MARKET ADAPTATION STRATEGIES OF MAJOR NATURAL GAS COMPANIES IN THE EUROPEAN UNION

A THESIS SUBMITTED TO

THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
THE MIDDLE EAST TECHNICAL UNIVERSITY

BY
SEZEN BOZKURT

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
THE DEPARTMENT OF EUROPEAN STUDIES

DECEMBER 2014

Approval of the Graduate School of Social Sciences

Prof. Dr. Meliha Altunışık
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Assoc. Prof. Dr. Galip Yalman
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

Prof. Dr. Oktay F. Tanrısever
Supervisor

Examining Committee Members

Prof. Dr. Meliha Altunışık (METU, IR) _____

Prof. Dr. Oktay F. Tanrısever (METU, IR) _____

Prof. Dr. Çınar Özen (AU, IR) _____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: Sezen Bozkurt

Signature :

ABSTRACT

MARKET ADAPTATION STRATEGIES OF MAJOR NATURAL GAS COMPANIES IN THE EUROPEAN UNION

Bozkurt, Sezen

M. Sc., Department of European Studies

Supervisor: Prof. Dr. Oktay F. Tanrısever

December 2014, 117 pages

The recent changes in the EU natural gas market as well as imminent aims of the European Union policy makers pushed natural gas companies into a position that strong change management systems and organizational modifications are in need. The regulatory changes enforced into the market are aimed to increase competition and ease the market entry. While the liberalization and unbundling in regulated markets are expected to bring better and healthier competition; some literatures point out that they may not create the expected results as projected.

Consequently this thesis argues that, together with the changing global dynamics of natural gas markets, reform packages in of the EU is causing the companies to get involved in different collaborative actions and strategic organizational changes which will compensate for the decreased control over markets due to unbundling and will not increase competition as expected.

Keywords: EU natural gas market, strategic management, market adaptation, liberalization, unbundling

ÖZ

AVRUPA BİRLİĞİ PAZARINDA FAALİYET GÖSTEREN BÜYÜK DOĞAL GAZ ŞİRKETLERİNİN PAZAR ADAPTASYON STRATEJİLERİ

Bozkurt, Sezen

Yüksek Lisans, Avrupa Çalışmaları Bölümü

Tez Yöneticisi: Prof. Dr. Oktay F. Tanrısever

Aralık 2014, 117 sayfa

Avrupa Birliği doğal gaz pazarındaki değişen dinamikler ve Avrupa Birliği'nin sürdürmekte olduğu reformlar pazardaki aktif şirketleri örgütsel değişime ve stratejik değişim yönetimi uygulamalarına yönlendiriyor. Avrupa Birliği gaz pazarındaki hukuki düzenlemeler rekabeti arttırmayı ve pazara yeni firmaların girişini kolaylaştırmayı hedefliyor. Pazardaki serbestleşmenin ve yönetim ayrıştırmasının daha sağlıklı bir rekabet sağlayacağı beklenmekte iken, literatürdeki bazı kaynaklar bu uygulamaların beklenen sonuçları yaratamayabileceğine dikkat çekiyor.

Bu tez çalışması, Avrupa Birliği tarafından düzenlenen gaz piyasası reform paketlerinin değişen dünya pazarı dinamikleri ile birlikte, şirketleri farklı işbirliği çalışmalarına ve stratejik örgütsel değişimlere yönlendirdiğini; bunun sonucu olarak da şirketlerin pazar içerisinde azalan kontrol güçlerini dengelediğini ve rekabetin beklendiği ölçüde artamayacağını savunmaktadır.

Anahtar Kelimeler: Avrupa Birliği doğal gaz pazarı, stratejik yönetim, pazar adaptasyonu, serbestleşme, yönetim ayrıştırması

ACKNOWLEDGMENTS

Throughout this Masters education, there are many people that I would like to acknowledge for their contribution.

First and the foremost, I would like to express my deepest gratitude to Prof.Dr. Oktay F. Tanrısever, my research supervisor, who abundantly offered his guidance and assistance. His encouragement and support made me materialise this dissertation. Also, I would like to acknowledge the examining committee members, Prof.Dr. Meliha Altunışık and Prof.Dr. Çınar Özen, for their feedback, directions and assistance. As well, all of my course instructors in METU have helped me learn a lot about European Studies.

Last but not least, a special recognition goes to my dear family who always supported me and believed in my success wholeheartedly.

TABLE OF CONTENTS

LIST OF TABLES

TABLES

LIST OF FIGURES

FIGURES

CHAPTER 1

Introduction

1.1 Scope of thesis

The scope of this study includes the analysis of recent changes and expected structural variations in near future of the EU natural gas market. While doing so, the effects of these changes on business owners and corporations, which are not commonly investigated, will be analysed and the strategies of market adaptation by the companies will be emphasized.

Energy is the capacity for doing dynamic activity. Every activity of human beings' requires energy; thus it has always been the key in life. It is indispensable for the production, industry, survival of nations and the world order.

When the Second World War left Europe devastated and divided, European nations went after a solution that will end the separation as well as lighten up exhausted economy. The key resources for production of energy in that era, coal and steel, bring six European countries together under the organization of European Coal and Steel Community on July 23, 1952[1]. Today European Coal and Steel Community does not exist anymore; it is perpetuated by the European Union. Besides coal and steel are far from being indispensable with the growing popularity of other energy sources. Now, natural gas is the energy source of new era. It is cleaner, accessible and deliverable; carrying several benefits for electricity and power generation. All around the world natural gas is now the vital component of energy supply. All scenario studies for future of energy market demonstrate that the demand for natural gas will rise until 2035 dissimilar to the

[1] Belgium, France, Germany, Luxemburg, Italy and Netherlands are the six founders. see *The History of European Union, europa.eu*

other fossil fuels[2].The importance of gas in the world's future energy source portfolio will continue for many long years. [3]

Europe is not able to produce enough gas to cover its needs. The main suppliers of the European Union are Russia, Norway and Algeria, which together accounts nearly for 50% of gas supply to Europe with Russia being the principal supplier with 34% for very long years[4].

According to the International Energy Agency gas consumption is expected to grow 42% by the year 2030[5]. As well, the EU estimates that to meet at least 30% of its primary energy needs natural gas will be used in year 2035, 80% of which is estimated to be imported[6]. Thus it would not be wrong to state that expected substantial increase in gap between supply and demand will cause European natural gas imports to increase prominently in near future.

There are many reasons for expected high increase in gas demand. Firstly production of European gas has already peaked and it has been going into a

---

[2]The annual growth of gas demand between 2009 and 2035 is expected to be between 0.9-2 percent. The largest share of demand growth is from Non-OECD countries. See Hisham Khatib,(2012), "IEA World Energy Outlook 2011-A Comment," *Energy Policy*, Volume, pp. 48 737–43

[3] Jonas Teusch, (2012),Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria,CEPS Working Document, p.2

[4] Morgan Bazilian, Ascha Pedersen, and Edmond Baranes. (2013) "*Will Shale Gas Be a 'Game-Changer' in Europe?*" retrieved from: https://cleanenergysolutions.org/blogs/11/shale-gas-game-changer-europe

[5] Tony Melling, Branko Terzic, Vello Kuuskraa, Chirstopher Goncalves, Hidehiro Nakagami, Mikhail Korchemkin, Adnan Vatansever, (2010), The Changing Fundamentals of Global Gas Markets – Europe as the Battleground?, Carniege Endovment for International Peace

[6] Morgan Bazilian, Ascha Pedersen, and Edmond Baranes. (2013) "*Will Shale Gas Be a 'Game-Changer' in Europe?*" retrieved from: https://cleanenergysolutions.org/blogs/11/shale-gas-game-changer-europe

decline[7]. Secondly, the capacity of gas-fired power generation is significantly increasing in Europe. Also, the Fukushima accident and many other recent accidents that caused discussion of energy production methods to escalate are another reason for preference of natural gas. Increase in demand will be much sharper especially when economic situation recover together, climate policy restrictions surge and geopolitical tensions increase which causes oil linked gas prices to escalate[8].

Another important fact to reflect is Europe's strong desire to diversify its suppliers. Other than selling the gas for higher prices, Russia is seen as unreliable supplier due to previous supply-cuts in critically energy needed times[9]. During crisis in 2006 and 2009, especially some Southeastern European countries, which today have unstable economies, met great interruption in gas supply. Furthermore, looking for new supply sources created an increased demand on Caspian gas too and thus the EU is supporting different pipeline projects to overpass Russia[10].

All the changes regarding market structure are bringing obstacles both for European policy makers and for the companies who are operating in the market itself or for the supplier companies outside the Union. In the light of this situation, the thesis is aiming to portray the environment where major natural gas companies are existing and their strategies.

---

[7] Matthew Hulbert, (2010) "Europe's Gas: Careful What You Wish for.", European Energy Review, Retrieved from: http://www.europeanenergyreview.eu/site/pagina.php?id=1813&print=1

[8] James, Stafford. (2012) "Renewable Technologies and Our Energy Future", European Energy Review, retrieved from: http://www.europeanenergyreview.eu/site/pagina.php?id=3630

[9] Anders Aslund,(2010) , Gazprom Is the Essence of the Energy Curse , The Moscow Times

[10] Larissa Eltsefon, (2010), Are Caspian and Middle-East Pipelines the Future of the European Gas Market? , Wilson Center

1.2 Review of Literature

In terms of the literature regarding market adaptation strategies of the major natural gas companies in the European Union, the basis of the discussion is based on the dynamics of relationship between regulating party and the companies. The nature of relationship between regulatory bodies, governments and oil-gas companies establish the strategic change management activities pursued by the companies. The concept which is applicable for that relationship is the agency theory discussing the difficulties between two parties, principal and agent, that engage into a transaction relationship[11]. In general, principal pays to agent to get the desired service; and in return agent becomes able to make decisions on the desired service on behalf of principal[12]. However at the same time principal tries to control agent's behavior by getting into contractual relationship together.

Due to the nature of this relationship, agents become more autonomous for the sake of maximizing their own interests but this happens at the expense of principals[13]. Thus a goal conflict arises between principal and agent[14]. Also, another conflict exists due to asymmetry of information between two parties. Asymmetric information concept is used in economy together with contract theory

---

[11] See Richard Lipsey, (1983) An introduction to positive economics. Weidenfeld and Nicolson, London;

Tita de Lange, (2005) A theory of the firm only a microeconomist could love? A microeconomist's reply to Iubatkin's critique of agency theory, Journal of Management Inquiry Volume 14, pp. 404-406;

Peter Wright, A. Mukherji, Mark Kroll, (2001), A reexamination of agency theory assumptions: extensions and extrapolations. The Journal of Socio-Economics, Volume 30, pp. 413-429.

[12] Kathleen Eisenhardt, (1989), Agency theory: An assessment and review, The Academy of Management Review, Volume 14, p. 58

[13] Anurag Sharma, (1997), Professional as agent: knowledge asymmetry in agency exchange, The Academy of Management Review, Volume 22, p 759

[14] International Energy Agency, (2007a), Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency, p.27

and it explain how one party holds significant information relevant to the transaction but does not transfer it to the other party[15].

Those conflicts cause two principal-agent problems to arise in the transaction; adverse selection and moral hazard. Adverse selection is a problem which occurs when one of the parties act for the sake of self-interest before the transaction happens[16]. On the other hand the moral hazard problem explains opportunistic behavior after the contract being signed.

In energy markets, government and regulatory bodies are the principals while oil and gas companies are their agents. Principals have the objective of meeting the energy demand while agents complete the work with less cost. On the other hand agents aim to maximize and grow their profits. In their transaction principal controls if the agent protects principal's rights using certain incentives and monitoring scheme.

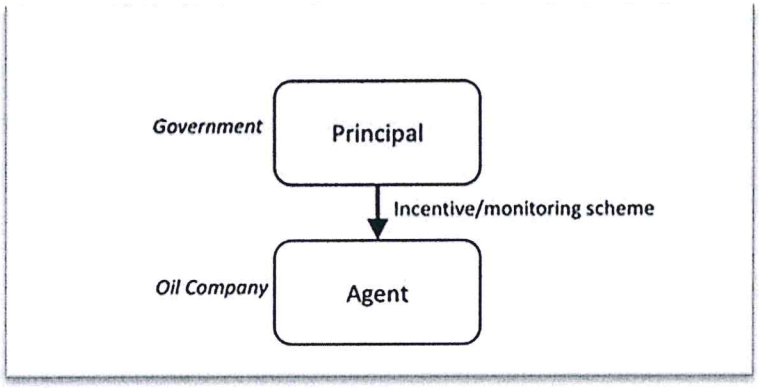

FIGURE 1
Principal-Agent Relationship in Oil and Gas Industry, source: Mark Thurber, 2012[17]

[15] George Akerlof, (1970), The Market for Lemons: Quality Uncertainty and Market Mechanism, The Quarterly Journal of Economics, Volume 84, No.3, p.489

[16] Oliver E. Williamson, (1985), The Economic Institutions of Capitalism: Firms, Market, Relational Contracting, p.3

[17] Mark Thurber, (2012), NOCs and the Global Oil Market: Should We Worry?, Stanford University Energy Seminar

It is highly apparent that regulatory decisions that are given by the government on the service agents cause, adverse selection problem to occur. While the government is the one holding decision power on regulations applied on the companies, the companies generally hold much more information on the market, activities and the industry. Due to asymmetric information, accurate regulatory decisions for the companies' or the market's interest are not always guaranteed.

The companies try their best to break asymmetric information flow with lobbying and public relations activities during the period of any new regulatory action taken. It is also seen different companies to come together under an organization to make their voices heard louder[18].

Because of the principal-agent problems, regulations do not fit thoroughly to the nature of business. Generally, it would need companies to adapt their systems and internal procedures according to the new regulation to survive their business. To run the businesses effectively and efficiently in such a dynamic environment they execute strategic business planning and organizational change management activities. Companies that do not adjust to changing environment will disappear or lose competitive advantage and also their position in the market they perform. Changes in European natural gas market also affected the performing companies although they mainly adapted to it.

Strategic business planning and change management translates the organization's strategy into set of actions to define strategic objectives, required resources and operating roadmap. These strategic activities generally involve developing new

[18] For example U.S. Climate Action Partnership (USCAP) was supported by oil and gas companies such as BP; ConocoPhillips in its early years. Wall Street Journal, (2010), Defections Shake Up Climate Coalition, Retrieved from: http://online.wsj.com/articles/SB10001424052748704804204575069440096420212

markets, services and products or totally changing the business nature or mergers and acquisitions[19].

To ensure robust strategy, the companies need to decide on the most attractive targets and proper resource allocation as well as organization, systems and technology needs to be aligned to support the strategy. The strategy is more of a roadmap for which units, employees and management is directed into and committed in following it[20]. With a proper strategic business planning, the company would work in a harmony to reach the common goal shared by every division and worker[21].

The practice of strategic business planning generally requires to be supported with strategic change management practices. The urge to change starts with external factors first. The market, politics, regulations or demand may change. These changes make the organization realize the need to adapt the new situation. Then a strategy for the organization appears. It is important to state that in this stage many organizations get into contact with managerial consultancy companies who are professionalized in market analysis and organizational change roadmap. Later, the strategy designed needs to be translated into an action plan on operational and people level.

Defining risks present in the market is one critical process in strategic planning. The risks faced in global business markets can be grouped into five: market risks, credit risks, operational risks, liquidity risk and political risk[22]. Managing

---

[19] Clive Reading, (2003) Strategic Business Planning-A dynamic system for improving performance and competitive advantage, London and Sterling VA, p.7

[20] Clive Reading, (2003) Strategic Business Planning-A dynamic system for improving performance and competitive advantage, London and Sterling VA, p.1

[21] Clive Reading, (2003) Strategic Business Planning-A dynamic system for improving performance and competitive advantage, London and Sterling VA, p.1

[22] Energy Information Administration, (2002), Derivatives and Risk Management in the Petroleum, Natural Gas and Electricity Industries, p.ix

political risk is a vital part of strategic change management. Any type of political decision or change that has power of alteration on companies' expected outcome of business actions is considered as political risk[23]. Today political risk is in such a business threatening level; thus there are even political risk insurance packages available for use of companies as risk mitigation tool[24]. According to a recent World Bank report, choosing political risk as the most important investment constraint in emerging markets are seen in more than half of the organizations[25].

For energy industry players, due to volatility of commodity prices market price and commercial risks have long been accepted as the most common obstacles[26]. However, geopolitics is distressing global industry and the effects of political risk are much more vibrant since the energy sourcing is always a part of global politics. While the complexity of markets and the pace of change are increasing, the impact of political risk on companies' performance is greater than before. Unsettled governance in energy-rich regions, energy supply security, sustainable business operations are pressuring the energy companies together with industry-wise competition on exploration and emerging markets business development activities[27]. Recent Eurozone crisis, Arab Spring Protests, debt ceiling in the United States and Russia-Ukraine crisis are just few of the political risks that are

---

[23] Price Waterhouse Coopers Advisory and Eurasia Group Viewpoint-Energy, (2006) How Energy Companies Can Improve Global Business Performance by Better Managing Political Risk, p.2

[24] Daniel Wagner, (2000), The Impact of Political Change and How to Protect Your Business Against It, International Risk Management Institute Online, Retrieved from: http://www.irmi.com/expert/articles/2000/wagner04.aspx

[25] World Bank Multilateral Investment Guarantee Agency, (2013), World Investment and Political Risk, p.5

[26] Alan Berlin, (2003), Managing Political Risk in the Oil and Gas Industries, Oil Gas & Energy Law, Volume 1 Issue 2, p.2

[27] Alan Berlin, (2003), Managing Political Risk in the Oil and Gas Industries, Oil Gas & Energy Law, Volume 1 Issue 2, p.2

threatening oil and gas industry players all around the world[28]. Essential fact regarding political risk is that it is not a consequence of the political system of host country; besides political risk emerges from the changing political circumstances of Host County from the period when oil and gas agreement was made[29].

The most common political risk mitigation techniques that are part of strategic business planning are engaging in lobbying activities, establishing local community programs, improving dialogue with local governments, hiring local workers and political risk insurances, alliances, mergers and acquisitions[30].The capital intensive nature of the industry requires large sums of liquid to be obtained at one time to continue operations in oil and natural gas fields. While the projects are mainly financed by bank credits, especially if political risk concerns are aroused it could not be easy to find commercially viable options from banks for project financing. Such a condition requires two or more companies to come together to merge an alliance so that the risk sharing can be realized without much interference of third party financial institutions. Whatever the company strategy is, it is nearly impossible to find any major oil and gas production or pipeline project which does not have more than one if not many more partners participating in it. For instance, Shah Deniz, the largest natural gas field in Azerbaijan, which will be supplying natural gas to Europe with the Southern Corridor consists of six partners that are BP, TPAO, SOCAR, Statoil, Lukoil and NICO.

When two or more firms come together voluntarily to enhance their competitive strategies effectiveness, it is called strategic alliance. It can be formed by

---

[28] Daniel Wagner, (2000), The Impact of Political Change and How to Protect Your Business Against It, International Risk Management Institute Online, Retrieved from: http://www.irmi.com/expert/articles/2000/wagner04.aspx

[29] Alan Berlin, (2003), Managing Political Risk in the Oil and Gas Industries, Oil Gas & Energy Law, Volume 1 Issue 2, p.3

[30] Accenture, (2012), Managing Political Risk – Controlling Loss Finding Opportunity, p.8

companies in similar or different positions of the natural gas value chain. It involves development of products, technologies and services, sharing and exchanging know-how. In oil and gas industry, alliances are formed mainly for cost and risk sharing objectives although the partners normally compete in the same market and the industry. While reaching economies of scale is the concern, the alliance can be formed for project financing, joint production or even common technological research and development activities[31]. Companies establish many different relationships with their competitors. The distinguishing elements of strategic alliance relationship are two-way exchange of know-how, trust and worrying about partners' performance[32].

Another common strategy practice in oil and gas industry is vertical integration which is expected to lose its popularity due to recent regulative changes in many markets. Vertical integration consists of holding oil and gas value chain under one single company. It is a successful practice especially to eliminate the risks involved in short-term markets[33]. Buying or controlling companies in different levels of value chain would ensure the supply and not being affected by price fluctuations while supplying companies mitigate risk of renegotiations. However, many liberalized markets do not allow natural gas companies to operate in all stages of value chain; also the European Union is trying to implement unbundling and independent system operator in transportation of natural gas.

1.3 Argument of thesis

This thesis argues that recent changes in the market together with imminent aims of the European Union policy makers put European natural gas companies into a position that strong change management systems together with organizational

---

[31] Andrew Inkpen, Kannan Ramaswamy, (2006), Global Strategy: Creating and Sustaining Advatage Across Borders, Oxford University Press p.81

[32] Andrew Inkpen, Kannan Ramaswamy, (2006), Global Strategy: Creating and Sustaining Advatage Across Borders, Oxford University Press p.81

[33] DNV KEMA, (2013), Study on LT-ST Markets in Gas Final Report, p.9

modifications are required to be applied. The regulatory changes applied into the market are aimed to increase competition especially as a result of unbundling obligation. There is a common argument of liberalization and unbundling in regulated markets bring better and healthier competition. Nonetheless, some scholars claim that unbundling may also have deteriorating results in competition.

Thus, the thesis argues contrary to the common belief, reform packages in the EU natural gas market is causing the companies to get involved in different collaborative actions and strategic organizational changes which will cover up for the decreased control over markets due to unbundling.

Consequently, the study focuses on companies' strategies to keep up with the changes in the EU Natural Gas Market. It is targeting to answer the below stated research questions:

-What are the recent and expected changes in European Natural Gas Market?

- How do Natural Gas companies active in European Natural Gas Market keep up with the changes?

Considering motivations had, the study is aiming to investigate the factors and strategies that bring various European companies competitive advantage whilst aligning their activities with the EU natural gas market changes. While trying to reach this objective, the study is expected to highlight the prominence of successful strategic management system to ensure a prospective future in highly dynamic sector such as the gas market of Europe.

Thus, the objectives are listed as:

- Identifying the critical and recent changes in the EU natural gas market
- Recognizing the possible roadmap of the Union's market with its effects on the companies
- Distinguishing market adaptation strategies of the companies that are active in the EU natural gas market.

1.4 Methodology

Research methodology is a way of gathering and analyzing the collected data from existing information been published or circulated[34]. Data is collected to be utilized as a source of rational, argument and assessment[35]. Data collection is required to grasp conclusions in any study. Based on the person collecting the data, there are two main types of it; primary and secondary. Primary data is collected for the specific purpose of the study by the researcher but secondary data is collected by someone else for another reason although it is being used by the researcher[36].

For the particular research designed for this dissertation, secondary data sources will be preferred considering the disadvantages of primary data as well as difficulties of collecting it from primary sources. There are considerable amounts of secondary data that are available in various sources regarding the scope of this research. The principal advantage obtainable from secondary study is the authentication and subsequent justification of data gathered. The data is mainly published in credible sources and thus peer reviewed which increases its credibility[37]. Also the data is available for cross matching in different sources which eliminates subjectivity until certain level.

Although relevant data will be gathered from various sources there are major documents which will be reviewed thoroughly in addition to many academic journals articles and international news:

- Reports and Publications of Directorate General for Energy

---

[34] Mark Saunders, Philip Lewis, and Adrian Thornhill, (2009), Research Methods for Business Students, Prentice Hall, p.5

[35] Erik Mooi, Marko Sarstedt, (2011), A Concise Guide to Market Research, Springer, p.26

[36] Erik Mooi, Marko Sarstedt, (2011), A Concise Guide to Market Research, Springer, p.26.

[37] Robert K, Yin (2003), Case Study Research: Design and Methods, Applied Social Research Methods Series, p.88

- EU Energy Law
- Agency for the Cooperation of Energy Regulators
- Annual Reports of Companies

1.5 Organization of Chapters

There are two main sections in the thesis excluding introduction and conclusion chapters. The first section consisting chapters 2, 3 and 4 will demonstrate the facts and changing dynamics about global and the EU natural gas market, the second section will focus completely on the active companies in the EU market and their strategies. All the information demonstrated in the thesis, especially the strategy section, will be analyzed and interpreted within the concepts of relevant literature on strategic management theories that are highlighted in this introduction chapter.

In the first chapter, Introduction, broader view of the topic is given together with the importance of it and the reasons to work on this topic. The chapter is aiming to help the reader to grasp a basic understanding of the relevant strategic management theories, thesis argument, objectives and structure of the thesis.

The second chapter gives the broad-spectrum information on natural gas and the natural gas markets. Differences between the local natural gas markets are underlined; overall reserve statistics are given. Besides, the chapter is mentioning the recent technological developments on natural gas that affect the entire world industry.

The third chapter aims to provide information on dynamics of the European natural gas market. Available reserves and demand, production and import amounts, gas transport system as well as contract types and gas pricing which are changing aspects of market that will be explained.

The fourth chapter is focusing exclusively on the reform in EU natural gas market, starting from a brief background of how natural gas market evolved in Europe. After explanation of how European natural gas market history energy reform

packages of the EU will be described with specific emphasis on each packages' different debate points.

After the fourth chapter, the second section of the thesis comes with chapter 5, Natural Gas Companies and Adaptation Strategies. The characteristics and variety of active companies in the EU gas market are illustrated; their strategies and the way they respond to the regulatory and technical changes of the market are further analyzed.

Finally, the Conclusion chapter summarizes the findings of thesis. It argues that the changing dynamics and natural gas market reform in the EU forces companies to adapt in order to survive in the market. Although the reform is designed to increase competition; strategies of the companies show that they are focusing on mutual cooperation and collaboration in which they try to eliminate the effects competition and sustain their power.

CHAPTER 2

Dynamics of Global Natural Gas Markets

This chapter is organized in three parts. In the first part the general information on natural gas and the natural gas industries is given. Differences between the markets of natural gas are highlighted. Available reserves, demand and production which are the changing aspects of the market will be explained. The last part of the chapter is mentioning the recent technological developments on natural gas that affect the entire world industry.

2.1 Natural Gas Basics

Natural gas is a diluted energy source containing the highest amount of hydrogen amongst all fossil fuels. One tone of natural gas has a volume of 1350 m^3 at standard conditions (15° C, 1013 mb), while oil has a volume little higher than 1m^3. It is an energy source containing the highest amount of hydrogen amongst all fossil fuels; thus being cleaner and less harmful for ecosystem when burned to create energy.

But on the other hand, being more diluted and occupying higher volumes makes natural gas harder to transport and store. It has less and inflexible options for supply and more costly to store when compared to oil[38]. The costs are not only higher compared to oil but they are also more variable based on the location; although produced energy per unit of volume is higher in oil compared to gas[39].

