

Years	1990	1995	2000	2005	2010	2012	Share of Total (2012)
Oil Production (Million tons)							
OECD	893.8	975.9	1006.0	924.8	857.5	903.0	21.9%
Non-OECD	2281.6	2310.1	2613.8	3018.3	3120.3	3215.9	78.1%
Total World	3175.4	3286.1	3619.8	3943.1	3977.8	4118.9	100%
Oil Consumption (Million tons)							
OECD	1941.0	2081.6	2223.6	2305.3	2112.6	2072.8	50.2%
Non-OECD	1218.2	1205.9	1357.8	1606.3	1925.6	2057.7	49.8%
Total World	3159.3	3287.6	3581.4	3911.6	4038.2	4130.5	100%
Gas Production (Million tons oil equivalent)							
OECD	774.4	886.0	973.2	983.0	1045.9	1096.2	36.1%
Non-OECD	1015.7	1024.5	1203.7	1526.6	1866.4	1937.2	63.9%
Total World	1790.1	1910.5	2176.9	2509.6	2879.3	3033.5	100%
Gas Consumption (Million tons oil equivalent)							
OECD	905.0	1073.5	1225.6	1296.2	1406.0	1433.6	48%
Non-OECD	863.1	852.8	951.8	1203.3	1458.1	1553.5	52%
Total World	1768.2	1926.3	2177.4	2499.5	2864.1	2987.1	100%
Coal Production (Million tons oil equivalent)							
OECD	1087.9	1008.9	999.1	1026.1	1002.2	973.4	25.3%
Non-OECD	1162.1	1232.0	1287.9	1916.3	2542.5	2871.9	74.7%
Total World	2250.0	2240.0	2286.9	2942.4	3542.7	3845.3	100%
Coal Consumption (Million tons oil eqivalent)							
OECD	1101.1	1058.8	1132.6	1178.1	1117.2	1053.1	28.2%
Non-OECD	1110.0	1175.7	1209.5	1745.1	2346.8	2677.0	71.8%
Total World	2211.2	2234.5	2342.1	2923.2	3464.0	3730.1	100%
Hydro power Consumption (Million tons oil equivalent)							
OECD	272.2	299.3	310.9	295.3	308.7	315.6	38%
Non-OECD	217.6	263.6	291.5	366.9	473.4	515.4	62%
Total World	489.9	562.9	602.4	662.2	782.1	831.1	100%

Source: British Petroleum Statistical Review, 2013

Note: Due the unavailability of authentic data for Hydroelectricity production, it is not tabulated in this table but it is considered to be the most environment friendly conventional energy source,

having no waste and CO2 emission and generated through simple proven technology. Our earth has massive source of water, but energy generation from this depends on our technological advancement and utility to convert it into more electricity and more than 100 countries have access to it. Hydro power accounts for around 15 per cent of the global electricity production. Brazil, Canada, China, Russia and the United States are top five countries in terms of hydro power capacity. Among them, China represents 24 percent of global installed capacity, exceeding the other countries. The total global installed capacity has enhanced by 55 percent and the actual generation by 21 percent, over the last two decades. However today, many countries are such as Tajikistan, Kyrgyzstan, Iceland, Nepal and Mozambique etc. remain dependent on hydro electricity (World Energy Council 2013b).

Natural gas is an environment friendly natural resource that is why, they are increasing its production comparatively other fossil fuel like coal and gas. On the other side, oil, gas and coal production in non-OECD countries drastically increased by 40.9 percent, 90.7 percent and 147.1 percent respectively in the same period (Table 3.2). As far as consumption of fossil fuel is concerned, oil consumption increased only 6.8 percent in OECD countries but they saw 58.4 percent significant growth in natural gas consumption and 15.9 percent in hydro power consumption during 1990-2012, which is another reason behind lowering the production of oil and coal (Table 3.2). They also reduced their coal consumption up to 4.4 percent in the same period (Table 3.2). In contrast, consumption scenario in non-OECD countries gives a different picture. Demand for oil, natural gas, coal and hydro power increased by 68.9, 79.9, 141.2 and 136.9 respectively in percentage at unexpected level during the period from 1990 to 2012 (Table 3.2).

Thus, the dependency of non-OECD countries over conventional energy resources has been increasing over the years. Although non-OECD's consumption growth rate remained very high during last two decades, their percentage share in the total world oil consumption is lower than OECD during last two decades, even in 2012 their share in the total world oil consumption is 49.8 percent that was only 38.6 percent in 1990 (Table 3.2). However use of fossil fuels, nuclear disaster are darkening their future due to their environmental side-effects (Kolb 2011: 189) and caused a contention between Developed and Developing countries on use of energy resources and environmental issues. There are number of agreements like Kyoto Protocol signed by developed and developing countries (Vermani 2009:

274). Since many of developing countries rely on fossil fuels for their rapid economic growth thereby increasing environment pollution which create the fear that recent trends in International trade liberalization can have negative consequences on the environment and halt the relations between developed and developing countries on environmental and energy use issues (Ibid 2009: 240). Kyoto Protocol agreement was signed by 150 countries to reduce global warming pollution at the Rio Earth Summit in 1992. But there are differences over this agreement between developed and developing countries as developing countries are agree that largest share of historical and current global emissions of green house gases has originated in developed world. On the other hand, developed countries are accusing developing countries for the share of global emissions originating in the developing countries will increase to meet their social economic and development needs. This was the reason why China, India and other developing countries were exempted from the requirements of the agreement because they were not the main contributors to the environmental pollution during the industrialization period that is believed to have caused today's climate change (Ibid 2009: 274). Thus, the alarm regarding the growth in consumption in the non-OECD area is particularly raised by the developed world. On the whole, non-OECD countries will largely leave OECD countries behind in energy consumption. Nevertheless, high prices and threats to environment, fear of scarcity can have negative effects on consumer demand for fossil fuels, which would potentially pushes the world towards the use of alternatives or non-conventional forms of energy sources.

3.3.2. Non-Conventional energy resources and its Consumption Pattern

It is a fact that conventional energy sources like oil, gas and coal will exhaust in a few hundred years because of their incapability to be restored and reproduced. The Arab oil embargo in the 1970s and the subsequent developments related to fossil fuels led international community to think that these are not long lasting, apart from having serious environmental externalities. As a result of this, almost all the nations have been trying to develop and harness non-conventional energy sources. Although they are costlier than fossil fuel sources, advancement in the technology and more research in this field may hopefully prove to be cost-

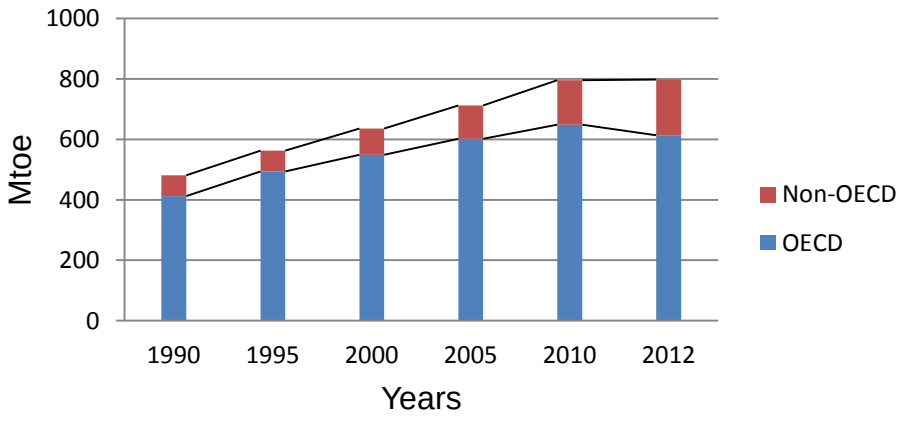
effective in the long run.[5] Hence there is an increasing realization of the importance of non-conventional energy sources such as solar, wind, geothermal, biomass and nuclear energy. The world is undergoing this change, as the use of solar, wind, geothermal and biomass is appreciably growing (Table 3.3).

Table 3.3: Total Consumption of non-conventional energy resources by countries grouping, 1990-2012 (Mtoe)

Years	1990	1995	2000	2005	2010	2012	Share of Total (2012)
OECD	412.2	494.1	548.9	601.5	648.7	613.7	76.9%
Non-OECD	69.1	68.6	86.9	109.8	146.2	184.1	23.1%
Total World	481.3	562.7	635.8	711.3	794.9	797.8	100%

Source: British Petroleum Statistical Review, 2013

Figure 3.3: Total consumption of non-conventional energy sources by countries grouping , 1990-2012 (Mtoe)



Source: British Petroleum Statistical Review, 2013

The total world consumption of non-conventional energy increased dramatically over more than 65 percent between 1990 and 2012 (Figure 3.3). This

[5]It has taken from the internet source under title "Non-conventional and Conventional Sources of Energy" and is accessed on November 21, 2013. Available at: http://www.newagepublishers.com/samplechapter/000329.pdf

is indeed remarkable as it shows signs of world moving towards less carbon emitting sources and more energy efficiency (World Energy Council 2013).

The record of OECD countries in making use of the non-conventional sources of energy is far better than that of the non-OECD countries. More than 76 percent share in the total world energy demand of non-conventional sources takes place in OECD countries, driven primarily by advancement in the technology and economic growth. In contrast, non-OECD area is still lagging behind in this respect, as their share in total world energy consumption of non-conventional is only 23 percent in 2012 (Table 3.3), which indicates less technological advancement for tapping non-conventional sources or poor governmental policies to implement such projects (Exxon Mobil 2013). In contrast OECD countries are encouraging technological advancements for getting energy from non-conventional sources to become energy efficient (Exxon Mobil 2013). Moreover, when we look into the growth rate in the demand of total non-conventional energy, it has grown more than three times in non-OECD countries than OECD countries from 1990 to 2012, and still it continues to grow (Figure 3.3). At the same time, it should be noted that OECD countries records 5.4 percent reduction in the total demand of non-conventional energy in general between 2010-2012 and made reduction in the total demand of nuclear consumption by 14.7 percent in particular (Table 3.4). This is seen as fallout of the Japanese nuclear disaster in March 2011, which significantly darkens the future of nuclear power. Many countries shut down their old nuclear power plants and started revaluating their existing nuclear projects, particularly, the OECD countries. Countries like France which largely depends on nuclear power generation, would have greater implications (Kolb 2011: 189). Germany also took a decision to close all nuclear reactors by 2022, based on the recommendations of an expert commission appointed in the aftermath of the Japanese disaster (Dempsey and Ewing 2011).[6] However, the reduction is happening only in nuclear power consumption but not much in other non-conventional energy sources. Moreover, the non-OECD countries did not really reduce much their nuclear power generation (Table 3.3).

[6]This has been taken from the website of *The New York Times* under the title "Germany, in Reversal, Will Close Nuclear Plants by 2022." Accessed date: November 20, 2013. Available at: http://www.nytimes.com/2011/05/31/world/europe/31germany.html?_r=0

Table 3.4 displays consumption trends in different non-conventional energy sources from 1990 to 2012. It shows that, OECD countries are increasingly enhancing their share in demand for non-conventional sources for their energy use than non-OECD countries, whether it is solar or wind or biomass or geothermal energies. It is expected to grow further according to some energy projection agencies (Exxon Mobil 2013).

Table 3.4: Consumption of non-conventional resources by countries grouping, 1990-2012 (Million tons)

Years	1990	1995	2000	2005	2010	2012	Share of Total (2012)
Solar Consumption							
OECD	0.1	0.1	0.2	0.8	6.6	19.5	92.7%
Non-OECD	^	^	^	^	0.2	1.5	7.3%
Total World	0.1	0.1	0.2	0.8	6.2	21.0	100%
Wind Consumption							
OECD	0.8	1.6	6.1	21.4	60.8	84.5	71.6%
Non-OECD	^	0.3	0.6	2.2	18.0	33.5	28.4%
Total World	0.8	1.9	6.7	23.6	78.8	117.9	100%
Geothermal, Biomass and others							
OECD	23.9	29.2	35.2	46.9	60.2	65.2	66.3%
Non-OECD	3.7	5.6	9.4	13.2	22.8	33.2	33.7%
Total World	27.6	34.8	44.6	60.1	83.0	98.4	100%
Nuclear Consumption							
OECD	387.7	463.2	507.4	532.4	521.1	444.5	79.3%
Non-OECD	65.4	62.7	76.9	94.3	105.2	115.9	20.7%
Total World	453.1	525.9	584.3	626.7	626.4	560.4	100%

^ Less than 0.05

Source: British Petroleum Statistical Review, 2013

Solar energy, for instance, is available in abundance and about 60 percent of total energy being emitted by sun reaches the earth's surface, but the use of solar energy is growing rapidly due to the fast declining of solar panel manufacturing costs. For example, the USA and Germany have increased solar PV capacity from 1168MW to 5171MW and from 5877MW to 25039MW respectively, during 2008-2011 (Woral Energy Council 2013b: 19). According to the British Statistical Review 2013, worldwide it has 100115MW installed capacity in 2012, which was only 1402MW in 2000. OECD countries make up 92.7 percent of total world solar consumption as of 2012, drastically higher than non-OECD (Table 3.4).

Wind is also a non-conventional energy source which is available everywhere on the planet with wide variations in its strengths. About every three and half years, world wind energy capacity has been doubling since 1990. At the end of 2011, its total capacity was over 238GW and the annual electricity generation is approximately 62GW that is almost equal to annual electricity consumption of Australia. On the other hand, lower subsidies, less attractive business environment and growing costs of material input may have negative impacts on wind industries (World Energy Council 2013b). Along with capacity, its demand has also increased by manifold, in which OECD countries make up 71.6 percent in total wind world energy consumption in 2012, leaving non-OECD countries with relatively lower consumption record (Table 3.4).

Energy from biomass is manufactured from variety of feed-stocks, industrial wastes and agricultural residues to generate heat, power, liquid bio-fuels etc. However, because of meagre availability and low level of standardization of data, it is a difficult task to make comparisons with earlier figures to that of bio-energy. But it is estimated that share of bio-energy in total primary energy sources was around 10 percent in 1990 and its supply has increased considerably during the last two decades (World Energy Council 2013b). Similarly, geothermal power capacity in the world, according to British Petroleum Statistical Review 2013, is 11.5GW in 2012. It was 8.6GW in 2000, which reveals a slower growth in comparison to solar and wind. Growth rate in bio-mass and geothermal energy demand has also not increased much (British Petroleum 2013). However, OECD countries keep their share high by 66.3 percent in the total world consumption of these sources too as of 2012 (Table 3.4), as compared with non-OECD countries.

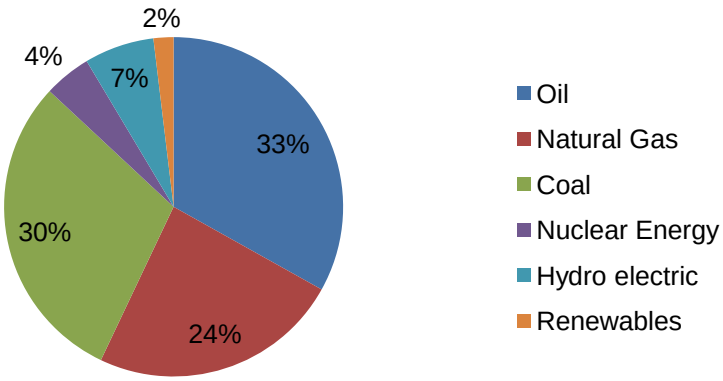
On the whole, it could be seen that since 1990 there is a greater change taking place in the production and consumption of both conventional and non-conventional energy sources in the world, though with considerable difference between the OECD and non-OECD countries.

Table 3.5: Total consumption of energy mix by countries grouping, 2012 (Million tons)

Mt	Oil	Natural Gas	Coal	Nuclear Energy	Hydro electric	Renewable	Total	Share of total (2012)
OECD	2072.8	1433.6	1053.1	444.5	315.6	169.2	5488.8	43.99%
Non-OECD	2057.7	1553.5	2677.0	115.9	515.5	68.2	6987.8	56.01%
Total World	4130.5	2987.1	3730.1	560.4	831.1	237.4	12476.6	100%

Source: British Petroleum Statistical Review, 2013

Figure 3.4: Total consumption of energy mix, 2012
(pecentage share in the world)



Source: British Petroleum Statistical Review, 2013

If, we scrutinize all conventional and non-conventional energy sources in the energy basket as of 2012, it can be easily noticed that fossil fuels are still dominating the world energy demand basket, although we always talking about to advancement in the non-conventional energy sector. The Table 3.5 presents the consumption scenario of total energy mix in the world in 2012 with percentage

share of OECD and non-OECD nations. At the same time, Non-conventional sources of energy only make upto 5 to 6 percent of the total energy consumption as shown in Figure 4. Nuclear energy is likely to grow with a desire to lessen CO_2 emission and increasing demand of electricity as it makes up 4 percent total consumption of world energy mix, irrespective of the recent setbacks (Figure 3.4).

Irrespective of the fact that conventional energy sources are depleting and its usage causing severe environmental consequences, we have been relying more on these energy sources. Although, some countries like the USA have developed shale oil and shale gas technologies which has increased its future prospects, but it is noted that they also are subjected to changing assessment to their environment impacts (Kolb 2011: 190). On the other side, we cannot ignore the increasing importance of non-conventional energy sources for their long term utility and safer environment. However, the reliance on conventional energy sources is not only not decreasing but also found to be increasing. Over the last two decades starting from 1990, developing countries are seen as the major game changer in the world energy scenario as they increased their consumption and production in energy space, particularly in fossil fuels with remarkable economic growth rate in order to cater to their increasing population and increase the standard of living. A related issue is the expansion of 'middle class' who are the major consumers of energy. Middle class has increased dramatically in developing countries after 1990 playing a crucial role in world energy scene. The next section describes the emergence middle class along with developing countries growth and their impacts on energy.

3.4. Developing Countries as New Economic Giants: Emergence of Middle Class

It is doubtless that energy is playing a central role in the economic development of all countries, especially in emerging economies like China, India and Brazil particularly for last two decades. The growth of these economies led to improvements in labour markets, income levels and legislations, alongside accelerating demand for energy (World Energy Council 2013). The commitment to economic growth and improvement in living standards is making these countries to look for more energy for growth. According to the estimates of Exxon Mobil, during

the period from 2010 to 2040**,** non-OECD countries will account for more than half of total global economic growth, in which China alone will add more than 20 percent of global economic growth due to rises in new middle classes and its economic output, with an average of more than 5 percent a year through 2040(Exxon Mobil 2013). India, with about one third the size of China's economy today, will also grow at a similar rate on average. As far as working age population is concerned, India and Africa will be two areas of biggest growth in Growth Domestic Product (GDP) over the next 30 years due to young workers. Among the OECD countries, the United States will led economic growth with 20 percent in the global economy, aided by its growing working age population (Exxon Mobil 2013). The estimates of the EIA also support this. EIA projected world's real GDP growing by an average of 3.6 per cent per year from 2010 to 2040. The non-OECD nations are projected for fastest growth rates with combined GDP increased by 4.7 percent per year, while OECD will comparatively keep slower growth at 2.1 percent per year (Energy Information Administration 2013). Therefore, it is pointed out that the energy demand in OECD countries will be rather flat as compared with non-OECD countries as shown already in Figure 3.2.

One of the pivotal reason and consequence of the high economic growth in the developing countries is the expansion of middle class in proportion to the total population. The emergence of new middle class brings changes and concerns around the world economy, in the government policies and energy demand. According to the research conducted by Catherine Wolfram, energy demand increases radically when people move from poverty into the middle class (Wolfram 2012). Energy demand does not increase much when people move from extreme poverty to just being poor, because they normally use their growing incomes to consume higher quality food. The same logic applies when people move from middle class to upper-middle class. Thus, fast economic growth of a country promotes many people into the middle class, as occurred in developing economies and consequently its demand for energy grows rapidly, which will have profound impact on the prices of oil, gas, coal and other fuels (Wolfram 2012). The same logic can be applied in this sense when under-developed countries moves into the basket of developing countries and then to developed countries. Also, this movement is sometimes tracked in terms of the increase in the proportion of

middle class. One of the often attributed fundamental characteristics of the middle class is their longing for self comforts, often overlooking environmental and other related aspects. On the other hand, developed countries are already matured as advanced economies, with a majority of middle class in their population, and their main objective is to maintain status-quo and to achieve more efficiency in energy use (Kharas and Gertz 2010: 4).

Middle class is commonly fall between the lower class and upper class or working and upper-middle class but there is no absolute measure for middle class as it varies country to country and region to region (Business Dictionary 2014). So, its size depends on how it is defined and unfortunately, there is no hard and widely accepted definition of middle class. But it is playing a vital role in the economic growth and now countries are giving emphasis on the importance of middle class as something desirable. United Nations describes it as a historic shift which has not been seen for 150 years (Yueh 2013). Organizations like United Nations and the OECD count a person belonging to middle class when s/he earns or spends $10 to $100 per day. In other words when you have disposable income to consume or to buy luxury things like refrigerator, air-conditioner or car then you become middle class (Kharas and Gertz 2010: 3). As industrialization geared up the growth and transformed the economies of Britain, the USA and Germany in 19th century, increasing income levels and creating significant proportion of middle class, such a development is now happening in the emerging economies, particularly in the Asia-Pacific. It has boosted the economies of China, India and Brazil equal to the size of industrialized G7 countries and are projected to account for nearly half of the world output by 2050, far exceeding the G7 (Yueh 2013). There were 1.8 billion people in the worldwide middle class in 2009 as estimated by Brookings Institution and it is expected to grow up to 3.2 billion by 2020 and to 4.9 billion by 2030. This growth has a fairly wide geographical distribution (Kharas and Gertz 2010: 5). The growth in Asia in this regard is more dramatic. Its middle class is predicted to triple to 1.7 billion by 2020 and in 2030 it will become the home of approximately 3.2 billion of middle class people which would be five times more than Europe (0.68 billion) and ten times more than in North America (0.32 billion). However, this growth is not only happening in the Asia-Pacific alone, but also in the rest of emerging world, for example in Latin America, Middle East and

Africa. Latin America's middle class is projected to grow from 181 million in 2009 to 313 million by 2030 which will be primarily led by Brazil. Similarly, in Africa and Middle East, it is expected to grow more than double from 137 million in 2009 to 222 million in 2020 to 341 million in 2030. In Asia, India will be leading the middle class surpassing China by 2030, as its middle class will expand, from 200 million in 2020 to 475 million by 2030 and will be the single biggest middle class population in the world (Yueh 2013). This transformation will have notable changes in the energy demands too.

The expansion of middle class offers a bigger challenge due to the resource crunch. For example, rising incomes in emerging economies are considered to be one of the reasons behind the run-up of food and fuel prices in 2007 and 2008 (Kharas and Gertz 2010: 5-6) as Barack Obama said in his statement that "I will cut taxes - cut taxes - for 95 percent of all working families, because, in an economy like this, the last thing we should do is raise taxes on the middle class due to their high share in consumption (Gill 2008)." Moreover, middle classes are sharing a big part in the emission of green house gases. China's status as the biggest emitter of the green house gases in the world is attributed to the growth of its middle class. China that is account for only 4 percent of global middle class consumption today will be the single largest middle class market by 2020 surpassing United States, but in 2030 it might be overtaken by India as already said, due to its (India's) rapid growth in population and more even income distribution in all segments of its society. India will account for 23 percent of global middle class consumption in 2030 by overtaking China which will have around 18 percent of global middle class consumption (Kharas and Gertz 2010: 6). While taking the regional grouping of countries, growth of countries in Asia-Pacifics will be more rapid as it accounted for only 23 percent of total global middle class consumption in 2009 which may account for 59 percent by 2030, which will be 30 percent for North America and Europe if combined (Ibid 2010: 6-7).

The growth of middle class thus leaves many challenges to the world in terms of resource generation and management as well as environment. Would the world be able to meet the demands of new global middle class in the coming future? If demands of resources continue to grow, will world nations be able to control the green house gases emission? Will global middle class maintain the

balance of power in the international arena? Will they try to affect the government policies in their own favour neglecting other common people's values? Undoubtedly, the rise in the middle class is a positive sign of development but it could lead to exacerbate resources pressure, unexpected environmental consequences along with striking increase in energy prices, which calls of considered attempts to address the challenge (Wolfram 2012). At the same time, it is pointed out the middle class values are such that they would also demand for clean environment. They are not only best known for consuming more but also as firm supporters of less pollution and lower emission and can contribute in the implementation of public oriented government policies due to the political awareness (Kharas and Gertz 2010: 7). As well known, it is the middle class that was helpful in bringing liberal democracy in developed world in 20th century and now in the developing world (Wolfram 2012). They insist for transforming public institutions to make them more accountable and transparent. The new global middle class has come with so many future prospects, complexities, uncertainties and challenges, particularly in the energy sector and the challenge is to manage the situation for the benefit of all through diligent planning (Furness, Scholz and Guarin 2012).

Attempts are made today to tackle these challenges through global cooperation and the result is the establishment of many governing energy institutions and organization like International Energy Agency (IEA), Organization for Petroleum Exporting Countries (OPEC), G8, G20, Asian Development Bank (ADB), Energy Treaty Charter (ETC) and many more emerged on the global scene. Such institutions presume that sound energy governance can lead to better cooperative atmosphere among nations on energy issues and thereby tackle the problem effectively. The next section gives glimpse of the global energy governance environment with special reference to a few institutions.

3.5. Global Energy Governance: Challenges and Prospects

The concept of global governance has assumed importance since the turn to globalization. James Rosenau's[7] pioneering studies on global governance in

[7] James Rosenau was an American political scientist and expert on international affairs who served as President of the International Studies Association from 1984 to 1985 and also known for his tremendous

1992 pointed out that global order lacks centralized authority with the capacity to enforce decisions on a global scale which means that it is very difficult to say that who makes rule for whom and who implements them for what (Biersteker 2009: 2). Global governance simply refers to a process of processes through which a group of nations sets rules and put in force through institutions to enable them to achieve desired outcomes at the global/transnational level (Florini and Sovacool 2009: 5239-40). Although there are number of organizations and treaties to exemplify global governors to promote energy governance, here the attempt is to very briefly look at the working of some prominent samples of global energy governors which are currently influencing the energy policies and practices around the world, such as International Energy Agency (IEA), Group of 20 (G20) and Asian Development Bank (ADB).

3.5.1. International Energy Agency (IEA)

IEA is an inter-governmental organization which is recognized as an institution of global governance. It has become a centre of attention of international relations scholars due to its expanding role in governing global energy space and has been the most substantial and influential Inter-Governmental Organization (IGO) in international energy cooperation field since its origin. In true reflection of the political economy of global power, its membership is limited to OECD member states only, fixing the rest of the nations at the receiving end. It publishes world energy outlook every year which provides valuable information about present and future world energy scenarios. It was founded in response to oil embargo and price volatility by the members of the Organization of Petroleum Exporting Countries (OPEC) during the Arab-Israel war in 1973. IEA came into being in 1974 in response to this, with an intention of ensuring energy security for all its members which includes all 28 energy consumer OECD countries (Florini and Sovacool 2009: 5242).

However, in the recent years, it is engaging itself with demand side, climate change issues and alternative energy technologies (Hirst 2012: 4). These are also the main focus of its recent World Energy Outlook 2013. IEA's manly aims

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work on Global Governance as one of the best theories of contemporary globalization (Held and McGrew 2002: 71).

are to promote its members' "access to reliable and ample supplies of all forms of energy and to promote sustainable energy policies along with economic growth and environmental protection in the global context". It also supports collaborative actions for global energy technologies in order to ensure secure energy future to mitigate climate change. It also seeks to improve "transparency of international energy markets through collecting and analyzing energy data in addition to extend dialogue with non-member countries and international organizations" (IEA 2013).[8]

Apart from this, it set up more than 40 international expert networks and in the recent years these networks are also being opened up to non-IEA countries. They have also emphasized the need for cooperation on energy technology but in the wake of limited membership attempt is made to initiate a plethora of new collaborative networks instead to build on existing IEA networks(Hirst 2012: 3). IEA is also trying to strengthen its relations with developing countries has not been very successful due to its closed membership and for holding the developing world primarily responsible for increased energy use and its consequent environmental hazards. As a result it remains less effective in playing a key role in addressing the global energy problems and it proved to inefficient in providing substantial energy policy support necessary even for G20 nations. Moreover, its regular declining share in of world oil trade and consumption are signs that the oil security mechanisms are becoming less effectives (Hirst 2012: 3-4). Hence it is necessary for IEA to open up its membership and take the developing world into confidence in finding lasting solutions to the energy crisis through cooperation and dialogue.

3.5.2. Group of 20 – G20

G20 is a summit process and a decision making body not an agency or institution like IEA. It came into existence in 1999 as a result of a meeting of ministers and central bank governors, following the 1997 Asian financial crisis. The summit of G20 leaders was also held in 2008 in the context of 2008 recession in an attempt to chalk out plans in response to the recession (Government of Australia 2013).[9] In reality, it came into existence in the wake of 2008 global

[8] IEA-World Energy Outlook 2013 Executive Summary. Accessed on: November 27, 2013. Available at: https://www.iea.org/publications/freepublications/publication/WEO2013_Executive_Summary_English.pdf

[9] Australian Government: Department of the Prime Minister and Cabinet. 12november 2013."G20.Australia 2014". Accessed on 26 November 2013. Available at: http://www.dpmc.gov.au/g20/index.cfm

recession with new global economic realities and declining effectiveness G8+5.[10] It was the demise of G8+5 and the gap it left in the global energy governance which brought the G20 countries into exist in an attempt to fill up the gap left by the former (Hirst 2012: 7). G20 countries include emerging economies which G8 countries did not (Yueh 2013). Apart from the G8+5, the G20 constitutes Argentina, Australia, Indonesia, Republic of Korea, Saudi Arabia, Turkey and European Union(Hirst 2012: 6-7). EU is recognized as a full member. Inclusion of Saudi Arabia, an influential and leading member of OPEC, in its membership is of great importance for this group as it could become a bridge link between oil consumer and producer countries negotiation (Ibid 2012: 7).

Moreover, at the Seoul summit in 2010, its leaders agreed to take some concrete steps in the direction to make transparency in physical oil markets and to improve regulation of financial oil derivative markets in the view of reducing the volatility of oil prices so that both consumers and producers can take benefit. They also agreed at Pittsburgh G-20 Summit in 2009 to rationalize and phase out over medium term inefficient fossil fuel subsidies to encourage wasteful consumption with the coordination of IEA, OPEC, OECD and World Bank (The White House 2010).

With membership of oil consuming and producing countries and developed and developing countries, G20 has the potential to lead the global energy governance as it is also closely working with international organizations like World Bank, International Monetary Fund, OECD, OPEC, the United Nations and IEA largely on global energy and economic issues (Government of Australia 2013). Even though, it assumes potential leadership, the absence of secretariat and institutional framework is making G20 ineffective in delivering sustainable programs of cooperation, as an institution can only give lead to day to day cooperation. The inclusion of Saudi Arabia has become its strength as well as weakness, as it complicated the character of the group as primarily a forum for taking specifically consumer initiatives (Hirst 2012: 10-11). At the same time it should be remembered that until we don't break the divide between consumers and producers, the role of the group will limit to some extent (Ibid 2012: 11). It is

[10] Name of the G8+5 countries are Canada, France, Germany, Italy, Japan, Russia, the United Kingdom and United State plus Brazil, China, India, Mexico and South Africa.

also pointed out that it also has to improve its relation with many multilateral organizations and recognized institutions at global and regional level to make global energy markets more secure and stable.

3.5.3. Asian Development Bank (ADB)

In the era of global governance, there are number of multilateral development banks (MDBs) that are providing economic and technical assistance to the developing nations for shaping their growth. The World Bank is the best example, which is playing a key role in shaping national energy programs. But there are other MDBs that are functioning at the regional levels with similar importance as that of World Bank. They are also extensively influencing energy policies, and Asian Development Bank is one of them as it is playing a great role in shaping growing energy infrastructure of Asia. It is a non-profit institution created in 1966 with its headquartered in Manila and aims at helping developing Asian countries. It has initially 31 members, which has increased to 67 members today (Florini and Sovacool 2009: 5244-45). Though wavering in the beginning, in the recent years ADB has taken many steps in the development of energy infrastructures and mechanisms.

Energy policy 2009 of ADB boosted its energy operations and aligns them with energy security, facilitating a transition to low-carbon economy, universal access to the energy and for achieving its vision of a region free of poverty. It also emphasizes energy efficiency and renewable energy, reforms of energy sectors and governance (ADB 2009). ADB officials think that their investments in the energy infrastructures can pave the way of poverty alleviation, restructuring and market liberalization, expand the use of clean energy within Asia and enhance regional cooperation on energy issues. Besides, it also envisages market deregulation and privatization, particularly public-private partnership which becomes an instrument to achieve good governance and competitive markets (Florini and Sovacool 2009: 5245). The recent Asian Development Outlook 2013 includes a separate chapter on energy, in which ADB emphasize equal energy access for all and acceleration of cross-border interconnectivity of powers because Asia alone cannot meet all their power requirements on their own without cooperation (Malinao 2013). Thus, ADB is playing a substantial role in

harmonizing energy policies in the Asian region through enhancing regional cooperation.