---

[38] Jonathan Stern, Coby van der Linde, (2004) The future of gas: will reality meet expectation?, 9th International Energy Forum-Amsterdam, p.6

[39] Howard V. Rogers, (2012) The Impact of a Globalising Market on Future European Gas Supply and Pricing : The Importance of Asian Demand and North American Supply, The Oxford Institute for Energy Studies, p.2

Natural gas can be transported in either under pressure using gas pipelines or in Liquefied Natural Gas (LNG) form which is created by cooling the gas at certain pressure. In both methods, projects are lengthy, requiring long construction times and capital-intensive. Industry involves higher financial risk based on high investment costs, lack of flexibility in the supply chain and geographical dispersion.

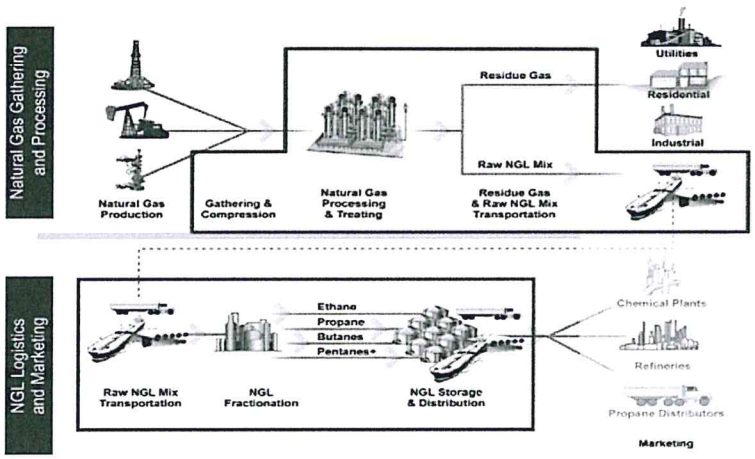

FIGURE 2

Natural Gas Value Chain, source: SemGroup Corp., Annual Report 2011[40]

Due to the nature of the industry, natural gas operations from production to consumption are vertically integrated in general[41]. This value chain starts from exploration and production of the gas, includes transmission and distribution systems and finalize at end-customer trading. There are varieties of firms involved in every segment of the value chain but gas production is considered as the most competitive segment of natural gas industry[42]. Exploration and production

[40] Targa Resources, (2012), Investor Presentation First Quarter 2012, p.4

[41] See Peter D. Cameron, Michael Brothwood (2002) Competition in Energy Markets: Law and Regulation in the European Union, Oxford University Press

[42] Roman Zyuzev, (2008), Gas Market Liberalization as a Key Driver of Change of the European Gas Market and Its Influence on the Strategies of the Main Players, Institut Europeen Des Hautes Etudes Internationales, p.10

activities in oil and gas industry are upstream; transportation and storage are midstream; and refinery and marketing are included in downstream sector[43].

Typically, producer company works with subcontractors such as seismic or driller companies to complete together upstream activities; then they sell natural gas to gas traders which uses gas transmission system, either long high-pressure international pipelines or LNG tankers and re-gasification terminals. Later, local companies also get involved in the system with local delivery pipelines and metering systems to deliver natural gas to the end user[44].

2.2 Global Natural Gas: Markets and Reserves

Natural gas is becoming one of the most popular energy sources all around the world; but there are three main areas where gas trade accumulates; these are North America, Europe and Asia-Pacific[45]. Usually gas markets have different structure and characteristics based on their region[46].

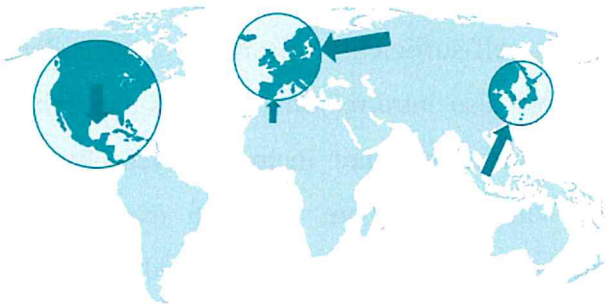

FIGURE 3
World Natural Gas Markets, source: IEA, 2007[47]

[43] Ruud Weijermars, (2010), Value chain analysis of natural gas industry-Lessons from the US regulatory success and opportunities for Europe, Journal of Natural Gas Science and Engineering, Vol 2, p. 88

[44] SemGroup Corporation, (2011), Annual Report, p.4

[45] International Energy Agency (2007b) Natural Gas Market Review, p.20

[46] MIT Energy Initiative, (2011), The Future of Natural Gas, p.3

[47] International Energy Agency (2007b) Natural Gas Market Review, p.21

North America market is mainly self-sufficient. Before unconventional methods became popular in the United States, nearly one-sixth of natural gas used was being imported from Canada[48]. North American gas market is already liberalized, enjoying gas-to-gas competition in which prices decrease when there is oversupply and prices increase during low supply times. Where the natural gas constitutes nearly 25 percent of primary energy supply, if gas prices increase, consumers have a choice to continue paying, reduce their gas use or use other energy sources instead[49].

Asian gas market development started in 1970s. Indonesia, Brunei, Malaysia, Australia and the Middle East countries are main gas producers since the beginning of Asian gas market and they supplied it through rest of the continent. Although gas is relatively smaller percentage in total energy sources in Asia-Pacific, natural gas is still quite important for Japanese power sector[50]. In Japan and Korea gas prices are linked to oil prices but around New Zealand and Australia the prices are dependent on gas-to-gas or gas-to-coal competition.

European market is not self-sufficient; it is highly import-dependent. Not only international imports, but also intra-regional trade is supplying required natural gas. Share of Norwegian exports are increasing year by year; and also the Netherlands and the United Kingdom are both exporting and importing[51]. Traditionally gas price was linked to the oil price and with the recent changes in the EU regulations, this is being changed gradually.

Main natural gas trade is accumulating in three regions but gas reserves are vastly dispersed around the world. According to International Energy Agency statistics

---

[48] International Energy Agency (2007b) Natural Gas Market Review, p.21

[49] International Energy Agency (2007b) Natural Gas Market Review, p.21

[50] International Energy Agency (2007b) Natural Gas Market Review, p.21

[51] International Energy Agency (2007b) Natural Gas Market Review, p.21

as of 2012 there is total of 187.3 trillion cubic meters of gas available. Majority of these reserves are in Middle East region with 43 percent of the total available reserves. The second one on the raking is Europe and Eurasia region. Europe, Eurasia and Middle East regions totals nearly 75 percent of World natural gas reserves. The important information to point here is more than half of the World's proven natural gas reserves are located in only three countries; Russia, Iran and Qatar [52].

Natural gas reserves generally discovered while exploration activities for oil is being conducted. This is due to the fact that natural gas was not being considered as an important and primary energy source until recent years. Also, as mentioned before, gas projects are much more capital intensive due to its nature and return on investment takes much longer years compared to the oil project. But then again with the current developments exploring gas sources alone became a motive to do an investment for petroleum companies. The following figure demonstrates how much of World proven reserves are being discovered in time. Alongside continuing and prospect gas exploration projects around the world, it is expected for proven reserves to increase in following years.

FIGURE 4

Distribution of proved natural gas reserves source: BP Statistical Review of World Energy, 2013[53].

[52] International Energy Agency (2007b) Natural Gas Market Review, p.21

[53] BP, (2013), Statistical review of world energy, p.21

The production amounts of countries are relevant to their total proven resources and proximity to main natural gas trading markets. In recent years, the highest amount of gas production is obtained from North American countries and the second one is Former Soviet Union (FSU) countries[54].

Changes in demand and supply of natural gas over time are highly correlated with economic growth rate of regions and also development in industries. The fastest growing region of the World is China with 12 percent average growth rate per year[55]. The growth rate of China doubles African growth rate which is the second fastest growing region[56].

TABLE 1: Natural Gas Supply and Demand between 1985-2018 (bcm), source: IEA, 2014b[57]

	1985	1990	1995	2000	2005	2010	2012	2018*
OECD DEMAND								
Americas	579	625	721	794	770	850	893	977
Europe	288	323	388	475	543	567	513	525
Asia Oceania	58	84	104	131	153	198	229	261
Total OECD	926	1 032	1 213	1 400	1 466	1 615	1 635	1 763
NON-OECD DEMAND								
FSU/non-OECD Europe	614	762	611	597	653	681	677	709
China	13	16	18	28	49	109	149	295
Other non-OECD Asia	38	67	109	152	220	283	286	360
Latin America	46	58	70	94	122	152	160	190
Middle East	55	88	134	179	262	370	407	492
Africa	24	35	44	55	87	105	113	154
Total non-OECD	789	1 025	986	1 105	1 394	1 700	1 792	2 200
Total demand	**1 715**	**2 057**	**2 199**	**2 505**	**2 860**	**3 315**	**3 427**	**3 962**
OECD SUPPLY								
Americas	583	643	716	760	738	816	885	994
Europe	217	211	258	303	314	300	277	253
Asia Oceania	19	28	36	42	45	60	66	159
Total OECD	819	881	1 010	1 105	1 097	1 176	1 228	1 406
NON-OECD SUPPLY								
FSU/non-OECD Europe	683	831	721	725	812	842	865	954
China	13	15	18	27	49	95	109	173
Other non-OECD Asia	75	115	163	216	275	326	315	367
Latin America	46	60	72	103	145	163	173	200
Middle East	58	92	141	202	309	462	537	607
Africa	45	64	79	119	180	209	206	252
Total Non-OECD	920	1 178	1 194	1 392	1 771	2 097	2 205	2 553
Total supply	**1 739**	**2 059**	**2 203**	**2 498**	**2 868**	**3 274**	**3 433**	**3 959**

[54] International Energy Agency, (2014a), Medium Term Gas Market Report, p.11

[55] The World Bank, (2014), GDP Growth (annual %), retrieved from http://data.worldbank.org/

[56] International Energy Agency, (2014a), Medium Term Gas Market Report, p.11

[57] International Energy Agency, (2014b), Energy supply security, p.51

The table 1 summarizes the demand and supply changes since 1985 and forecasts of year 2018 data. Until the year 2000, FSU countries were supplying the most amongst the world but economic achievement of unconventional gas production in the United States and Canada let Americas to overtake FSU's top producer position. In the meantime global gas demand is expected to increase and to reach nearly 4000 billion cubic meters (bcm) by the year 2018 mainly due to the effect of Non-OECD member countries' growth rate[58].

TABLE 2: Demand and supply changes of natural gas (bcm); source: Interational Energy Agency, 2014a[59]

Total	Demand	Supply
OECD Europe	-26	-9
OECD Americas	-12	-19
OECD Asia Oceania	-6	-9
Africa	-3	-7
Non-OECD Asia	-16	-15
China	-5	9
FSU/non-OECD Europe	-31	-51
Latin America	6	3
Middle East	24	32

The table above compares the most recent demand and supply changes around the world. It is shown that except Latin America, Middle East and China, natural gas supply has been decreased. The interesting fact is that together with supply the demand is also decreased in majority of the regions. This figures are the result of slower economic growth, maturity of the markets and popularity of renewables and/or coal in some of these regions[60].

However, the trade between different natural gas markets has continued and also international trade volume forecasts of near future is showing positive results (see figure 5).

[58] International Energy Agency, (2014b), Energy supply security, p.51

[59] International Energy Agency, (2014a), Medium Term Gas Market Report, p.12

[60] International Energy Agency, (2014a), Medium Term Gas Market Report, p.12

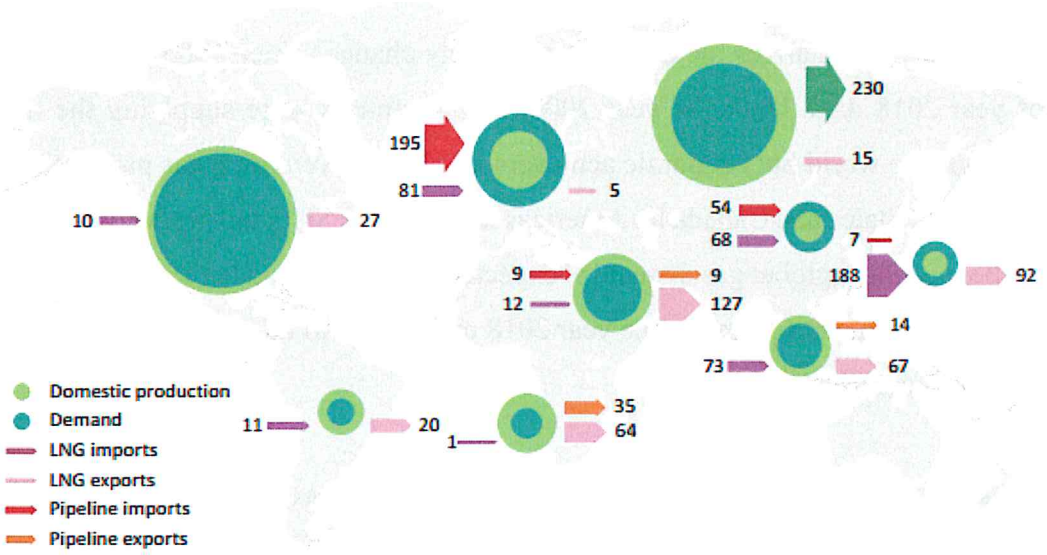

FIGURE 5

Inter-regional natural gas trade, source: IEA, 2014b[61]

As demonstrated in the figure, it is expected for international gas trade to observe important progress based on the supply and demand change forecasts of coming future. The most important change is that United States is expected to become net exporter of natural gas thanks to its increasing domestic production. European will stay as the largest importer; and its imports will continue to be based on pipeline transmission systems. Thus the European countries will be the world's largest pipeline based natural gas importer[62]. This argument is supported with various prospective pipeline projects that the European Union gets involved or interested in the very recent years.

Correspondingly, China will increase its imports as a result of its natural gas production-demand gap will reach to 122 bcm which is the triple of its amount of

[61] International Energy Agency, (2014b), Energy supply security, p.52

[62] International Energy Agency, (2014b), Energy supply security, p.52

year 2012[63]. If the situation for China will be as estimated, it will be the second largest natural gas importer after European region.

In the meantime, Asia Oceania region will also stay as net importer; and the imports will be in LNG form as it is today. Thus, the region is expected to keep its position as the largest LNG importer of the world thanks to Japan which will be the world's largest LNG importer country by itself.

2.3 Natural Gas Technology: LNG and Shale Gas

There are technologies recently being developed and expanded. Upstream (unconventional methods), midstream (carbon sequestration) and downstream (smart metering) parts of gas value chain will all be affected by these technological developments[64].New technologies are shaping the future of industry and affecting the demand.

The liquefied natural gas (LNG) technology is getting more and more popular around the world due to the imports become an alternative for domestic production and pipeline transport when increasing demand or depleted production times. Besides, economies of scale of LNG equipment are still increasing which makes LNG investments attractive[65]. There is similarly Gas to Liquids (GTL) which is also conversion of natural gas into liquid fuel. The production costs of GTL and LNG are quite similar but GTL stays in liquid form in room temperature while LNG needs to be cooled down at -162 Celsius, making it costly to obtain required transport equipment. Thus GTL is another striking option for commercializing ample gas reserves. GTL is a complementary technology

---

[63] International Energy Agency, (2014b), Energy supply security, p.52

[64] See Colette Lewiner, (2010), European energy markets observatory, Springer Science Business Media B.V

[65] See Patrick Cayrade, (2004), Investments in gas pipelines and liquefied natural gas infrastructure. What is the Impact on the Security of Supply?, Nota di Lavoro, p.4

US Energy Information Administration, (2003), The Global Liquefied Natural Gas Market Status and Outlook

together with LNG to create innovative ways to expose inaccessible gas reserves for world markets[66].

LNG and GTL are one way of diversifying gas transport techniques away from traditional pipelines and also let inaccessible natural gas producer countries to export their production, causing more supply options. Thus, it support continental markets turning into a one global market. Although this technology has been used since 1960s, until the end of 1990s it was only used for supplies to Japan and South Korea[67]. The most important global LNG supply players are North America, Australia, Qatar and Nigeria[68]. Nonetheless, it is expected for competition for LNG to increase among Asian, American and Europeans in near future[69].

LNG is one of the significant technologies for the European natural gas market changes. Before, Russia and the other neighboring regions were seemed as the only option for natural gas supply; but now with LNG techniques it is possible to import large amounts of gas by tankers to Europe. It is represent nearly 25% of European imports[70]. The maximum amount of imports is obtained by the United Kingdom and followed by Spain and France; however, in case of increasing interconnection of Spain to the rest of European continent will let the Union to utilize more of Spain's excess import capacity by LNG.

---

[66] See International Energy Agency (2005), Resources to Reserves: Oil and gas technologies for the energy markets of the future, OECD, Paris

[67] Ruud Egging, Steven Gabriel, Franziska Holz, and Jifang Zhuang, (2008), A Complementarity Model for the European Natural Gas Market, Energy Policy, Volume 36 Issue 7, p. 2385

[68] Howard Rogers, (2012), The Impact of a Globalizing Market on Future European Gas Supply and Pricing: The Importance of Asian Demand and North American Supply, Oxford Institute for Energy Studies, Oxford, p.5

[69] Frank A. Verrastro, Sarah O. Ladislaw, Matthew Frank and Lisa A. Hyland (2010), The Geopolitics of Energy: Emerging Trends, Changing Landscapes, Uncertain Times, report to the CSIS Energy and National Security Program, October, p.12

[70] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.6

For LNG trade there has to be two basic types of terminals; liquefaction and re-gasification. To import LNG, the importing country needs to have re-gasification terminal. After the re-gasification process, the gas can be used either in local consumption or exported to another country through pipelines. From the exporters' point of view, LNG terminals are much more flexible compared to building pipelines since LNG liquefaction facilities are not destination bounded[71]. The figure 6 is demonstrating the total LNG re-gasification capacity as of September 2011 and planned capacity until 2020. Until the year 2020, the capacity will nearly double with increasing number of terminals in existing countries and additional terminals built in new countries.

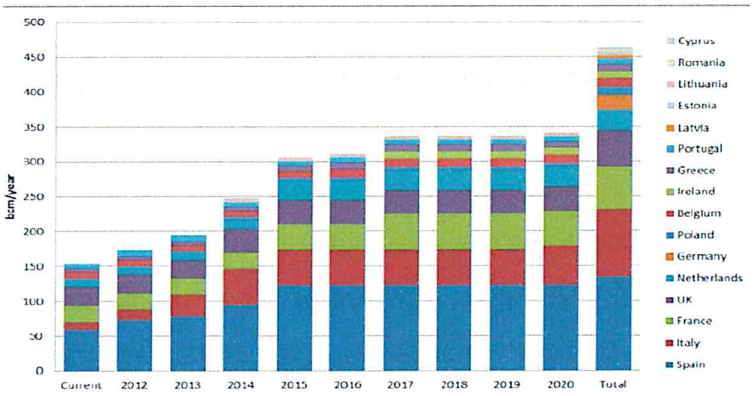

FIGURE 6

Total LNG re-gasification capacity, source JRC (2012) [72]

The main LNG suppliers to Europe are Qatar, Algeria and Egypt; and Qatar is the largest supplier among those, owning many LNG import terminals around Europe. The largest LNG consumers in Europe are the U.K, Spain and France with 22 LNG import terminals in total. Following the increasing popularity of LNG, many countries created policies to motivate LNG infrastructure development. Also, LNG has been part of many European Commission priority projects in Trans-

[71] Jonas Teusch,(2012), Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria,CEPS Working Document, p.5

[72] Joint Research Centre of the European Commission (JRC), (2012), Unconventional Gas: Potential Energy Market Impacts in the European Union, European Commission, Institute for Energy and Transport, p.167

European Energy Networks[73]. Recently, Eastern European countries such as Poland and Estonia also started building of LNG terminals in Baltic Sea to distribute imported LNG throughout Northern and Eastern Europe[74].

Despite the fact that these projects demonstrate Europe's hope to replace some of its Russian imports with LNG imports from different countries, they certainly do not guarantee these hopes to become a firm reality. The European Union is not the only customer for LNG imports. Following 2011 Fukushima accident, some nuclear power plants are switched off in Asia causing gas-fired power generation to gain much more popularity. Unless more LNG is supplied into global markets, certainly there will be a competition between customers to guarantee their supply.

Whereas, new technologies becoming widely used are promising possible benefits to consumers of natural gas, many suppliers find themselves under pressure to adapt changing market situations. For example stress on Russia's natural gas business is not only due to Europe's unending exertion of diversifying the supply source but also global LNG trade. In case of USA starting to dominate global LNG gas market with its large amounts of unconventional natural gas production, gas prices would decline causing Russia's natural gas export profits to drop and lose its market power[75].

Besides, LNG and GTL techniques go hand in hand unconventional natural gas production in a way that dispersed unconventional reserves around the world that

---

[73] See

EC, (2004) Trans-European energy networks: TEN-E priority projects, Luxembourg. Office for Official Publications of the European Communities.

EC, (2006) Decision 1364/2006/EC of the European Parliament and of the Council of 6 September 2006 laying down guidelines for Trans-European Energy Networks and repealing Dec. 96/391/EC and Dec. 1229/2003/EC.

[74] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.26

[75] Meagan Clark, (2014), Europe has several possible replacements for russian gas but all are risky,expensive and will take years to develop, International Business Times

frequently cannot be connected to certain lands by pipelines will reach to those markets such as the European natural gas market by liquefied natural gas tankers.

One of the most recent developments in gas industry is unconventional methods used in gas exploration and development being commercialized. [76]. Although it has recently been popular, its first production dates back to 1821 in USA[77]. It is known in the Europe for at least 135 years but it has never been accepted as a significant source until the conventional natural gas became much of a scarce resource.

Unconventional gas is a generic name for different natural gas extraction methods using more sophisticated technologies such as horizontal drilling and hydraulic fracturing. Unconventional gas include various types such as shale gas[78], tight gas and coalbed methane, among which shale gas is accepted as the most promising one[79].

Especially after the US shale gas boom many debates started all around the world if these techniques should be used to benefit from unconventional resources[80]. Amounts of unconventional natural gas produced in the US are equal to total conventional production of many OPEC countries (see figure 7). This fact denotes how changing the unconventional production can be in one country's position

---

[76] Jonas Teusch, (2012), Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria,CEPS Working Document, p.1

[77] Richard Selley, (2011), UK Shale gas: The story so far, Marine and Petroleum Geology, Volume 31 , p 109

[78] "Shale gas is the gas trapped in fine-grained sedimentary rock called shale that has characteristic flaky quality"; "Tight gas is the gas trapped in relatively impermeable hard rock, limestone or sandstone"; "Coalbed methane is the gas trapped in coal seams, absorbed in the solid matrix of the coal" see JRC (2012), op.cit., p. iv

[79] Jonas Teusch, (2012), Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria,CEPS Working Document, p.1

[80] Jonas Teusch, (2012),Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria,CEPS Working Document, p.1

amongst producer countries. The interesting fact is while conventional resources of natural gas are found in locations close to oil, unconventional gas resources can be found in entirely different areas[81]. This will be affecting the global energy power balance with more of unconventional resources to be developed.

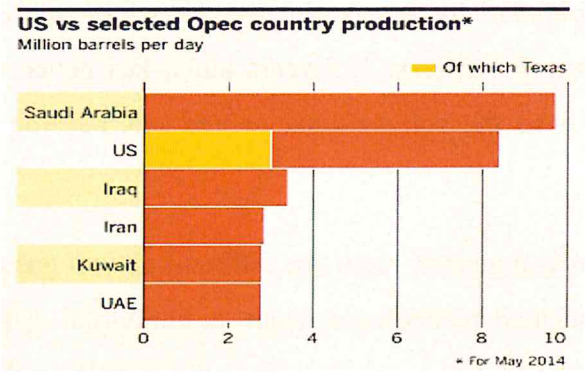

FIGURE 7
US Unconventional Natural Gas Production vs. Opec Countries conventional production source: Financial Times[82] ("Texas" represents unconventional production)

It is expected that in coming 20 years the United States will pursue its position in global unconventional natural gas production and will be followed by China (see figure 8).

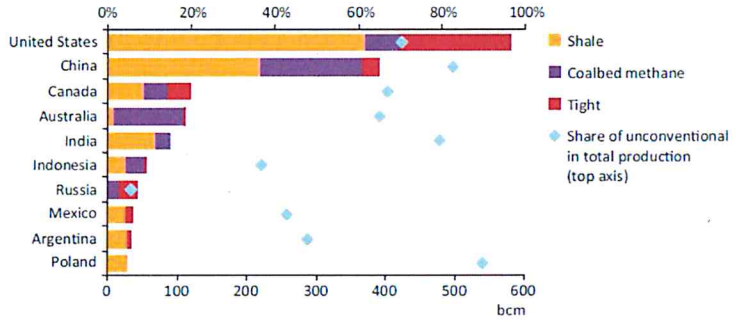

FIGURE 8
Ten Largest Unconventional Gas Producers in 2035 source: Jonas Teusch, (2012)[83]

[81] Frank Verrastro, Sarah O. Ladislaw, Matthew Frank and Lisa A. Hyland, (2010), The Geopolitics of Energy: Emerging Trends, Changing Landscapes, Uncertain Times, report to the CSIS Energy and National Security Program, October, p.13

[82] Financial Times (26 August 2014), Us Shale: What Lies Beneath

While the figure 8 is summarizing the assumed unconventional gas production profile in year 2035, it is demonstrating a very important fact. Many of the countries listed are expected to create majority of their natural gas production from unconventional sources; meaning that their production sums with conventional methods were far from being in the top producers list. Thus, clearly the global powers of natural gas market will be changing in near future.

On the other hand, the EU has not yet started its own shale gas revolution. The pace of discussions on production and development vary depending on the countries' energy source mix and also environmental and energy security perceptions. Then again recoverable reserves of Europe should not be undervalued. The US Energy Administration reports that Europe's recoverable reserves are around 18 tcm while the US reserves are 24 tcm[84]. Nonetheless, it should be kept in consideration that there are very different estimation on how large the European reserves are (see figure 9).