Like other global governance mechanisms, ADB also have some shortcomings. Some critics point out that ADB's policies and decisions are extensively influenced by its two largest donors, USA and Japan and hence its investment turns out to be a proxy for Japanese and American hegemony (Florini and Sovacool 2009: 5245). The Greater Mekong Sub-region (GMS) growth model initiative is criticized by Oxfam that it will have negative impact on the poor people, particularly rural communities and women.[11] Moreover, it is seen as encouraging unsustainable natural resources exploitation, resulting in environmental degradation.[12] Apart from these, there are various types of mechanisms with potential to govern global energy issues and challenges in varying degrees, such as the Renewable Energy and Energy Efficiency Partnership (REEEP)[13], Organization of the Petroleum Exporting Countries (OPEC)[14], Energy Treaty Charter (ETC)[15], G8[16], etc. These all are doing varieties of tasks in the energy field having different energy agendas and policies. However, the existing institutions have largely failed to achieve their goals in meeting the requirements of global energy governance and to tackle the challenges. In addition, limited membership nature of some organizations like IEA, different opinion on energy issues and

[11] GMS is a natural economic area which is bound together by Mekong River that covers 2.6 million km^2 and have a combined population of around 326 million. With the help of ADB, six countries (China, Lao People's Democratic Republic, Myanmar, Thailand and Vietnam) entered into a project of subregional economic cooperation which is design to enhance the economic relations among the countries (ADB 2013).

[12] "ADB Greater Mekong Subregion Program". *Oxfam Australian*. Accessed on: November 27, 2013. Available at:https://www.oxfam.org.au/explore/infrastructure-people-and-environment/oxfams-work-on-infrastructure-development/adb-greater-mekong-subregion-program/

[13] REEEP is a market catalyst for cleaning energy in developing countries and emerging markets and acts as a funder and information provider for up-scaling clean energy business model came into existence in 2002 (Renewable Energy and Energy Efficiency Partnership 2013). It deeply influenced by discussions in the G8 Renewable Energy Work Force concerning to renewable energy and sustainability prior to the 2001 summit, a collection of regulators, businesses, banks, and non-governmental organizations decided to establish REEEP in 2002 in the United Kingdom, where it was located in the United Kingdom Foreign and Commonwealth Office (Florini and Sovacool 2009: 5245).

[14] OPEC is the permanent intergovernmental organization of 12 oil exporting oil nations which was established in Sept. 1960 at the Baghdad conference for coordinating and unifying the petroleum policies of its members countries (OPEC 2014).

[15] ETC (Energy Treaty Charter) is an international agreement to establish multilateral framework for crossborder cooperation in energy industry which was signed in December 1991 (Energy Charter 2012).

[16] G8 it is a forum for governments of world's eight largest national economies which was originated in 1975 for coordinating their economic policies. It includes France, United States, United Kingdom, Russia, Germany, Japan, Italy and Canada (G8 Information system 2014).

climate change problems, divides between OPEC and OECD countries on energy agenda are big hurdles in ensuring satisfactorily global energy governance.

The world is thus undergoing great changes and challenges in the global energy space, particularly over the last two decades. The dependency over fossil fuels is increasing, even though many countries have advanced renewable technologies. As pointed out in this chapter, emergence of developing economies like China and India, population growth, increasing production and consumption, price volatility, political transitions, enormous growth in global middle class particularly in developing countries are changing the global energy landscape. The many global energy mechanisms to meet these challenges have not been much successful. Let’s now turn to the predicament of India in this regard.

Chapter 4

Energy Crisis in India and its Strategies to Deal with the Crisis since 1990

4.1. Introduction

India is an emerging economy and making progress to stand among the category of great powers. With a population of around 1.2 billion, India ranks second in most populous countries in the world and ranks fourth in total world primary energy consumption after China, the United States and Russia (PTI 2013c). The growth of industrialization and expansion of its middle class has entirely changed its energy landscape and demand scenario. The economic growth during the last two decades is another main factor in India's growing energy demand. There is a compulsion on it to sustain its economic growth rate around 8 percent to 10 percent in the next 25 years in order to eradicate poverty and to achieve considerable strides in human development index (Bhaskar 2013: 6). This requires huge amount of energy, and India's growing dependence on energy imports exposes its energy needs to external price shocks. The situation demands an integrated and comprehensive approach to tackle the problem which requires appropriate domestic policy as well as foreign polcy. In the pre-1990 india did not face any severe anergy challenge as it is experiencing in the post-Soviet era and India's turn to economic liberalisation and globalisation and the resultant economic growth has increased India's energy demands to skyrocketing heights (Government of India 2006: 123-24). Due to such growing demand for energy and extremely inadequate domestic supply, energy issue began to occupy a predominant position in India's foreign policy too. Yet, the situation is grave leading to series of energy crises in the country, and government response to encounter these challenges has been seen as very weak and inadequate (Sreenivas and Dixit 2012: 10).

4.2. India's Energy Landscape

Energy landscape of India is changing very fast due to its accelerated growth, which engendered new dynamics in geopolitics and attempts to review its energy policy. India is among the major energy producing and consuming

countries. Speaking at the 8th Asia Gas Partnership Summit, Prime Minister Manmohan Singh said that India is currently world's seventh largest energy producer and fourth largest energy consumer. He also added that combination of market-based pricing and technology is essential for meeting nation's energy needs and to provide rapidly growing economies like India with energy solution corresponding to our needs. If the consumption growth rate continues in the present pace, India will become third largest energy consumer in the world within next seven years. There is a need to put more emphasis on domestic exploration of energy resources and today government is encouraging global and domestic companies to explore onshore and offshore regions, which are essential to bridge the gap between demand and supply (PTI 2013c). Alongside resolving the problems at the supply side it is also important to address the negative environmental externalities caused by some fuels and their extraction, temporary shortages and potential supply risks (Reddy and Balachandra 2003: 60). Hence it is realised that what is needed is a comprehensive policy which address all these associated issues effectively.

India's energy intensity has been declining over the years and expected to decline further which is a good news because falling energy intensity indicates that the growth in energy use is less than the growth of GDP (Planning Commission 2013: 130). This also implies that the energy elasticity is declining over the years. India's National Integrated Energy Policy, 2005 noted current elasticity at 0.80 per cent based on GDP growth rate of 7-8 perecnt which is expected to decline to 0.75 percent in 2011 and 0.67 in 2021-22 (Krishnan 2006). According to the data collected from the 12th Planning Commission report, energy elasticity is declining from 1.09 kgoe/$ in the period of 1980-81 to 2000-01 and to 0.91 kgoe/$ during 2000-01 to 2010-11 (Planning Commission 2013: 130). At the same time, India's energy intensity using purchasing power parity (PPP) GDP is 0.191 for the year 2010 which is higher than most of European countries. In contrast, China's energy intensity is 0.283, that is 1.5 times more than that of India. However, the elasticity of commercial energy in India is higher than the elasticity of total primary energy, because people are shifting from non-commercial to commercial energy (Krishnan 2006; Planning Commission 2013: 131).

Table 4.1: Trends in Supply of Primary Commercial Energy in India

(Million tons of oil equialvalent)

	2000-01 (Actual)	2006-07 (Actual)	2011-12 (Provisional)	2016-17 (Projected)	2021-22 (Projected)
Domestic Production					
Coal	130.61	177.24	222.16	308.55	400
Lignite	6.43	8.76	10.64	16.80	29
Crude Oil	33.40	33.99	39.23	42.75	43
Natural Gas	25.07	27.71	42.79	76.13	103
Hydro Power	6.40	9.78	11.22	12.90	17
Nuclear Energy	4.41	4.91	8.43	16.97	30
Renewable Energy	0.13	0.87	5.25	10.74	20
Total Domestic Commercial Energy	206.45	263.20	339.72	481.84	642.00
Non commercial Energy	136.64	153.28 (1.93%)	174.20 (2.6%)	187.66 (1.5%)	202.16 (1.5%)
Total	343.09	416.56	513.92	669.50	844.16
Imports					
Coal	11.76	24.92	54.00	90.00	150.00
Petroleum Products	77.25	98.41	129.86	152.44	194.00
LNG	0	8.45	12.56	24.80	31.00
Hydro Power	0	0.26	0.45	0.52	0.60
Total net Imports	89.01	132.04	196.87	267.76	375.60
Total Commercial Energy (Growth over the previous five years)	295.46	396.32 (5.01%)	536.59 (6.25%)	749.60 (6.91%)	1017.60 (6.30%)
Total Primary Energy	432.01	549.60 (4.09%)	710.79 (5.28%)	937.26 (5.69%)	1219.76 (5.41%)

Source: Government of India, Planning Commission, Twelfth Five Year Plan (2012-17), Volume II, p. 133, Table 14.4 (excerpted).
Note: *Figures in brackets are annual average growth over the previous and projected five years' period.*

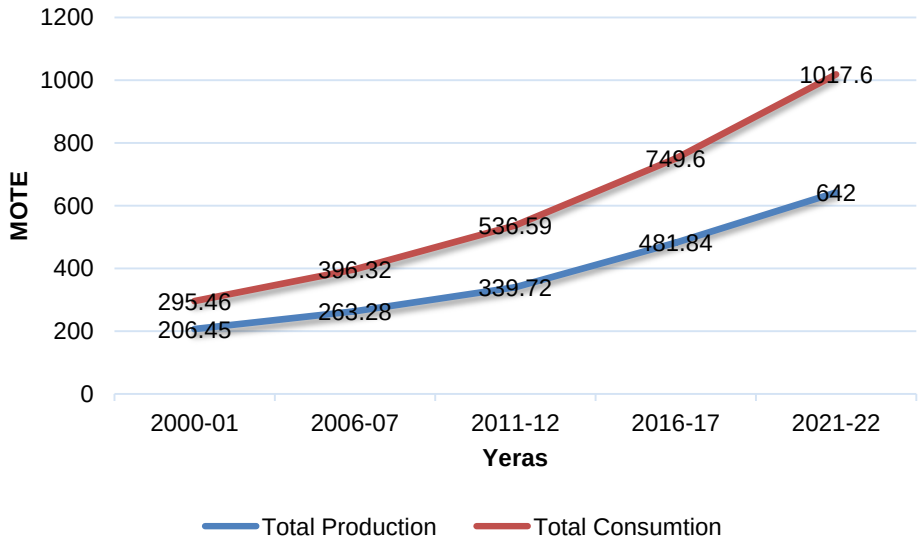
Growing availability of clean fuels and replacing traditional fuels such as wood and cow dung cake for meeting household energy needs are seen as the main reasons behind the declining share of non-commercial energy (Planning Commission 2013: 131). As the table 4.1 shows, the primary commercial energy demand is growing and the Planning Commision estimates that it will increase further as the economy grows and energy access in the rural areas expands.

However, faster growth in the 12th plan reflects the need to meet growing energy demand.[17] As far as the growth of the non-commercial energy is concerned, it is expected to decline because of the expansion and access to commercial energy in the country (Table 4.1). Commercial energy demand is expected to grow at 6.91 percent per year in the eleventh plan, whereas non-commercial energy is expected to grow by 2.6 percent in the same period, which continues for the projected years too. By the end of thirteenth plan, growth rate of non-commercial energy is projected to decline up to 1.5 percent. Import dependency continues at high level in spite of increase in the domestic production. Petroleum products are dominant in the energy imports, where approximately 78 per cent of the demand will be covered through imports by the end of 12th plan (Table 4.1). On the other side, in spite of having coal resources, dependency over coal import is estimated to increase from 18.8 per cent in 2011-12 to 22.4 per cent by the end of twelfth plan. Besides, dependency over LNG imports is also expected to grow. If we do not achieve the domestic production levels of coal, petroleum and natural gas, the dependency over imports would increase for maintaining the considerable GDP growth at a desirable level. At the same time it should not be forgotten that the growth in the commercial energy reflects the expansion in the Indian industries, rising living standard of its people and population growth (Planning Commission 2013: 133).

Besides, as Figure 4.1 shows, the gap between energy production and consumption in India is widening. India produces 2.4 per cent total annual energy of the world and accounts for around 3.3 percent of the world's total annual energy consumption (Bhaskar 2013: 8). This imbalance is increasing, as India's total consumption of energy is 536.59 Mtoe, which is more than energy production of 339.72 Mtoe in 2011-12 that reflects the need for 36.69 percent of India's total energy requirement (Figure 4.1). Even the dramatic increase in the domestic production of gas cannot fill the growing gap between production and consumption that pushes India to increased imports and to rethink about its energy strategy for increasing domestic exploration, infrastructure and transnational issues, energy pricing, etc. (Planning Commission 2013: 133).

[17] The 10th plan period was from 2002 tp 2007 and 11th Five Years Plan was from 2007 to 2012. Currently, 12th Five Years Plan from 2012 to 2017 has been adopted by Government of India. India's 13th Five Years Plan will start from 2017 and end in 2022.

Figure 4.1 India's Energy Balance

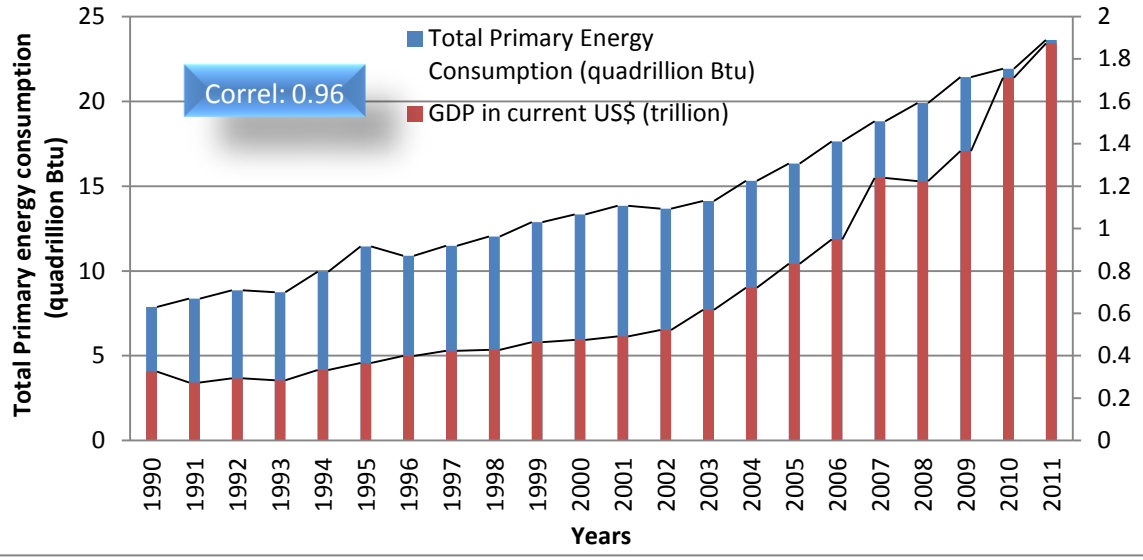


Source: Government of India, Planning Commission, Twelfth Five Year Plan (2012-17), Volume II, p. 133.

Moreover, GDP growth raises the income level of the people, which further increases the energy use. Figure 4.2 shows the positive very high correlation (0.96) between GDP growth and energy consumption. The growth of energy consumption in India is increasing over the years, since 1990 in particular as a result of change in GDP growth (Figure 4.2). According to the Planning Commission, for 9 percent GDP growth during 12th year plan period from 2012-13 to 2016-17, energy supply has to grow at 6.5 percent per year. Thus, energy boosts the economic growth and prosperity and vice versa.[18] However, it also indicates that due to the lack of availability of natural resources, less progress in domestic exploration, increasing dependency over imports, India cannot keep pace of energy use with GDP growth. Nevertheless, the increasing energy consumption is compelling India to think new ways to meet the increasing demand of energy to lessen the dependency on imports.