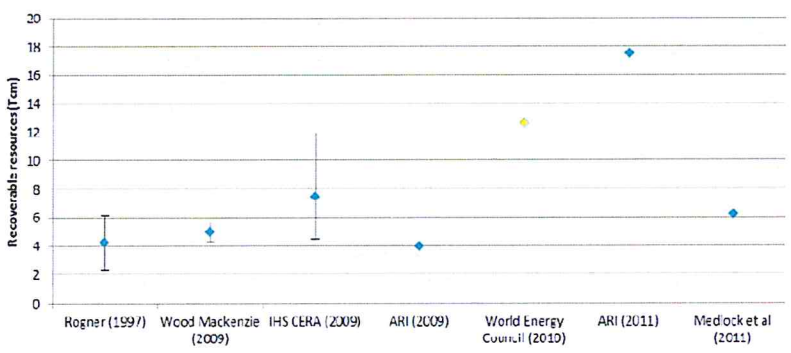

FIGURE 9
Technically recoverable reserve estimates in different researches, source: JRC (2012)[85]

[83] Jonas Teusch, (2012), Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria,CEPS Working Document, p.3

[84] Ekaterina Zelenovskaya, 2013, Impact of Shale Gas Production on the Market Fundamentals and Energy Security of Certain Countries, International Centre for Climate Governance, p.4

[85] Joint Research Centre of the European Commission (JRC), (2012), Unconventional Gas: Potential Energy Market Impacts in the European Union, European Commission, Institute for Energy and Transport, p 29

Europe's largest amount of reserves is located in Poland. The start of commercial unconventional natural gas production in Poland is being delayed due to gas corruption scandal in 2012[86]; still a further investigation is continuing.

If unconventional gas resources in the EU are produced it would balance the expected decline in conventional natural gas production in Europe although the import dependency would not be reduced[87]. Best estimates assume the EU's import dependence level is fixed to 60% with unconventional natural gas production replacing the declining conventional production of natural gas in the Union[88].

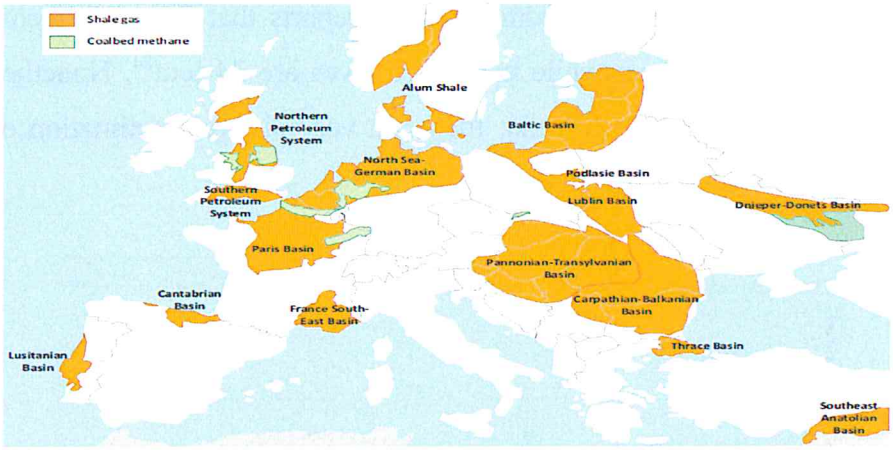

FIGURE 10
European unconventional natural gas resources, source: IEA (2012)[89]

---

[86] Natural Gas Europe, (17 January 2012), Poland Shale Gas Scandal, Retrieved from: http://www.naturalgaseurope.com/tusk-blames-poland-shale-gas-corruption

[87] Jonas Teusch, (2012), Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria, CEPS Working Document, p.3

[88] Joint Research Centre of the European Commission (JRC), (2012), Unconventional Gas: Potential Energy Market Impacts in the European Union, European Commission, Institute for Energy and Transport, p. Xi

[89] International Energy Agency, (2012), Golden rules for a golden age of gas, p.121

Meanwhile, many discussions are raised with the fear of negative environmental effects. While the effect of unconventional methods on climate is not certain, especially in natural resource scarce regions air and water pollution drawback is the main reason for hindrance of unconventional methods[90]. The risk causes of environmental effects are diligently similar to the environmental risks of conventional natural gas production. These are gas migration, ground water and above surface contamination, waste and chemical water spills[91].

Market access issues are another face of European unconventional gas production discussions. Large-scale of unconventional production has not yet seen in countries other than liberalized ones. While USA is being the largest producer of unconventional resources, its market is fully liberalized for long time. On the other hand liberalization process for the European Union is still going on and even far from being completed anytime soon for some opinions[92]. Thus it is not yet clear how the EU regulations can be applied on unconventional natural gas production.

---

[90] See AEA Technology, (2012a), Support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe, report for European Commission DG Environment, p.25;

AEA (2012b), Climate impact of potential shale gas production in the EU, Final Report, Report for European Commission DG CLIMA;

Stefan Lechtenböhmer, Matthias Altmann, Sofia Capito, Zsolt Matra, Werner Weindrorf, Werner Zittel (2011), Impacts of shale gas and shale oil extraction on the environment and on human health, Wuppertal Institute for Climate, Environment and Energy and Ludwig-Bölkow-Systemtechnik GmbH, study requested by the European Parliament's Committee on Environment, Public Health and Food Safety;

Daniel P. Schrag (2012), "Is Shale Gas Good for Climate Change?", Dædalus, the Journal of the American Academy of Arts & Sciences, Volume 141, No. 2

[91] Joint Research Centre of the European Commission (JRC), (2012), Unconventional Gas: Potential Energy Market Impacts in the European Union, European Commission, Institute for Energy and Transport, p.vi

[92] Joint Research Centre of the European Commission (JRC), (2012), Unconventional Gas: Potential Energy Market Impacts in the European Union, European Commission, Institute for Energy and Transport, p.vi

LNG and unconventional natural gas production developments are going hand in hand. So it would not be sufficient if their effects on markets are discussed separately. Increasing global LNG trade volumes together with increasing investment on liquefaction and regasification terminals demonstrate how the trend of LNG popularity will continue in coming years. Increasing domestic production due to unconventional methods in USA resulted with USA LNG imports to route into Europe and Asia while this trend affected regional hub prices to get linked[93]; such development resulted especially in the EU with benefiting natural gas at cheaper prices which are nearly 25% lower than oil-indexed natural gas prices[94].

2.4 Conclusion

Natural gas basics, global natural gas markets and recent technologies are the dynamics that are explained in this chapter. Due to characteristics of natural gas it is harder and more costly to transport but on the other hand high volumes of hydrogen consistence makes it desirable especially for environmental safety purposes.

For many reasons its popularity is increasing around the world and the trade accumulates in three main regions; North America, Europe and Asia-Pacific. While North America is being mainly self-sufficient, Europe is the highly-import dependent one among all natural gas markets. The importance of it surged in Asia-Pacific especially after Fukushima accident which caused many nuclear power plants to shut down.

In this chapter it is highlighted that although natural gas trade is mainly consisting transactions between these three major areas, the natural gas resources are highly dispersed around the world. The highest portion of reserves is located in the Middle East, followed by Eurasia and Europe, Asia-Pacific, Africa and North-

---

[94] Joint Research Centre of the European Commission (JRC), (2012), Unconventional Gas: Potential Energy Market Impacts in the European Union, European Commission, Institute for Energy and Transport, p.vi

America. The disparity between major markets and major producers comes from the demand and need for the natural gas in energy mixture of regions.

In recent years due to increasing popularity of natural gas usage around the world, new technologies are being developed for decreasing the costs and increasing production. Two main developments that go hand in hand are liquefied natural gas and unconventional natural gas production methods. North American market has been enjoying the unconventional production by becoming highly self-sufficient. In Europe, the discussions on whether or not unconventional resources should be developed are continuing. Liquefied natural gas technology is becoming more popular as larger amounts of production are being available due to new techniques of unconventional methods. It allows natural gas to be transported easily without the need of pipelines. Also it is cheaper and much more flexible gas transportation method.

While global natural gas dynamics are changing the balance of power in natural gas markets, there are certain characteristics of European Union market. The following chapter will focus entirely on the EU Natural Gas Market.

CHAPTER 3

EU Natural Gas Market

Traditionally European gas markets could be identified as national markets where the national companies holding exclusive import rights dominated the market although a few retail companies exist. The national companies were holding long-time supply contracts with those retailers ruling out the chance of competition. In the markets pipelines belonging to national energy companies were supplying the gas into value chain sometimes even until the end consumer[95].

This chapter is describing the characteristics of EU Natural Gas Market with diving into details of reserves, demand, production, imports, infrastructure and pricing mechanism.

3.1 Reserves and Demand in the EU Natural Gas Market

The EU produces its energy from coal, nuclear, oil and natural gas mainly. 37 percent of the energy is obtained from oil, almost 18 percent from coal, and 12 percent from nuclear and nearly 24 percent is from natural gas[96] .

First coal was the most popular energy source; later newly built power plants were designed to generate energy from nuclear sources. In the recent years, natural gas is becoming the most popular energy source.

The following figure is showing the existing and planned thermal power plants grouped by the fuel used and their age, by the year 2004. It is clearly demonstrating the increased use of natural gas as a fuel in European power generation industry.

---

[95] Alan Riley, (2006), Energy Security, Gas Market Liberalisation and Our Energy Relationship with Russia, European Energy Security,Working Paper of the European Security Forum, p.30

[96] Eurogas ,(2007), Long Term Outlook for Gas Demand and Supply, p.3

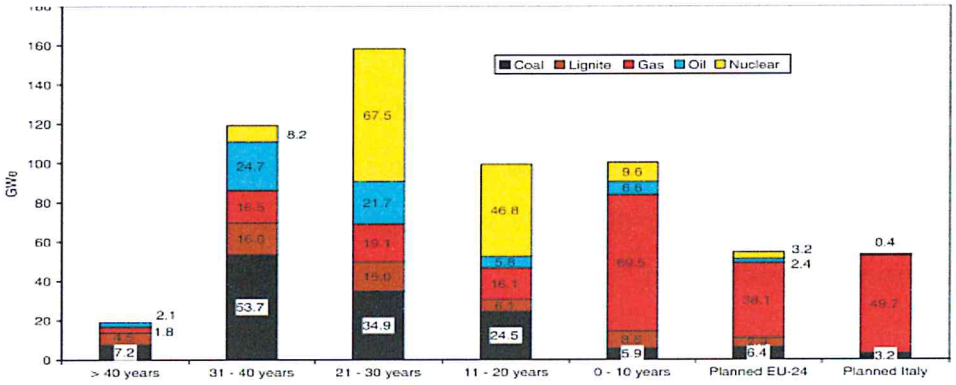

FIGURE 11

Existing and planned thermal plants in EU-25, source: Kjarstad and Johnsson, (2004) [97].

Local natural gas production of the EU mainly comes from the United Kingdom (almost 10 percent) and the Netherlands (almost 30 percent). Though, as North Sea blocks are showing a declining production ratio these two countries' contribution to the EU production is decreasing[98]. The Netherlands has expected to become a net importer of natural gas in 2025 and the UK has already passed that point[99].

The demand rise in the EU is continuous and more upsurges are anticipated in coming years. Estimates show that natural gas demand in the EU will grow nearly 0.7 percent per year together with some decrease in domestic production[100]. In the time being, 25-30 percent of the energy produced from coal would also be

---

[97] Jan Kjärstad, F. Johnsson, (2007), Prospects of the European Gas Market, Energy Policy, Volume 35 Issue 2, p.872

[98] BP, (2006), Quantifying Energy, p.20

[99] Franziska Holz, Christian von Hirschhausen, Claudia Kemfert, (2008), A Strategic Model of European Gas Supply (GASMOD), Energy Economics ,Volume 30 Issue 3, p.769

[100] It is announced that the Netherlands will cut one-fourth of its gas production from Groningen field which is the largest gas field in Western Europe, starting from January 2014, see Natural Gas Europe (2014), Underground storage: down in the dumps, 17 March 2014

terminated together with phase outs of many nuclear power plants by 2020, which requires these amounts to be replaced from another energy source[101].

Another factor for the rising natural gas demand is CO2 emission decisions of the EU. Natural gas is generally described as the cleanest fossil fuel. It produce 29 percent less carbon dioxide per joule when compared to burned oil for same amount of energy production[102].

Besides, the total share of natural gas in energy production is expected to reach 32% in 2020[103]. Plus rising natural gas demand means increasing import dependency.

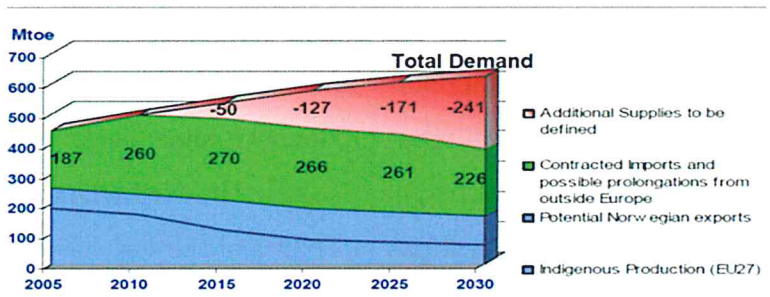

FIGURE 12

European supply gap until year 2030, source: Eurogas[104]

The figure above is demonstrating decrease pattern in supply and increase pattern in demand together with the expected shortfall of natural gas in EU-27 countries. Until the year 2030, not only domestic production of the European Union countries is expected to decrease, but also contracted exports from outside Europe

[101] Germany announced in 2011 that its nuclear power plants will be phased out by the year 2022. See New York Times, (2011), Germany will close nuclear power plants by 2022, retrieved from: http://www.nytimes.com/2011/05/31/world/europe/31germany.html?_r=0

[102] David Cyr, Unclean and Unnatural Side of Natural Gas, retrieved from: http://www.un-naturalgas.org/Un-Natural_Natural_Gas-090129.pdf

[103] Franziska Holz, Christian von Hirschhausen, Claudia Kemfert, (2008), A Strategic Model of European Gas Supply (GASMOD), Energy Economics ,Volume 30 Issue 3, p.768

[104] Eurogas ,(2007), Long Term Outlook for Gas Demand and Supply, p.5

and non-European Union member countries will also fall. Compared to the increasing demand pattern there is a significant amount of natural gas supplies needed.

3.2 Production and Imports

Together with the liberalization of the industry, increases in the demand for natural gas and import dependency are the challenges that the EU is taking for coming decades. One of the largest energy importers of the world is the European Union. It is importing nearly 55% of its energy supply, roughly 84% of oil and 64% of natural gas[105].

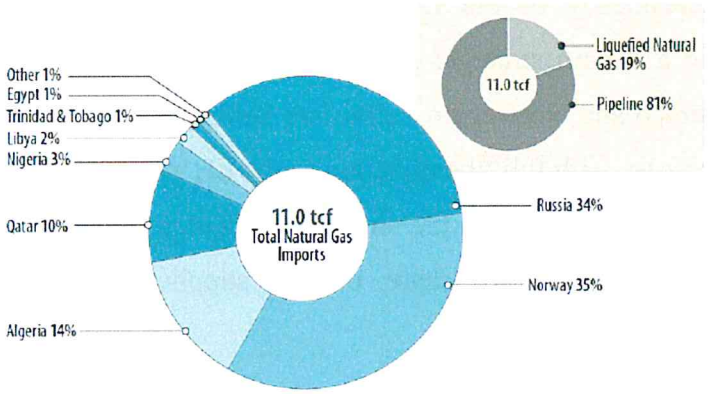

FIGURE 13
EU Natural Gas Imports by 2012 (tcf), source: BP (2013) [106]

For natural gas, Russia is an indispensable supplier for the European Union so far. By 2012 natural gas imports from Russia to the European Union was 155 bcm, which is equal to nearly 34 percent of overall natural gas demand. In the same year, the EU imported 35% of its natural gas from Norway, 14 percent from Algeria, 10 percent from Qatar and the rest mainly from other African countries.

---

[105] European Commission, (2011), Market Observatory for Energy-Key Figures, June 2011, Retrieved from: http://ec.europa.eu/energy/observatory/countries/doc/key_figures.pdf, p.6

[106] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.6

81 percent of this imported gas supplied through pipelines and the rest by LNG tank ship[107] .

The EU's dependence on few exporting countries is not only a source of potential energy deficit but already caused this unwanted situation to be experienced in January 2006 and 2009 when Gazprom cut gas flow to Ukraine[108]. More than half of this imported gas came into the EU through Ukraine, proving Ukraine being the key transit route for the Russian gas into the EU. It is important to mention that the recent problem between Ukraine and Russia over Crimea is reminding Europe one more time that they need to diversify the gas supply as much as possible[109].

Other than dependency of the EU to certain importing countries supplying producers have a certain strategic power in the market. Gazprom from Russia, Algerian Sonatrach and Norwegian Petoro are holding a strategic power which is expected to decrease with full liberalization of the EU gas market[110].
The following table summarizes the study of Holz et.al. regarding the change in export quantities and market share of gas supplier countries in different

[107] All of the gas supplied from Qatar to the EU is in LNG form. Also in year 2012, USA re-exported some amount of natural gas in LNG form since its domestic production increased and its imports become a surplus.

[108] Russian Gazprom cut off the supplies to Ukraine in 2006 due to disputes on gas transit fees and pricing regime. Although the cut off was intended only to Ukraine, some other European countries also had decreasing gas flow in pipelines since Ukraine diverted some gas for its domestic use. See J Stern, (2006), The Russian-Ukrainian Gas Crisis of January 2006, The Oxford Institute for Energy Studies. Then later in 2009, before the commencement of new gas supply contract Russia requested debt of Ukraine for already consumed gas to be paid and due to this request not being fulfilled by Ukraine, gas flow was cut completely one more time.

[109] Following 2014 Ukrainian Revolution, an international crisis emerged between Ukraine and Russia over controlling of Crimean peninsula. See Guy Chazam, (2014), Europe Seeks Alternative Gas Supplies., 27 April 2014, Financial Times

[110] Algerian Sonatrach supplies natural gas to Italy and Spain; and Petoro is the gas export consortium selling the products of Statoil and Hydro to mainly Northern Europe. See Ruud Egging, Steven Gabriel, Franziska Holz, and Jifang Zhuang, (2008), A Complementarity Model for the European Natural Gas Market, Energy Policy, Volume 36 Issue 7, p. 2385

competition scenarios [111]. As it is demonstrated in the table, results of EU liberalization will enhance diversification of gas supplied from different countries into the EU. Compared to the actual export quantity and market share data of year 2003, major suppliers Norway, Russia and Algeria will see decreasing market share in the EU while other countries enjoys an increasing share. Thus, liberalized market is an indispensable structure to be completed for ensuring supply security and fair trade.

TABLE 3: Export quantities and market share source: Holz et.al., (2008)

Exporter	EU liberalization		Reference exports to Europe 2003 [a]	Reference market share 2003
	Exports (bcm/year)	Market share		
Algeria	66.0	11.9%	57.0	17.6%
Libya	14.5	2.6%	0.8	0.2%
Egypt	11.9	2.2%	0	0.0%
Iran	10.0	1.8%	3.5	1.1%
Middle East	26.6	4.8%	2.4	0.7%
Russia	134.4	24.3%	131.8	40.1%
Norway	86.0	15.6%	68.4	20.8%
Netherlands [b]	80.4	14.6%	42.2	12.8%
UK [b]	81.5	14.7%	11.5	3.5%
Nigeria	22.7	4.1%	10.4	3.2%
Trinidad	18.7	3.4%	0	0.0%
Total	552.6 [c]	100.0%	328.7	100.0%

According to some experts the best option Europe has to decrease import dependency is to increase existing pipelines' interconnectivity, increase gas storage facilities and increase transparency to let companies have more efficient business[112].

Since the options for diversification is narrow so far for Europe, various actions are taken with regard to securing supply in the shorter term. In the middle of April 2014 forty-eight percent of gas storage facilities were full, preparing the EU for any short-

[111] Franziska Holz, Christian von Hirschhausen, Claudia Kemfert, (2008), A Strategic Model of European Gas Supply (GASMOD), Energy Economics ,Volume 30 Issue 3, p.778

[112] Increased transparency in gas market will allow operating companies to calculate transport costs more accurately and enter the market with a realistic feasibility studies. See Meagan Clark, (2014), Europe has several possible replacements for russian gas but all are risky,expensive and will take years to develop, International Business Times.

term gas cut-off [113] To retransfer the stored excess gas new interconnector pipelines have been built between Romania and Hungary, Slovenia and Austria, Poland and the Czech Republic and Hungary and Croatia; currently another one between Hungary and Slovakia is being prepared for serving next year[114]. Meanwhile reverse flow pumps are also being installed to let the gas pumped from west to east when needed[115].

Although there is handful of alternatives for diversifying the natural gas supply, Central Asian gas, North African gas and LNG imports, each of these options has their own challenges[116].

TABLE 4. North African Natural Gas as of 2012, source: Ratner et.al. (2013) [117]

Units = trillion cubic feet (tcf)

	Reserves	Production	Exports to EU
Algeria	159.1	2.9	1.7
Egypt	72.0	2.2	0.1
Libya	54.6	0.4	0.2
TOTAL	**285.7**	**5.5**	**2.0**

North African countries such as Algeria, Libya and Egypt can be the candidates to become one of the largest suppliers for European countries. Although total of these three countries can provide nearly half of what Russia provides to Europe, the political instability and infrastructure for transportation of the gas are making it harder to reach to the point.

[113] Guy Chazam, (2014), Europe Seeks Alternative Gas Supplies., 27 April 2014, Financial Times

[114] Guy Chazam, (2014), Europe Seeks Alternative Gas Supplies., 27 April 2014, Financial Times

[115] Guy Chazam, (2014), Europe Seeks Alternative Gas Supplies., 27 April 2014, Financial Times

[116] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.23

[117] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.23

The second largest exporter of North African continent Algeria is thought to have much more shale gas reserves than its current proven reserves[118]. Even though development of these reserves could bring Algeria to being a significant natural gas producer and exporter, its potential has been limited due to difficult business environment [119].The investment and export laws of Algeria is changing frequently and also the natural gas industry is dominated by state-owned Sonatrach; thus there is a little room for competitiveness and excellence in the industry[120].

Another reserve rich country of North Africa is Libya where production of natural gas decreased a sizeable sum since 2011 civil war[121]. Even though the industry has been recovering there are still certain unrest issues close to the production fields. Certainly a potential of increase in natural gas exports exist after new regime and new oil and gas trade system established in the country[122]. Also in Egypt where the domestic demand for natural gas has been increasing, due to uncertain political environment, terrorist attacks as well as hard-to-reach reserves production is not increasing[123]. To be able to be one of the important suppliers for Europe, Egypt needs to encourage western investments and ensure more stable environment[124].

Another significant natural gas resource for Europe is the Caspian Region where proven natural gas reserves estimations are being one of the largest in the world reserve holding regions[125]. Although it is estimated by IEA that the Caspian

---

[118] KPMG, (2013), Oil and Gas in Africa, Full Sector Report, p.11

[119] KPMG, (2013), Oil and Gas in Africa, Full Sector Report, p.11

[120] KPMG, (2013), Oil and Gas in Africa, Full Sector Report, p.11

[121] KPMG, (2013), Oil and Gas in Africa, Full Sector Report, p.8

[122] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.25

[123] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.25

[124] KPMG, (2013), Oil and Gas in Africa, Full Sector Report, p.16

[125] International Energy Agency, (2014b), Energy supply security, p 455

Region's proven and recoverable gas reserves are nearly 7% of the total world reserves, the regions geographic isolation to the world markets causes increase in economic and political risks[126]. The long distance pipelines required to be built are costly; meanwhile the pipelines need to pass through different countries to reach the Europe which makes gas supply vulnerable to any political instability in those countries[127]. Details regarding pipeline projects to connect Central Asian natural gas into the EU are explained in the Gas Infrastructure section of the thesis (3.3).

TABLE 5. Central Asian Natural Gas as of 2012, source: source: Ratner et.al. (2013) [128]

Units = trillion cubic feet (tcf)

	Reserves	Production	Exports to EU
Azerbaijan	31.5	0.6	0.0[a]
Kazakhstan	45.7	0.7	0.0
Turkmenistan	618.1	2.3	0.0
Uzbekistan	39.7	2.0	0.0
TOTAL	735.0	5.6	0.0

3.3 Gas Infrastructure

The gas network is established in Europe step by step throughout the last 70 years. Gas transport network consists of international pipelines, domestic pipelines and LNG tankers and harbours. The pipeline grid was a part of production and wholesale companies which are vertically integrated. With the recent liberalization

[126] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.18

[127] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.18

[128] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification, p.20

the EU market is headed to unbundling of transportation and production. Now there are separate pipeline operators that spare certain amount of capacity to trader companies.

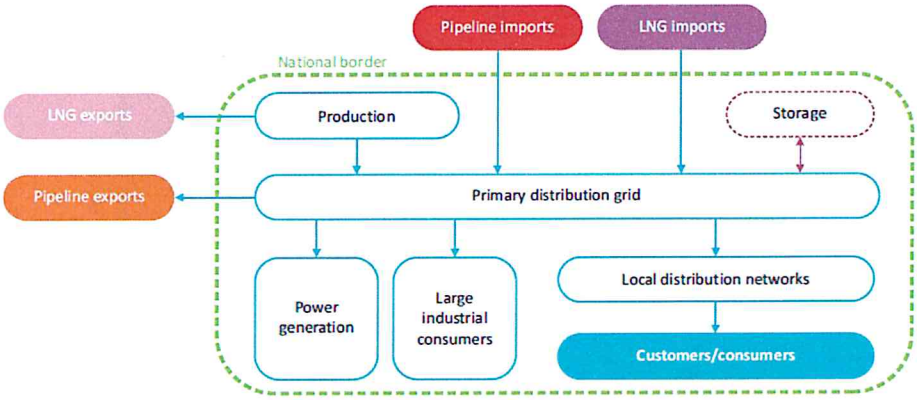

FIGURE 14
Natural Gas Supply Chain, source: International Energy Agency, (2014b)[129]

The international pipelines are mainly built by the partners of major natural gas or oil projects. When companies come together for exploration of a petroleum field and find commercially viable amount of product they may agree on building a pipeline to carry the product into desired route. In such a case the third parties together with founder parties will be able to carry their product in the pipeline but generally with a higher tariff than what founder parties pay.

Currently in the supply chain, after pipeline and LNG imports are carried into the national borders they either go to storage facilities or distribution grids. From that point it can either be sold to large industrial consumers or power generation plants; or pumped into local distribution networks with lower pressure to reach end-customers.

[129] International Energy Agency, (2014b), Energy supply security, p.53

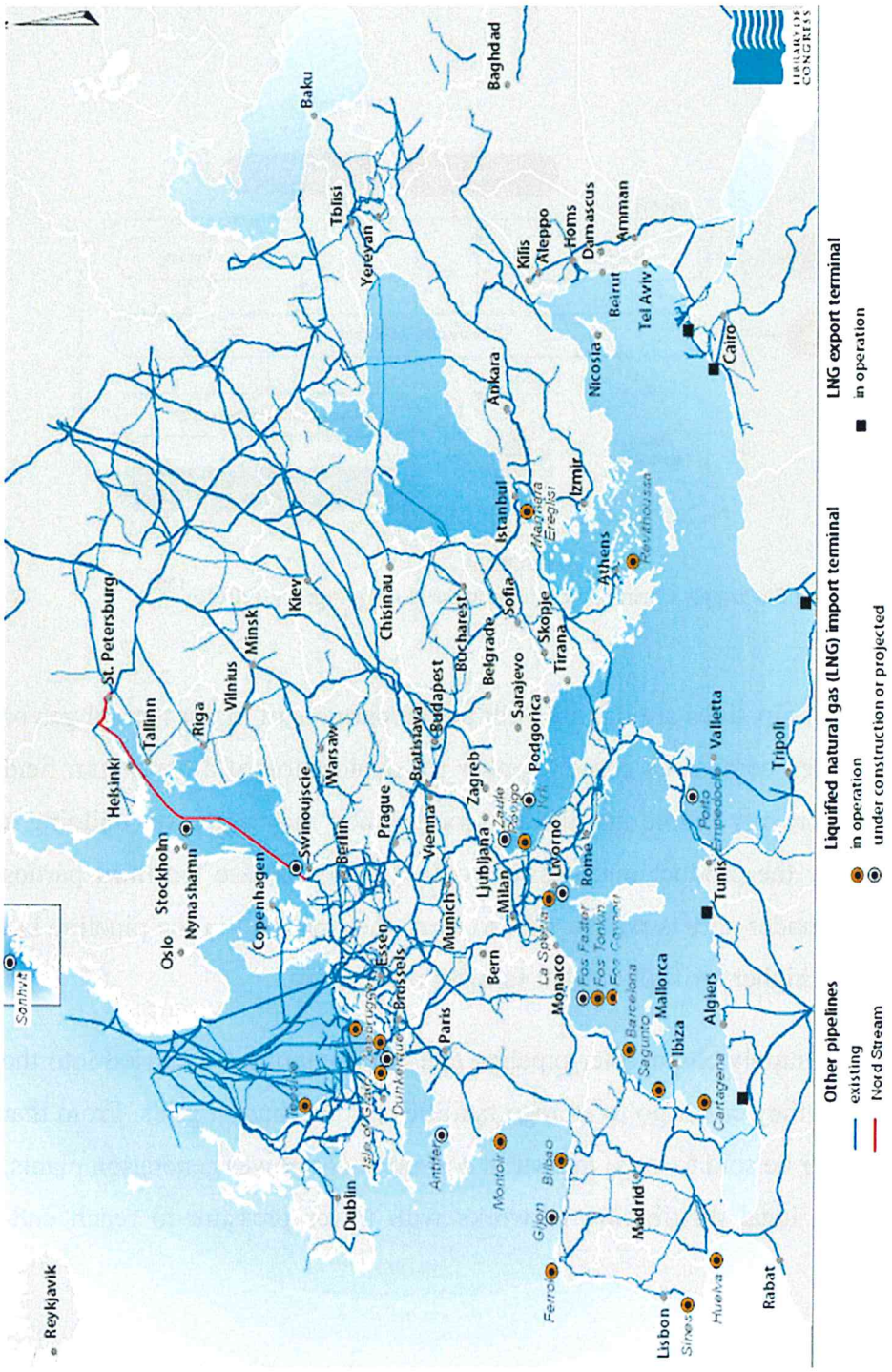

FIGURE 15

European Natural Gas Infrastructure, source: Ratner et.al. (2013)[130]

[130] Michael Ratner, Paul Belkin, Jim Nichol, Steven Woehrel (2013), Europe's energy security: options and challenges to natural gas supply diversification p.17

The South-Western corridor is connecting Algerian gas with the GPDF pipeline to Spain via Morocco and Trans-Mediterranean to Italy. But generally it is commented that due to low interconnectivity of Spain and Italy to the rest of continental Europe, the imports from North Africa is not being enjoyed equally around all Europe[131].

One other option of diversifying natural gas supplies to Europe is transferring the gas from reserve-rich Central Asian countries. Long and expensive pipelines passing through many different countries are making it much of a burdensome project. The Southern Corridor project was initially developed for the sake of transporting Central Asian gas into the Europe. In 2008 Action Plan[132] it is mentioned as one of the highest energy security priorities of the EU. Nabucco pipeline was the popular idea back then, but now Trans-Anatolian-Pipeline (TANAP) and Trans-Adriatic-Pipeline (TAP) have taken its place. Even these projects will take years to complete and later there would be need for continuing infrastructure projects inside Europe to transfer the gas from Italy to rest of the continent.

3.4 Contracts and Pricing

Once the first international gas trade started it was sensible to link gas prices to crude oil prices due to gas being used as a substitute for oil in power generation and heating. Long-term and take-or pay contracts were also necessary arrangements since producers would need to ensure their costly investments of infrastructure and transportation. It was beneficial for buyers as well, who secured their supplies in a business environment that production and supply options are not widely available.

---

[131] Jan Abrell, Clemens Gerbaulet, Franziska Holz, Casimir Lorenz, Hannes Weigt, (2013), Combining Energy Networks: The Impact of Europe's Natural Gas Network on Electricity Markets until 2050, Deutsches Institut für Wirtschaftsforschung, p.9

[132] The European Union announced the Energy Security and Solidarity Action Plan in 2008. It proposes actions regarding connecting isolated markets into Europe, increase energy diversity by making use of other sources such as LNG and developing interconnectors. It was aimed to serve for the European Union's energy targets of 2020.

When the European gas markets were affected by recession and USA shale gas boom, the refusal for oil-indexed gas price asked by state-owned gas suppliers has started. Starting from 2008 LNG from Qatar became a surplus for USA and redirected to Europe; also in early 2009 oil prices increased. Thus with the little diversification of gas into Europe, the difference between spot gas price and oil-indexed price became self-evident.

Obviously, buying the gas in higher prices is undesired for the EU as any other buyer; especially since the EU is promoting the idea of fair and competitive markets in any industry. The concept of gas prices being indexed to oil prices also limits the possibility of arbitrage [133] in the market. When the possibility of renegotiating the price is not considered, the case where spot price is higher than oil-indexed price, the annual contract quantity level (ACQ) [134] denote the maximum value of oil-indexed import and the counter case would denote the minimum [135].

The following figure (figure 16) compares spot market gas prices and Gazprom's oil indexed prices between years 2005 and 2013. As it is seen, the difference went up to 80% in year 2009 due to high oil prices. Possibility of such a difference in prices applied by the main supplier and market price is causing a great cost and serving highly priced product to the end customer. This pricing choice of Gazprom is one of the main reason why European Union strongly

---

[133] Definition of arbitrage in economics is being able to buy a product at a certain price and then sell it into another market with higher price. The profit occurred at the end of this transaction will be called arbitrage profit. Since in the EU market prices are linked to oil price which is generally high, it does not let European companies to sell the gas in higher price than what they bought for. Thus making arbitrage profit in European gas market is not possible as long as short-term gas spot price based import contracts are not being applied.

[134] ACQ is "the volume of gas which the seller must deliver and the buyer must take in a given contract year". See Gas and LNG industry glossary;
http://www.gasstrategies.com/industry-glossary#Annual Contract Quantity

[135] Jonas Teusch, (2012), Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria,CEPS Working Document, p.4

desires to diversify its suppliers and change the market structure into more competitive design.

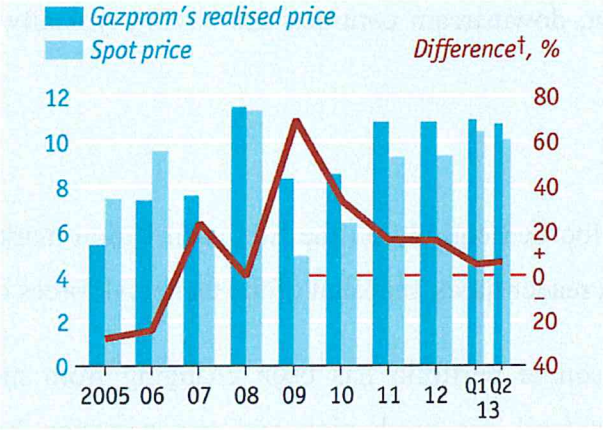

FIGURE 16
European Gas Prices (mmbtu), source: The Economist (2014) [136]

The EU wholesale gas market can be characterized by the contract length and pricing terms of indexation to crude and refined oil prices. These characteristics of the market are interrelated in a way that fixed or oil indexed prices, high take-or-pay conditions and long-term contract life are correlated while on the other side spot pricing, short term duration and low or no take-or-pay are simultaneous [137].

If competition exists or emerging in a market, short-term contracts would enhance the chance of easier entrance and exit to the market. It will positively affect liquidity, hedging and paper trade[138].

---

[136] The Economist, Paying the Piper, 4 January 2014, retrieved from: http://www.economist.com/news/business/21592639-european-efforts-reduce-russian-state-owned-companys-sway-over-gas-prices-have-been

[137] See DNV KEMA, (2013), Study on LT-ST Markets in Gas Final Report, p.22

[138] See DNV KEMA, (2013), Study on LT-ST Markets in Gas Final Report, p.7

In today's market, after the directives of liberalization and increased competition, flexible contracts considering the volume of gas and more short-term orientation are more common. Along the end of gas value chain it is observable that contracts are becoming shorter[139]. While upstream contracts are likely to have long-term duration, downstream contracts are having typically below 5 years of duration.

3.5 Conclusion

In this chapter, I focused entirely on the European Union market. The chapter is designed to give a reader quick snapshot of the technical forces of the EU market.

The EU energy source portfolio has been changing from more coal to more natural gas. As natural gas production and transportation become easier and cheaper, it becomes much more favorable in the EU especially considering climate change and sustainable energy. While the largest production in the EU has been coming from Netherlands production fields, it is a known fact that the production has entered into a decline due to mature fields of the region. However energy demand is increasing day by day, growing the EU's import dependency more.

While the EU is working on improving the gas infrastructure to reach more suppliers easily, many LNG re-gasification terminals are being built to not to be dependent on pipelines. Also traditional oil-indexed contracts are being less popular due to the spot prices being available with LNG supplies of different countries.

The following chapter will enlighten on how the EU natural gas market has been evolving together with changing global and domestic dynamics that has been described until this chapter.

---

[139] See DNV KEMA, (2013), Study on LT-ST Markets in Gas Final Report, pp.8-9

CHAPTER 4

Reform in the EU Natural Gas Market

After portraying the status of global and EU natural gas markets in previous chapters, this chapter is focusing entirely on the reform in EU natural gas market, starting from a brief history of European markets evolution. After elucidation of how European natural gas market evolved, energy reform packages of the EU will be described with specific emphasis on each packages' different discussion points.

4.1 Evolution of European Natural Gas Market

There are three main periods where European natural gas market evolved into its structure today. It is important to differentiate between usage of the term "European market" and "EU market". European energy and natural gas markets denote a larger area both in economic and geographical means. But still "European" and "EU" markets have an indispensable bond since the EU market is highly dependent on non-EU natural gas producers and the emergence of EU natural gas market is connected to emergence of whole European natural gas producers.

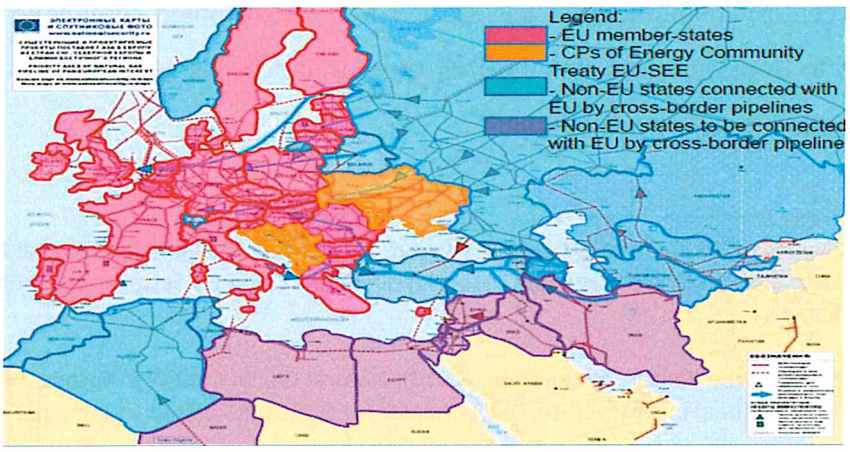

FIGURE 17
European Energy Market source: A. Konoplyanik, (2011)[140]

[140]A. Konoplyanik, (2011), Third EU Energy Package: Regulatory Changes for Internal EU Energy Markets in Gas and Possible Consequences for Suppliers (Incl. Non-EU Suppliers) and Consumers, OGEL Journal, p.1

The countries that are affecting and being affected are shown in the figure 17. Currently, the EU natural gas market has indispensable connections with Non-EU states that are exporting gas into the EU with pipelines, non-EU states that are exporting gas into the EU by other means and South-East European signatory parties of Energy Community Treaty[141]. Thus in this part evolution of European natural gas market will be explained to give a broader insight on how natural gas market started in the EU.

First the manufactured gas was produced and used in Europe until the domestic gas production starts[142]. In the second period, first international gas trades started and then until 1970s energy policies are developed in different countries. The last period starting in 1980s is the period in which oil prices decreased; and this period continued until the start of liberalization of European gas markets in 1998[143].

Manufactured gas is produced mainly from coal and sometimes from wood and oil was being used for lighting purposes in the early 19th century. The manufactured gas producing companies were either privately owned or belong to municipality, and the gas market was not regulated. The gas was also referred as town gas which stresses that it is produced and used locally. In the beginning of the 20th century manufactured gas started to be distributed with long-distance pipelines to domestic users for the first time; thus the gas started to be used for domestic purposes such as cooking[144].

---

[141] A. Konoplyanik, (2011), Third EU Energy Package: Regulatory Changes for Internal EU Energy Markets in Gas and Possible Consequences for Suppliers (Incl. Non-EU Suppliers) and Consumers, OGEL Journal, p.1

[142] Per Högselius, Arne Kaijser, Anna Aberg, (2010), Natural Gas in Cold War Europe: The Making of Critical Transnational Infrastructure, Draft Chapter for EUROCRIT edited volume, p.3

[143] Ian Cronshaw, Jacob Marstrand, Margarita Pirovska, Daniel Simmons, Joost Wempe, (2008), Development of Competitive Gas Trading in Continental Europe, International Energy Agency Information Paper, p.20

[144] Malcolm W.H. Peebles (1981), Evolution of the Gas Industry, New York University Press, p.138

The discovery of the Groningen field in Netherlands in 1959 can be accepted as the beginning of the modern history of natural gas in Europe; and few years later in UK North Sea discoveries followed it and Norwegian part of North Sea also becomes a substantial natural gas discovery area starting in 1970s[145]. These discoveries created a big domestic market in UK but in Norway it was the other way around; thus number of pipelines was built to deliver gas into Continental Europe[146].

During the same period Netherlands gas was being exported in larger volumes to West Germany where the industry was mainly dependent on manufactured gas produced in the Ruhr region[147]. Meanwhile in the East Germany natural gas production was developing around Altmark region; but the gas produced there had low calorific potential[148].

After the Second World War the gas industry started to be built in Italy, around state-owned and vertically integrated company ENI[149]. Italian gas market development succeeded due to the monopolist or dominant player position of ENI in the gas chain from production to sale[150]. Being vertically integrated let ENI to

---

[145] Jonathan Stern, (2005), Gas Pipeline Co-Operation between Political Adversaries : Examples from Europe, Chatham House, p.6

[146] Jonathan Stern, (2005), Gas Pipeline Co-Operation between Political Adversaries : Examples from Europe, Chatham House, p.6

[147] Jonathan Stern, (2005), Gas Pipeline Co-Operation between Political Adversaries : Examples from Europe, Chatham House, p.1

[148] The calorific value of Salzwedel gas was around 3000 kcal/m3 but European natural gas calorific value was ranging between 7600-9000 kcal/m3 See Jonathan Stern (2003), Natural Gas in Europe – The Importance of Russia, p.1

[149] Anouk Honore, (2013), The Italian Gas Market : Challenges and Opportunities, The Oxford Institute for Energy Studies, p.11

[150] Anouk Honore, (2013), The Italian Gas Market : Challenges and Opportunities, The Oxford Institute for Energy Studies, p.11

expand the gas network all around Italy; yet the Southern regions were not investment friendly due to low demand and higher distribution costs[151].

Similar to Italy, in France nationalization and monopolistic control over the gas market was seen as a mean to develop the industry which was stagnating due to unviable economy of manufacturing sites and transportation network[152]. Within the post-war economic reforms[153] the gas industry was nationalized under Gaz de France (GdF) to cover 94% of all the manufactured gas production, transportation and distribution in 1946[154]. However, the natural gas production, which started in 1939 in the south of France, was excluded from nationalization; yet GdF had taken the exclusive rights of transportation together with other non-nationalized distribution companies[155].

Meanwhile, following the Second World War Eastern European countries got connected to the Soviet Union and slowly decreased their relationships with Western Europe. In 1949, as a response to US Marshall Plan for Western Europe, the Soviet Union founded the Council for Mutual Economic Assistance (CMEA).

---

[151] Alberto Cavaliere, (2007), The Liberalization of Natural Gas Markets : Regulatory Reform and Competition Failures in Italy, Oxford Institute for Energy Studies, p.33

[152] Ian Cronshaw, Jacob Marstrand, Margarita Pirovska, Daniel Simmons, Joost Wempe, (2008), Development of Competitive Gas Trading in Continental Europe, International Energy Agency Information Paper, p.9

[153] Charles de Gaulle led provisional government nationalized the key economic sectors such as energy, air transport, banks in 1945. See Globalsecurity.org, Fourth Republic 1946-1958, http://www.globalsecurity.org/military/world/europe/fr-fourth-republic.htm

[154] Ian Cronshaw, Jacob Marstrand, Margarita Pirovska, Daniel Simmons, Joost Wempe, (2008), Development of Competitive Gas Trading in Continental Europe, International Energy Agency Information Paper, p.10

[155] There were 17 other natural gas distribution companies existing in France. Although they are not nationalized, they had a majority public shareholding. The large companies were supplying gas to major cities in addition to some subsidiaries of coal companies such as Les Houilleres Nationales were delivering gas to industrial areas. See Jay Pederson (2001), International Directory of Company Histories, St. James Press

The start of oil and gas industry development in Russia began at the end of nineteenth century with initiative of foreign investors such as the Rothschild family and Nobel brothers. The first exploration well was drilled in Bibi-Eybat (near Baku) in 1846 and in less than 100 years there were around 3500 wells in Baku-Absheron area[156]. Until the year 1900 Russian Empire was producing over 40% of global hydrocarbons production[157].

Starting from 1940s, the Soviet natural gas industry was being developed around the region of Volga; consequently creating the cornerstone of the Soviet economic strategy on energy[158].

As a result, the hydrocarbon imports from the Soviets would be the energy source for Eastern European countries' industries. The Russian gas was being exported to Poland since 1940s, but exporting it to Western Europe in larger amounts was unfeasible due to distance[159]. Besides Russian gas production was moving through Siberia from North Caucasus and Ukraine; and that meant requirement of additional several thousand kilometers of transport lines. When the giant gas fields were discovered at Medvezhe, Urengoy and Yamburg, multiple strings of large pipelines were built from Siberia to Ukraine, requiring a shorter extension to transport the gas into Central and Western Europe[160].

---

[156] Nadejda Victor Makarova (2008), Gazprom : Gas Giant Under Strain, Stanford University, Working Paper No:71, p.69

[157] Nadejda Victor Makarova (2008), Gazprom : Gas Giant Under Strain, Stanford University, Working Paper No:71, p.69

[158] Ian Cronshaw, Jacob Marstrand, Margarita Pirovska, Daniel Simmons, Joost Wempe, (2008), Development of Competitive Gas Trading in Continental Europe, International Energy Agency Information Paper, p.13

[159] Jonathan Stern (2003), Natural Gas in Europe – The Importance of Russia, p.1

[160] Jonathan Stern (2003), Natural Gas in Europe – The Importance of Russia, p.1

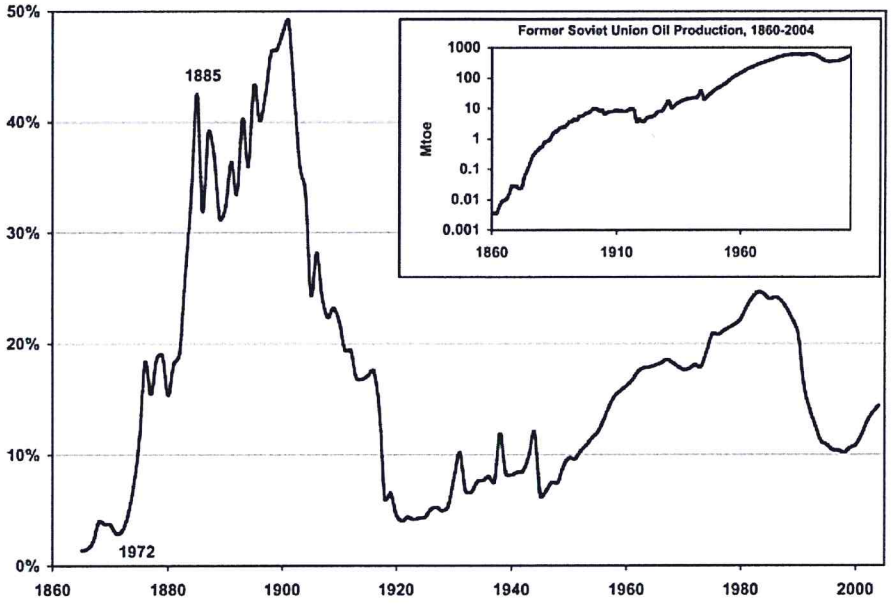

FIGURE 18
Share of Former USSR in Global Oil Production between 1865-2004, source: Makarova (2008) [161].

The natural gas carried by the pipelines from Soviets to Western Europe has increased from 3.4 Bcm to 26 Bcm from 1970s to 1980s. Total Soviet Gas exports were 109 Bcm in 1990s and Western Europe had become the largest customer with 63 Bcm of imports[162]. Following the increase of Soviet gas imports, the ongoing debates on import dependency started in those years. Particularly, there was a strong opposition to Soviet gas imports from USA side, arguing that the Soviet Union would be able to use gas imports to control its influence on Europe to weaken the power of NATO[163] .

[161] Nadejda Victor Makarova (2008), Gazprom : Gas Giant Under Strain, Stanford University, Working Paper No:71, p.70

[162] Nadejda Victor Makarova (2008), Gazprom : Gas Giant Under Strain, Stanford University, Working Paper No:71, p.70

[163] Paul Stevens, (2010), The History of Gas, EU Policy on Natural Resources, p.11

FIGURE 19
Pipelines connecting Siberian gas to Ukraine source: Stern (2003)[164]

Important watershed for the natural gas demand in Europe was the First Oil Crisis. It started in 1973 with the members of OPEC to proclaim an oil embargo, resulting oil prices to nearly quadruple. The reason was the decision of USA to support Israel in 1973 Arab-Israeli War led by Syria and Egypt against Israel .With the embargo together with the USA, other countries such as the Netherlands, Portugal and South Africa supporting Israel was banned from petroleum imports as well as oil production decrease was introduced[165]. With steep increase of the oil price in 1973, the European countries had more urgent need to diversify their energy source. On one side oil price linked gas contracts were introducing gas as an expensive commodity product. On the other side it was forcing the European countries to use natural gas and other energy sources more

[164] See Jonathan Stern (2003), Natural Gas in Europe – The Importance of Russia, Annex. P.2

[165] The US Department of State Office of Historian, (2013), Oil Embargo, retrieved from: https://history.state.gov/milestones/1969-1976/oil-embargo

instead of oil. The idea of having scarce energy resources and high prices increased the efforts of investment in hydrocarbons exploration and transporting facilities. The amount of gas available for consumption in Europe increased mostly due to exploration activities of the UK, Norway and Soviet Union and North Africa[166]. With this new situation Europe had a chance to diversify its exports more.

In the meantime Soviet gas was not the only export source for Europe. Trans-Mediterranean pipeline built between Algeria and Sicily through Tunisia pumped its first gas to mainland Italy in 1983; later with the contracts signed in 1991 and 1993 its capacity was doubled[167]. Moreover, Maghreb-Europe pipeline between Algeria and Spain had become another source for North African gas since 1990s[168].

FIGURE 20
Pipelines connecting North African gas into Europe source: Stern (2003)[169]

[166] Ian Cronshaw, Jacob Marstrand, Margarita Pirovska, Daniel Simmons, Joost Wempe, (2008), Development of Competitive Gas Trading in Continental Europe, International Energy Agency Information Paper, p.13

[167] Jonathan Stern, (2005), Gas Pipeline Co-Operation between Political Adversaries : Examples from Europe, Chatham House, p.9

[168] North Africa has been producing a considerable amount of hydrocarbons. Libya has the largest oil reserves and Algeria has the third largest reserves in the continent. Alternatively regardless of its amount of reserves, due to the rapid increase in oil consumption Egypt whose production does not meet the demand is now a net-oil importer, see KPMG (2013) op.cit

[169] See Jonathan Stern (2003), Natural Gas in Europe – The Importance of Russia, Annex p.3

Following the high oil prices, in mid-1980s crude oil prices suddenly fell due to increase in production of Saudi Arabia and its allies[170]. These countries desired to produce more than what OPEC allocated for them and as a consequence the prices fell. Since the gas contracts were linked to oil prices, the European companies and countries had to adapt themselves to this cheaper energy period.

A different episode of the European gas evolution had started with the efforts of the Union to build unified and competitive gas market[171]. Although for the numerous European gas market players liberalization was an indication of end of the civilization, ideas of liberalization and privatization of gas market had already appeared in the 1980s and 1990s[172].

One of the European countries, the UK, has already started its journey through privatization and liberalization of its gas market in 1990s. These efforts have raised intensely the share of gas in energy production[173]. Even this would be an inspiration the European Commission to achieve structure of UK gas market. The journey to reach to desired point would be lengthy and difficult due to national interests of different countries and companies who do lobbying to block the Commission's attempts.