[18] India's Energy Scenario in 2013 – Challenges & Prospects. *Report: Hydrocarbon Asia*. June-March, 2013. 6-10. Accessed on December 11, 2013. Available at: http://www.hcasia.safan.com/mag/hcajanmar13/r06.pdf

Figure 4.2: Total Primary Energy Consumption (quadrillon btu) and GDP current US$ (trillion) in India, 1990-2011



Source: U.S. Energy Information Agency, International Energy Statistics 2013, and World Bank Data 2013

Similarly, the share of each energy sources in total domestic production as well as their share in imports in India is increasing. The combined domestic production of coal and lignite constitutes two-third (66.38%) of total production of commercial energy in 2000-01 and is projected to be around the same to the end of thirteenth plan. The combined share of coal and lignite in the total consumption of commercial energy on the other hand is projected to increase from 50.36 per cent in 2000-01 to 56.90 per cent 2021-22. Reversely, the share of oil in the total consumption of commercial energy is expected to decline to 23.3 per cent by 2021-22, from the level of 37.5 per cent in 2000-01 (Planning Commission 2013: 132). Also, there will be dramatic increase in the share of natural gas and LNG, as its share in total consumption of commercial energy is projected to increase from 8.59 per cent in 2000-01 to 13.17 per cent in 2021-22 and production will also increase in the same period. The supply of renewable sources is also expected to increase rapidly as their share in the total commercial energy supply will increase from 0.04 percent in 2000-01 to 1.97 percent by the end of thirteenth plan. Even their share in the total commercial energy production will rise from 0.06 percent to 3.12 percent in the same period (Ibid 2013: 134). However, its share of renewable in the total commercial energy consumption remains small as comparable with many countries such as USA (1.7 %), Indonesia (1.4%), Thailand (1.0%) and

China (0.5%) as already mentioned in table 3.5 of the previous chapter, Developed countries have big share in consumption of non-conventional with 76 per cent of the total world non-conventional consumption. Overall, consumption of petroleum products and natural gas is increasing in the total commercial energy, which is posing an alarming and fundamental challenge for India (Planning Commission 2013: 132-133). Thus, the present energy scenario is far from satisfactory as it represents a crisis due to over-dependence on external supply and conventional energy sources, alongside our inability to make use of renewable sources significantly and controlling the environmental externalities thereof. As already indicated, the need of the hour is an integrated energy strategy with a focus on hastening the use of renewable energy sources, more investment on energy infrastructure, acceleration of domestic production, reducing conventional energy imports and sensitization on environmental issues side by side with poverty alleviation, economic growth and sound, human development.

4.3. Factors Responsible for the Energy Crisis in India

4.3.1. Population Growth

Relationship between population growth and energy demand is apparent. The policies of every welfare state are formulated in such a way that every household should have considerable access to the energy in order to have a desirable standard of living and wellbeing. More population means more consumption of energy for transportation, agriculture, construction, industry, cocking and healthy living. Dramatic population growth and increase in the population density of India has been a major factor that accelerated India's energy demand (Nagdeve 2007). According to the 2011 Census data India's population is more than 1.2 billion which is expected to increase further.[19] Thus, the massive growth is putting massive pressure on energy resources and compelling India to expand dependency over the imported energy for meeting the demand of its people (Nagdeve 2007). According to the Ministry of Statistics and Programme Implementation, Government of India, per capita energy consumption in India is 6419. 53 KWH in 2011-12, which was 2232.50 KWH in 1990-91 that shows approximately three time increases since 1990 in per capita energy consumption

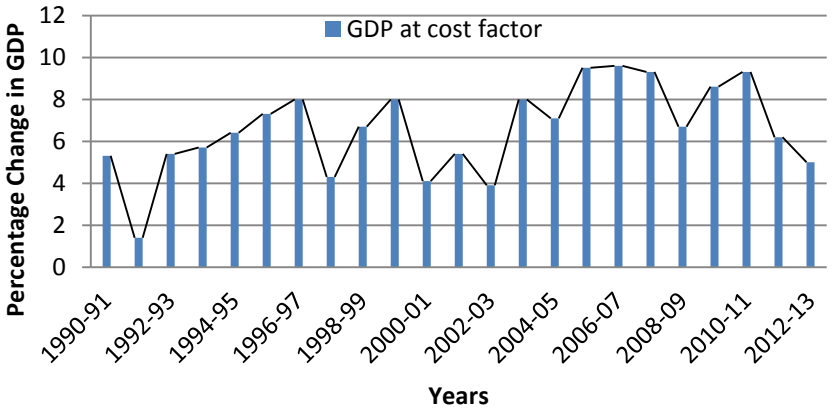
[19] "Population Census 2011". Accessed on December 18, 2013. Available at: http://www.census2011.co.in/

of India (Ministry of Statistics and Programme Implementation 2013: 44). At the same time Liquid Petroleum Gas (LPG) use has increased from 2 per cent in 1993-94 to 11.5 per cent in 2009-10 because of the population growth and changing living standards, and the percentage of urban households using LPG increased more than doubled from 30 per cent to 64.5 per cent in the same period shows its other side (Ibid 2013: 1). Moreover, According to the Ministry of Road Transport and Highway there were 19.1 million total registered vehicles in 1990 in India and their number increased upto 159.4 million in 2012 due to dramatic growth in population and urbanization. However, number of four wheelers out of total registered vehicles has increased from 2.6 million in 1990 to 21.5 million in 2012 which shows a dramatic growth rate (Ministry of Road Transport and Highways 2013: 1-2). Even though the majority of the people is surviving at subsistence level and lacking access to the energy but, to satisfy the basic needs of a growing population at the present level of consumption has become a great concern. In addition, its adverse affects on environment with the growing production and consumption are becoming great policy concerns in tackling these problems (Nagdeve 2007).

4.3.2. Economic Development

Population demands energy for prosperous life, which can only be met through the significant economic growth that is also of vital importance for inclusive growth and human development (Bhaskar 2013: 6). It has already been discussed in the Figure 4.2 of this chapter that there is positive correlation between economic growth and energy consumption, as both feed each other, which is increasing over the years particularly since 1990 (Figure 4.2). The economic growth rate of India at the cost factor of GDP was 5.3 percent in 1990-91 has increased to 9.3 percent in 2010-11 (Figure 4.3), in which it consumed an estimated 164.32 Mtoe energy. Sustaining 8 to 10 per cent economic growth rate is seen as necessary for India at least for the next 25 years in order to remove poverty and achieve plausible human development. At the same time, poverty has been a major challenge to the India's economy and approximately 412 million people are living without access to commercial energy even today. Therefore, India needs to improve access to energy resources (Bhaskar 2013: 6).

Figure 4.3: Percent Change in GDP at cost factor during 1990-2013



Source: Ministry of Statistics and Programme Implementation, Central Statistics Office, 2013

4.3.3. Subsidization and Price Distortion

According to a study conducted by TERI (The Energy and Resources Institute) and IISD (International Institute for Sustainable Development's Global Subsidies Initiative) subsidizing fuels for energy can encourage the consumption and discourage the investment in cleaner forms of energy. It estimated that phasing out consumption subsidies on fossil fuels between 2011 and 2020 would cut global carbon dioxide emission by 5.8 percent (IISD 2012: 24). In other words, subsidizing energy not only accelerates demand and consumption but also will have adverse impact on environment. India is also one of countries in the world giving subsidies to its enormous population, especially for the poor, for improving energy access by making prices more affordable with the objective of protecting its consumers from international price volatility. Petroleum sector is one of the most highly subsidized energy sectors in India. Even though, India's government deregulated the price of petrol in June 2010, but the prices for Diesel, PDS Kerosene and domestic LPG continue to be regulated and subsidized. Even in the case of petrol, oil markets companies can change the price every fortnight but only after seeking the approval of the government. In contrast to the fuel subsidies at the central level, state governments, at considerable cost to state budget, distribute subsidies in electricity. However, it is found that subsidies promote significant amount of diversion, misuse and malpractice in the energy sector (IISD 2012: 4). For example, subsidized kerosene is used to adulterate more expensive

transport fuels, which neutralizes the substantial investment made by refiners in improving fuel quality (IISD 2012: 18). In addition, use of subsidized LPG cylinders (only for household usage because there is a substantial gap between the price of domestic and commercial LPG) for automobile fuel and wasteful consumption of free electricity in the agriculture sector are also seen highly critical (IISD 2012: 19). Free/subsidized power supply leads to overuse and thus there is dire need to change the paradigm of subsidies (Johl 2013). At the same time, reforms regarding subsidies need to be approached carefully as it affects of millions of people, particularly the poor (IISD 2012: 26). Subsidies are not only profitable in many sectors but also is seen essential to raise the standard of living of millions of dis-privileged and poor. In the farm sector, for instance, developed countries provide huge subsidies to their farmers. American farm sector subsidies are the maximum and Europe comes in the second position. Similarly in Japan, the farmers who produced corn and raised pigs are at advantage of 27 times compared to the international market price of pig meat (Johl 2013).

The situation is also seen as creating price distortion in India, which led to over pricing for some fuels. Duties on petroleum products are main sources of government revenue which are not uniform across products. Differential state taxes and custom duties on crude and petroleum products infuse further energy pricing distortions of this sector in the country. For example, the monopoly of Coal India Limited (Public Sector Unit) in the coal sector, is seen as resulting in low production volume of coal and under-utilisation of domestic reserves (Bhaskar 2013: 165-66). Although, the marketing of transportation fuels was opened to private sector companies such as Reliance, Essar and Shell etc. and also to NOCs (National Oil Companies) in 2002. But these companies have not yet been given a level playing field as they could continue to compete with public sector companies, as public sector companies market fuels at subsidized and government controlled rates thereby large number of petrol pumps of private companies are currently closed (IISD 2012: 21). At the same time, public sector oil companies both at downstream and upstream levels are bearing a portion of under-recovery burden. It is seen that Upstream companies such as Oil and Natural Gas Corporation Limited (ONGC), Oil India Limited (OIL) and Downstream companies borne under-recovery burden which was $6.65 billion and $1.51 billion

respectively in 2010-2011. It would have adverse affect on their cash flow and profitability and also halt the process of oil upstream companies in improving and enhancing their exploration and production operations. On the other hand, subsidy and financial assistance is provided only to public sector companies which create uncompetitive environment for private companies at the time of higher market prices thereby limited participation of private companies in marketing fuels such as petrol, diesel, kerosene and LPG (IISD 2012: 20). The misalignment between the prices of LPG, petrol and diesel is seen as a burden on the oil companies leading to diversion and adulteration. Petrol prices are aligned with world price but prices of diesel are at least 20 percent lower than they should be if they are to be fully aligned according to the oil companies. Similarly, kerosene and LPG prices are lower to 70 and 50 percent respectively causing price distortions. The most part of LPG subsidies benefits go into the completely untargeted middle and upper class people.[20] This is thus a big concern area for India's Government.

4.3.4. Urbanization and Middle Class changing the consumption patterns

As pointed out in the previous chapter, growing urbanization and growth in the middle class are being considered as important factors in the excessive utilization of commercial energy resources in the recent time, particularly in developing countries like India, China and Brazil. The 2011 census of India shows that increase in population is more in urban areas than that in rural areas. The level of urbanization increased from 27.81 per cent in 2001 to 31.16 per cent in 2011. This represents a dramatic increase in the urban population since independence in the country. On the other hand, unlike urban population, the level of rural population proportion declined from 72.19 per cent in 2001 to 68.84 per cent in 2011. Migration, natural increase and inclusion of new areas under urban areas are considered as major reasons behind this (Chandramouli 2011). More urbanization and more urban population mean more energy consumption, which in turn encourages the energy demand. There is a significant relationship between urbanization and middle class, as rise in the per capita of income of the growing middle class in India is boosting urbanization. The real household income in urban

[20] "Energy Pricing in India" Indian Energy Sector. Accessed on: December 21, 2013. Available at: http://www.indianenergysector.com/overview/energy-pricing-in-india

areas particularly has increased by more than double since 1985 (Boao Review 2012). As per the measurement of living standard of people, India's per capita income has increased up to 11.7 per cent from Rs 5130 per month in 2011-12 a fiscal year to Rs 5729 per month in 2012-13 (PTI 2013a). It is estimated that, the middle class would be the dominant section of Indian population by 2030, and it will have the single biggest middle class population in the world (Yueh 2013). Urbanisation and expansion of middle class in India together will increase the electricity use (Reddy and Balachandra 2003: 62). Electricity generation is largly coal-based thermal power generation in India, which generate three-fourth of the total electricity produced in India (Planning Commision 2013: 132). The demand for electricity is on the rise, for instance during last three years, demad for coal and electricity increased at 8 to 9 percent. The energy requirements for urabn mobility in a country where private vehicles are skyrocketing is another major challenge associated with urbansisation and expansion of middle class. Due to the low reserves of oil and natural gas in the country, it depends heavily on imported crude oil and as a result hydrocarbons dominates the India's energy consumption patterns (Reddy and Balachandra 2003: 62; Behera 2013: 94). If India sustains its economic growth, urbanisation and middle-classisation, energy will continue to be a major concerns in the coming years too.

4.3.5. Privatization

Privatization in the energy sector is intended to facilitate energy access to Indian households which has been part of India's policies of liberalization. The government of India undertook the economic reforms in 1991 due to the severe financial crisis. There was high rate of inflation, external debt, deteriorated current and capital account, depleted foreign exchange reserves etc (Singh 2012: 17). This financial crisis arose due to the gulf war which increased the oil prices and resulted in increase in the oil import bill and decline in the foreign remittance by the NRIs to India. The new economic liberalization was aimed at eliminating controls exercised by the central government and thereby increasing the role of state governments and private players in the areas that were critical for economic development (Ahluwalia 2000: 1648). The aim of new industrial policy, introduced in 1991, was to shift the Indian economy from the inward looking import substitution policies to outward looking policies. The government of India

dismantled the control over the industrial licenses except a few industries in order to ensure private participation in India's growth. The permission was given to the private and foreign investments in priority sectors alongside liberalizing investment norms. The permission was also given to foreign investors for seeking to high technology for the export competing sectors (Mohan 2006: 3-4). The public investment, the major part of the total investment, was invested in the backward states in the pre reform period. It was withdrawn and approval was given to the private investors to invest in any state. The public sector reforms also diluted the credit flow to the backward states and priority sectors. The states were also persuaded to remove the concessions offered to attract industry to their respective states. Thus, the pattern of the private investment turned more in favour of the developed states where the returns to the private investment were high (Bhattacharya and Sakthivel 2004: 1075). The new economic reforms were also seen as responsible for the large fluctuations in growth rate and economic performance of the states during the post reform period. From the beginning of the reform process, it is apprehended that new economic policies would promote a regionally concentrated pattern of investment (Singh 2012: 18-19). However, these initiatives of economic reforms with the introduction of de-regularization of industries and privatization policy measurements encouraged the energy consumption, apart from attempts to bring private capital in energy sector. The government, in general, is giving private companies a warmer welcome in the oil and gas sector, such as Indian companies like Essar Oil Limited (EOL), Reliance Industries Limited (RIL), Videocon Industries and foreign companies like BG Group, BP, Cairn Energy Limited, and Royal Dutch Shell. Their role across the energy sector in India is increasing (Diwan 2009: 107-08). The supporters of privatization argue that although the doctrine of privatization has been acknowledged by many political parties, but they all continue to adopt an escapist attitude towards the complete privatization for safeguarding their vote banks. The electoral politics in India is seen as detrimental to achieve energy security as it is not alluring destination for foreign investors because of hindrances like bureaucracy, redtapism, political setbacks and corruption. Nevertheless, with the more liberal reforms, future of privatization appears to be bright which may further the production and demand for energy (Kousadikar and Singh 2013: 20-21). At the same, it is apprehended that the privatization is also promoting market dynamics

into the energy sector with companies insisting for inflated prices, which denies energy to the majority of people at affordable rates.