---

[170] Paul Stevens, (2010), The History of Gas, EU Policy on Natural Resources, p.1

[171] During the first oil crisis all OPEC members required to cut their production amounts to bring the prices into their desired level and keep it. Saudi Arabia was the one which decreased its outputs the most. When Saudi Arabia increased its output (and resulted the price to decrease) the other OPEC members' revenues reduced in considerable amount although Saudi Arabia did not get affected much. See Dermot Gately, (1986), Lessons from the 1986 Oil Price Collapse, Brookings Paper on Economic Activity

[172] See Jonathan Stern, (1998) , Competition and liberalization in European gas markets: a diveristy of models, Royal Institute of Ineternational Affairs, London

[173] Important point to consider on the UK's privatization journey is that there was considerable amount of domestic gas production which allowed a competitive gas market to be developed after the privatization of Britisih Gas. But in continental Europe, regarding the number of domestic producers and the amount of domestic production, it was not the case. See Paul Stevens, (2010), The History of Gas, EU Policy on Natural Resources, p.12

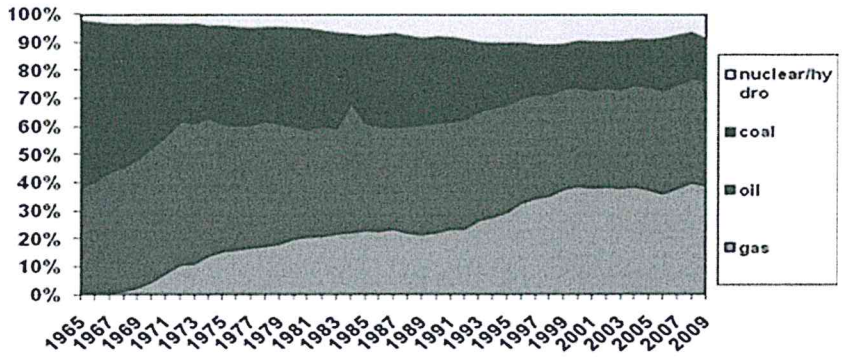

FIGURE 21
UK Primary energy consumption by fuel 1965-2009 source: Stevens (2010) [174]

Results of the regulative changes in the UK gas market can be seen in the figure above. Together with the changes, the share of gas in total energy consumption increased in time.

The UK system encouraged many the EU for developing a similar market but on the other hand studies the US and the UK natural gas market system is not totally applicable for the Continental Europe[175]. While the natural gas industry was being developed on domestic sources in the US and the UK, the Continental Europe has always been dependent on imports. Also, the domestic gas fields of the US and the UK are comparably smaller which causes total production to be supplied from many differed small to medium sized fields while the Continental Europe uses giant production fields both in domestic and import natural gas. Also, the US and the UK market economy are mainly controlled by the decisions of several private companies operating in there but on the other hand the Continental Europe market economy has been ruled by sovereign non-EU exporting countries which decide on contracting and pricing strategies[176].

---

[174] Paul Stevens, (2010), The History of Gas, EU Policy on Natural Resources., p.12

[175] See Energy Charter Secretariat, (2007), Putting a Price on ENERGY: International Pricing Mechanisms for Oil and Gas, Brussels

[176] See Energy Charter Secretariat, (2007), Putting a Price on ENERGY: International Pricing Mechanisms for Oil and Gas, Brussels

Generally, energy markets are evolving either bottom-up way or with design[177]. The bottom-up evolution of markets appears naturally to serve the needs of participants, while the designed markets are much of an external intervention with the hope of reaching desired outcomes. The EU reform in natural gas markets are reflecting a designed process by administrative and political powers decisions which are not all fully-proved and well justified[178].

The idea of building a single gas and electricity market has its roots from the EC Treaty which dictates creation of common market in many areas including energy. But on the other hand initial debates around the idea of Internal Market was not including energy sector along with transportation, network and communications industries[179]. However as the national monopoly providers' domination in these sectors became clear, the issue was started to be seen as an obstacle for integrated European economy[180]. Firstly, the discussions regarding EU Energy Law focused on free movement of goods and issues of state monopolies. However, as the efforts of opening up the market has started being realised the focus shifted from state to market; thus the role and significance of competition law increased[181]. At present, if the field of European Energy Law is analysed, it is seen that there are

---

[177] Jiri Novotny (2010), Market Power and the Power of the Market, Presentation at the Argus European Natural Gas and LNG Trading Conference, 6-7 October 2010, London, UK quoted in A. Konoplyanik, (2011), Third EU Energy Package: Regulatory Changes for Internal EU Energy Markets in Gas and Possible Consequences for Suppliers (Incl. Non-EU Suppliers) and Consumers, OGEL Journal, p.6

[178] A. Konoplyanik, (2011), Third EU Energy Package: Regulatory Changes for Internal EU Energy Markets in Gas and Possible Consequences for Suppliers (Incl. Non-EU Suppliers) and Consumers, OGEL Journal,, p.5

[179] EFTA, (2014), Free Movement of Goods, EFTA Secretariat, Brussels, p.6 retrieved from; http://www.efta.int/media/publications/fact-sheets/EEA-factsheets/GoodsFactSheet.pdf

[180] EFTA, (2014), Free Movement of Goods, EFTA Secretariat, Brussels, p.6 retrieved from; http://www.efta.int/media/publications/fact-sheets/EEA-factsheets/GoodsFactSheet.pdf

[181] Kim Talus, (2011), Vertical Natural Gas Transportation Capacity, Upstream Commodity Contracts and EU Competition Law, Energy and Environmental Law and Policy Series vol.18, Kluwer Law International p.73

two main legal regimes getting interrelated; the general EU law (particularly Competition Law) and energy market regulation[182].

The objectives and motives of these two regimes both have similarities and differences hidden in the detail. While both the competition law and energy market regulations seek for the benefit comes from free competition; the variance is in their main objective[183]. While competition law support both competitive market economy and internal market, energy market regulation looks beyond into other purposes of sustainable community development and consumer protection[184]. In the light of these debates, the EU Natural Gas Market reform has been designed.

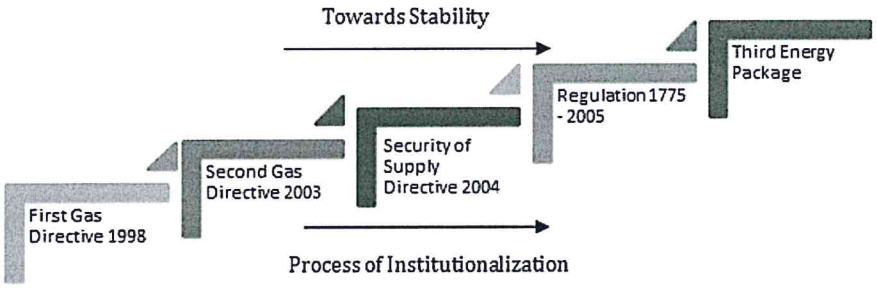

FIGURE 22
Incremental Reform in the EU Natural Gas Market, source: Hasse (2009) [185]

[182] Kim Talus, (2011), Vertical Natural Gas Transportation Capacity, Upstream Commodity Contracts and EU Competition Law, Energy and Environmental Law and Policy Series vol.18, Kluwer Law International p.73

[183] Massimo Motta, (2005), Competition Policy – Theory and Practice, Cambridge University Press, pp.17-22

[184] Christopher Bellamy & Graham Child, (2001), European Community Law of Competition , , Oxford University Press, p.39

[185] N Hasse, (2009), European Gas Market Liberalisation: Competition versus Security of Supply?, Energy Delta Institute, p.168

Reform of the EU natural gas market is designed in incremental way to make adaptation easier for natural gas market players. The following parts will explain the three main steps of reform process of the EU natural gas market; first package, second package and third package.

4.2 First Package

Before the liberalization attempts had started, structure of gas market in the EU was highly different from electricity market. In general, there are differences in both technical and physical ways which electricity and gas transport from producer to consumer. Transit and investment costs are higher in gas as well as tarification. Though the gas is more dispersed around different geographical regions of Europe, electricity can be produced in numerous power generation sites in all countries. Also while Europe is more or less self-sufficient in electricity generation, it is import dependent for natural gas. Thus, as expected the EU implemented regulations earlier and in shorter period for electricity while it became a longer and harder process for the gas. Reforms with the aim of creating more competitive and efficient European energy industries has started with electricity in 1996[186], and then followed by gas markets in 1998[187] as a response to concerns regarding to keep pace with global markets.

The regulations in the gas market was mainly targeted to create more gas-to-gas competition to increase economic efficiency and to lower the costs for end consumers of the market which dominated by monopolies frequently [188] . Meanwhile single gas market would increase gas security due to having higher flexibility in case of any supply interruption.

---

[186] See Directive 96/92/EC (Official Journal L 027, 30/01/1997 P. 0020–0029)

[187] Directive 98/30/EC (Official Journal L 204, 21/07/1998 P. 0001–0012)

[188] Ian Cronshaw, Jacob Marstrand, Margarita Pirovska, Daniel Simmons, Joost Wempe, (2008), Development of Competitive Gas Trading in Continental Europe, International Energy Agency Information Paper, p.8

The First Gas Directive was adopted on 10 August 1998 by the energy ministers after the acceptation of the European Council's common position by the European Parliament. Subsequently, relevant actions were supposed to be taken place at the national level. With specified derogation, given time was until 10 August 2000 to transpose the first directive[189].

It was required that the European Commission will be the monitoring body for the harmonization activities in the Member Countries. The Commission shared the updates regarding the activities by the reports it had published. The report published through the end of 1999 is important to see the situation at the beginning of liberalization process.

The transposition of EU directives into national legislation seemed efficacious but actually there was many problems being faced in implementation process[190]. The most vital point raised was the existing barriers for cross-border trade and introduction of third Party Access[191]. The First Energy package did not solve the issues of cross-subsidization and third party discrimination completely[192].

The summit held in Lisbon in 2000 was the second step towards liberalized gas market. In Lisbon summit, the strategy developed was aiming the European Union to be the most competitive economy in the world[193]. For this matter, importance

---

[189] The member countries except Finland, Greece and Portugal was allowed time to give force to the directive by passing required implementation measures until year 2000

[190] Vesna Tisler, (2013), the Role of the Agency for the Cooperation of Energy Regulators (ACER) in the Liberalization of Energy Markets, Masters Thesis, Europa-Institut Saarland University, p.3

[191] The point that makes third part access important is that if eligible customers wish they can buy gas directly from the producers. By this means, competition in the market will be fairer

[192] Cross-subsidization occurs when one group of customers are charged higher prices for the sake of providing cheaper service to another group. See D. Cameron, (2005),The Internal Market in Energy: Harnessing the New Regulatory Regime, 30 European Law Review, p.631-640

[193] N Hasse, (2009), European Gas Market Liberalisation: Competition versus Security of Supply?, Energy Delta Institute, p.169

of energy sources and competitive energy markets was also stressed. It is suggested that until 2004 full liberalization and integration of energy markets should be realized to contribute the excellence target of the EU.

Following Lisbon, in May European Gas Regulatory forum was held in Madrid discussing tariff methodology, capacity rights and other regulatory instruments[194]. The discussions held in the forum were vital for the European companies and recognition of their interests.

4.3 Second Package

Liberalization is a journey rather than a process and the First Gas Directive opened up the way to build step by step an integrated and liberalized natural gas market in Europe. It would be totally unrealistic to expect the market system built over 40 years will change in one night with series of regulatory actions. The liberalization regulations started with the First Gas Directive in 1998 required only third party access to pipelines and separation of transportation and other operations of gas on accounting basis.

In 2003 a new liberalization directives were adopted for electricity and for gas[195]. With the second directive, the formal separation of transportation and operational business to ensure non-discriminatory third-party access into the gas transportation is required. It is requested that commercial customers to be free to choose their suppliers by July 2004 and residential customers by July 2007[196]. To

---

[194] During the forum it is recognized that the interests of gas transmission companies is not necessarily the same with other gas companies. Thus it is decided to form a separate association for the transmission operators; and following the forum the Gas Transmission Europe (GTE) was founded under the Union of Gas Industry. See Energy Community, (2009),Study on the Improvement of Operational Rules for Natural Gas Transportation in the Energy Community, p.112

[195] See Directive 2003/54/EC (Official Journal L 176, 15/07/2003 P. 0037–0056) and Directive 2003/55/EC (Official Journal L 176, 15/07/2003 P. 0057–0078).

[196] Alan Riley, (2006), Energy Security, Gas Market Liberalisation and Our Energy Relationship with Russia, European Energy Security, Working Paper of the European Security Forum, p.31

realize the free trade in energy markets non-discriminatory operation was emphasized since it would not be possible for suppliers to continue their business without transmission systems[197]. High risk of being discriminated by transmission operators for the suppliers' demands, non-discriminatory access to the transmission system is being ensured in lieu of equal competition. The idea of equal competition would achieve variety of supplier choices for the market, superior efficiency and innovation for the suppliers and lower prices for the consumers.

Another objective of improving physical interconnection capacity would be realized by permitting two-way capacity on every cross-border interconnectors, encouraging extra infrastructure and guaranteeing non-discriminatory third party access [198]. At the same time liquidity would be promoted by the help of restructured market mechanisms such as reselling of unused capacity.

After the announcement of the directive although the liberalization efforts were formally in progress, the national markets did not break their monopolies at once. When the year 2007 started Gaz de France in France, ENI in Italy, ENAGAS in Spain were still de facto monopolies of wholesale trading and in numerous other countries, for example in Germany, there were only very limited number of active companies [199].

4.4 Third Package

The European Union's new energy policy was stated as –increased security of supply, ensured competitiveness, affordable energy, sustainable environmental

---

[197] Booz&Co., (2013) Benefits of an Integrated European Energy Market, Final Report prepared for Directorate-General Energy European Commission, p.13

[198] Cosimo Corsini, Sven Heiligtag, Dieuwert Inia, (2013), Strategic Choices from Midstream Gas Companies, McKinsey Working Papers on Risk, Number 50, p.2

[199] Franziska Holz, Christian von Hirschhausen, Claudia Kemfert, (2008), A Strategic Model of European Gas Supply (GASMOD), Energy Economics ,Volume 30 Issue 3, p.768

policy and opposing climate change– in 2007 with Energy Policy for Europe report[200]. Based on previous packages' debates and recent reports the third energy package was announced in 2009.

Third package includes the Directive 73/EC/09, regulations 713/2009 and 715/2009. On September 3rd 2009, they have entered into force and transposition of the majority of regulations into national legislation was requested to be completed on March 3rd 2011 the latest. The third package was continuation of the previous ones which were not satisfactory in application. For example, the third party access concept was not exclusive for the third package. The idea was introduced with the first package, become mandatory with the second package and the third package was introducing further explanations on the concept with the purpose of increase obedience to the second package directives[201].

Another concept that was introduced since the first package was ownership unbundling. The idea was vertically integrated energy companies selling their transmission infrastructure to third parties so that fair third party access into the gas transmission infrastructure will be ensured[202].

Also what the third package recognises is the requirements on existing public services to facilitate all consumers to benefit completely from fair prices and competition, which can be ensured by raising the minimum standards on services[203].

---

[200] Jacques J. De Jong, (2008), The 2007 Energy Package: The Start of a New Era?, Intersentia, p. 101

[201] Mark Newberry, Silke Goldberg, (2011), The European Energy Handbook 2011, Herbert Smith LLP , p. 12 cited in Vesna Tisler, (2013), the Role of the Agency for the Cooperation of Energy Regulators (ACER) in the Liberalization of Energy Markets, Masters Thesis, Europa-Institut Saarland University, p.3

[202] Euractiv, (2008), Liberalisation of the EU Gas Sector, retrieved from: http://www.euractiv.com/energy/liberalisation-eu-gas-sector-linksdossier-188455

[203] Mario Monti, (2010), A New Strategy for the Single Market, Report to the President of the European Commission, p.47

Currently, many debates are going on about how not enough the third package was to complete internal energy market of the EU. It is stated that not many progress has been made so far and besides in many member countries consumers are still facing high prices, low service quality, tariffs and limited supplier choice [204]. Undoubtedly the EU would continue working on new ways of encouraging a higher implementation of the all packages.

4.5 Conclusion

This chapter explained how European natural gas markets evolved and how the EU natural gas market grew into today's regulative situation.

The term "Europe" denotes a wider area than geographical territories of the EU when natural gas market is considered. The EU market has deep connections to non-EU member European countries as well as non-EU member Asian and African countries due to its import dependency. Thus, history of natural gas market in the EU inseparable from the European natural gas markets history.

It is clear that since the beginning of natural gas trade around today's European Union, the non-member states always played an important part in how structure of the market is shaped. Since the EU being dependent on external sources, for many long periods the rules of the product owner forced the market into higher prices, longer contracts and fewer choices of suppliers. The EU wanted to change the system in the market so that better and fairer competition will create much more customer-friendly environment. It is underlined that reforms in the EU natural gas market started with designed approach where the regulatory powers design the market dynamics as they wish. This approach caused adaptation and implementation of regulations into national legislations take longer so the reform has been pursuing an incremental nature which has not yet been completed.

---

[204] European Parliament, (2013), Completing the EU's internal energy market, Press Release

Together with this chapter, the section of thesis on market is completed. In following chapters, I will focus on major players of the EU natural gas market, their characteristics and how they survived and adapted to the long pursuing EU natural gas market reform.

CHAPTER 5

Natural Gas Companies and Adaptation Strategies

In the European Union natural gas market, there are various players pursuing their business activities. In general oil and gas companies are grouped into two; international oil and gas companies (IOCs) and national oil and gas companies (NOCs) according to their ownership. In the EU natural gas market both of these company groups are active in different level of value chain.

This chapter is aiming to explain the characteristics and variety of active companies in the EU gas market. Their strategies and the way they respond to the regulatory and technical changes of the market are further analyzed.

5.1 International and National Oil and Gas Companies

The major division between oil and gas companies is made according to their ownership status. They show very different characteristics and business methods; thus it is essential to understand their nature to evaluate the strategies accordingly.

International oil companies (IOCs) are the largest players of the industry and they are not owned by any states. They generally have technology and reputation advantages over national oil and gas companies (NOCs) in exploration and production activities.

All petroleum business majors have been operating in all stages of the petroleum business value chain; upstream, midstream and downstream. They perform exploration and production, oil transportation, refining and end-customer selling stations. Also their operations are pursued by operating companies together with the assistance of service companies in areas such as research, safety and training

Together with oil, they also produce natural gas. The importance of natural gas is rapidly increasing for all of the international oil companies such as Shell, Total

and ExxonMobil. These large producers take any major investment decision when there is highly probable demand for the end products in the near future[205]. Thus, the increasing interest given to gas business by oil majors is due to development of gas markets and increasing demand for natural gas as an energy source.

Conversely, NOCs are fully or majority owned by national governments. For the EU Market players' sake, both European gas producers and external suppliers of natural gas can be NOCs. They are frequently originated from nationalization and recently increasing their investment outside of their national borders. Other than making profit, NOCs have aim of securing national supply and creating employment.

Majority of these companies were emerged in the second half of 20th century when there was a large state intervention in the economies of their countries[206]. Since oil was a source of income to national treasuries it was seemed as strategic; thus setting up national oil companies were also strategic move[207]. Governments needed to create a national entity to hold the control over oil and gas operations in the country[208]. Ever since the importance of NOCs in oil and gas markets are tremendous. While the IOCs were in the top biggest petroleum companies list, today NOCs covered IOCs place with higher income, sales and value.

After 1990s there was a common impulse for free energy markets around the world and that motive triggered many full and partial privatizations of NOCs. When economies of developing countries were not performing well, "corrupt"

---

[205] Karel Beckman, (2011), Shale gas will not be as important in Europe as in the US, European Energy Review, 9 May 2011

[206] Center for Energy Economics, (2008), A Citizen's Guide to National Oil Companies, The University Texas Austin, p.3

[207] Miranda Ferrell Wainberg Michelle Michot Foss, (2006), Commercial Frameworks for National Oil Companies, Center for Energy Economics, The University of Texas Austin, p.1

[208] See Michael Olorunfemi, (1991), The dynamics of national oil companies, OPEC Review, Winter Volume 15, No 4

governments were the ones blamed for the result[209]. The reasons of the privatization decision were mainly due to lower oil and gas prices, need of revenue for governments, changing preferences of government roles and pressure of international capital markets[210]. Besides, eliminating the conflict of interest due to political and economic interest clash of governments and promoting efficiency by increased competition was the other motives behind privatization moves[211]. However, there are still many NOCs and even it will not be wrong to claim that they control many of oil and gas markets around the world. Nine out of the ten large companies according to the reserves they hold are NOCs[212].

Today, IOCs and NOCs work together as partners in major oil and gas projects. Both have their own competitive advantage. NOCs are holding easy access ability to oil and gas reserves around the world due to their national nature and they clearly are preferred partners in large projects in the host country. On the other hand, IOCs already established a strong position in major energy markets and they easily perform in those markets. But there is also a common ground between these two types of companies since they have similar targets and challenges on their business, which is serving to the energy demand of the modern society[213].

5.2 Companies in European Natural Gas Market

In this part companies who are actively performing in the market by production, supply and exploration are listed. While the production and supply statistics

---

[209] Miranda Ferrell Wainberg Michelle Michot Foss, (2006), Commercial Frameworks for National Oil Companies, Center for Energy Economics, The University of Texas Austin, p.5

[210] Paul Stevens, (2003), National Oil Companies: Good or Bad? A Literature Survey, World Bank Workshop, Washington, p.3

[211] Aegis Energy Advisors Corporation, (2002), State Oil Company Privatizations, Presentation, p.3

[212] Miranda Ferrell Wainberg Michelle Michot Foss, (2006), Commercial Frameworks for National Oil Companies, Center for Energy Economics, The University of Texas Austin, p.2

[213] Luis F. Ayala, (2009), IOCs and NOCs; The Fourteen (and plus) Sisters, The Way Ahead Vol.5 p.2

clearly give the information on how active the companies' are, it is required to look into their reserve amounts for exploration activities. The figure below presents the data regarding reserves of different companies in the market.

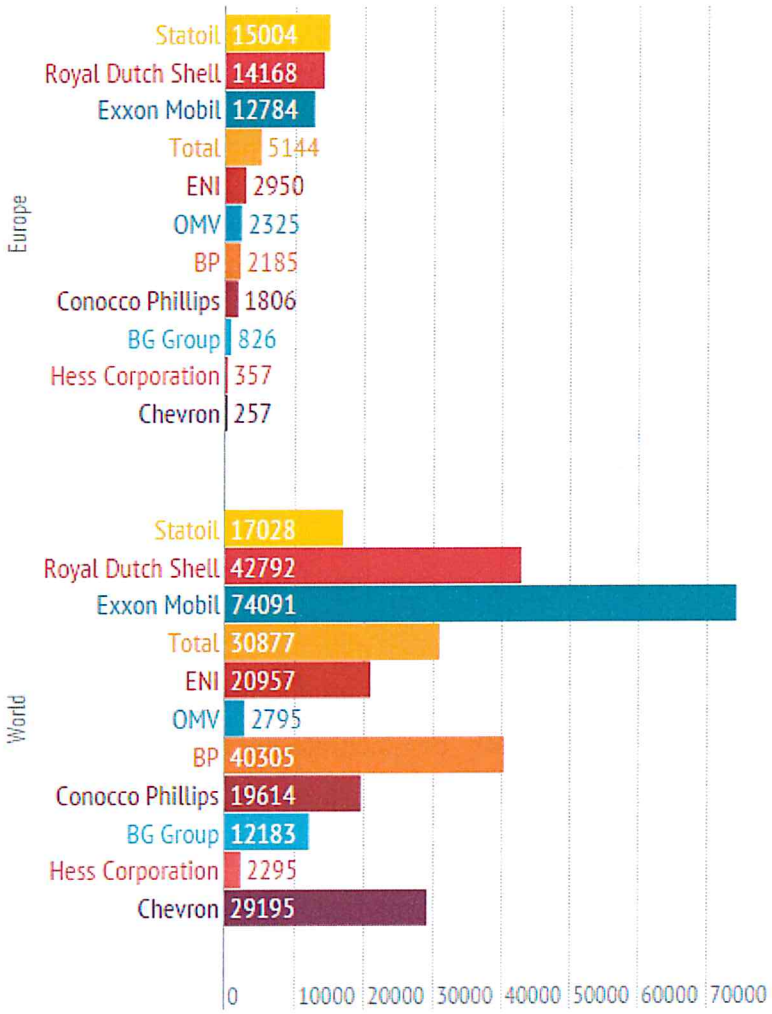

FIGURE 23
Natural Gas Reserves by Company (bcf) end of 2013, adapted from: Ernst & Young (2013)[214]

Although the ranking of the companies may change from year to year, the general portrait is such that the majors who are producing in the market are IOCs who are privatized NOCs mainly. While analyzing the reserves statistics presented above, it is important to compare it with the company's world reserves. The ratio of European reserves to the world reserves show how important the European market

[214] Ernst & Young, (2013), Global Oil and Gas Reserves Study, pp.32-33

for companies' exploration activities. In other words, it shows how much focus is given to the market by the company considering that amount of European reserves are not much significant compared to other parts of the world. For example, while Statoil and OMV is doing majority of their activities in the Europe (over 80%), BP, ConocoPhillips and Chevron are doing very little of their total activity (less than 1%). Thus the companies who are focusing mainly in European market would be much more affected of the regulative changes or reforms in the market.

The figure 23 is not only demonstrating the production in the EU area but also larger European continent. It presents natural gas production statistics from countries such as the UK, Norway and Eastern Europe since the natural gas production in larger European area is also targeted mainly into the EU market. What the figure 23 does not present is the amounts of natural gas imported into the EU from non-European countries of Russia, Algeria, Qatar and the others.

In the part 4.2 of this thesis, it is mentioned that the major natural gas suppliers from outside Europe are Gazprom (Russia), followed by Sonatarch (Algeria) and Qatargas (Qatar). Since these companies are the main NOCs in their countries, the country export statistics actually demonstrate the companies' export into the EU market. According to 2012 import statistics of the EU, Gazprom sold 3.74 tcf, Algeria sold 1,54 tcf and Qatar sold 1,1 tcf of natural gas. While the natural gas from Qatar is delivered in the form of LNG, the rest are delivered by pipelines. All these countries' major income source is their hydrocarbon exports. Thus, changes in European market are likewise very significant for these companies too.

Lastly, one another group of companies that perform in the EU market are national distribution operators such as E.ON, GDF-SUEZ (GrDF), ENI [215].