4.3.6. Energy Availability and Energy Intensity

Energy availability plays a good role in determining the demand level of any given type of fuel. Any type of commercial energy that is of high quality, economically priced and easily accessible automatically attracts the energy demand. Some of the factors which make energy availability difficult are the high costs of import, relentless environmental implications, natural disasters in case of hydropower and delay in project implementations etc (Reddy and Balachandra 2003: 62). Similarly, lack of sufficient energy sources affects the energy demand, results in increasing energy import that may also enhance the need for domestic exploration of renewable and non-renewable sources. Energy intensity, on the other hand, indicates energy performance that how much energy is used per unit of GDP of the given country and there is a great combination between the both. In India, it is pointed out that huge amount of energy goes waste because of households, public and private offices, industries use outdated and inefficient equipments and production processes and this results in more energy use than what is actually necessary (Reddy and Balachandra 2003: 62; Behera 2013: 96). It is found that there is remarkable difference between economic growth and energy intensity in different sectors such as industrial, household and transport sectors in India. The industrial sector consumes more than half of total energy as it broadly comprises energy intensive industries such as iron and steel, petroleum refining, cement, aluminium, fertilizers, pulp, paper etc. and displays inefficient use of energy with an intensity of 139 ktoe/Rs. Billion. Residential sector has relatively low energy intensity with 11.2 ktoe/Rs. Billion. Unlike this, transport sector shows high intensity with 280 ktoe/Rs. Billion. As far as energy consumption in the industrial sector is concerned it is growing year after year; it grew from an annual average of 5.6 per cent in the 1990s to 7.3 per cent during 2000-05. According to the International Energy Agency, India's energy intensity is around 0.85 tons of oil equivalents (toe) per $1000 of GDP compared to around 0.175 toe per $1000 of GDP of OECD countries and around 0.3 toe per $1000 of GDP of world average. It broadly indicates the low efficiency of India's energy sector in spite of the fact that energy intensity in general has been decreasing since 1980 (Reddy and

Balachandra 2003: 61; Bhaskar 2013: 127-28). Thus, energy intensity and energy efficiency are two interrelated factors that influence the energy demand and consumption. Apart from this, energy inefficiency also results in high amount of pollution contributing to global warming and climate change (Tripathi 2013: 87).

Apart from these, there are other factors which can potentially affect the energy demand and reliable energy access such as, regional politics and self-interests, international pressure on the use of energy resources due to their environmental consequences, terrorism, political ideologies and upheavals, uneven distribution of energy sources in the country etc (Kumar 2013: 52). Indian government has been trying to address these issues through its policy interventions in the energy sector, both in the external and internal dimensions, but has not much succeeded and most of people are still living without the access to energy (Sreenivas and Dixit 2012: 12-13). The next section summarizes important and influential policies and their role in determining the energy access and failures in proper implementation in India, though it is very difficult to accurately analyze the impacts of various energy policies.

4.4. Energy Policy and Strategies of India for achieving Energy Security since 1990

Government of India has been giving priority to the energy sector since independence and achieved significant growth. Despite such achievements, it has not kept pace with the growth in demand, which has exposed the country to the peak shortages in energy supply (Dwivedi 2011: 21). However, major changes in the India's energy policy have occurred in the post-Soviet era, which has considerably improved the situation though not to the desirable extent. As pointed out already, liberalization, privatization and reforms in 1990s changed the mode of energy use from non-commercial energy to commercial energy with the rising living standard of people. Comprehensive changes were initiated to reform the energy policy, which included legislation, international treaties, incentives to investment, guidelines for energy conservation, taxation and other public policy techniques (Diwan 2009: 92).

In fact, energy was recognized as a separate entity only in the Sixth Five-year Plan (1980-81 to 1984-85); till then it was part of "mineral and oil" when it was

first listed in the second Five-year Plan (1956-57 to 1960-61) (Bhaskar 2013: 13). Realizing its importance, all energy private business, such as Esso and Burma Shell Catlex and IBP were nationalized and made public sector companies during 1974-76. Subsequently the Kuwait war of 1990-91 had increased the inflation rate up to 13 percent thereby import burden and high oil prices affected the balance of payments and foreign exchange reserves of India turned down to $1 billion. This has eventually led to a macroeconomic crisis and stagnant domestic economic scenario, which forced India to liberalize its economy. Because of the dramatic turn from nationalization to liberalization, it has opened the exploration and production sector to private investments for hastening the increase in energy capacity and efficiency. India's five year plans began to be re-oriented accordingly with a change of priority. The first eight five-year plans had largly focused on growing the public sector with regard to energy. But since the ninth five year plan (1997-2002), the focus began to shift more to the commercial viability of energy sector and the role of private sector and lesser on the public setor (Bhaskar 2013: 13-14; Ahn and Graczyk 2012: 22).

As well known, oil has been historically the primary focus of Indian energy policy. However, with the discovery of offshore Bombay high fields by Oil and Natural Gas Corporation Limited (ONGC) in 1974, gas also attracted the attention of the policy makers. Following this, the government of India recognized the need for gas distribution network and set up a Gas Authority of India Limited (GAIL) in 1984 as a state owned company. ONGC discovered another western offshore Bassein field in 1988, which intensified the focus of gas production in the 1990s. Because of increasing awareness about gas as a substitute fuel to oil, the GAIL set up the first large inter-regional pipeline between Hazira-Vijaypur-Jagdishpur in 1990 (Jain and Sen 2011: 9). This was an important turning point India's energy sector, which not only changed the industry structure but also accelerated the process of privatization and liberalization in the energy sector (Shahi 2006: 14).

The government of India set up the OIL and Natural Gas Commission in 1993 and made it a corporation in 1994 as a result of Government of India's decision in July 1991 to liberalize economic policy. Consequently, it deregulated and de-licensed the core sectors including petroleum sector thereby recognizing Oil and Natural Gas Commission as a limited company under the Company's Act

1956 in February 1994 (ONGC 2013). In 1997, the government launched the New Exploration Licensing Policy (NELP), which was based on greater private sector participation, international participation and production sharing agreements. In the Pre-NELP era, India's exploration and production was dominated by ONGC and Oil India Limited (OIL), but NELP has increased the participation of foreign exploration companies and private players. It has made about 30 oil and gas discoveries to the date, such as discovery of gas reserve in the Krishna-Godavari Basin in Andhra Pradesh, the largest oil discovery by Cairn Energy in Mangala, Rajasthan, in 2003, etc (Bhaskar 2013: 15; Deloitte Touche Tohmatsu India Private Limited 2013). Thus, the government of India provided equal platform to both public and private companies in the production and exploration of natural resources in the country. To date, nine rounds of NELP have been completed, and the ninth one was launched on October 15, 2010 and attracted 74 bids for 33 out of the 34 blocks on offer.[21] The tenth round of NELP is likely to take place in the month of January, 2014, said by OIL Minister Veerappa Moily at KPGM Energy Conclave in New Delhi. Under NELP, 100 percent Foreign Direct Investment (FDI) has been permitted in exploration and production of oil and gas. In the previous nine rounds, government has awarded 254 blocks for exploration, which has been playing significant role in the domestic exploration of natural resources (PTI 2013b). However, it has been pointed out that despite implementing NELP for almost more than a decade, almost none of global oil majors, who have the resources to locate and tap large new finds, have shown any interest because of the absence of a stable and transparent framework in the energy sector. Poor pipeline infrastructure is seen as adding to the problem as efforts to encourage new suppliers by laying domestic and trans-border pipelines and increase competition have not been very successful. Thus the rectification of anomalies, infrastructure inadequacies and correcting policy deficit should be central in the efforts to achieve energy security (The Times of India 2013).

India has taken another significant step towards energy security by formulating "Hydrocarbon Vision 2025" in 2000. It provides a framework, which would guide the policies regarding the hydrocarbon sector for next 25 years (Carl

[21] NELP IX Licensing Round bid summary. Accessed on December 15, 2013. Available at: http://www.psg.deloitte.com/NewsLicensingRounds_IN_110411.asp

Rai and Victor 2008). It is seen as a forward looking initiative to address the issues such as energy security, use of alternative fuels, interchangeability of technology, developing hydrocarbon sector as a globally competitive industry, external policy, refining and marketing, tariff and pricing, indigenous exploration and production, oil security and restructuring and disinvestment. This is seen as vital in ensuring that the mix of energy source used in economy is optimal and sustainable and is made available to the Indian consumers at the reasonable price (Ahmed 2009: 138). Strategies for achieving energy security and for increasing domestic production should also be coincided by efforts to address high level of energy intensity in the country (Planning Commission 2013: 130). Keeping this in mind, government introduced the Energy Conservation Act, 2001, providing for institutionalizing and strengthening of delivery mechanism for energy efficiency (Ibid 2013: 157). It requires the large energy consumers to adhere to energy consumption norms, to follow energy conservation building code and appliances to meet energy performance standards and to display energy consumption labels (International Business Publications 2009: 30). Further, government established Bureau of Energy Efficiency in 2002, under this act to assist in developing policies and strategies in line with self-regulation and market principles for reducing energy intensity. Nevertheless, it is understood that it can only be achieved through the active participation of the stakeholders and more and more investment in research and development programs (Tripathi 2013: 89).

Moreover, Indian Parliament passed the 'Deregulatory Petroleum Bill' in April 2006 based on report of the Rangarajan committee to liberalize the Indian petroleum markets. This report was on pricing and taxation of petroleum products in India, the recommendations of which includes three broad proposals such as to allow the flexibility to oil companies to fix retail price, pricing of domestic LPG and Kerosene and reconstructing excise and custom duty (Rangarajan 2006: 15). In the same year, a long awaited draft on Integrated Energy Policy (IEP) providing long term energy policy perspective was formulated by the Planning Commission, which became a further boost to the energy security policy in India. It was vital to ensure the energy efficiency, demand side management, creating conducive environment, provide incentive to the decision makers, socially and economically desirable outcomes, private firms and autonomous public corporations,

transparent and targeted subsidies, safe and convenient energy and supply in medium and long term perspecticve (Bhaskar 2013: 15-16). The policy is also well informed by the concerns of environment and sustainable development, and thereby aims at providing the environmental friendly and economically viable energy. It also emphasizes on the energy efficiency because no policy can assure energy security in India without bringing energy efficiency and demand side management. Following this policy, several measures have been taken up to promote energy efficiency in India, for example, in April 2010, the Prime Minister has approved a National Mission on Enhance Energy Efficiency (NMEEE) (Kumar 2013: 53-54). It has several implications as it covers four important policy goals such as; to promote market based mechanism enhancing energy efficiency in energy intensive large industries, to enhance the energy efficient appliances, to create Energy Efficiency Financing Platform and to prepare framework for energy efficient economic development (Bawari 2010). Besides, Integrated Energy Policy has also recognized the augmentation of resources for increasing energy security by doing exploration beyond coal, oil and gas. Therefore, the thorium deposit in Indian coasts has been widely in the limelight in recent years as a huge possibility towards its energy security. As a result there is an emphasis on developing thorium cycle for nuclear power and exploiting non-conventional energy particularly solar power to achieve India's energy dependence beyond 2050 (Shahi 2006: 5-6). Apart from this, to control the uneven distribution of resources, Indian government set up five ministries such as Coal, Petroleum and Natural Gas, Power, Atomic Energy and Non-Conventional Energy Sources to handle structurally the energy sector through concerted efforts. But, this efforts to bring structural synchrony between the ministries and policies are not much successful as the ministries work only in their respective areas and make independent policies though often with significant overlaps (Tripathi 2013: 87).

However, even after the adoption of IEP, energy landscape is changing rapidly and energy basket has rapidly been expanding both at global and national level, which encourages the government to augment and diversify this policy (Bhaskar 2013: 246-47). Any policy ensuring energy security of India cannot be limited only to the domestic level but it needs to expand at the international level and diplomatic level too, because of its large dependency on the imports of fossil

fuels from different countries (Sarma 2012). To reform the energy sector, regional cooperation strategy will be important in the long run. It is pointed out that India need to capitalize the great opportunities for energy collaboration with its neighboring countries such as trading hydroelectricity with Nepal, natural gas and coal generated electricity with Bangladesh, natural gas with Iran and Turkmenistan through Pakistan, undersea gas with Oman, gas with Myanmar and coal generated electricity with Pakistan. Of course, each of this involves geopolitical and foreign policy issues, but examining them seriously is necessary for India to meet its increasing energy demand (Ebinger 2011). Therefore, India needs to make the good connection between internal and external policies in the right direction, diversifying its energy sources and energy supplying countries.

Presently, India is importing more than 70 percent of its oil needs, largely from countries in the Middle East. It is estimated that India will be the third largest importer of energy by the year 2025 with energy occupying 90 percent of its import (Centre for Strategic and International Studies 2006). ONGC Videsh as India's international arm of ONGC has been actively exploring foreign energy sources for energy supply contracts, exploration and drilling rights. In Central Asia, it has made important inroads into Iran, Kazakhstan, Turkmenistan and Tajikistan. It also has formally bid on Tengiz and Kashaguan oil fields and Kurmangazy and Darkhan exploration blocks in Kazakhstan (Ahmed 2009: 142). Currently, it has participation in 32 projects in 16 countries, out of which 11 are producing projects, 5 discovered and underdevelopment projects, 14 exploratory projects and 2 pipeline projects (OVL 2013). The Indian OIL Corporation (IOC) is also the largest state owned company in the downstream sector which controls about three quarters of domestic oil transportation network. Private participation is also increasing; Reliance Industries which is a private Indian firm opened India's first privately-owned refinery in 1999 and gained a considerable in India's oil sector by now (Ahmed 2009: 142). In 2011, Reliance and British company BP (British Petroleum) completed a partnership in the oil and gas business. BP got a 30 per cent stake in 21 oil and gas production sharing contracts that Reliance operates in India, including the KG-D6 block for $7.2 billion. Reliance also formed 50:50 joint ventures with BP for sourcing and marketing of gas in India (ET Bureau 2011). Nevertheless, India's downstream sector is still dominated by state-owned entities

in spite of increases in the private shares. India is also now trying to arrange for the supply of gas from Bangladesh to the north Indian markets and explored the idea of a pipeline from Myanmar to India via Bangladesh but neither of these ideas materialized due to the political prssure in Bangladesh and competing arrangements between Mayanmar and China. Of late, however, Bangladesh has lifted its opposition to a gas pipeline linking India and Myanmar running through its territory, that would paves the way for the establishment of a regional gas grid (Ahmed 2009: 142; Bhaskar 2010).

In spite such efforts at policy, administrative and diplomatic levels, India is still unable to achieve energy security at national level as well as international level. Government of India is lacking somewhere due to unstable indoor security situation and its tense relationship with neighboring countries which can become transit countries and disadvantageous competition with China and weak administrative capacity due to inadequate response of the government. Moreover India's energy cooperation with Middle Eastern countries like Iran, which is one of the prominent countries exporting hydrocarbons to India, complicates India's relationship with Western governments, particularly with the USA (Hanif 2010). Apart from this, there are still a number of associated challenges and drawbacks in pursuing energy strategy in India and next section highlights a few of them.

4.5. Challenges and Drawbacks in Implementing Energy Policies

4.5.1. Demand and supply mismatch of energy has been a big concern in India over the decades due to the lack of continuous and regular government's response. It has already been pointed out that India produces 2.4 percent total annual energy of the world and consumes 3.3 percent total annual energy of the world. This imbalance and perpetual gap reflects that India's government is not as much active as it should be about securing energy security that pushes it to increase imports. High imports effects on domestic growth. If it can reduce energy import to about 5 percent of GDP in 2016-17 and invest the 2 per cent saved domestically which could result in additional GDP growth of about 0.5 percent. Bridging the gap between demand and supply thud has been a long run problem of the country (Sreenivas and Dixit 2012: 11).

4.5.2. There is also perpetual **difference between state level laws and centre level laws** impacting energy sector. To achieve comprehensive energy policy, these laws need to be integrated and synergised (Diwan 2009: 96). Some state governments supply cheaper energy to the consumer to stay in power and safeguarding vote banks in contrast to the centre following different laws (IISD 2012: 32). This disharmony is seen as a major problem in the Indian administrative system.

4.5.3. **Multi-Party politics, corruption and excessive bureaucracy** also complicate the process of making a comprehensive and integrated energy policy. Instead of making an overarching strategy, they make a cluster of policies resulting in delay and inefficiency of projects which lead to informality and corruption. Thus, Corruption, delay and inefficiency are inter-related and cannot live without each other. Weak administration is one of other responsible reasons for this. Moreover, in a multi-party political system, politicians interfere with the process of making energy policies to secure their vote bank through facilitating unintelligible subsidies (Diwan 2009: 96). An expert namely Bhamy Shenoy said that oil sector subsidy is a mother of all corruption as it can generate enormous amount of black money. For instance, state-owned electricity companies are losing money because of political interference in the management of electricity boards/companies (Shenoy 2009: 10).

4.5.4. India has been unable to promote **public-private partnership (PPP) model** which is seen as essential to maintain economic activity in the country. There is no PPP regulator so far in order to attract more domestic and international private funding of the infrastructure. It also lacks a comprehensive studies and database regarding the projects and sectors where PPP could be encouraged. The absence of adequate project development by authorities leads to reduced interest by the private sector, mispricing and many times delays at time of execution (Kanoria 2012: 10-11). The limited capacity to undertake large and complex projects at various central ministries, particularly at the state and local level bodies hinder the translation of targets into projects. However, government of India is trying its best to sort out these challenges, but the limited availability of sources of funding is the

biggest bottleneck for the success of the PPP format (Ibid 2012: 11). There is need to bring more efficiency and reforms to achieve PPP in the energy sector.