[215] Roman Zyuzev, (2008), Gas Market Liberalization as a Key Driver of Change of the European Gas Market and Its Influence on the Strategies of the Main Players, Institut Europeen Des Hautes Etudes Internationales, p.53

5.3 Strategies of Adaptation to the EU Market

Reforms and changes in the EU natural gas market make it harder for any company to success and sustain for long time without the help of the others. There is no single company which has knowledge and power enough to succeed in every part of natural gas supply system. Thus, the most common strategies from natural gas market companies contain the ones which deliver cooperation and collaboration.

Strategic alliances are the most common strategy that is seen in energy industry and it is no different for the EU natural gas market. Especially after the unbundling rule is being applied, the options of cooperation between different levels of supply chain were limited. Although it is not possible to obtain control over full supply chain in natural gas industry under one single company name, with strategic alliances different companies benefit each other's assets and power as one single company. For instance, Total has formed a strategic alliance with Russian Novatek for the Yamal LNG project which is expected to supply considerable amount of natural gas[216]. Due to increasing natural gas demand in Europe, together with increasing number of LNG regasification terminal LNG projects more attractive. Natural gas fields such as Yamal require high capital and recent technology which makes it a suitable project for strategic alliance between an IOC and a local partner. Moreover, Qatar's LNG success is also a fruit of strategic alliance between Exxon Mobil and Qatar Petroleum[217]. Also, shale gas technologies force many companies to work together such as Chevron and PGNIG (Poland), Total and Lukoil[218].

---

[216] Total, Yamal LNG, retrieved from http://www.total.com/en/energies-expertise/oil-gas/exploration-production/projects-achievements/lng/yamal-lng?%FFbw=kludge1%FF

[217] National US-Arab Chamber of Commerce, (2011), Exxon Mobile's Strategic Partnership, US-Arab Tradeline, Volume 15 No:1 , p.22

[218] Rigzone, (2014), E&P News: Company Mergers, Acquisitions and Joint Ventures, retrieved from: http://www.rigzone.com/news/type.asp?t_id=5&r_id=15&lxd=365

Strategic alliances do not occur only between two companies on a project. It is also a common practice to develop new technologies. Many companies work together with renowned research centers and institutions. For instance ENI is working with Massachusetts Institute of Technology for research and development activities[219]. Another example of technology focus in the industry is Shell which represent its present strategy for success as technology and partnerships [220].The three important areas of focus Shell claims are "the strategic options and decisions of corporate and business unit executives; the opportunities offered by new technology and R&D, and the evolving external environment in which the company operates"[221]. The reason for Shell's focus on technology is creating a unique selling point which cannot be attained easily by the smaller competitors[222].

Asset swapping is another strategic method of creating bonds between two companies. When two companies exchange part of their assets in different projects, it allows them to have access and control over each other's resources for a common benefit. One example of this practice is Gazprom's agreement with ENI, Enel, E.On, and BASF to allow them an access to Gazprom resources[223]. This way, Gazprom would easily access and purchase European assets. This practice also helps natural gas markets to get globalized. The example for it will be from Gazprom again, in which Gazprom Marketing and Trade swapped UK

---

[219] ENI, Alliances and Collaborations in R&D, retrieved from http://www.eni.com/en_IT/innovation-technology/alliances-collaborations/alliances-collaborations.shtml

[220] Karel Beckman, (2010), Shell: from oil tanker to floating LNG vessel, European Energy Review 28 June 2010

[221] Rafael Ramirez, Leo Roodhart, Willem Manders, (2011), How Shell's domains link innovation and strategy, Long Range Planning, Volume 44, p. 251

[222] A. Wilkinson, R. Kupers, (2013), Living in the Futures, Harvard Business Review, p.123

[223] Gazprom,(2009), OAO Gazprom Annual Report, p.14

assets with EDF Trading from US to reach natural gas sources in the UK and the US[224].

One another strategy to build connection over different stage of supply chain is acquisitions. Especially the companies who needed to exit from natural gas transit segment, focused on different alternatives which will allow them to have some control over natural gas supply into the market. Also large exporters and producers secure their supply volume in the market by the same strategy. In case of wholesalers and suppliers buy less volume of gas from producers, they will be able to compensate it by directly selling to the end customer, which will balance the total gas supply[225]. Again the example is Gazprom who acquired midstream companies Wingas and WIEH from Germany and WINZ and Wintershall from Netherlands[226]. As a result of these acquisitions Gazprom gained access to gas storage and gas supply systems in those two EU countries[227]. At the same time the European countries and supply companies try to create options for Russian gas imports with focusing on gas storage. GDF-Suez from France and RWE from Germany got involved in negotiations with Ukraine to benefit their gas storage in case of any Gazprom supply cut[228]. While they are in a search for alternating Gazprom's exports, Gazprom's move to obtain storage facility in the EU is highly beneficial for the company to protects' its importance. Moreover, Statoil also own

---

[224] EDF Trading, (2009), Gazprom Marketing & Trading and EDF-Trading announce Trans-Atlantic gas swap, http://www.edftrading.com/Media/Press-releases/Gazprom-Marketing-Trading-and-EDF-Trading-Announce

[225] DNV KEMA, (2013), Study on LT-ST Markets in Gas Final Report., p.51

[226] See European Commission Press Release, 4 December 2013, Mergers: Commission approves acquisition of German and Dutch gas supply and storage joint ventures by Gazprom, http://europa.eu/rapid/press-release_IP-13-1207_en.htm

[227] Cosimo Corsini, Sven Heiligtag, Dieuwert Inia, (2013), Strategic Choices from Midstream Gas Companies, McKinsey Working Papers on Risk, Number 50, p.2

[228] Reuters, 14 April 2014, Europe speeds up gas storage to prepare for Russian cut, http://www.reuters.com/article/2014/04/14/ukraine-crisis-gas-europe-idUSL6N0N620C20140414

natural gas storage shares in Germany and Netherlands[229]. In addition, Royal Dutch Shell has acquired majority of Repsol's LNG assets[230].

However, many other strategies are focused on diversifying the companies' markets other than only adapting to the market changes. Companies want to create a meaningful balance of assets portfolio for risk mitigation in case of non-adaptable sudden market changes in their portfolio. Again Gazprom is trying to enhance its operations together with the other strategies aiming to adapt to natural gas market changes. The recent expansion move of Gazprom was decision of investing in the downstream electricity sector[231]. Considering the EU's aim of merging natural gas and electricity together, it is clear once more that Gazprom would like to stay on track; plus focusing on downstream is a classic response to the uncertain nature of the natural gas market by many other companies[232].

For many, focusing on assets outside the EU especially in Asia is a trend in diversifying markets. Increasing need to natural gas and increasing gas price since Fukushima event made Asian markets an attractive alternative of the EU market[233]. While Gazprom has signed a memorandum of understanding with CNPC, Exxon get involved in strategic alliance with Sinopec and Shell signed a global strategic alliance agreement with CNOOC[234].

---

[229] DNV KEMA, (2013), Study on LT-ST Markets in Gas Final Report, p.41

[230] Ernst and Young (2013), Global Oil and Gas Transactions Review 2013, p.12

[231] The Wall Street Journal, 21 October 2011, Gazprom pushing into European downstream despite EU probe, http://blogs.wsj.com/emergingeurope/2011/10/21/gazprom-pushing-into-european-downstream-despite-eu-probe/

[232] Ove Eikeland, (2007), Downstream natural gas in Europe – High hopes dashed for upstream oil and gas companies, Energy Policy, No:35, p.236

[233] Enerdata, (2014), How is Gazprom adapting to changing market conditions?, http://www.enerdata.net/enerdatauk/press-and-publication/energy-news-001/how-gazprom-adapting-changing-market-conditions_28540.html

[234] See Enerdata, (2014), op.cit
Shell, (2014), Media Release, Shell and CNOOC sign global strategic alliance agreement;

Some other companies go further with investing in cleaner energy which is the trending topic in the EU and will continue to increase its importance. GDF-Suez for example is investing in biogas and aiming to be a leader in renewable energy[235]. They also focus on smart metering and grids, LNG retail and demand management[236]. Also, Chevron has activities on geothermal power; BP and Shell are working on wind and solar energy[237].

Relationship building with governments and NOCs is another step further in market strategies. It allows companies to learn and affect the possible changes in market before they happen.

One example is Shell who always build a very strong bond with regional governments and National Oil Companies. Cleverly designed partnership structures and good relationship with governments bring competitive advantage to the company when compared with other oil majors[238]. The ability to manage those relationships has brought a great strength to the company which did not let governments to go with national choice when awarding a contract in various critical sites of the world. Another good example would be BP who is actively involving in lobbying activities through strong European institutions[239]. GDF-

---

CNN, (2002), Sinopec firms up alliance with Exxon
http://edition.cnn.com/2002/BUSINESS/asia/10/21/hk.sinopec/

[235] Geert de Clercq, Benjamin Mallet, 27 February 2014, GDF ditches monopoly past invests in growth markets, Reuters

[236] See Geert de Clercq, Benjamin Mallet, 27 February 2014, GDF ditches monopoly past invests in growth markets, Reuters

[237] Jason Switzer, (2014), When renewables meet oil and gas industry opposites attract, Renewable Energy World

[238] See Jedrzej Frynas, (2003), Royal Dutch/Shell, New Political Economy, Vol.8 Issue 2, pp.275-285

[239] See ESCP Europe Business School, (2011), BP Lobbying Europe,
http://www.escpeurope.eu/uploads/media/G8._BP_Lobbying_Europe.pdf

Suez is also known as being involved in lobbying activities especially for shale gas bans in Europe[240].

All of the companies actively involved in any market are working harder on their strategies to create the best balance between their business activities and changing market conditions. The risk of a market or challenges in it affect companies' decisions on trade and investment; thus for anyone and everyone performing in a specific market it is better to investigate and envisage current and future developments so that correct and adequate decisions can be given on how the business activities should be pursued[241]. Such lobbying activities help companies to break asymmetry of information, get a saying in legislation, taxation and competition matters, and also international relations in regions related to the companies' business.

5.4. Results of Strategic Adaptation

The adaptation strategies mentioned in previous section was all planned and followed by major companies to protect their share in the market. The following table is demonstrating statistical data on number of major natural gas companies existing in the European Union natural gas market between years 2003 and 2012.

While all regulative changes in the EU market are designed to let easier market entry and better competition, the table demonstrates how successful the effort was. As it is clear from these statistics, there is no significant change in the number of major companies actively performing in the member countries. It demonstrates that the majors who were already active managed to keep their positions despite the regulative enforcements.

[240] S. Buisset, O. Oye, J. Selleslaghs,(2012), Lobbying shale gas in Europe, Pact Europe, p.7
[241] A. Konoplyanik, (2011), Third EU Energy Package: Regulatory Changes for Internal EU Energy Markets in Gas and Possible Consequences for Suppliers (Incl. Non-EU Suppliers) and Consumers, OGEL Journal, p.1

TABLE 6. Number of major companies from 2003 to 2012 in the EU market, source: Eurostat (2012) [242]

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belgium*	1	2	2	3	3	3	3	3	2	:
Bulgaria	1	1	3	3	1	1	1	1	2	2
Czech Republic	1	1	1	1	1	2	2	3	4	1
Denmark**	2	1	1	1	1	1	1	2	:	:
Germany	5	5	7	7	6	6	7	7	6	3
Estonia	2	2	2	2	2	2	2	1	1	1
Ireland	4	5	4	6	6	5	4	6	5	5
Greece**	1	1	1	1	1	1	1	3	:	:
Spain	4	4	6	5	5	5	4	5	4	5
France	1	1	3	3	2	1	2	3	4	4
Croatia	1	1	1	1	1	1	2	2	2	2
Italy	4	3	3	3	3	3	3	3	3	3
Latvia	1	1	1	1	1	1	1	1	1	1
Lithuania	3	4	4	4	4	4	4	4	4	4
Luxembourg	1	1	1	1	1	1	2	1	1	1
Hungary	4	4	3	3	3	3	4	6	4	4
Netherlands*	:	:	:	:	:	:	:	:	:	:
Austria	1	4	3	3	4	4	4	4	3	3
Poland	1	1	1	1	1	1	1	1	1	1
Portugal	1	1	1	1	1	1	1	2	2	3
Romania	4	4	4	4	4	5	2	2	2	2
Slovenia	1	1	1	1	1	2	1	2	2	2
Slovakia	1	1	1	1	1	2	2	3	3	3
Finland	1	1	1	1	1	1	1	1	1	1
Sweden	1	1	1	1	1	:	1	2	1	1
United Kingdom	6	6	7	6	7	8	7	7	6	6

Correspondingly, the following figure demonstrates the Top 10 oil and gas companies in Europe according to their net value during the years 2006 and 2014.

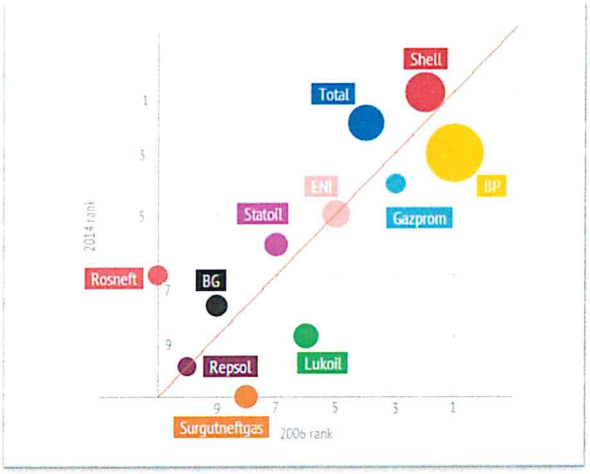

FIGURE 24
Top 10 oil and gas companies in Europe years 2006 and 2014, adapted from Financial Times Global 500[243]

[242] Eurostat, (2012), Natural gas market indicators *Data regarding Netherlands and Belgium are not demonstrated on the table due to the confidentiality reasons. Malta and Cyprus does not exist on the table because of not having a significant natural gas market. **Information is not available.

[243] Financial Times, Global 500, retrieved from: http://www.ft.com/intl/indepth/ft500#global500

The Financial Times Global Top 500 list shows how the competitive position of companies changes over time. The companies located on the red performance line are able to keep their 2006 raking in 2014. The ones above the line improved themselves compared to 2006, while the ones below the line lost their rankings. Strategic business practices helps companies to position themselves on and above the performance line.

Besides demand-supply volatilities, global changes of natural gas markets and challenging new technologies, the most compelling change from the major companies' perspective was unbundling rule.

According to Moschieri and Mair, unbundling is "disposal and sale of assets, facilities, product lines, subsidiaries, divisions and business units"[244]. Many studies in the literature reviewed unbundling from company strategy view which accepts it as a planned internal motive. For some it is a corrective action to replace earlier acquisition decision[245]; or adjustment of company's operational segment[246]. But then again, it is also accepted as a "reflection of economic cycle"[247]. Still, the nature

---

[244] Caterina Moschieri, Johanna Mair (2005), Research on Corporate Unbundling: A Synthesis, IESE Business School Working Paper, University of Navarra, p.1

[245] See;

Lorin.Hitt, Robert Hoskisson, Richard Johnsson, D.D. Moesel, (1996),The market for corporate control and firm innovation, Academy of Management Journal, Volume 39 Issue 5, pp.1084-1119;

Lorin Hitt, Robert.Hoskisson, Jeffrey.Harrison, T.P.Summers, (1994), Human capital and strategic competitiveness in 1990s, Journal of Management Development, Volume 13, Issue 1, pp. 35-46;

Constantinos Markides, (1992), Consequences of corporate refocusing: ex ante evidence, Academy of Management Journal, Volume 35 Issue 2, pp. 398-412;

Michael Porter, (1987), From competitive advantage to corporate strategy, Harvard Business Review, Volume 65 Issue 3, pp.35-66;

A.Seth, J.Easterwood, (1993), Strategic redirection in large management buyouts: the evidence from post buyout restructuring activity, Strategic Management Journal, Volume 14 Issue 4, pp.251-273

[246] A. McGahan, B.Villalonga, (2003), Does the value generated by acquisitions, alliances and divestures differ?, Working paper, Harvard Business School, Boston, cited in Caterina Moschieri, Johanna Mair (2005), Research on Corporate Unbundling: A Synthesis, IESE Business School Working Paper, University of Navarra, p.1

[247] See;

of unbundling operation is stayed unsettled from the point if it is a proactive or a corrective strategy[248].

Ownership unbundling create a strict vertical disintegration in the companies, among which the transmission company will required to be fully separated from the other segments of the supply chain[249]. The less strict versions of unbundling that have been discussed are accounting unbundling and legal unbundling; which the former requires keeping separate books for different segments of the business and the latter allows same owner operating the different segments under different companies[250]. Joskow supports that the stricter unbundling will allow higher efficiency in the market[251].

In the EU natural gas market, ownership unbundling was introduced as an action from the decision makers; in which any conflict of interest between producers, suppliers and transmission operators is aimed to be removed[252]. Due to the external

---

J Aron, (1991), Using the capital market as a monitor: corporate spin-offs in an agency framework, RAND Journal of Economics, Volume 22 Issue 4 pp.515-518;

I.M. Duhaime, I.S. Baird, (1987), Factors influencing divestment decision making: evidence from a field study, Strategic Management Journal, Volume 5 Issue 4,pp. 301-318;

D.A. Garvin, (1983),Spin-offs and the new firm formation process, California Management Review, Volume 25 Issue 2, pp.3-20;

K. Ito, (1995), Japanese spin-offs: unexplored survival strategies, Strategic Management Journal, Volume 15, pp. 35-51

[248] K.Eisenhardt, S.L.Brown, (1999), Patching: restricting business portfolios in dynamic markets, Harvard Business Review, Volume 77, pp. 72-82, see Cited in Caterina Moschieri, Johanna Mair (2005), Research on Corporate Unbundling: A Synthesis, IESE Business School Working Paper, University of Navarra, p.1

[249] Christian Growitsch, Marcus Stronzik, 2014, Ownership unbundling of natural gas transmission networks: empirical evidence, EWI Working Paper, No:11/7, p.2

[250] Christian Growitsch, Marcus Stronzik, 2014, Ownership unbundling of natural gas transmission networks: empirical evidence, EWI Working Paper, No:11/7, p.2

[251] P.Joskow, (2008), Lessons learned from electricity market liberalization, The Energy Journal, Volume 29, p.35

[252] European Comission, (2013), Ownership Unbundling: The Comission's practice in assessing the presence of a conflict of interest including in case of financial investors, Commission Staff Working Document, SWD (2013) 177 final, p.4

enforcement nature of unbundling into the market, companies did not have much choice over how and when to apply it into their structure.

There were much opposition to ownership unbundling idea with the questions of how operability of the system is ensured, who hold enough economic power to buy transmission systems and who will compensate energy companies' losses[253]. It is feared that any negative effect of improperly established unbundling system will seriously harm the whole natural gas market liberalization in the EU[254].

Also some benefit-cost comparison of ownership unbundling shows that it is highly probable for benefits not to exceed costs[255]. As a response to the oppositions being raised for ownership unbundling since the beginning, the European Commission suggested another option called "Independent System Operator" which suggests keeping the ownership of transmission system assets but allowing their management to an independent company. The independent system operators based on each member state also requires holding strong managerial and intervention power such as fining companies if any anti-competitive behavior occurs in transmission systems[256].

Besides, while it is seen as an indispensable practice in growing industries, vertical integration is needed in declining and emerging industries[257]. The reason why integration in useful in emerging industries is hardship of collective participation in

---

[253] See Michael Pollitt, (2008), The arguments for and against ownership unbundling of energy transmission networks, Energy Policy, Volume 36 Issue 2, pp. 704-713

[254] European Regulators Group for Electricity and Gas, (2008), Guidelines for good practice on functional and informational unbundling for distribution system operators, p.3

[255] See Johann-Christian Pielow, (2009), Legal and economic aspects of ownership unbundling in the EU, Journal of World Energy Law and Business, Volume 2 Issue 2, pp. 96-116

[256] Roman Zyuzev, (2008), Gas Market Liberalization as a Key Driver of Change of the European Gas Market and Its Influence on the Strategies of the Main Players, Institut Europeen Des Hautes Etudes Internationales, p 84

[257] See George Stigler, (1951), The division of labor is limited by the extent of the market, Journal of Political Economy, Volume 59, pp. 185-193

a business where there is many new and uncertain technologies are in need of use[258]. Considering the capital and technology intensive nature of oil and gas industries the benefit that can be gathered out of integrated company and collective participation is indispensable for survival of a company.

It is argued that with the ownership unbundling there will be a benefit from competition point of view since the network operator will not have a chance to discriminate between a conglomerated or independent producer[259]. The idea is correct when it is considered that the company stays still in the part of value chain it is located. Nevertheless, even companies apply ownership unbundling rigorously and sell their assets, are able to buy many other in production or retail segments with the incomes generated out of those assets. Therefore while the competition increase in one segment of natural gas supply chain; it may decrease in the others[260]. And finally as the statistics show, the majors managed to control the competition and their overall strategic position in the supply chain.

5.4 Conclusion

The EU natural gas market involves various major companies active in it; NOCs, IOCs, local midstream and downstream companies. All these companies together form the EU natural gas supply chain.

---

[258] D. Evans, A.Hagiu, R.Schmalensee (2008), Invisible engines: How software platforms drive innovation and transform industries, MIT Press, p.260

[259] See John Vickers, (1995), Competition and regulation in vertically related markets, The Review of Economic Studies, Volume 62 Issue 1, pp. 1-17

[260] See Rob Aalbers, Barbara Baarsma, (2005), Unbundling of energy companies reduces competition, Economisch Statistische Berichten, Volume 90, Issue 4468, pp.356-357 cited in Christian Growitsch, Marcus Stronzik, 2014, Ownership unbundling of natural gas transmission networks: empirical evidence, EWI Working Paper

M.Mulder, V.Shestalova, G.Zwart, (2007), Vertical separation of Dutch energy distribution industry: an economic assessment of political debate, Intereconomics, Volume 42, Issue 6, pp.305-310

The companies who perform in the exploration activities are mainly IOCs together with their local NOC partners. Also some NOCs from non-EU countries are main suppliers of imported natural gas. Midstream transportation and storage companies as well as downstream end-customer suppliers are mainly local private companies with sometimes IOCs ownership.

With the recent changes in the EU natural gas market, many companies change their strategies to survive and increase their market share. Strategic alliances, joint ventures, acquisitions and asset swapping are the most common strategies that companies follow in order to create collaboration as well as risk sharing.

Another common practice is diversifying the markets to create a balanced asset portfolio. Though some are trying to invest in other EU-popular energy sources such as renewables, the others try to expand their systems wider into the natural gas supply chain. While many big companies are focusing on their upstream activities, many other producers are trying their best chances to enter midstream and downstream markets.

The most interesting point here would be the Europeans' devotion to gas storage facilities to mitigate risk of Gazprom cutting natural gas supplies, while Gazprom itself is acquiring many stakes in European natural gas storage facilities to have its importance in the market increased.

While the long term contracts which were popular for so long in the market were securing an income for large capital-intensive projects, with today's spot market natural gas sales the companies are bound to come together for one single project.

In all cases, it is clear that whatever change happens in the market the EU natural gas market players will increase their collaboration and cooperation day by day for the sake of common benefit and protecting their power.

CHAPTER 6

Conclusion

This thesis is written to identify the market adaptation strategies of natural gas companies in the EU which has been going through a serious reform for the natural gas and electricity markets. The thesis aimed to identify how dynamics of global natural gas trade, technology, increasing demand and the EU reform are affecting the business environment for the companies targeting EU natural gas market. Besides the thesis argued that adaptation strategies applied in the market illustrates the focus of companies' on cooperation and collaboration in which they try to eliminate the effects competition and sustain their power.

The history of natural gas shows that it had long been consumed in where it was produced. Nonetheless it is seen that the markets are getting globalized now and trade between far continents are easier compared to the past. Thus, there is an opportunity of increased competition which can be a mean for supplying better service at lower prices to the customers. The EU which has ever increasing energy demand and growing concerns of sustainable and cleaner energy is seeing natural gas as one of the best energy sources to reach its targets both in environmental protection and meeting the demand. At some other natural gas markets, there has been a fierce competition between companies, increasing production and quality of service together with decreasing prices. Consequently, the idea of liberalized energy market emerged and the reform process has started in the EU to enjoy the similar improvements at the interest of customers.

The reform of the EU natural gas market is designed in a way that the changes and improvements will be implemented step by step; so that companies, regulative and controlling authorities will be prepared for it. The idea of liberalizing the market with taking government out of the management system of companies was

designed to eliminate conflict of interest. With a direct involvement into the business, governments have to carry both principal and agent role at the same time. While the principal is aiming to meet energy demand at cheaper prices, sustain it for long time and provide work for people, the agent aims higher income and lower costs. Thus, pushing government out of business partnership is an important step to solve disambiguation in management roles.

Likewise, unbundling in natural gas supply chain idea has been introduced since the beginning of first reform package and it became mandatory as the new packages were announced. Unbundling rule in the natural gas market aims to allow third party access to the segments of supply chain which are not natural monopolies. The idea requires separation of ownership in upstream and midstream segments of the supply chain, which correspond to separate entities controlling production and transmission of natural gas. Because, while the transmission and regional distribution segments become a natural monopoly; there is still a room for competition in segments of production and retail of natural gas. With ownership unbundling the EU aimed to advantage from possible competition in the other segments of natural gas supply chain. Nonetheless, there is the risk of asymmetric information between regulators and companies, due to which regulators do not clearly identify the proper actions for companies and the industry and the companies also cannot anticipate the possible changes and risks the industry is expecting.

Natural gas markets are changing; they are getting more global and much more merged than ever. At the same time the reserves are diminishing and search for new reserves has become a fierce competition. Besides the natural gas industry is still a developing one with new techniques and technologies are being developed ever since. New technologies such as deep water drilling, LNG and floating LNG vessels, hydraulic fracturing, 4-D seismic imaging and many more are not easy and cheap to develop. Considering the fact that EU counties are lacking behind in these technologies especially due to environmental concerns, totally competitive

market in the EU is still far from being applicable. Small and medium sized companies of the market require being in partnerships and alliances with the majors to gain necessary know-how until they will become capable enough to operate the projects as well as obtain necessary amount of capital or bank credit alone. Accordingly, the governments need to provide feasible fiscal regimes and production sharing mechanism to make their Greenfield projects attractive for the majors of natural gas industry. Because, there is always a chance that majors can prefer performing in countries where regulations are easier to tackle with, costs are lower, reserves are higher. If the EU would like to compete with global markets of natural gas, they need to provide similar investment incentives and business design to the companies. As Stigler (1951) [261] suggests vertical integration is beneficial for declining and emerging industries in a way that it allows collective participation to develop and use new and uncertain technologies.