4.5.5. There is a lack of **robust and reliable data regarding energy demand and supply** which is the basis on any policy formulation. There have always been discrepancies in data released from multiple official sources, such as inconsistency between oil usage and transportation activity data. Similarly, there is about 15 percent discrepancy in coal usage data in accordance with “Interim Report of the Expert Group on Low Carbon Strategies for Inclusive Growth 2011”. It reflects the lack of responsible agency for basic tasks such as generating reliable baseline data, which is another reflection of weakness of administration and institutional approach. Strong institutional approach is necessary because it can create transparent and predictable rules of game within the current market economy (Sreenivas and Dixit 2012: 11; Mohapatra and Gaan 2013: 68).

4.5.6. **Inefficient management of resources** is another big challenge in India. There are five separate Indian ministries handling different energy resources and each of these ministries is concerned with its own specific area of operations, policies and programmes, without a comprehensive plan or harmony across different energy sectors. Therefore, opportunities of inter-linkages and synergy are missing that cause the low quality solutions (Tripathi 2013: 87; Dwivedi 2011: 9).

4.5.7. **Inadequate financial assistance** to overseas arm of government owned Company like ONGC Videsh Limited (OVL) is a drawback of its strategy to secure energy assets in foreign countries. OVL is empowered to invest on its own only in projects costing less than $75 million, and beyond this, it has to go through a lengthy approval for process. Unlike this, cash rich Chinese companies such as CNPC, CNOOC, and Sinopec have outbid OVL in overseas bidding using political influence of Chinese government. This is the reason why these companies are willing to accept lower rates of return pricing that China has so far been ready to pay for securing equity oil abroad. Recently, OVL has lost the race to buy an 8.4 per cent stake in Kazakhstan oil

field to Chinese oil firm CNPC which would have been critical in achieving its target of 60 million tons by 2030. There is thus a need to provide adequate financial assistance and freedom to companies like OVL for making successful breakthroughs abroad (Carl, Rai and Victor 2008; Modi 2013).

This overview of India's energy issues show that India is undergoing a number of energy related challenges and the strategies to meet these challenges for achieving energy security is complex and multidimensional. It calls for wide ranging reforms including strengthening the political and administrative systems, increasing domestic production and developing reliable foreign partnership for ensuring energy security. The government of India is of course expanding its list of suppliers due to increase in the future demand, for which it has selected new locations for bringing energy into the country such as Nigeria, Venezuela, etc. Central Asia region is also one among these destinations, as it is emerging as a new hub of energy resources for India. Because of having political interactions, historical-cultural and trade relations, India has recently adopted Connect Central Policy, to which we turn now in the next chapter.

Chapter 5

Relations between India and Central Asia on Energy Issues

5.1. Introduction

As already indicated in the previous chapter, India's growing population, particularly the middle class and significant economic growth is forcing the country to diversify its energy mix as well as energy suppliers. Energy security today has become a vital imperative in national security and foreign policy. India finds itself in a vulnerable position due to the uncertainty prevailing with its conventional energy suppliers and look for new suppliers especially in central Asia and Africa. India's remarkable rise in its efforts to engage with Central Asian countries are seen driven by two primary concerns- energy and it commitment to fight terrorism and Islamic fundamentalism that would pose a threat to India's security (Ahmad 2010: 145; Campbell 2013: 1). Nevertheless, energy remains the main thrust area for India's interest in this region. Central Asian region has historical connection with India through merchant diaspora and business and trade networks and during the time of the great game, Russia and Britain had made the region their strategic target location in order to establish/retain control over South Asia (Kaur 2011: 250). Central Asia is seen as a site of a New Great Game in which new powers have developed interests in the region, including the US, China, Turkey, Iran, Pakistan, India etc., for energy and strategic control. Russia is trying to maintain its legacy in the region (Abbas 2012: 3). Moreover, the partition in 1947 and politics of South Asia in the aftermath of partition and the independence of Central Asian countries after the collapse of Soviet Union in 1991 have changed the geographical and geopolitical landscape in South and Central Asia (Taraporevala et al 2014). As a result, India has lost its direct land route connectivity to the region and India's attempt to re-connect with Central Asia has not been very successful. In such a context, to boost up the efforts in this direction India has recently launched the 'Connect Central Asia Policy' (CCAP). The chapter focuses on how Central Asia's energy stock and India's energy needs are factored in its CCAP.

5.2. Central Asia: A Source of Attraction

Globalization has become a buzzword of the 21st century but the process of globalization did not occurred uniformly across the globe. It has been shaped and

modified by the unique characteristics of regions and nations which include the history, level of economic development, existing political systems, regional cooperation, established patterns of civilization and stability of culture providing geographical distinctiveness to any defined space (Hanks 2010: 3-4). In today's multi-polar world, regionalization and regions are assuming importance in international affairs and Central Asia is also one of the important burgeoning regions in this regard. It is the heart of Asian continent and a crossroad of invaders and traders since the ancient times as represented by the ancient silk route. It constitutes five republics today, namely Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. It constitutes a vast geographical space which has always been a source of attraction and analysis for neighbouring powers as well as foreign ones due to its geopolitical and strategic importance (Duarte 2013: 30-31). With more than a total population of 92 million people, availability of abundant natural resources and strategic location on the global map, particularly on that of Asia's map, it has emerged as most eye-catching region in the world both economically and strategically (OECD 2011: 3). This region is also surrounded by some of fastest growing economies in the world such as Russia, India and China. Central Asian economies are heavily dependent on the export of energy resources. Kazakhstan holds an estimated 65 years of oil reserves and 308 years of coal reserves. On the other hand, Turkmenistan holds 223 years of natural gas reserves, while Kyrgyzstan and Tajikistan have substantial sources of hydropower (OECD 2011: 4). Tajikistan has great potential to generate 527 billion KwH of Hydropower capacities among the former Soviet States and second after Russia (Prasad and Mullen 2013). The region's richness in both human and natural resources have thus contributed to its strong growth over the past decade (OECD 2011: 4).

For centuries, Central Asia has been the centre of rivalries and conspiracies by the great powers. During the nineteenth century, Britain feared that there was possibility that another European power would take advantage of Islamic Asia's political decay. It began with France and followed by Russia (Duarte 2013: 30). It was apprehended that Russia wanted to move forward along the caravan routes of the ancient conquerors, threatening to establish a new world monarchy (Fromkin 1980: 936). Consequently, Britain expressed its concern

regarding the consequences of the steady march of the Russian Empire towards South Asia. In the last quarter of the nineteenth century, it was relatively a common statement in Europe, that the next major war - the inevitable war - would be the final confrontation between Britain and Russia. Central Asia was thus at the center of rivalry between Tsarist Russia and British Empire, which was called as the 'Great Game' (Fromkin 1980: 936; Lansford 2002: 128).[22] Both the imperial powers fought for control over Afghanistan as a strategic base that could be used for invading each other (Abbas 2012: 3). Russia and Britain never declared open war against each other, instead the war occurred as silently and secretly in remote places of Central Asia, which apparently went through three phases. The first phase started with the expansion of the Russian Empire in the Caucasus and Central Asia region from late eighteenth century which was ended in 1907 with the signing of Anglo-Russian convention. Subsequently, the second phase began in 1907 which lasted up to 1917 and ended with the agreement on the same methods used in the previous phase as resorting to secret agents who sought to manipulate local population and tribes. In the end, the final phase of the Great Game occurred after the 1917 Russian revolution to liberate the whole Asia from imperialist domination through the armed revolt (Duarte 2013: 31). Security and power were two objectives of the two powers and the game continued until the Second World War. After the World War II, Soviet Russia and the United States emerged as the dominant powers in the world politics, leading to the called cold war. Cold war witnessed so many vibrant conflicts and confrontations occurred in the Middle East and other Asian regions, while the present Central Asian countries were part of Soviet Russia. The collapse of Soviet Russia in 1991 and independence of CARs brought Central Asia back as a site of contestation between diverse powers, often referred to as the New Great Game (Duarte 2013: 31; Edwards 2003: 85). It is said that the level of regional internationalization remained at peak even in the New Great Game era. In the new power game, the United States and its allies are using the region as an important supply hub for the Afghanistan war effort to control terrorism (Edwards 2003: 87). Russia wants to exert its geopolitical influence to maintain its legacy in the region and China is

[22] The term Great Game was firstly coined by Arthur Conolly as the power struggle between the two mighty empires as 'Great Game' in 1840, though it was immortalized by Rudyard Kipling in his novel *Kim* (Kipling 2009; Hopkirk 1990).

looking at the region with energy hungry eyes and wants to make partnerships with them to stabilize and develop the restless Xinjiang (Cooley 2012).

The expression of the New Great Game was introduced by Pakistani Journalist Ahmed Rashid in 1990s, in which regional energy resource potential became geopolitical concern in the international interactions (Abbas 2012: 3). Central Asia again has become core place of the new geopolitical game which also involves Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan along with major big powers such as Russia and United States and other emerging powers such as China, India, Turkey, Iran and Pakistan showing interests in the power game at play in the region (Abbas 2012: 3). However, the New Great Game does not meant for the effective control of a certain geographical area in Central Asia, rather it is changing from geostrategic pull to the politics of energy and making economic profits from pipelines, tanker routes, petroleum consortium, treaties and contracts (Edwards 2003: 85). CAR's energy resource potential has already been mentioned in the table given in Introduction chapter. Kazakhstan has 30.0 thousand million barrel oil reserves and 1.3 trillion cubic metres (tcm) of gas reserves at the end of 2012 and gas reserves in Turkmenistan are 17.5 trillion cubic metres highest in Central Asia and 0.6 thousand million barrel oil reserve capacity. However, it does have much amount of oil reserves. Uzbekistan has 0.6 thousand million barrel oil reserves and 1.1 trillion cubic metres gas reserves (Dudley 2013).

Not only other powers are taking interest in the region, Central Asian countries have also started to establish relations with neighboring countries for their advantage. Unlike the old Great Game in the period of conquest and competition, CAR governments are now working overtime to capitalize the involvement of the external powers for their power advantageous and political control (Kharkongor 2013). It is their misfortune that they are land-locked, which results in limited space for oil and gas transport routes. Nevertheless, there are four routes are available for this such as Northern route, Western route, Southern route and East route (Jacob 2005). Mostly, oil and gas are imported through Northern and Western routes as shown below in two different maps of oil and gas transportation.

Map 5.1: Oil Transportation Pipeline Routes in Central Asia

Source:http://news.bbc.co.uk/nol/shared/spl/hi/world/10/oil_gas_786/img/gas_network_jan2010_786.gif (Accessed on January 15, 2014)

Map 5.2: Gas Transportation Pipeline Routes in Central Asia

Source:http://news.bbc.co.uk/nol/shared/spl/hi/world/10/oil_gas_786/img/gas_network_jan2010_786.gif (Accessed on January 15, 2014)

Northern route is favoured and occupied by Russia which runs from Baku and Tengiz field of Kazakhstan to Novorossiysk, a Russian seaport in the black sea. However, with the passage of time, CARs started to search for new transport routes because of Russia's monopolistic and dominant policies over the most transport network of the region (Shah 2010). As a result, they have started to develop Western and Southern routes. The western transportation route is being

developed with the help of extra-regional powers such as Azerbaijan, Georgia, Turkey and the United States. This route flows to the Georgia port of Suspa on Black sea from Baku. Another option is BTC (Baku-Tbilisi-Ceyhan) pipeline in western route. This route is favoured and supported by Iran to transport oil and gas to Persian Gulf through its territory but it is opposed by the US. So, it is still under-consideration (Shah 2010). If it becomes operational, India can also certainly benefit from this. The Eastern route is proposed and supported by China which is connected with two oil fields of Caspian Sea in Kazakhstan. Kazakhstan-China oil pipeline is 3200 km long in which both have invested (Shah 2010). It is also proposed to construct Kazakhstan-China gas pipeline. China has also invested in Uzbekistan and Turkmenistan to join gas pipeline. Since China has a border with South Asia, there is possibility to bring Kazakhstan oil to South Asia through the Eastern route (Shah 2010).

On the whole, CARs have been stretching the world powers and the 9/11 and its aftermath has accelerated the region's strategic, geo-economic and geo-political importance. And the abundance of natural resources remains to be their primary asset, which made the region an arena of competition of various powers which are investing in big development projects in Central Asia. Central Asian countries are also trying to develop their diplomatic as well as economic relations to secure stability and economic growth. India, an emerging power is also expecting these countries as good friends to secure energy security as a result of its increasing demand. To strengthen relations with the region, India has been seeking permanent membership in SCO (Shanghai Cooperation Organization) and makes considered attempts to achieve important breakthrough through its CCAP (Kharkongor 2013).

5.3. India's Engagement with the CARs and Achievements

India has concluded several energy ties with many countries, particularly with those in the Persian Gulf. As already pointed out, the uncertainties in the Middle East compelled India to look for new supply options to sustain its economic growth and achieve development (Bhaskar and Roche 2011). Economic growth of India in turn has facilitated its efforts to increase the number of energy suppliers (Taraporevala et al 2014). As a result, it has shown persistent interest in the newly

energy rich CARs to pursue its energy security goals. Though broken into five independent republics, India has been invoking the Indian subcontinent's historic connection with Central Asia, as the two regions were closely linked with each other through trading routes and cultural linkages, the beginnings of which is be traced back to the time of Harappan civilization (Kaur 2011: 250). Trade was the vibrant source of their relationships in the ancient silk route time which have decreased after the partition in 1947 in the absence of direct land corridor to the region. Therefore, Indian trade has to find much longer routes which usually involved the sea route to Iran and through Iran to Afghanistan and Central Asian republics. This made India's trade less competitive in the region (Kaur 2011: 250; Taraporevala et al 2014). In addition, it is pointed out that the disintegration of Soviet Union and the emergence of Central Asia have placed Central Asia in a specific intellectual context influenced by geopolitical theories and debates around the concepts of "end of ideology" and "clash of civilizations" which have very much shaped the new framework of power around Central Asian states and Afghanistan. Therefore, Sir Halford Mackinder gave idea that one, who controls the heartland (Central Asia), controls the world (Laruelle et al 2010: 1-2). However, this situation changed the geopolitical perspectives of India. Although, India has lost its visibility in Central Asia since the disintegration of Soviet Union but now it is trying to regain its footprints in the strategic and energy sector through political negotiations and economic cooperation and by partaking in the efforts aimed at deterring terrorism in the region to the desired extent (Mukerji 2012: 2).

India has already started to establish its footprints in the energy sector despite the lack of energy transportation infrastructure between these regions. Although, we have not much succeeded in securing direct land route with the region due to the political instability in the transitional zone between the subcontinent and the region, yet necessity of India to engage with Central Asia cannot be ignored because Central Asia is not only important in terms of energy but it has also of security and other economic interests such as raw material like coal, iron ore, wheat, steel, aluminium, wool and other materials (Garibov 2013). Therefore, along with tapping energy resources, India is also interested in cooperation in mining, IT, Agriculture, hydro-power and pharmaceutical sectors in order to strengthen and complement the imperatives of energy. It is expected that

such diverse cooperation would strengthen the profile of India in CARs, which would allow it achieve important gains in energy cooperation. Generally, In terms of commercial relations with Central Asia, India is far behind in trade with this growing region. India-Central Asia Trade is hardly near $750 million, comparatively very lower to that of China's $46 billion in 2012 (Garibov 2013; Gupta 2013; Foshko 2012: 50). Table 5.1 below shows India's total trade with Central Asian countries, in which it has very good trade relations with Kazakhstan as their trade is $ 436.25 million in 2011-12 and $ 426.22 million in 2012-13. India's total trade with the region is $ 687.67 million in 2011-12 and less than $ 800 million in 2012-13. At the same time, it has grown more than seven times between 2001-02 and 2012-13.