Many external changes in markets including legislative ones force companies to adapt accordingly for not to lose their competitive advantage. The changes that affect business results negatively and that are caused by the political powers' decisions are accepted as political risks. Especially in industries such as oil and gas, capital-driven projects and geopolitical nature of the business force companies to face and mitigate many political risks. The most common practice for risk mitigation is sharing the risk with more than one other partner. It is seen that the EU oil and gas companies are forming strategic alliances and joint ventures to enjoy cost and risk sharing, increased know-how and strong lobbying power against local governments.

With the unbundling rule, natural gas companies in the EU market lost their monopolistic control power which was allowing them to enjoy benefits to use for investment and new technology application. Now, all the strategies they follow demonstrate their need of covering for the lost power. As it is illustrated in the

[261] See George Stigler, (1951), The division of labor is limited by the extent of the market, Journal of Political Economy, Volume 59, pp. 185-193

previous chapter, many companies got involved in projects in the market segments that they were not involved before. Losing position in transmission systems forced companies to look for alternatives to exist in segments where they can control natural gas supply. Many companies who have a concern of keeping their importance for the EU bought assets of natural gas storage facilities. Specifically, Gazprom's strategies to acquire midstream companies as well as to involve in natural gas storage facilities are ironic from the EU's viewpoint. While the EU is trying to lessen its dependence on this main supplier, the new system of market is leading the supplier into a more aggressive and expansionist nature. It shows that increasing competition is not always ensured by unbundling rules in the market. Hence, benefits of unbundling in the EU natural gas market are debatable when competition is considered.

Aalbers and Baarsma (2005)[262], as well as Mulder et.al. (2007)[263] argued that while unbundling is increasing the competition in one segment of the market, it may decrease competition in the others. Because they argue that a company who sell assets of transmission operations may use the income generated to buy assets in natural gas production or retail segments. Thus exiting one segment of the market can help companies to strengthen their power in the others.

In conclusion, in this thesis it is observed that market adaptation strategies applied in the EU natural gas market demonstrates the companies' need of increased control power, decreased risk and vast usage of new technologies. All the strategies followed have the common point of collaborative action and risk sharing.

---

[262] See Rob Aalbers, Barbara Baarsma, (2005), Unbundling of energy companies reduces competition, Economisch Statistische Berichten, Volume 90, Issue 4468, pp.356-357, cited in Christian Growitsch, Marcus Stronzik, 2014, Ownership unbundling of natural gas transmission networks: empirical evidence, EWI Working Paper

[263] See M.Mulder, V.Shestalova, G.Zwart, (2007), Vertical separation of Dutch energy distribution industry: an economic assessment of political debate, Intereconomics, Volume 42, Issue 6, pp.305-310

This study is carried out for both theoretical and practical drives. First of all, the theoretical motivation of the research arises from insufficiency of exploration about the effects of the EU natural gas market change on business owners. Especially when it is about European Union energy or gas market the available literature mainly focuses on policy makers' actions or suggestions given on necessity European regulations; but the consequences for the companies are overlooked. Thus, the thesis would provide an insight of the companies on changes of the EU natural gas market.

Finally, the practical motivation of this thesis is for any individual who is involved in oil and gas business, providing learning outcomes on market adaptation strategies that are exemplified from successful innovative and competitive companies.

REFERENCES

Aalbers Rob., Baarsma Barbara, (2005), Unbundling of energy companies reduces competition, Economisch Statistische Berichten, Volume 90, Issue 4468, pp.356-357

Abrell Jan, Gerbaulet Clemens, Holz Franziska, Lorenz Casimir, Weigt Hannes, (2013), Combining Energy Networks: The Impact of Europe's Natural Gas Network on Electricity Markets until 2050, Deutsches Institut für Wirtschaftsforschung

Accenture, (2012), Managing Political Risk – Controlling Loss Finding Opportunity

AEA Technology, (2012a), Support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe, report for European Commission DG Environment

AEA Technology (2012b), Climate impact of potential shale gas production in the EU, Final Report, Report for European Commission DG CLIMA

Aegis Energy Advisors Corporation, (2002), State Oil Company Privatizations, Presentation

Akerlof George, (1970), The Market for Lemons: Quality Uncertainty and Market Mechanism, The Quarterly Journal of Economics, Volume 84, No.3, pp. 488-500

Aron J, (1991), Using the capital market as a monitor: corporate spin-offs in an agency framework, RAND Journal of Economics, Volume 22 Issue 4, pp.515-518

Aslund Anders, (2010) , Gazprom Is the Essence of the Energy Curse , The Moscow Times

Ayala Luis F., (2009), IOCs and NOCs; The Fourteen (and plus) Sisters, The Way Ahead Vol.5

Bazilian Morgan, Pedersen Ascha, Baranes Edmond, (2013), Will Shale Gas Be a 'Game-Changer in Europe?, retrieved from: https://cleanenergysolutions.org/blogs/11/shale-gas-game-changer-europe

Beckman Karel, (2010), Shell: from oil tanker to floating LNG vessel, European Energy Review 28 June 2010

Beckman Karel, (2011), Shale gas will not be as important in Europe as in the US, European Energy Review, 9 May 2011

Bellamy Christopher, Child Graham, (2001), European Community Law of Competition, Oxford University Press

Berlin Alan, (2003), Managing Political Risk in the Oil and Gas Industries, Oil Gas & Energy Law, Volume 1 Issue 2

Booz&Co., (2013) Benefits of an Integrated European Energy Market, Final Report prepared for Directorate-General Energy European Commission

BP, (2006), Quantifying Energy,

BP, (2013), Statistical Review of World Energy

Buisset S., Oye O., Selleslaghs J.,(2012), Lobbying shale gas in Europe, Pact Europe

Cameron D., (2005), The Internal Market in Energy: Harnessing the New Regulatory Regime, 30 European Law Review, p.631-640

Cameron Peter D., Brothwood Michael (2002) Competition in Energy Markets: Law and Regulation in the European Union, Oxford University Press

Cavaliere Alberto, (2007) The Liberalization of Natural Gas Markets : Regulatory Reform and Competition Failures in Italy

Cayrade Patrick, (2004), Investments in gas pipelines and liquefied natural gas infrastructure. What is the Impact on the Security of Supply?, Nota di Lavoro

Center for Energy Economics, (2008), A Citizen's Guide to National Oil Companies, The University Texas Austin

Chazam Guy, (2014), Europe Seeks Alternative Gas Supplies., 27 April 2014, Financial Times

Clark Meagan, (2014), Europe has several possible replacements for russian gas but all are risky,expensive and will take years to develop, International Business Times

CNN, (2002), Sinopec firms up alliance with Exxon , retrieved from: http://edition.cnn.com/2002/BUSINESS/asia/10/21/hk.sinopec/

Corsini Cosimo, Heiligtag Sven, Inia Dieuwert, (2013), Strategic Choices from Midstream Gas Companies, McKinsey Working Papers on Risk, Number 50

Cronshaw Ian, Marstrand Jacob, Pirovska Margarita, Simmons Daniel, Wempe,Joost (2008), Development of Competitive Gas Trading in Continental Europe, International Energy Agency Information Paper

De Clercq Geert, Mallet Benjamin, 27 February 2014, GDF ditches monopoly past invests in growth markets, Reuters

De Jong Jacques J., (2008), The 2007 Energy Package: The Start of a New Era?, Intersentia

De Lange Tita, (2005), A theory of the firm only a microeconomist could love? A microeconomist's reply to lubatkin's critique of agency theory, Journal of Management Inquiry Volume 14, pp. 404-406

Directive 96/92/EC (Official Journal L 027, 30/01/1997 P. 0020–0029)

Directive 98/30/EC (Official Journal L 204, 21/07/1998 P. 0001–0012)

Directive 2003/54/EC (Official Journal L 176, 15/07/2003 P. 0037–0056)

Directive 2003/55/EC (Official Journal L 176, 15/07/2003 P. 0057–0078)

DNV KEMA, (2013), Study on LT-ST Markets in Gas Final Report

Duhaime I.M., Baird I.S., (1987), Factors influencing divestment decision making: evidence from a field study, Strategic Management Journal, Volume 5 Issue 4, pp. 301-318

Cyr David, Unclean and Unnatural Side of Natural Gas, retrieved from: http://www.un-naturalgas.org/Un-Natural_Natural_Gas-090129.pdf

EDF Trading, (2009), Gazprom Marketing & Trading and EDF-Trading announce Trans-Atlantic gas swap, retrieved from: http://www.edftrading.com/Media/Press-releases/Gazprom-Marketing-Trading-and-EDF-Trading-Announce

EFTA, (2014), Free Movement of Goods, EFTA Secretariat, Brussels, retrieved from: http://www.efta.int/media/publications/fact-sheets/EEA-factsheets/GoodsFactSheet.pdf

Egging Ruud, Gabriel Steven, Holz Franziska, and Zhuang Jifang, (2008), A Complementarity Model for the European Natural Gas Market, Energy Policy, Volume 36 Issue 7, pp. 2385–2414

Eikeland Ove, (2007), Downstream natural gas in Europe – High hopes dashed for upstream oil and gas companies, Energy Policy, No: 35, pp.227-237

Eisenhardt Kathleen, (1989), Agency theory: An assessment and review, The Academy of Management Review, Volume 14, pp. 57-74.

Eisenhardt Kathleen, Brown Shona, (1999), Patching: restricting business portfolios in dynamic markets, Harvard Business Review, Volume 77, pp. 72-82

Eltsefon Larissa, (2010), Are Caspian and Middle-East Pipelines the Future of the European Gas Market? , Wilson Center

Enerdata, (2014), How is Gazprom adapting to changing market conditions?, http://www.enerdata.net/enerdatauk/press-and-publication/energy-news-001/how-gazprom-adapting-changing-market-conditions_28540.html

Energy Information Administration, (2002), Derivatives and Risk Management in the Petroleum, Natural Gas and Electricity Industries

Energy Charter Secretariat, (2007), Putting a Price on ENERGY: International Pricing Mechanisms for Oil and Gas, Brussels

Energy Community, (2009),Study on the Improvement of Operational Rules for Natural Gas Transportation in the Energy Community

ENI, Alliances and Collaborations in R&D, retrieved from http://www.eni.com/en_IT/innovation- technology/alliances-collaborations/alliances-collaborations.shtml

Ernst & Young, (2013), Global Oil and Gas Reserves Study

Ernst & Young, (2013), Global Oil and Gas Transactions Review 2013

ESCP Europe Business School, (2011), BP Lobbying Europe, http://www.escpeurope.eu/uploads/media/G8._BP_Lobbying_Europe.pdf

Euractiv, (2008), Liberalisation of the EU Gas Sector, retrieved from: http://www.euractiv.com/energy/liberalisation-eu-gas-sector-linksdossier-188455

Eurogas ,(2007), Long Term Outlook for Gas Demand and Supply

Europa, The History of European Union, retrieved from: http://europa.eu/about-eu/eu-history/index_en.htm

European Commission, (2004), Trans-European energy networks: TEN-E priority projects, Luxembourg. Office for Official Publications of the European Communities

European Commission, (2006), Decision 1364/2006/EC of the European Parliament and of the Council of 6 September 2006

European Commission, (2011), Market Observatory for Energy-Key Figures, June 2011, Retrieved from: http://ec.europa.eu/energy/observatory/countries/doc/key_figures.pdf

European Commission, 8 May 2013, Ownership Unbundling: The Commission's practice in assessing the presence of a conflict of interest including in case of financial investors, Commission Staff Working Document, SWD (2013) 177 final, p.4

European Commission Press Release, 4 December 2013, Mergers: Commission approves acquisition of German and Dutch gas supply and storage joint ventures by Gazprom, http://europa.eu/rapid/press-release_IP-13-1207_en.htm

European Parliament, (2013), Completing the EU's internal energy market, Press Release

European Regulators Group for Electricity and Gas, (2008), Guidelines for good practice on functional and informational unbundling for distribution system operators

Eurostat (2012), Natural Gas Market Indicators, Retrieved from: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Natural_gas_market_indicators

Evans D., Hagiu A., Schmalensee R. (2008), Invisible engines: How software platforms drive innovation and transform industries, MIT Press

Financial Times, Global 500, retrieved from:
http://www.ft.com/intl/indepth/ft500#global500

Financial Times (26 August 2014), Us Shale: What Lies Beneath

Frynas Jedrzej, (2003), Royal Dutch/Shell, New Political Economy, Vol.8 Issue 2, pp.275-285

Gas Strategies, Gas and LNG Industry Glossary, Retrieved from:
http://www.gasstrategies.com/industry-glossary#Annual Contract Quantity

Garvin D.A., (1983), Spin-offs and the new firm formation process, California Management Review, Volume 25 Issue 2, pp.3-20

Gately Dermot, (1986), Lessons from the 1986 Oil Price Collapse, Brookings Paper on Economic Activity

Gazprom, (2009), OAO Gazprom Annual Report

Globalsecurity.org, Fourth Republic 1946-1958, retrieved from:
http://www.globalsecurity.org/military/world/europe/fr-fourth-republic.htm

Growitsch Christian, Stronzik Marcus, 2014, Ownership unbundling of natural gas transmission networks: empirical evidence, EWI Working Paper, No:11/7

Hasse N, (2009), European Gas Market Liberalisation: Competition versus Security of Supply?, Energy Delta Institute

Hitt Lorin, Hoskisson Robert, Johnsson Richard, Moesel D.D., (1996),The market for corporate control and firm innovation, Academy of Management Journal, Volume 39 Issue 5, pp.1084-1119

Hitt Lorin, Hoskisson Robert, Harrison Jeffrey, Summers T.P., (1994), Human capital and strategic competitiveness in 1990s, Journal of Management Development, Volume 13, Issue 1, pp. 35-46

Holz Franziska, von Hirschhausen Christian, Kemfert Claudia, (2008), A Strategic Model of European Gas Supply (GASMOD), Energy Economics ,Volume 30 Issue 3

Honore Anouk, (2013), The Italian Gas Market : Challenges and Opportunities, The Oxford Institute for Energy Studies

Högselius Per, Kaijser Arne, Aberg Anna, (2010), Natural Gas in Cold War Europe: The Making of Critical Transnational Infrastructure, Draft Chapter for EUROCRIT edited volume

Hulbert Matthew, (2010) Europe's Gas: Careful What You Wish for, European Energy Review, Retrieved from: http://www.europeanenergyreview.eu/site/pagina.php?id=1813&print=1

Inkpen Andrew, Ramaswamy Kannan, (2006), Global Strategy: Creating and Sustaining Advatage Across Borders, Oxford University Press

International Energy Agency (2005), Resources to Reserves: Oil and gas technologies for the energy markets of the future, OECD, Paris

International Energy Agency, (2007a), Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency

International Energy Agency (2007b), Natural Gas Market Review

International Energy Agency, (2012), Golden rules for a golden age of gas

International Energy Agency, (2014a), Medium Term Gas Market Report

International Energy Agency, (2014b), Energy supply security

Ito K., (1995), Japanese spin-offs: unexplored survival strategies, Strategic Management Journal, Volume 15, pp. 35-51

Joint Research Centre of the European Commission (JRC), (2012), Unconventional Gas: Potential Energy Market Impacts in the European Union, European Commission, Institute for Energy and Transport, p.167

Joskow P., (2008), Lessons learned from electricity market liberalization, The Energy Journal, Volume 29, pp.9-42

Khatib Hisham (2012), IEA World Energy Outlook 2011-A Comment, *Energy Policy*, Volume, pp. 48 737–43

Kjärstad Jan, Johnsson F., (2007), Prospects of the European Gas Market, Energy Policy, Volume 35 Issue 2

Konoplyanik A., (2011), Third EU Energy Package: Regulatory Changes for Internal EU Energy Markets in Gas and Possible Consequences for Suppliers (Incl. Non-EU Suppliers) and Consumers, OGEL Journal

KPMG, (2013), Oil and Gas in Africa, Full Sector Report

Lechtenböhmer Stefan, Altmann Matthias, Capito Sofia, Matra Zsolt, Weindrorf Werner, Zittel Werner, (2011), Impacts of shale gas and shale oil extraction on the environment and on human health, Wuppertal Institute for Climate, Environment and Energy and Ludwig-Bölkow-Systemtechnik GmbH, study requested by the European Parliament's Committee on Environment, Public Health and Food Safety

Lewiner Colette, (2010), European energy markets observatory, Springer Science Business Media B.V

Lipsey Richard, (1983), An introduction to positive economics. Weidenfeld and Nicolson, London

Makarova Nadejda Victor (2008), Gazprom: Gas Giant Under Strain, Stanford University, Working Paper No:71

Markides Constantinos, (1992), Consequences of corporate refocusing: ex ante evidence, Academy of Management Journal, Volume 35 Issue 2, pp. 398-412

McGahan Anita, Villalonga Belen, (2003), Does the value generated by acquisitions, alliances and divestures differ?, Working paper, Harvard Business School, Boston

Melling Tony, Terzic Branko, Kuuskraa Vello, Goncalves Chirstopher, Nakagami Hidehiro, Korchemkin Mikhail, Vatansever Adnan, (2010), The Changing Fundamentals of Global Gas Markets – Europe as the Battleground?, Carniege Endovment for International Peace

MIT Energy Initiative, (2011), The Future of Natural Gas, retrieved from: https://mitei.mit.edu/system/files/NaturalGas_Report.pdf

Mooi Erik, Sarstedt Marko, (2011), A Concise Guide to Market Research, Springer

Moschieri Caterina, Mair Johanna, (2005), Research on Corporate Unbundling: A Synthesis, IESE Business School Working Paper, University of Navarra

Motta Massimo, (2005), Competition Policy – Theory and Practice, Cambridge University Press

Mulder M., Shestalova V., Zwart G., (2007), Vertical separation of Dutch energy distribution industry: an economic assessment of political debate, Intereconomics, Volume 42, Issue 6, pp.305-310

National US-Arab Chamber of Commerce, (2011), Exxon Mobile's Strategic Partnership, US-Arab Tradeline, Volume 15 No:1

Natural Gas Europe, (2012), Poland Shale Gas Scandal, retrieved from: http://www.naturalgaseurope.com/tusk-blames-poland-shale-gas-corruption

Natural Gas Europe, (2014), Underground storage: down in the dumps, 17 March 2014, retrieved from http://www.naturalgaseurope.com/european-gas-conference-2014-ugs-cedigaz

Newberry Mark, Goldberg Silke, (2011), The European Energy Handbook 2011, Herbert Smith LLP

New York Times, (2011), Germany will close nuclear power plants by 2022, retrieved from:
http://www.nytimes.com/2011/05/31/world/europe/31germany.html?_r=0

Novotny Jiri (2010), Market Power and the Power of the Market, Presentation at the Argus European Natural Gas and LNG Trading Conference, 6-7 October 2010, London, UK

Olorunfemi M.A., (1991), The dynamics of national oil companies, OPEC Review, Winter Volume 15, No 4

Pederson Jay (2001), International Directory of Company Histories, St. James Press

Peebles Malcolm W.H. (1981), Evolution of the Gas Industry, New York University Press

Pielow Johann-Christian, (2009), Legal and economic aspects of ownership unbundling in the EU, Journal of World Energy Law and Business, Volume 2 Issue 2, pp. 96-116

Politt Michael, (2008), The arguments for and against ownership unbundling of energy transmission networks, Energy Policy, Volume 36 Issue 2, pp. 704-713

Porter Michael, (1987), From competitive advantage to corporate strategy, Harvard Business Review, Volume 65 Issue 3, pp.35-66

Price Waterhouse Coopers, (2006), How Energy Companies Can Improve Global Business Performance by Better Managing Political Risk, Advisory and Eurasia Group Viewpoint-Energy

Ramirez Rafael, Roodhart Leo, Manders Willem, (2011), How Shell's domains link innovation and strategy, Long Range Planning, Volume 44, pp. 250-270

Ratner Michael, Belkin Paul, Nichol Jim, Woehrel Steven, (2013), Europe's energy security: options and challenges to natural gas supply diversification

Reading Clive, (2003) Strategic Business Planning-A dynamic system for improving performance and competitive advantage, London and Sterling VA

Reuters, 14 April 2014, Europe speeds up gas storage to prepare for Russian cut, http://www.reuters.com/article/2014/04/14/ukraine-crisis-gas-europe-idUSL6N0N620C20140414

Rigzone, (2014), E&P News: Company Mergers, Acquisitions and Joint Ventures, retrieved from: http://www.rigzone.com/news/type.asp?t_id=5&r_id=15&lxd=365

Riley Alan, (2006), Energy Security, Gas Market Liberalisation and Our Energy Relationship with Russia, European Energy Security,Working Paper of the European Security Forum

Rogers Howard, (2012), The Impact of a Globalizing Market on Future European Gas Supply and Pricing: The Importance of Asian Demand and North American Supply, Oxford Institute for Energy Studies, Oxford, p.5

Saunders Mark, Lewis Philip, and Thornhill Adrian, (2009), Research Methods for Business Students,Prentice Hall

Schrag Daniel P. (2012), Is Shale Gas Good for Climate Change?, Dædalus, the Journal of the American Academy of Arts & Sciences, Volume 141, No. 2

Selley Richard, (2011), UK Shale gas: The story so far, Marine and Petroleum Geology, Volume 31

SemGroup Corporation, (2011), Annual Report

Seth A., Easterwood J., (1993), Strategic redirection in large management buyouts: the evidence from post buyout restructuring activity, Strategic Management Journal, Volume 14 Issue 4, pp.251-273

Sharma Anurag, (1997), Professional as agent: knowledge asymmetry in agency exchange, The Academy of Management Review, Volume 22, pp. 758-798

Shell, (2014), Media Release, Shell and CNOOC sign global strategic alliance agreement

Stafford James, (2012), Renewable Technologies and Our Energy Future, European Energy Review, retrieved from: http://www.europeanenergyreview.eu/site/pagina.php?id=3630

Stern Jonathan, (1998) , Competition and liberalization in European gas markets: a diveristy of models, Royal Institute of Ineternational Affairs, London

Stern Jonathan, (2003), Natural Gas in Europe – The Importance of Russia

Stern Jonathan, (2005), Gas Pipeline Co-Operation between Political Adversaries : Examples from Europe, Chatham House

Stern Jonathan, (2006), The Russian-Ukrainian Gas Crisis of January 2006 The Russian-Ukrainian Gas Crisis of January 2006, The Oxford Institute for Energy Studies

Stern Jonathan, van der Linde Coby, (2004) The future of gas: will reality meet expectation?, 9th International Energy Forum-Amsterdam

Stevens Paul, (2003), National Oil Companies: Good or Bad? A Literature Survey, World Bank Workshop, Washington

Stevens Paul, (2010), The History of Gas, EU Policy on Natural Resources

Stigler George, (1951), The division of labor is limited by the extent of the market, Journal of Political Economy, Volume 59, pp. 185-193

Switzer Jason, (2014), When renewables meet oil and gas industry opposites attract, Renewable Energy World

Talus Kim, (2011), Vertical Natural Gas Transportation Capacity, Upstream Commodity Contracts and EU Competition Law, Energy and Environmental Law and Policy Series vol.18, Kluwer Law International

Targa Resources, (2012), Investor Presentation First Quarter 2012, retrieved from: http://files.shareholder.com/downloads/NGLS/1946003937x0x566301/a80071ba-bd2c-4fa7-92ab-436427780a69/Targa_Q1_FY_2012_Final.pdf

Teusch Jonas (2012), Shale Gas and the EU Internal Gas Market : Beyond the Hype and Hysteria,CEPS Working Document

The Economist, Paying the Piper, 4 January 2014

The US Department of State Office of Historian, (2013), Oil Embargo, retrieved from: https://history.state.gov/milestones/1969-1976/oil-embargo

The Wall Street Journal, 21 October 2011, Gazprom pushing into European downstream despite EU probe, retrieved from: http://blogs.wsj.com/emergingeurope/2011/10/21/gazprom-pushing-into-european-downstream-despite-eu-probe/

The World Bank, (2014), GDP Growth (annual %), retrieved from http://data.worldbank.org/

Thurber Mark, (2012), NOCs and the Global Oil Market: Should We Worry? Stanford University Energy Seminar

Tisler Vesna, (2013), the Role of the Agency for the Cooperation of Energy Regulators (ACER) in the Liberaliszation of Energy Markets, Masters Thesis, Europa-Institut Saarland University

Total, Yamal LNG, retrieved from http://www.total.com/en/energies-expertise/oil-gas/exploration-production/projects-achievements/lng/yamal-lng?%FFbw=kludge1%FF

US Energy Information Administration, (2003), the Global Liquefied Natural Gas Market: Status and Outlook, retrieved from: http://www.eia.gov/oiaf/analysispaper/global/pdf/eia_0637.pdf

Verrastro Frank A., Ladislaw Sarah O., Frank Matthew, Hyland Lisa A. (2010), The Geopolitics of Energy: Emerging Trends, Changing Landscapes, Uncertain Times, report to the CSIS Energy and National Security Program

Vickers John, (1995), Competition and regulation in vertically related markets, The Review of Economic Studies, Volume 62 Issue 1, pp. 1-17

Wagner Daniel, (2000), the Impact of Political Change and How to Protect Your Business against It, International Risk Management Institute Online, Retrieved from: http://www.irmi.com/expert/articles/2000/wagner04.aspx

Wainberg Miranda Ferrell, Foss Michot Michelle, (2006), Commercial Frameworks for National Oil Companies, Center for Energy Economics, the University of Texas Austin

Wall Street Journal, (2010), Defections Shake up Climate Coalition, Retrieved from: http://online.wsj.com/articles/SB10001424052748704804204575069440096420212

Weijermars Ruud, 2010, Value chain analysis of natural gas industry-Lessons from the US regulatory success and opportunities for Europe, Journal of Natural Gas Science and Engineering, Vol 2, pp. 86-10

Wilkinson A., Kupers R., (2013), Living in the Futures, Harvard Business Review

Williamson Oliver E., (1985), the Economic Institutions of Capitalism: Firms, Market, Relational Contracting

Wright Peter, Mukherji A., Kroll Mark, (2001), a re-examination of agency theory assumptions: extensions and extrapolations. The Journal of Socio-Economics, Volume 30, pp. 413-429

World Bank Multilateral Investment Guarantee Agency, (2013), World Investment and Political Risk

Yin Robert K, (2003),Case Study Research: Design and Methods, Applied Social Research Methods Series

Zyuzev Roman, (2008), Gas Market Liberalization as a Key Driver of Change of the European Gas Market and Its Influence on the Strategies of the Main Players, Institut Europeen Des Hautes Etudes Internationales

Zelenovskaya Ekaterina, (2013), Impact of Shale Gas Production on the Market Fundamentals and Energy Security of Certain Countries, International Centre for Climate Governance

APPENDICES

A. TURKISH SUMMARY

Enerji, dinamik faaliyetlerin gerçekleşebilmesi için ihtiyaç duyulan güçtür. İnsanlığın gerçekleştirdiği her bir aktivite enerjiye ihtiyaç duyar; bu nedenle enerji hayatın içerisinde her zaman önemli olmuştur. Üretim, endüstriyel faaliyetler, milletlerin ve dünya düzeninin ayakta kalabilmesi için enerji elzemdir.