Table 5.1: India-Central Asia Trade (2001-13) (Trade in US$ millions)

Country	2001-02	2003-04	2005-06	2007-08	2009-10	2011-12	2012-13
Kazakhstan	53.09	84.07	117.16	188.77	291.45	436.25	426.22
Kyrgyzstan	11.53	38.74	29.56	32.43	27.48	31.44	37.08
Tajikistan	2.56	8.42	12.13	22.21	32.56	30.14	48.02
Turkmenistan	6.30	28.55	31.18	44.64	46.15	63.41	78.25
Uzbekistan	23.80	42.84	50.57	56.52	84.00	126.43	156.75
Total Trade	97.28	202.62	240.60	344.57	481.64	687.67	746.32

Source: Export-Import Data Bank, Ministry of Commerce and Industry, Department of Commerce, Government of India, 2013

No doubt, overall Indian trade with the region remains low, but there are increasing trends in the export of certain sectors. The trade in Indian pharmaceuticals is an instance, which shows substantial increase during the period 2008 to 2013 and it now constitute India's primary export to the region (Taraporevala et al 2014). India imports minerals such as zinc, sulphur and limestone largely from Central Asia. Moreover, it signed an agreement on Cooperation in Peaceful Uses of Nuclear Energy in 2011 to import uranium for its civil-nuclear reactors from Kazakhstan. Now it is planning to import uranium from Uzbekistan as well. On the whole, Indian exports to the region are relatively increasing than imports (Ibid 2014). There is thus vast scope for economic

cooperation with the region. The growing trade relations are certainly a good news in determining their relations in strategic sector too in security perspectives for maintaining peace in South and Central Asia and robust energy cooperation. India is thus making its economic policies not only to ensure its economic prosperity but also aiming at certain political goals to translate its foreign policy as an effective tool in Central Asia (Ibid 2014).

In order to strengthen the connection, India used to stress upon the geo-strategic importance of CARs to India. The Minister of State for External Affairs E. Ahamed in his key note address at the first meeting of India-Central Asia Dialogue on 12 June, 2012 in Bishkek said that "India's dynamic presence in the Central Asia will add to stability and development in the entire Central and South Asia region. In this direction, it must factor in the regional situation, especially the challenge of rebuilding the Afghan nation. A mutual and cooperative approach for embedding Afghanistan into a more meaningful regional economic and security framework would have benefits for the entire region. One way is to work towards converting Afghanistan into a hub for trade and energy is connecting Central and South Asia regions. The landmark agreement for the construction of the TAPI pipeline project has put the spotlight on the importance of Central Asia for India's future energy plans in energy sector."[23] It is pointed out by many experts that the "arc of instability" starts from Ferghana Valley, which is heavily populated area of Central Asia, and this arc covers the whole Afghanistan, Pakistani tribal area and ends up in Kashmir. Hence cooperation with Central Asia is central to India's security considerations too. In addition, the withdrawal of international troops from Afghanistan, can pose potential threat of instability and terrorism to India's security. Therefore, India is trying to build strategic relations with Central Asia in the field of security in order to deal with possible threat of instability in Afghanistan and across the region (Garibov 2013). Thus, India's presence in Central Asia is driven by multiple considerations, which would complement its primary economic interest of securing energy from the region.

[23] Ministry of External Affairs, Government of India (Media Centre). *Keynote Address by MOS E. Ahamed at First India-Central Asia Dialogue:India's Connect Central Asia Policy.* June 12, 2012. Accessed on January 30, 2014. Available at: http://www.mea.gov.in/Speeches-Statements.htm?dtl/19791/Keynote+address+by+MOS+Shri+E+Ahamed+at+First+IndiaCentral+Asia+Dialogue

5.4. India's Initiatives on Energy with CARs and Achievements

As already emphasised, to bring energy to India from Central Asia is main factor of its geopolitical engagement in the Central Asian region. In September 1995, India's then Prime Minister P.V. Narasimha Rao, during his visit to Turkmenistan, announced Central Asia as an area of priority to promote stability and cooperation. For this purpose, he hinted to 'Look North Policy' which included long lasting historical relations incorporating the political, economic, cultural and religious aspects for strengthening ties between India and Central Asia (Kharkongor 2013). However, in 1998, Indo-Central Asia's growing relations were jeopardized as a result of India's nuclear testings which were criticised by CARs. They believed that India was just a spectator in their politics and could not pay adequate devotion to Central Asia. Thus, in order to make them realize India's seriousness towards the region, it has adopted 'Forward Central Asia Policy' in post 1998 period for making India more engaging in the Central Asian countries (Ibid 2013).

The India Hydrocarbon Vision 2025, drafted in 2000 also recognized that sufficient supply of hydrocarbons was essential to India's planned economic growth of 8 to 10 percent over the next three decades. Apart from domestic production, it empowers the Indian companies to find equity oil abroad to diversify the energy suppliers (Carl Rai and Victor 2008). However, the shift of the US policy towards India has indicated its growing importance in the world affairs. It has become an important factor of India's foreign policy. The 2008 nuclear deal between the India and the US exempted India from international sanctions regime that prevented India from importing fuel or civilian nuclear technology unless it gave up its nuclear weapons. It was the US who persuaded international community to end this policy. The Indian policy makers and strategists are integrating the goal of energy security into its foreign policy as they are seeking to build partnerships with oil exporting countries, planning new pipeline from Central Asia and the Caucasus to India and also are negotiating agreements on nuclear cooperation (Hanif 2010; The Hindustan Times 2013). Recently, in the press release at Petrotech-2014, Petroleum Minister Veerappa Moily declared that the gas will bring from Turkmenistan to the Indian Border by August 2017. Officials of four countries (Turkmenistan, Afghanistan, Pakistan and India) will prepare a framework with cooperation on this project. However, focus on new Central Asian

countries as a long term energy partners for tapping hydrocarbons have factored in India's Connecting Central Asia policy as an important priority in its foreign policy. Thus, Central Asia has emerged in the energy map of India. He also had a hectic schedule of bilateral and multilateral meetings with his counterparts of fifteen emerging nations such as Ecuador, Uganda, Canada, Sudan, Turkmenistan, Azerbaijan etc. who participated in this addition of Petrotech. Azerbaijan, a successful oil producer, invited upstream Indian companies like ONGC to participate in their oil and gas industry and enable skill development in the new country. Indian Oil Corporation has a term contract for Azeri crude also, while Bharat Petroleum Corporation Limited (BPCL) and Hindustan Petroleum Corporation (HPCL) too were keen to enter term contract for sourcing crude oil from Azerbaijan (PIB 2014: 1-2).

India's interests were more inspired by its energy and security interests in Central Asia which forms the backdrop of these policies. India's energy interests can be viewed through the mirror of her relationship between cooperation and competition with China in the region (Kharkongor 2013). Moreover, most of the Central Asia's energy export is transported through the territory of Russia and the Russian monopoly is a major factor jeopardising Central Asia's energy supply. As a result, CARs themselves are seeking for western, eastern and southern routes for energy supply to reduce its dependence on Russia (Nawal 2011: 107). Keeping in mind, Central Asia's efforts aimed at the diversification of energy supply and India's energy security, in 2005, Prime Minister Dr. Manmohan Singh advised the Indian policy makers to CARs on board to achieving energy security, particularly in the context of China's inroads into CARs (Kharkongor 2013). To strengthen relations between them, many high level visits have been made from both side, for instance, President of Kazakhstan Nursultan Nazarbayev, visit to India and his Indian counterpart President Pratibha Patil's visit to Tajikistan in 2009, Prime Minister Manmohan Singh to Kazakhstan in 2011 and Uzbekistan's President Karimov's visit to India in may 2011 (Roy 2012). These all political exchanges and negotiations have been effective tools for their growing political relation and determining India's desire for meet energy needs in Central Asia in the future (Roy 2012). In parallel, India has also started to make attempts in the direction of energy cooperation with her old a friend Russia and invested in oil and gas

exploration in the joint Russia-Kazakh Kurmangazy oilfield in Caspian Sea. But it said that Russia has vested interests in cooperation with India and China to keep the United States out of the Central Asian region (Kharkongor 2013). On the other side, India and Kazakhstan have started oil and gas sector cooperation and is participating in the exploration and development of its oil and gas field through joint ventures with oil and gas companies of Kazakhstan (Ibid. 2013). During the past few years, India has achieved success in its growing engagement with CARs both bilaterally and multilaterally and expressed its desire to play a meaningful role in the SCO if it gets full membership in the organisation with a similar intention (Kharkongor 2013). India faces challenging competition from China in achieving some of its energy related breakthroughs in Central Asia. For example, in the late 2005 China's CNPC (China National Petroleum Corporation) had outbid India to buy Petro-Kazakhstan with raising its bid to USD 4.18 billion (Gulshan 2011: 116). Recently it has lost the race to buy an 8.4 percent stake in Kazakhstan oil field to the Chinese CNPC (Modi 2013). No doubt that India has started to appear in the energy scene in the region with the beginning of many high level diplomatic and political dialogues with CARs (Gulshan 2011: 117). In 2005, Prime Minister of India Dr. Manmohan Singh launched Look West policy to boost cooperation with the Gulf (PIB 2005) after the Look East Policy, but with its close eye on Central Asia for its long term energy engagement and establishing itself as a considerable player in the region (CSIS 2007). The Look West Policy also underlines India's growing attention to the far corners of northern Africa, newly independent CARs and the Caucasus (Mohan 2004).

In 2006, during a visit to Tashkent in Uzbekistan India's P.M. Dr. Manmohan Singh signed a series of documents between two countries which also included a memorandum between GAIL and Uzbekneftegaz (an oil and gas national holding company) for boosting the joint exploration and exploitation of Uzbekistan fields and also for the construction of liquid gas and oil factories in the Western region of Uzbekistan (Kharkongor 2013). In this direction, President of Kazakhstan paid visit to India in January 2009 and during the visit, India's ONGC Mittal Energy Limited (OMEL is a joint venture between ONGC Videsh and Mittal Investments Sarl) and KazMunaiGaz (KMG) signed a Heads of Agreements for

exploration of oil and gas in the Satpayev Block in the Caspian Sea (Gulshan 2011: 117).

Moreover, both India's ONGC and ME (Mittal Energy) have acquired 30 percent of the shares of oil fields in the Turkmen sector of the Caspian Sea in 2007 and also signed a memorandum for cooperation in the oil and gas sector. However, because of exploratory failure in oil and gas fields, these companies withdrew from the blocks. No doubt, in spite of these failures, India has succeeded to carry out many energy agreements with CARs (Gulshan 2011: 118). For more than a decade the $7.6 billion TAPI gas pipeline project has been in the limelight, which has always been jeopardised by geopolitical uncertainties regarding gas reserves in Turkmenistan, the security concerns in Afghanistan and tense relations between India and Pakistan. In 2006, India was formally invited to join the project and Indian Government authorised the Ministries of Petroleum and Natural Gas for making formal request to join the project and in April 2008, India, Pakistan and Afghanistan signed a framework agreement to buy gas from Turkmenistan (Mahesh 2011: 178-79). In order to o connect with Central Asia via International North South Transport Corridor (INSTC), from 2000 attempts were successfully made to link the large cities of Russia with the Iranian ports of the Persian Gulf and after with the Indian Ocean and first commodity started to flow in 2004, albeit remained limited (Taraporevala et al. 2014). Northern Distribution Network was also launched in 2009 contributing to the launch of trans-Afghan train which was a potential link between Tashkent, Islamabad and India but it seems impossible to develop in the current geopolitical realities in South Asia (Nawal 2011: 107-108). North-South Transport Corridor (NSTC) through Iran to connect India's trade with Central Asia and Eurasia, once realised will serve as India's entrance through the Zaranj-Delaral Roadway (ZDR) in Nimroz Province. With India's assistance it would be further connected to the Garland Highway that Connects with Central Asia. Moreover, India will be able to get access to Russia through the Iranian port of Bandar Anzali on the Caspian cost (Das 2012). This project is still under construction but as it becomes operational it would definitely benefit India in energy sector and economic growth because Suez Canal route is 40 percent larger and 30 percent costlier than Iran route (Mahapatra 2012).

Also, India and Tajikistan have been cooperating in Tajikistan's massive hydroelectricity power projects as a result of which Tajikistan's National Hydro Power Corporation (NHPC) and Bharat Heavy Electricals Limited (BHEL) have signed a Memorandum of Understanding to implement the Government of India funded modernisation of Varzob- 1 hydro power plant in 2012 which will complete the work very soon (Tajik Embassy 2012). However, though, India has contributed given about $20 million in grants to Tajikistan for the modernisation of the hydro power project from 2006 to 2012, but its assistance to hydropower generation in Tajikistan remains limited. India needs to convince the private sector for investing in hydroelectric resources of Central Asia to achieve more concrete results in this direction (Prasad and Mullen 2013). In April 2013, India's Vice President Dr. M. Hamid Ansari paid visit to Tajikistan and signed agreement for bilateral cooperation in IT, energy, health, education, trade, commerce, mining and agriculture. Still, as compared to China, India's actual bilateral cooperation with Tajikistan is very small (Campbell 2013: 6).

India has at least three options to pursue for its energy interests in the region according to Jacob in his article "India's Overseas Energy Policy: The Central Asian Factor" (Jacob 2005: 309). The first option is Turkmenistan-Afghanistan-Pakistan-India. Recently, the Indian Minister for Petroleum and Natural Gas M. Veerappa Moily said that under the US backed $9 billion TAPI pipeline (1680 km long) project, Gas is expected to reach India by 2017-18 (PTI 2013d). India's future energy demand is expected to be met by participating in this pipeline project. China's territory Xinjiang province is India's second option via land route in Central Asia as well as in Russia. Under this plan, natural gas can be transported from Russia, Kazakhstan, Turkmenistan and Uzbekistan through pipeline up to India. Therefore, India needs to strengthen its cooperation with China having strong footprints in the region instead of competing with it for materialising this option (Jacob 2005: 309-12). The Iran territory can be the third option for India to transport energy resources from Central Asia. India can use this route via Iran territory either directly or through Afghanistan which will reach India's west coast through sea. Chah Bahar-Kabul-Kunduz-Badakhshan is the proposed highway from Chahbahar through Afghanistan to Tajikistan which will provide India transport corridor to access Central Asia region. However, closer ties with

Northern Alliance of Afghanistan and its neighbour Tajikistan can boost India to effectively control the often harmful influence of Pakistan's military establishment exercises in Kabul which would help India to strong foothold in the region (Prasad and Mullen 2013). India has to pursue these options, all or selectively, to have connectivity with the land-locked Central Asia to transport energy materials.

On the whole, Central Asia has been source of source of attraction for India especially for more than a decade because of its richness in natural resources, though it couldn't achieve much in concrete from the region to assuage its energy hunger. In the recent years, India has strengthened its efforts to link up the region at diplomatic as well as negotiation levels. Irrespective of these given efforts of India regarding relations with the region, it is still unable to make strong foothold in the Central Asia due to some drawbacks and challenges to their direct connectivity.

5.4.1. Drawbacks and challenges to India-Central Asia Connectivity

In fact, importance of Central Asia is a challenge in itself and there are several drawbacks in speeding up the relationships and governmental interactions of India with the region under the present circumstances. In the present settings of South and Central Asia it seems to be very difficult to bring energy directly and easily from the region. Here are some of vibrant challenges to India and to establish connectivity with Central Asia to satisfy its energy needs in particular.

a) **Lack of direct route connectivity**: India has been lacking direct land route links since its partition. This forms the fundamental challenge in establishing easy and sustainable connection. This poses a great difficulty for India's trade with Central Asia as it has to seek other options to connect with Central Asia. Land route connection plays a key role in developing trade and transport of energy materials (Foshko 2012: 8).
b) **India's relations with neighbouring countries and weak border**: This is the main geopolitical challenge and associated problem with the above stated point. Governments of India's neighbours are poor, corrupt, unstable and dysfunctional, and can be easily manipulated. Moreover, India has hostile neighbours like Pakistan and China. China's encirclement of India via Nepal, Bangladesh, Sri Lanka and Pakistan poses problems for its

security. These types of relationships with neighbouring countries and weak borders (e.g. Pakistan's infiltration into Kashmir, pressures of migration from Bangladesh, Tamils' identity in Sri Lanka and Nepal's open borders) made India an isolated land which has to struggle for making presence across the region.[24] These conditions are the major challenge for projects like the TAPI pipeline as Indian government apprehends that Pakistan would everything possible to jeopardize its energy security. In addition, the present political situation of Afghanistan not conducive to this project (Jacob 2005: 311).

c) **Islamic extremism**: This issue has been focal point of India's concern on its national security. The terrorist activities such as Taliban insurgency on domestic soil of Afghanistan and Pakistan has been enthreatening. The attack on Indian Parliament in 2001 and Mumbai attacks in 2008, masterminded by Pakistan-based Lashkar-e-Taiba (LeT) are telling examples. Due to the proximity of CARs to the Afghan border, Central Asian countries are also experiencing terrorist activities and drug trafficking which has become a big security concern for India too. The threat of Islamic Movement of Uzbekistan (IMU) and Islamic Jihadists Union (IJU) undermining domestic stability are grappling the region (Sharan 2012). Since there is always threat of disruption to India's energy initiatives across the region it has become vital for India to ensure strategic and border security along with energy security.

d) **Geopolitical competition between great powers in the energy sector**: There is an intense competition in the region between great powers of the world such as the US, Russia and emerging power China, which are economically as well as politically involved in the region, in the energy sector. China is one of the major energy competitors for India in the Central Asian energy story. Chinese companies are outbidding the Indian companies like ONGC Videsh Ltd. Recently, in 2013 China won $5 Billion oil deal from India, thereby facing intense competition with China (Saikia 2013) as already mentioned in previous chapter.. Russia wanted to maintain it soviet legacy over the region. Both China and Russia are

[24] "China, India and Energy in South and Central Asia". Accessed on November 19, 2013. Available at: https://www.youtube.com/watch?v=Heq5T9SdMx4

members of SCO and aiming at reducing the US influence in the region. On the other hand, the US is trying to exploit energy resources of the region and make this a strategic base to control Islamic terrorism (Ahmad 2010: 139). Hence India has to push its interests through the interplay of these powers and across their individual interests. Moreover, Pakistan, Iran and Turkey are trying to pursuing their intersts in the region and Pakistan conitnues not only to block India geographically but also politically (Blank 2014). China is not supporting India's membership in SCO and left india behind as a investor in Central Asia, particularly in energy sectors. There is a probability that US withdrawl from Afghanistan would reduce India's ability to gain foothold in the region (Ibid 2014). In addition, US sanctions on Iran are reducing India's potential to invest in INSTC linking Central Asia.

In short, India has been lagging behind in meeting its energy needs in Central Asia because of these challenges. Nevertheless, India has been trying to make foothold in the region in several ways using its soft power and investment measurements and diplomatic and political negotiations. It is with such an intention India has recently launched the CCAP which covers all areas of India's goals to achieve in the region. It is an integrated, multifaceted and long-duration strategy to achieve positive results on Central Asia. Such a concerted approach would allow India to push its energy priorities with regard to CARs.

5.5. India's Soft Power Initiative in CARs: 'Connect Central Asia Policy'

As already pointed out, after having a successful experience from its Look East Policy, India has now started think ways to exploit the energy rich region of Central Asia which would give boost to its foreign policy on energy. Irrespective of the difficulties like the presence of great powers in the region, limited trade and limited size of markets, Central Asia has gained valuable place in the foreign policy of India for more than a decade. The 'Connect Central Asia Policy' is a concrete testimony of this growing interest, which is based on pro-active political economic and people to people connectivity with the region both individually and collectively (Parashar 2012). CCAP obviously add to its energy policy to tap the natural resources in the region.

The Connect Central Asia Policy was first disclosed by the Minister of State for External Affairs E. Ahmed on the occasion of First India-Central Asia dialogue organized on 12-13 June in 2012 in Bishkek, Kyrgyzstan for strengthening India's relations and interests in its extended neighbourhood countries in the region. It aimed at increasing India's engagement with the region both bilaterally and multilaterally, which has been limited in the last two decades (Sarma 2012). This also offers chances for Central Asian countries to meet their desire to diversify hydropower and energy export routes, corresponding with India's quest for diversifying energy imports (Kharkongor 2013). CCAP highlights the broader aspects of India-Central Asia cooperation on several subjects such as exchanges of high level visits to strengthen political relations both bilaterally and multilaterally, to gain strategic and security cooperation via military training, joint research, counterterrorism coordination and close consultation on Afghanistan. It also proposes to bolster engagement with Central Asian partners through the SCO, Eurasian Economic Community and the Custom Union and for this purpose it is already proposing Comprehensive Economic Cooperation Agreement to integrate its markets within Eurasian space. The policy is also looking at the region as a long term partner in energy and natural resources (Das 2012). Apart from this, setting up of civil hospitals and clinics in the medical field to ensure modern health care system in CARs, contributing to higher education system like setting up a Central Asian University in Bishkek to impart world class education in areas like IT, Management, Philosophy and languages, to work on Central Asian e-networking with its hub in India, to encourage construction sector, promote land connectivity through reactivating INSTC route are some of its soft power initiatives in the region (Taraporevala et al. 2014). In addition, through this policy India wants to expand viable banking infrastructure and policy environment which is absent in the region, a major impediment to trade and investment. Finally, to improve air connectivity to promote tourism and to enhance people to people connectivity through mutual exchanges of youth delegations, students, scholars, academics and future leaders of India to sustain our deep engagement are also India's policy concerns (Ahamed 2012). Such a comprehensive approach would be beneficial for India to strengthen its engagement in the energy sector of the region from a long-duree perspective. A country which is relying on imports for 90 percent of its oil and more than half of its gas and coal requirements, Central Asia is will certainly remain a favourable

option for India (Taraporevala et al. 2014). Chabahar port of Iran in the Gulf of Oman and Bandar Abbas port near the Strait of Hormuz are likely to become as potential route for transporting into Afghanistan and through its territory to Central Asia (Ibid 2014) which is part of INSTC route as already have been discussed previously. India has already allocated $ 100 million to develop Chabahar port in May 2013. The policy outlines the role of India to promote INSTC trade route as it is involved in ongoing discussion with Iran to complete under-construction portion of this route which will result in shorter transit time for trade with Central Asia (Ibid 2014). In addition, the policy ensures other route other possible routes discussed previously (Das 2012). These all are the concern of CCAP.

Exchanges of high level visits by leaderships from both sides as described in the policy can help in strengthening the cooperation in multiple areas. In addition, joint research programs and exchanges of ideas of scholars on energy, trade and geopolitical issues probably contribute to the research on India-Central Asia's joint ventures in the energy sectors which would provide them a space for decision making regarding energy and security strategy (Ahamed 2012). This policy further emphasizes on People to people connectivity and humanitarian concerns such as opening hospitals and education systems through which they can know about each other needs and win the governments favour (Ahamed 2012). Thus, it is expected that India would increase its cooperation in the region both bilaterally and multilaterally through these soft power initiatives which would prove to be effective tools of its engagement in the region's energy sector.

This policy also outlines the role of India's engagement with Central Asian partners though the SCO, EEC and Custom Union. SCO is more influential multilateral organization in Central Asia. India has already engaged the SCO member states in humanitarian areas which are also covered in its CCAP and would continue to seek to strengthen these through the SCO platform. For achieving goals and objectives of CCAP India is seeking cooperation of Iran and SCO members (Ahamed 2012). It also considers SCO as strategic platform to discuss the challenges related to Afghanistan because stability in Afghanistan which can complete political, economic and security transitions in the years to come and acquire its historical importance as a hub of trade and transit routes during silk route days (Ibid 2012). Moreover, in spite of not a member of SCO,

India has strongly endorsed the proposal of Russia creating an SCO energy club that was first articulated in 2007. Further, SCO Development Bank could be a useful vehicle for economic cooperation. SCO Development Bank would be effective tool in promoting South and Central Asian cooperation and exchanges (Anand 2013).

No doubt, realization of this policy can spur the development of Indian engagement in the region. Indian government and business has already started to make contacts with their Central Asian counterparts for enhancing mutual cooperation through this policy framework. Its main focus on cooperation on developing transportation infrastructure linking India-Central Asia region to facilitate the increase of trade turnover and import of strategic natural resources still remains a needed component which is essential for the growth of Indian economy (Garibov 2013). It is thus expected that this policy would help to revitalize South and Central Asia trade links which can further give boost to energy imports of India from the region (Taraporevala et al. 2014). Finally, it looks impossible to bring energy directly from Central Asia on the face of the current geopolitical realities in South Asia, but CCAP is going to be an effective tool for India in order to make strong footholds in the region, and slowly push its energy agenda effectively. The challenge is to bring the policy into practice in real sense rather than considering it just as a written document.

Chapter 6

Conclusion and Policy Directions

Energy has been a geopolitical commodity in the world affairs for centuries. The present study indicates that international system is undergoing vibrant changes and challenges in the global energy space, especially over the last two decades. World economies are unable to reduce the dependency over fossil fuels even though some of them have advanced renewable technologies. At the same time demand of energy is growing by prohibitive heights since the industrial revolution in the 18th century, developing into a crisis by early 1970s, leading to the integration of energy security in the international theories. Thereafter, world economies continued to face energy crisis mainly due to political and economic fallouts which led to fluctuation in the energy prices. Political events such as 1979 Iranian revolution, Iraq invasion of Kuwait in 1990, disintegration of Soviet Union, 1997 Asian financial crisis, violence in Gulf countries, 9/11 consequences, American led invasion of Iraq, Israel Lebanon conflict in 2006 and violence in Nigeria perpetuated the crisis, apart from the global recession in 2008. The global energy situation continues to be engulfed by uncertainties due to geopolitical circumstances which add more pressure on global energy markets. This is also coupled with growing energy demands due to demographic change and economic growth and development. The growth rate in demand and consumption is more in the developing non-OECD nations, as compared to the OECD nations, as per the projections for 2010-2040.

The consumption and production trends between non-OECD and OECD nations in terms of conventional and non conventional energy resources from 1990 to 2012 indicate that there is robust growth rate in the production and consumption of conventional energy resources in non-OECD nations than that of OECD nations. Though growth rate do not really tell much about the actual consumption, the present growth rate if continued unabated has the potential to leave the OECD nations behind in this race. These trends are opposite in terms of non-conventional energy resources in which share of OECD nations is growing in production and consumption as they are attaching themselves with more energy efficiency technologies, wherein non-OECD countries lag behind. But the global

energy basket is still being dominated by fossil fuels which constitute more than 85 percent. The study pointed out that the rapid economic growth in developing economies like Brazil, China and India over the last two decades and absorbing expansion of middle class have been two major components giving boost to increasing energy demand. As per the estimates, India will have the maximum of middle class population in the world, surpassing China, as it will expand from 200 million in 2020 to 475 million by 2030. Therefore, fast economic growth particularly in developing world, growth in the world middle class having both negative and positive impacts and could be managed by successful planning and predicting as far as energy is concerned. Promoting good governance and management gave way to an idea of global energy governance as a result of which several governing energy institutions such as IEA, OPEC, G8, G20, ADB etc. emerged on global scene. The study, nevertheless, found that existing institutions have largely failed to achieve their goals to meet the requirements of global energy governance due to the self interests and lack of coordination on global energy issues. As a result the world is facing energy crisis, not primarily because of shortage of energy resources, we still have enough fossil fuels and also have abundant non-conventional energy resources having good environmental implications beyond our needs, but because of unawareness and lack of effective management.

India has been experiencing dramatic economic growth since 1990 which led to the growth of industrialization, open markets and upward movement in living standards. Due to limited natural resources of energy and growing energy demand with population growth, expansion of middle class and surge in the living standards, it is facing an energy crisis. After analyzing India's current energy landscape, the study found that the supply side is facing persistent shortages. Moreover there is less progress in domestic exploration, which results in excessive dependency over imports and vulnerabilities of global political order. The gap between energy production and consumption is widening, thereby increasing imbalance between demand and supply. At the same time, around 412 million are living in India without access to commercial energy, which is a big challenge for developing nation. It is pointed out that inappropriate subsidies on energy enhance price distortions, diversions, misuse and malpractice in the energy sector and petroleum sector is one of the highly subsidized sectors in the country. India has

deregulated the prices of petrol in June 2010, but prices of diesel, PDS Kerosene and domestic LPG continue to be regulated. Though the study is not against the principle behind subsidies, it underlines the need for reforms as most part of subsidy benefits goes into the pockets of untargeted groups, which results in overuse of energy. Growing urbanization and middle-classisation is found going hand in hand. The urban population in the country increased from 27.81 per cent in 2001 to 31.16 per cent in 2011 as per the census data. Privatization is seen as another factor responsible for encouraging the energy demand through facilitating easy access to energy to its households, alongside making energy costly and inaccessible. India faces a challenging task to effectively address these daunting issues in the energy sector through considered policies and changes at the level of governance.

India efforts in the direction of achieving energy security by making policy shifts and crucial strategies in the post-Soviet period, such as open market policies, re-drawing five years plans with an emphasis on energy, boosting the role of private and public sectors, launching New Exploration Energy Policy in 1997, formulating Hydrocarbon Vision 2025 in 2000, passing Deregulatory Petroleum Bill and Integrated Energy Policy in 2006, approving National Mission on Enhance Energy Efficiency etc., has been commendable. In spite of this, India is not very successful in securing energy security not only at the domestic level but also at the international level, due to indoor problems and tense relationship with neighbouring countries. There are crucial problems like demand and supply mismatch, divergence between the state and centre level laws regarding energy, compulsions of multiparty/regional politics, excessive bureaucracy and corruption, which complicate the process of making comprehensive energy policy. Public-private partnership model remains less attractive, which is seen as essential to maintain economic activity in the country. Lack of robust and reliable baseline data regarding energy demand and supply reflects the absence of responsible agency for this. Inefficient management of resources and lack of coordination and synergy between the five ministries on different energy resources pose enormous problem. Inadequate financial assistance to the overseas Indian companies is seen as a fundamental problem in securing energy assets in other countries. All these inadequacies calls for more reforms in the domestic energy sector, side by side it

should expand the list of suppliers. India's exploration into Central Asia is part of the latter. The study indicates that the recently adopted 'Connect Central Asia Policy' would have future implications for India in the direction of its desire to achieve secure energy supply.

The study outlines the importance of Central Asia as a source of attraction for various world powers due to its strategic and commercial importance. Today Central Asia has emerged as a region rich in energy resources. For instance, Kazakhstan has 30.0 thousand million barrel oil reserves and 1.3 trillion cubic metres (tcm) of gas reserves at the end of 2012 and gas reserves in Turkmenistan are 17.5 trillion cubic metres, which the highest in Central Asia and 0.6 thousand million barrel oil reserve capacity and Uzbekistan has 0.6 thousand million barrel oil reserves and 1.1 trillion cubic metres gas reserves. However, it does have much amount of oil reserves, which created a situation of a New Great Game after the collapse of Soviet Union in which US, Russia, China, Turkey, Iran, Pakistan etc. are partakers to establish their influence over the region. After the 9/11, the region has additionally become strategically, geo-economically and geo-politically important. It found that emerging economy like India is also pursuing its interests in the region due to its historical relations along with the imperative of energy security. However, India does not have much trade with the region, though it is gradually growing which is currently less than $ 800 million. These, countries are also important in terms of India's security concerns which require their mutual cooperation on the stability in the both regions. But, in spite of this, it is still unable to make strong foothold in the Central Asia due to some drawbacks and challenges such as absence of direct land route connectivity, its tense relations with neighbouring countries and weak border, threat of Islamic extremism in both regions and geopolitical competition with great power involved in Central Asia, especially that of China.

India has been making consistent efforts to make strong cooperation with CARs in the energy front, though the success has been so far minimal. Initiatives of joint exploration and production, acquisition of shares in oil fields, efforts towards the TAPI pipeline and INSTC transport corridor, establishing port connectivity leading to CARs, cooperation in hydroelectric power projects, etc. are a few breakthroughs. Much is left unachieved. Nevertheless, the study argues that

India's newly adopted 'Connect Central Asia Policy' can prove to be crucial in its energy policy in the region as it covers various areas of cooperation bilaterally and multilaterally and based on pro-active political, economic and people to people connectivity with the region both individually and collectively. Therefore it is likely to become Indian government's soft power initiative which would highlight the close ties between them, and to achieve the goals of this policy, which require strong commitment to translate policy into practice.

Policy Directions and Recommendations

India has to work out a multipronged strategy to address the energy issue and overcome the crisis it is currently undergoing. There is a need to stabilize the population growth, to make the growing middle class accountable and to enhance trade, cooperation and peace though planning and diplomacy. Steps need to be taken for using energy intelligently and discriminatively. Providing education to the people about the environmental consequences of fossil fuels and about the energy efficiency, and giving more and more emphasis on non-conventional energy resources which have good environmental implications are important here. At the same time, strategies to reduce dependency on external supply would only bring long term solutions and India must accelerate its domestic exploration of energy resources and develop sophisticated technologies for the same. Subsidies must be carefully and intelligibly dispensed, alongside putting in place institutional structures to address corruption in the energy sector. There is a need to bring greater cooperation and coordination in the working of different ministries, particularly those handling different energy sources. Having realized the practical difficulties in transporting energy from Central Asia under the present geopolitical realities, India should adopt pragmatic strategies and should continue its political dialogues with CARs and other transit countries. A strategy of cooperation rather competition would best suit its interests. India needs to pursue its 'Connect Central Asia Policy' energetically, irrespective of its unimpressive gains so far, to achieve plausible breakthroughs in energy cooperation with CARs.

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