İkinci Dünya Savaşı Avrupa'yı bölüp harap ettikten sonra, Avrupalı milletler bu bölünmüşlüğü sona erdirecek ve bitkin ekonomiyi canlandıracak bir sonuç arayışına giriştiler. O dönemde, enerji üretiminde kullanılan temel kaynaklar kömür ve çelik, 23 Temmuz 1952 tarihinde altı Avrupa ülkesini Avrupa Kömür ve Çelik Topluluğu çatısı altında bir araya getirdi[1]. Günümüzde Avrupa Kömür ve Çelik Topluluğu yerini Avrupa Birliği'ne bırakmıştır. Bunun yanı sıra, popülaritesi yükselen diğer enerji kaynakları sebebiyle kömür ve çelik enerji üretimi için olan zaruri konumlarını kaybetmiştir. Artık yeniçağın enerji kaynağı olarak temiz, kolay ulaşılabilen ve taşınabilen doğal gaz gösterilmektedir ve doğal gaz dünyanın dört bir tarafında enerji temininin önemli bir parçası olmuştur.

Enerji pazarının geleceğini öngörmek için yapılan tüm senaryo çalışmaları, diğer fosil kaynakların aksine doğal gaza olan talebin 2035 yılına kadar artacağını gösteriyor[2]. Bu durum kanıtlıyor ki doğal gazın dünya enerji kaynakları portfolyosundaki önemi uzun yıllarca devam edecek.

---

[1] Belgium, France, Germany, Luxemburg, Italy and Netherlands are the six founders. see *The History of European Union, europa.eu*

[2] Yıllık doğal gaz talebi artışının 2009-2035 yılları arasında yüzde 0.9-2 olması beklenmektedir. Talep artışının en büyük kısmı OECD üyesi olmayan ülkelerden gelecektir. Hisham Khatib,(2012), "IEA World Energy Outlook 2011-A Comment," *Energy Policy*, Volume, pp. 48 737–43

Avrupa, kendi ihtiyacını karşılayabilecek miktarda doğal gaz üretememektedir. Avrupa Birliği'nin en önemli tedarikçileri Rusya, Norveç ve Cezayir'dir. Bu üç ülkeden temin edilen doğal gaz miktarı Avrupa Birliği'nin toplam ithalatının yaklaşık %50sini oluşturmaktadır[3]. Bu ülkelerden Rusya ise yaklaşık %34'lük doğal gaz tedariki ile uzun yıllardır ana tedarikçi statüsünü korumaktadır[4].

Uluslararası Enerji Ajansı'nın verilerine göre 2030 yılına kadar doğal gaz tüketiminin %42 artması beklenmektedir[5]. Aynı zamanda, Avrupa Birliği 2035 yılındaki enerji ihtiyacının en az %30'unun doğal gaz ile karşılanacağı ve bu doğalgaz miktarının da en az %80'inin ithal kaynaklardan elde edileceğini öngörmektedir[6]. Bu sebeple, Avrupa Birliği doğal gaz pazarındaki arz ve talep farkındaki artışın AB doğal gaz ithalatını arttıracağını söylemek yanlış olmayacaktır.

Doğal gaz talebindeki yüksek artış beklentisinin birçok sebebi vardır. Öncelikle, Avrupa'daki doğal gaz üretimi hâlihazırda en yüksek noktasına ulaşmış ve bundan sonra düşmesi beklenmektedir[7]. Bunun yanı sıra, doğal gaz kaynağı ile enerji üretimi Avrupa'da önemli derecede artmaktadır. Özellikle Fukushima kazası ve diğer yakın tarihlerde vuku bulan kazalar enerji üretim yöntemleri ile ilgili

---

[3] Morgan Bazilian, Ascha Pedersen, and Edmond Baranes. (2013) "*Will Shale Gas Be a 'Game-Changer' in Europe?*" retrieved from: https://cleanenergysolutions.org/blogs/11/shale-gas-game-changer-europe

[4] Morgan Bazilian, Ascha Pedersen, and Edmond Baranes. (2013) "*Will Shale Gas Be a 'Game-Changer' in Europe?*" retrieved from: https://cleanenergysolutions.org/blogs/11/shale-gas-game-changer-europe

[5] Tony Melling, Branko Terzic, Vello Kuuskraa, Chirstopher Goncalves, Hidehiro Nakagami, Mikhail Korchemkin, Adnan Vatansever, (2010), The Changing Fundamentals of Global Gas Markets – Europe as the Battleground?, Carniege Endovment for International Peace

[6] Morgan Bazilian, Ascha Pedersen, and Edmond Baranes. (2013) "*Will Shale Gas Be a 'Game-Changer' in Europe?*" retrieved from: https://cleanenergysolutions.org/blogs/11/shale-gas-game-changer-europe

[7] Matthew Hulbert, (2010) "Europe's Gas: Careful What You Wish for.", European Energy Review, Retrieved from: http://www.europeanenergyreview.eu/site/pagina.php?id=1813&print=1

tartışmaların tırmanmasına ve doğal gazın daha güvenli bir enerji üretim yönetimi olarak popülerliğinin artmasına neden olmuştur. Özellikle düşüşe geçen global ekonominin toparlanması, Avrupa Birliği'ndeki iklim politikası tedbirleri ve jeopolitik gerilimler sebebiyle petrol fiyatlarına endeksli gaz fiyatı değişimleri de doğal gaza olan talebin yükselmesinde rol oynayacaktır[8].

Bu konuda önemli bir nokta da Avrupa Birliği'nin tedarikçilerini çeşitlendirme isteğidir. Daha önce doğal gaza fazlaca ihtiyaç duyulduğu dönemlerde tedariki kesmiş olması ve ayrıca yüksek fiyatlandırma uygulaması Rusya'nın itimatsız bir tedarikçi olarak görülmesine sebep olmuştur[9]. 2006 ve 2009 krizleri sırasında, özellikle bugün istikrarsız ekonomilere sahip olan Güneydoğu Avrupa ülkeleri gaz tedariklerinde büyük kesilmelerle karşılaşmışlardır. Buna ilaveten, Avrupa Birliği'nin yeni tedarik kaynakları arayışına girmesi, Hazar gazının öneminin artmasına ve dolayısıyla Avrupa Birliği'nin Rusya'yı es geçebileceği farklı boru hattı projelerini de desteklemesi gibi gelişmelere önayak olmuştur[10].

Market yapısına ilişkin tüm bu değişiklikler hem Avrupa Birliği politika yapıcılarına hem de pazar içerisinde operasyonlarını sürdüren işletmelere zorluklar yaratmıştır. Söz konusu durumun ışığında, bu tez büyük doğal gaz firmalarının operasyonlarını sürdürdüğü pazar yapısını ve bu firmaların pazar içerisinde uyguladıkları stratejileri tasvir etmeyi amaçlamıştır.

Bu tezin kapsamı son dönemde Avrupa Birliği doğal gaz pazarında görülen değişikliklerin ve yakın gelecekte gerçekleşmesi beklenen yapısal değişimlerin analizini içerir. Bu çalışma sırasında, yaygın olarak araştırılmamış olan söz konusu değişikliklerin işletme sahipleri ve şirketler üzerindeki etkileri analiz

---

[8] James, Stafford. (2012) "Renewable Technologies and Our Energy Future", European Energy Review, retrieved from: http://www.europeanenergyreview.eu/site/pagina.php?id=3630

[9] Anders Aslund,(2010) , Gazprom Is the Essence of the Energy Curse , The Moscow Times

[10] Larissa Eltsefon, (2010), Are Caspian and Middle-East Pipelines the Future of the European Gas Market? , Wilson Center

edilmiş ve şirketlerin bu değişikliklere uyum sağlamak için ortaya koyduğu stratejilere ağırlık verilmiştir.

Avrupa Birliği'nde faaliyet gösteren büyük doğal gaz firmalarının pazar uyum stratejilerine dair literatür kaynakları söz konusu olduğunda, tartışmaların temeli kanun koyucu ve şirketler arasındaki ilişkinin dinamikleri üzerinedir. Bu iki tarafın arasındaki ilişkinin yapısı şirketler tarafından izlenecek stratejik değişim yönetimi aktivitelerini belirlemektedir. Bu ilişkinin analizi için uygulanabilir kavram vekâlet teorisidir. Vekâlet teorisi bir alışveriş ilişkisine dâhil olan asil ve vekil taraflar arasındaki ilişkiyi inceler[11].

Asil talep ettiği servisi alabilmek için çoğunlukla vekile bir ödeme yapar ve karşılığında vekil ilgili servis üzerinde asilin yerine karar verebilme yetkisine sahip olur[12]. Ne var ki aynı zamanda asil vekil ile akdi bir ilişkiye dâhil olarak vekilin karar ve davranışlarını kendi lehine denetlemeye çalışır. Bu ilişkinin doğası sebebiyle, vekil daha özerk bir yapıya kavuşmaya çalışarak, asilin kaybı pahasına kedi çıkarlarını azami mertebeye eriştirmek için çaba gösterir[13]. Bu sebeple, vekil ve asil arasında amaç çatışması ortaya çıkar[14]. Ayrıca, ortaya çıkan diğer bir çatışma ise asimetrik enformasyondur. Asimetrik enformasyon kavramı

---

[11] Richard Lipsey, (1983) An introduction to positive economics. Weidenfeld and Nicolson, London;

Tita de Lange, (2005) A theory of the firm only a microeconomist could love? A microeconomist's reply to Iubatkin's critique of agency theory, Journal of Management Inquiry Volume 14, pp. 404-406;

Peter Wright, A. Mukherji, Mark Kroll, (2001), A reexamination of agency theory assumptions: extensions and extrapolations. The Journal of Socio-Economics, Volume 30, pp. 413-429.

[12] Kathleen Eisenhardt, (1989), Agency theory: An assessment and review, The Academy of Management Review, Volume 14, p. 58

[13] Anurag Sharma, (1997), Professional as agent: knowledge asymmetry in agency exchange, The Academy of Management Review, Volume 22, p 759

[14] International Energy Agency, (2007a), Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency, p.27

ekonomide sözleşme teorisi ile birlikte önemli bilgiyi elinde tutan tarafın bu bilgiyi karşı tarafla paylaşmaması üzerinde durur[15].

Bu çatışmalar vekil ve asil arasında iki önemli problemin oluşmasına neden olur; ters seçim problemi ve ahlaki tehlike. Ters seçim problem akdi ilişkiye dâhil olan taraflardan birinin akit öncesinde kendi çıkarları için hareket etmesi ile ortaya çıkar[16]. Diğer taraftan ahlaki tehlike ise akit sonrasında taraflardan birinin fırsatçı davranışlar göstermesi durumunu açıklar.

Enerji pazarı içerisinde, devlet ve kanun yapıcı kurumlar asil konumunda iken petrol ve gaz şirketleri onların vekilidirler. Asiller ülkenin veya bölgenin enerji talebini karşılamayı hedeflerken, vekiller işlerini daha düşük maliyet ve daha yüksek karla tamamlamayı ister. Bu akdi ilişkide asil vekilin kendi çıkarlarına uygun hareket edip etmediğini belli teşvik ve denetleme mekanizmaları ile kontrol eder.

Açıkça görülebilir ki devlet tarafından işletme sahipleri üzerinde verilen kanuni kararlar ters seçim probleminin oluşmasına sebep olabilir. Devletler işletme sahipleri üzerinde geçerli olacak kanun ve kurallara karar verme gücüne sahip olan taraf iken, şirketler ise genellikle pazar, endüstri ve pazar içerisindeki aktiviteler üzerine daha fazla bilgiye sahip olan taraftırlar. Bu ilişkideki asimetrik enformasyon sebebiyle işletmelere ve pazarın yapısına uygun kanuni kararların verilebilmesi her zaman kesin değildir. Bu ilişki içerindeki şirketler lobi ve kurumsal iletişim aktiviteleri ile bu asimetrik enformasyon akımını kendi lehlerine çevirmek için özellikle kanuni değişim dönemlerinde fazlasıyla çaba gösterirler.

---

[15] George Akerlof, (1970), The Market for Lemons: Quality Uncertainty and Market Mechanism, The Quarterly Journal of Economics, Volume 84, No.3, p.489

[16] Oliver E. Williamson, (1985), The Economic Institutions of Capitalism: Firms, Market, Relational Contracting, p.3

Ayrıca birçok şirketin tek bir organizasyon altında bir araya gelerek seslerini daha fazla duyurmaya çalıştıkları da görülebilir[17].

Asil vekil problemleri sebebiyle pazar üzerinde uygulanması karar verilen kanunlar işin doğasına uygun olmayabilir. Bu sebeple genellikle işletmelerin aktivitelerini sürdürebilmek için sistemlerini ve iç mekanizmalarını yeni kanunlara uydurmaları gerekir. Bu derece değişken bir pazar ortamında işlerin esaslı ve verimli bir şekilde yürüyebilmesi için stratejik iş planlaması ve örgütsel değişim yönetimi uygulanması zorunlu hale gelir. Değişen iş koşullarına adapte olmayan şirketler pazardan yok olacak ya da rekabetçi avantajlarını kaybedeceklerdir. Avrupa Birliği gaz pazarı içerisindeki aktif şirketler de söz konusu değişiklikler sebebiyle etkilenmiş ve birçoğu değişikliklere adapte olma çabasını göstermişlerdir.

Stratejik iş planlaması ve değişim yönetimi örgütün stratejisini eylem planı haline getirerek stratejik hedeflerin, gerek duyulan kaynakların ve örgütsel yol haritasının oluşmasını sağlar. Bu stratejiler genellikle yeni market, servis ya da ürün geliştirmeyi veya işletmenin yapısını şirket birleşme ya da satın almaları ile tamamen değiştirmeyi içerir[18].

Sağlam bir strateji temin etmek için, işletmeler en cazip hedefler ve uygun kaynak dağıtımı üzerine kararlar vermek zorundadır. Aynı zamanda örgüt yapısı, iş sistemleri ve kullanılan teknolojiler de stratejiyi destekleyecek şekilde düzenlenmelidir. Strateji çoğunlukla ünitelerin, çalışanların ve yönetim kadrosunun hedeflediği ve takip etmeye karar verdiği bir yol haritası olarak

---

[17] For example U.S. Climate Action Partnership (USCAP) was supported by oil and gas companies such as BP; ConocoPhillips in its early years. Wall Street Journal, (2010), Defections Shake Up Climate Coalition, Retrieved from: http://online.wsj.com/articles/SB10001424052748704804204575069440096420212

[18] Clive Reading, (2003) Strategic Business Planning-A dynamic system for improving performance and competitive advantage, London and Sterling VA, p.7

görülür[19]. Uygun stratejik iş planı ile işletme, ahenk içinde ortak hedefe ulaşmaya çabalayan kişilerden oluşan bir örgüt haline gelir[20].

Stratejik iş planını destekleyen stratejik değişim yönetimi uygulamalarını tetikleyen değişim isteği genellikle dış faktörler ile başlar. Pazar yapısı, politik ortam, kanunlar ya da iş koluna olan talep değişebilir. Bu değişiklikler örgütün yeni duruma alışma ihtiyacı duymasını sağlar; bunun ardından örgütün stratejisi ortaya çıkar. Bu noktada belirtmek gerekir ki birçok işletme yönetim danışmanlığı üzerine uzmanlaşmış, market analizi ve örgütsel değişim üzerine profesyonel çalışmalar yürüten şirketler ile çalışırlar. Daha sonrasında, tasarlanan strateji örgütsel ve bireysel düzeyde bir aksiyon planına dönüştürülür.

Pazardaki risklerin tespiti stratejik planlamanın kritik parçalarından biridir. Global iş dünyasında karşılaşılan riskler beş gruba ayrılabilir: pazar riskleri, kredi riskleri, örgütsel riskler, nakit riskleri ve politik riskler[21]. Politik riskleri yönetebilmek değişim yönetimi sürecinde büyük önem taşır. İşletmelerin aktiviteleri sonucunu değiştiren herhangi bir politik karar ya da değişiklik politik risk olarak kabul edilir[22]. Günümüzde politik riskler işletmelerin sürdürülebilirliğini tehlikeye sokacak seviyelere gelmiş, bu nedenle politik risk sigorta paketleri bile şirketlerin kullanımına sunulmuştur[23]. Dünya Bankası tarafından yayınlanan güncel rapora

---

[19] Clive Reading, (2003) Strategic Business Planning-A dynamic system for improving performance and competitive advantage, London and Sterling VA, p.1

[20] Clive Reading, (2003) Strategic Business Planning-A dynamic system for improving performance and competitive advantage, London and Sterling VA, p.1

[21] Energy Information Administration, (2002), Derivatives and Risk Management in the Petroleum, Natural Gas and Electricity Industries, p.ix

[22] Price Waterhouse Coopers Advisory and Eurasia Group Viewpoint-Energy, (2006) How Energy Companies Can Improve Global Business Performance by Better Managing Political Risk, p.2

[23] Daniel Wagner, (2000), The Impact of Political Change and How to Protect Your Business Against It, International Risk Management Institute Online, Retrieved from: http://www.irmi.com/expert/articles/2000/wagner04.aspx

göre, örgütlerin yarısından fazlası gelişmekte olan pazarlarda yatırım yapmak üzerine en büyük kısıtın politik riskler kaynaklı olduğunu belirtmiştir[24].

Enerji endüstrisi oyuncuları için emtia piyasasındaki değişken fiyatların da etkisi ile pazar fiyatları ve ticari riskler en sık karşılaşılan engeller olarak kabul edilmektedir [25]. Fakat diğer taraftan jeopolitik durumlar küresel endüstriyi bunaltmakta ve enerji her zaman küresel politikanın parçası olduğundan politik risklerin etkileri net şekilde görülebilmektedir.

Global doğal gaz pazarındaki zorluklar ve değişimin hızı artarken politik riskin şirketlerin performansı üzerindeki etkisi öncesine göre çok daha yüksek. Enerji kaynakları yüksek coğrafi bölgelerdeki istikrarsız hükümetler, enerji tedarik güvenliği, arama faaliyetleri üzerindeki küresel rekabet işletmelerin üzerinde büyük bir baskı yaratıyor[26]. Son dönemdeki Euro bölgesi krizi, Arap baharı protestoları, Rusya-Ukrayna krizi, ABD borç tavanı gibi gelişmeler petrol ve gaz endüstrisi oyuncularını tehdit edici politik risklerden sadece bir kaçıdır [27]. Petrol ve gaz endüstrisini tehdit eden politik risklere dair önemli faktör, riskin petrol-gaz kaynağına sahip ülkenin politik sistemi değil petrol-gaz anlaşmasının yapıldığı dönem içerisinde ortaya çıkan politik değişiklikler olduğudur[28].

Literatür kaynaklarına göre en sık görülen risk kontrol teknikleri lobi aktivitelerine dâhil olmak, yerel kalkınma programları düzenlemek, devletlerle

---

[24] World Bank Multilateral Investment Guarantee Agency, (2013), World Investment and Political Risk, p.5

[25] Alan Berlin, (2003), Managing Political Risk in the Oil and Gas Industries, Oil Gas & Energy Law, Volume 1 Issue 2, p.2

[26] Alan Berlin, (2003), Managing Political Risk in the Oil and Gas Industries, Oil Gas & Energy Law, Volume 1 Issue 2, p.2

[27] Daniel Wagner, (2000), The Impact of Political Change and How to Protect Your Business Against It, International Risk Management Institute Online, Retrieved from: http://www.irmi.com/expert/articles/2000/wagner04.aspx

[28] Alan Berlin, (2003), Managing Political Risk in the Oil and Gas Industries, Oil Gas & Energy Law, Volume 1 Issue 2, p.3

olan ilişkileri güçlendirmek, politik risk sigortası yaptırmak, şirket birleşme ve satın almalarıdır[29].

Petrol ve doğalgaz endüstrisinin sermaye yoğun yapısı tek seferde büyük meblağlarda nakit kullanımını gerektirir. Projeler büyük ölçüde banka kredileri ile finanse edilirken özellikte politik risk kaygılarının yükseldiği durumlarda bankalardan ticari olarak uygun proje finansmanı seçenekleri elde etmek mümkün olmayabilir. Bu durum birden fazla işletmenin bir ortaklık altında bir araya gelerek risk paylaşımında bulunmasını, böylece banka gibi dış kaynaklara duyulan ihtiyacın azalmasını sağlar. İşletme stratejileri ne olursa olsun herhangi bir doğal gaz, petrol veya boru hattı projesini tek başına üstlenen bir kuruluş görmek neredeyse mümkün değildir.

Avrupa Birliği doğal gaz pazarında aktif olarak faaliyetlerini sürdüren birçok farklı işletme vardır. Bunlar; milli petrol şirketleri (NOCs), uluslararası petrol şirketleri (IOCs), yerel taşıma, depolama, pazarlama ya da rafineri şirketleridir. Tüm bu şirketler hep birlikte Avrupa Birliği doğal gaz pazarı tedarik zincirini oluştururlar.

Pazarda arama faaliyetlerini sürdüren şirketler genellikle uluslararası petrol şirketleri olmakla birlikte, bu şirketlerin yerel milli petrol şirketleri ile beraber çalıştıklarını görmek mümkündür. Ayrıca Avrupa Birliği'ne dâhil olmayan bazı ülkelerin milli petrol şirketleri de Avrupa Birliği pazarına sağlanan doğal gazın ana tedarikçisi konumundadır. Genellikle, taşıma ve depolama şirketleri ile birlikte rafineri sonrası son kullanıcıya hizmet veren tedarikçiler de uluslararası petrol şirketlerinin ortak olduğu yerel özel şirketlerdir.

Bu tez çalışması sürecinde yapılan araştırma gösteriyor ki, Avrupa Birliği doğal gaz pazarında son dönemde görülen değişimlerle birlikte birçok işletme pazardaki varlıklarını sürdürebilmek ve hatta pazar paylarını arttırmak üzere stratejilerini değiştirme yoluna girmiştir. Stratejik ortaklıklar, ortak girişimler, satın almalar ve

[29] Accenture, (2012), Managing Political Risk – Controlling Loss Finding Opportunity, p.8

varlık takasları işletmelerin iş birliği geliştirmek ve risk paylaşmak adına en sık başvurduğu stratejilerdendir.

Bir diğer sık başvurulan strateji ise dengeli varlık portfolyosu elde edebilmek adına yapılan pazar çeşitlendirmesidir. Her ne kadar birçok işletme yenilenebilir enerji kaynakları gibi Avrupa Birliği içerisinde popüler olan diğer enerji kaynaklarına yönelmeyi tercih ettiyse de, diğerleri doğal gaz tedarik zincirinde daha büyük bir alana sahip olmak için aktif oldukları iş kollarını genişletmişlerdir. Birçok büyük şirket arama faaliyetlerine ağırlık verirken, diğer birçokları taşıma, depolama, rafineri gibi tedarik zincirinin farklı halkalarında performans göstermeye çabalamaktadırlar.

Avrupa Birliği doğal gaz pazarında yıllardır uygulanmakta olan uzun vadeli anlaşmalar sermaye yoğun yapılı projeler için gelir akışını garantilemekteydi; fakat günümüzün spot piyasası şirketleri her koşulda bir araya gelerek gerekli nakit akışını sağlamaya yönlendirmiştir.

Özellikle dağıtım şirketleri için tasarlanan ayrıştırma kuralı ile birçok doğal gaz şirketi pazar tedarik zincirindeki tekel gücünü kaybetmiş; dolayısıyla bu tekel gücü ile gelen gelirin sağladığı yeni yatırım ve teknolojik çalışmalar yavaşlamıştır. Bu sebeple şirketlerin takip ettikleri tüm stratejilerde kaybolan kontrol gücünü telafi etmeye çabaladıklarını görebiliyoruz. Şirketlerin dağıtım ağı içerisinde sahip oldukları pozisyonu kaybetmeleri ile diğer birçok segmentte yer almaya çalıştıkları açıktır. Bu noktada belirtilmesi gereken en dikkat çekici unsur, Avrupa Birliği'nin Gazprom gibi ana tedarikçilerin gaz akışını kesmesine karşın bir taktik olarak gaz depolama tesislerine önem vermesi; fakat diğer yandan Gazprom'un Avrupa'daki birçok doğal gaz depolama tesisinde hisse sahibi olarak tedarik zincirinin bu kısmında da önemini hissettirmeye çalışmasıdır. Bu da gösteriyor ki rekabetin artışı salt ayrıştırma kuralı ile sağlanamayacaktır. Bu sebeple rekabet arttırma kaygısı söz konusu olduğunda ayrıştırma kuralının avantajları tartışılır konumdadır.

Sonuç olarak, bir yandan Avrupa Birliği'nin doğal gaz pazarını daha rekabetçi ve gelişime açık hale getirmek için tasarladığı kanuni yapının amacına ulaşmakta tek başına yeterli olmadığı görülürken, pazarda aktif rol alan işletmelerin de gerekli stratejileri uygulayarak kendi rekabetçi konumlarını korumayı başardıkları açıktır. İşletmelerin bu sonuca varmalarını sağlayan stratejiler ise iş birliği ve risk paylaşımı esaslıdır.

B. TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü ☐

Sosyal Bilimler Enstitüsü ☒

Uygulamalı Matematik Enstitüsü ☐

Enformatik Enstitüsü ☐

Deniz Bilimleri Enstitüsü ☐

YAZARIN

Soyadı : BOZKURT
Adı : SEZEN
Bölümü : AVRUPA ÇALIŞMALARI

TEZİN ADI (İngilizce) : MARKET ADAPTATION STRATEGIES OF MAJOR NATURAL GAS COMPANIES IN THE EUROPEAN UNION

TEZİN TÜRÜ : Yüksek Lisans ☒ Doktora ☐

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. ☐
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. ☐
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz. ☒

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: