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SECURITY OF EC ENERGY SUPPLY AND AFFECTS OVER TURKEY

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Emine Ebru BAYDAK

Supervisor: Associate Professor Ramazan KURTOĞLU

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3) Jüri Üyesi : Yrd. Doç. Dr. Ercüment İstemi	.....

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GENEL BİLGİLER

İsim ve Soyadı : Emine Ebru BAYDAK

Ana Bilim Dalı : Siyasi Bilimler ve Uluslararası İlişkiler

Programı : Siyasi Bilimler ve Uluslararası İlişkiler

Tez Danışmanı : Yrd.Doç. Ramazan KURTOĞLU

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ÖZET

Bağımsızlıkların gittikçe genişlediği bir dünyada, enerji güvenliği ülkelerin karşılıklı veya çok taraflı sistemlerde ilişkilerini nasıl yöneteceklerine gelecekte daha çok bağlı hale gelecektir. Bu durum enerji güvenliğinin önümüzdeki yıllarda neden Avrupa Birliğinin dış politikasında ana sorunu olacağının da nedenini teşkil etmektedir. Yeni rekabetçi ortam sadece gelecekteki değil, çok daha karmaşık hale gelmiş ve birbirine girmiş küresel enerji sisteminin ve bunun parçası durumundaki ülkelerin aralarındaki ilişkilerin gerçekliğinin yarattığı zorlukların döngülerinin gerisine de dikkat edilmesini gerektirmektedir.

Elektrik enerjisinde ortaya çıkacak % 75'lik talep artışı ile birlikte, 2025 yılında küresel enerji talebinin % 50 oranında artış göstereceği tahmin edilmektedir. Bu büyümenin yarıdan fazlasının yükselen ekonomilerden kaynaklanacağı öngörülmektedir. Mevcut ekonomik krize rağmen, dünya yüksek petrol fiyatlarıyla da olsa, pozitif bir ekonomik büyüme tecrübesi yaşamaktadır. Bütün ülkeler bu şekilde devam edebilmek maksadıyla güvenli, sürdürülebilir ve bağımsız enerji tedarik kaynaklarına ulaşabilmeye ihtiyaç duymaktadırlar. Dünyanın her yerinde ve özellikle Çin ve Hindistan gibi bölgelerde

yaşanmakta olan güçlü ekonomik büyüme nedeniyle, enerjiye olan küresel talebin önümüzdeki 25 yıl içerisinde önemli oranda ve büyük bir hızla artacağı beklenmektedir.

Enerji güvenliğini sağlamak maksadıyla, ülkelerin enerji tedarik kesintilerinin etkilerini azaltmaları, enerji altyapılarını genişletmeleri, yabancı yatırımcıları teşvik edecek şeffaf ve istikrarlı bir yatırım ortamı oluşturmaları ve yenilenebilir enerji, temiz kömür ve emisyonsuz nükleer enerji dahil olmak üzere temiz enerji teknolojilerini geliştirmeleri zorunlu olmaktadır.

Türkiye'nin gittikçe artan oranda hayati öneme sahip bir enerji transit merkezi haline gelmekte olduğu inkar edilemez. Türkiye Doğu ile Batı arasında önemli bir enerji geçiş yoludur. AB, Türkiye'de olduğu kadar, bölgede de enerji güvenliğini geliştirmek, enerji tedarik miktarını artırmak ve enerji ulaşım yollarını çeşitlendirmek üzere çabalarını sürdürmekte ve güvenli bir müttefik olarak, güvenilir ve şeffaf kurallarla yönetilen bir pazarda en önemli transit petrol ve gaz transit yolu olarak rolü nedeniyle Türkiye'yi desteklemektedir.

Türkiye her geçen gün enerji taleplerinin karşılanması konusunda yaptığı katkılar nedeniyle bölgesinde ve dünya çapında önemli bir rol oynamaktadır. AB ile Türkiye arasındaki işbirliği bu amaca ulaşılmasını kolaylaştırmaktadır. Gerçekten de, her iki taraf da enerji güvenliği konularında daha yakın işbirliği yapmak üzere birbirlerine tekliflerde bulunmuşlardır. Türkiye üreticiler ile tüketiciler arasında bir geçiş yolu haline getirilmek yoluyla bir lider ülke olmak üzere hazırlanmaktadır.

Yine de sahip olduğu lider ülke rolünü genişletmek üzere, şeffaflık, istikrar ve güvenilirlik alanlarında olduğu kadar, yatırımları, rekabeti, pazar fiyat oluşumunu, enerji etkinliğini de teşvik ederek cesaretlendirecek, pazar merkezli bir yaklaşım oluşturma konusunda Türkiye'nin daha proaktif bir rol üstlenmesi gerekmektedir. AB Türkiye'yi stratejik bir müttefik, Doğu-Batı enerji koridorunda kilit konumda bir oyuncu ve Rusya ile Hazar Denizi enerji zenginliklerinin dünya pazarlarına ulaştırılması konusunda bir temel taşı olarak görmektedir. Türkiye bölgesel enerji güvenliğinin sağlanması konusunda da önemli bir oyuncu olabilir. Ancak, bunu gerçekleştirmek

maksadıyla özelleştirme, hukukun üstünlüğü, şeffaflık ve diğer ilgili konularda Türkiye'nin daha fazla ilerleme kaydetmesi gerekmektedir.

Bu çalışma, bir enerji geçiş yolu olarak Türkiye'yi ele almaktadır. Özellikle Türkiye bu kapsamda gerek bölgesel, gerekse dünya barışının olduğu kadar hayati öneme sahip güvenlik konularında gelecekte müştereken sağlayabilecekleri katkılar nedeniyle hem kendisi hem de AB için bir çerçevede bir fırsat olma konumundadır. Bu tezin ana amacı, enerji konuları esas olmak üzere Türkiye ile AB arasındaki ilişkinin önemini, avantajlarını ve kaçınılmazlığını değerlendirmektir. Bu tezin temel önermesi, bir enerji geçiş yolu olarak Türkiye'nin bu alandaki ilerlemesinin AB değerlendirmeleri esas olmak üzere AB tarafından desteklenmesinin beklenmesi gerektiği ve Türkiye'nin bu amaçlarını gerçekleştirmek üzere bu alanda gelecekte daha aktif politikalar izlemesinin doğru olacağıdır.

GENERAL KNOWLEDGE

Name and Surname : Emine Ebru BAYDAK

Field : Politicial Science and International Relations

Programme : Politicial Science and International Relations

Supervisor : Associate Professor Ramazan KURTOĞLU

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ABSTRACT

In a world of increasing interdependence, energy security will depend much on how countries manage their relations with one another, whether bilaterally or within multilateral frameworks. That is why energy security will be one of the main challenges for EU foreign policy in the years ahead. The new competition environment requires looking not only around the corner, but also beyond the difficulties of cycles to both the reality of an ever more complex and integrated global energy system and the relations among the countries that participate in it.

It is estimated that the global demand for energy may increase as much as 50 percent by 2025, with the demand for electricity rising more than 75 percent. More than half of this growth is projected to come from the world's emerging economies. In spite of the current economic crisis, the world is experiencing positive economic growth even with high oil prices. In order for that to continue all nations, need access to safe, affordable, and dependable supplies of energy. Because of the robust economic growth around the world especially in places like China and India the global demand for energy is expected to increase dramatically and at a rapid pace over the next 25 years.

To ensure energy security, countries must mitigate the effects of energy supply disruptions, expand energy infrastructure, promote a transparent and stable investment

climate that attracts foreign investors, and advance clean energy technologies including renewable energy, clean coal, and emissions free nuclear power.

It is undeniable that Turkey is evolving into a vital energy transit hub. Turkey is an important energy gateway between the East and the West. The EU is, throughout the region, as well as in Turkey, working to enhance energy security, increase energy supplies, and diversify energy transportation routes. And the EU supports Turkey, which is a strong and dependable ally, in its role as a major oil and gas transit route in a market governed by fair and transparent rules.

Turkey plays an important role in helping meet the growing energy demands in the region and around the world. The cooperation between the EU and Turkey furthers that goal. Actually, both sides have offered to collaborate more closely on energy security issues. Turkey is poised to be a leader by further establishing itself as a gateway between producers and consumers.

However in order to expand it's leadership role Turkey must take a more proactive role in establishing a market oriented approach that will encourage investment, competition, market pricing, energy efficiency, as well as transparency, stability, and reliability. The EU sees Turkey as a strategic ally, a key player in the East-West energy corridor, and a lynchpin in getting Russian and Caspian energy assets to world markets. Turkey can be a major player in assuring regional energy security. However, it must continue to move forward on privatization, rule-of-law, transparency, and related issues that must be worked to make that a reality**.**

This study examines Turkey as an emerging energy hub. In particular, it assesses this concept as an opportunity for both the EU and Turkey regarding their future allied contributions to the emerging security issue as well as regional and global peace. The main goal of this thesis is to evaluate the importance, advantage, and inevitability of relationship between Turkey and EU based on energy issues. The basic premise throughout this thesis is that Turkey, as an emerging energy hub, should expect to be supported in its progress based on the EU evaluation and it is required to follow more proactive policies in the future in order to achieve this purpose.

PREFACE

I would like to acknowledge and extend my heartfelt gratitude to my thesis advisor, Associate Professor Ramazan KURTOĞLU, for his vital encouragement and support, and for his understanding and assistance. This thesis would not have been written were it not for their vision and enthusiasm.

Emine Ebru BAYDAK November 2012, Istanbul

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SYMBOLS AND ABBREVIATIONS

BTC	Baku-Tbilisi-Ceyhan Pipeline
BTE	Baku-Tbilisi-Erzurum Pipeline
CIS	The Commonwealth of Independent States
CPC	Caspian Pipeline Consortium
EC	European Commission
EU	European Union
FSU	Former Soviet Union
GDP	Gross Domestic Product
GMEI	Greater Middle East Initiative
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
LNG	Liquefied Natural Gas
mbd	million barrels a day
NED	National Endowment for Democracy
NEGP	North European Gas Pipeline
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
OPEC	Organisation of the Petroleum Exporting Countries
PKK	Partiya Karkaren Kurdistan (Kürdistan İşçi Partisi)
SCGP	South Caucasus Gas Pipeline
tcf	trillion cubic feet
TPAO	Türk Petrolleri Anonim Ortaklığı (Turkish National Petroleum Company)
UAE	United Arab Emirates
UK	United Kingdom
US	United States
USA	United States of America
WW	World War

CHAPTER I

INTRODUCTION

1. INTRODUCTION

Following the exploration of oil resources in 19th century, it became the dominant and shaping factor for the international policies of important states. In the early and mid age, the empires have shared an important part of their power in order to provide the security of main trade routes. Because these trade routes were equal to money and strong economy of the empire and it was equal to a powerful army and a strong authority in their region. Bu after beginning of engine usage in the ships, an other factor has appeared which was going to be dominant for determining foreign policies of the states in a short time: it was oil.

Energy security is one of the defining policy issues in also today. Dwindling low-cost hydrocarbon reserves, the rise of new and spectacularly hungry energy consumers such as China and India, and the spectre of climate change highlight that a fundamental reordering of the global energy system is in the works. That reordering raises many fears and concerns.

Unfortunately, so far most policy debates on energy security issues take on a rather myopic character. The predominant focus in policy debates on energy is on "security of supply," suggesting that states around the world are locked into a competition over access to crucial energy resources that provide the key to continued prosperity and state power. This zero-sum perspective on energy security is certainly not new. Ever since Great Britain led the way in opening the Middle East for oil production in the early 20th century, energy security has been understood as an exercise in geopolitical scheming and competition. This paradigm stands to this day, and defines analytical foci and policy prescriptions.

The world has changed since the “Global Struggle” for oil. Energy markets are increasingly international in nature; in the case of oil, they are truly global. In addition, they are structured by a broad variety of different actors, public as well as private. In

addition to governments, private companies, i.e. international energy firms, financial institutions and others interact through market-based transactions, and thus determine outcomes in global energy. These market-based transactions of course do not occur in a political vacuum. International and national energy markets—much like any market—are embedded in institutions that define the rules of the game.

Politics and power plays a big role with regard to how markets are organized. And given the important role energy plays for modern societies, both in producer and consumer nations, energy will always be politicized. Nonetheless, a focus on markets and institutions that structure them—or, coined differently, a focus on global energy governance—opens a different perspective on energy security.

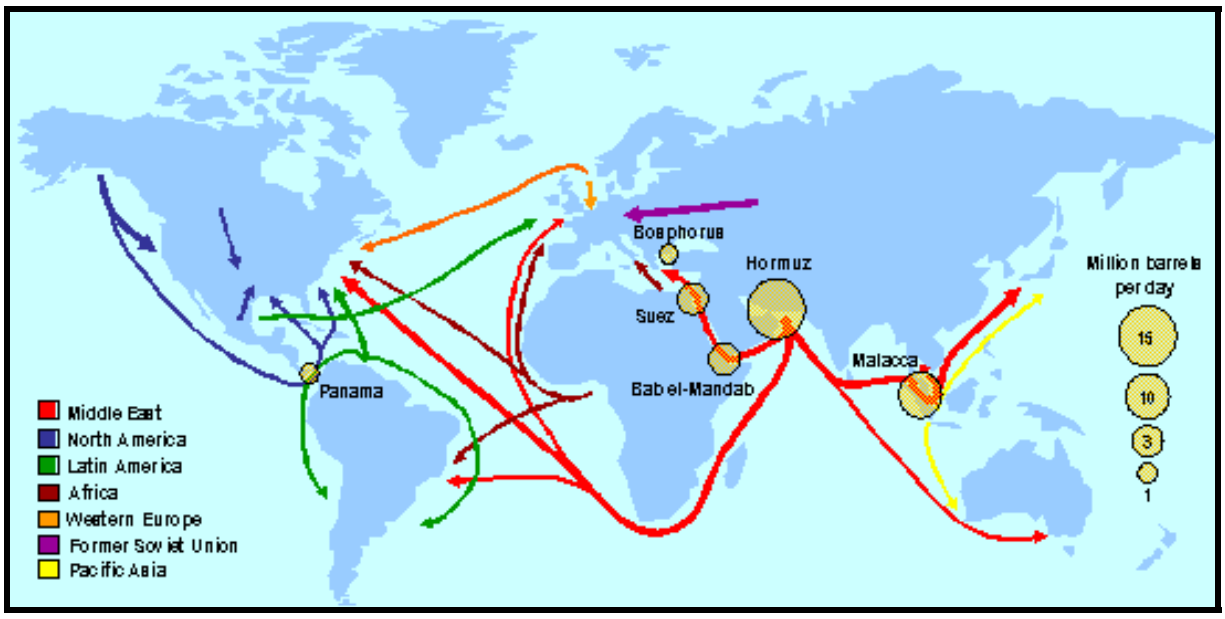

Figure 1.1. Oil Transportation Routes in the World (Source: Giovanni Ercolani, Energy security and terrorism: Perceptions and narratives for an old war of fire, United Nations Institute for Training and Research, Nottingham Trent University (UK), 2006).

Most importantly, it steps beyond the myopic view of energy security as an area fully determined by zero-sum games. Rather, energy becomes a multi-dimensional policy arena where, as Joseph Stanislaw noted some years ago, "the question to ask is not who is winning the battle, but rather how the market can accommodate the divergent needs of the individual players and encourage the cooperation that has become more prevalent in recent years".

For Turkey, which is a state makes plans to be a regional power in this century the story has different importance because of its geostrategic country. However it doesn't have large energy resources, the geographic shape and position of Turkey provides variety of opportunities for it in order to determine its energy and foreign policies. Because it is located between the most energy supplying and the most energy demanding countries of the world, it plays the role of being a bridge or corridor for the transportation of oil and gas from suppliers to consumers.

Today many of the problems discussed in Turkey and region are mainly the results of this situation. Big actors of the game always keep security of energy in their mind and determine their energy and foreign policies in accordance with this concept. They sometimes support a terrorist group in the region or a state, sometimes pull their support or cause to regional conflicts between countries or intervene in these conflicts or regional problems. All these activities are just for getting the control of energy and providing the usage of it by friendly countries in a secure way. Because, energy is very important for the big economies of western world to survive in this competitive world.

If we speak about the energy security regarding Turkey's situation and approach to this issue, this topic attracts much more importance than any other country in the region and also EU. Even some analysts suggest that the PKK terrorism threaten the east regions of Turkey is the result of this big game and policies related with energy security. Today specialists and thinkers who are expertise over terrorism take the pipelines and energy investments into consideration when they make analysis regarding PKK terrorism. This point of view is rather interesting for analysing the reasons of terrorist activities in the country.

In this study all of these approaches mentioned above were tried to be discussed. In the first chapter, an introduction to the subject takes place. In the second chapter, the concepts of energy security and national security and the historical development regarding this issue are main topics. In this section the energy security concept is defined and relation between energy security and national security are discussed through taking the important events such as world wars, gulf war and other oil shocks in the last century into consideration. In the third chapter European Union (EU)

and its energy security policies are the main topics. Information related with new and renewable energy sources are given at the fourth chapter. Energy supply policies of European Union and their affects over Turkey are analyzed in the fifth chapter.

CHAPTER II

THE CONCEPTS OF ENERGY SECURITY AND NATIONAL SECURITY AND THE HISTORICAL DEVELOPMENT

2.1. ENERGY SECURITY AND RELATION BETWEEN ENERGY SECURITY AND NATIONAL SECURITY

Energy issues, including the security of supply, have shot to the top of all big players' agenda in the world. Because global demand for energy is rising rapidly while supply is maturing. The investment needs to ensure future supply run into hundreds of billions of Dollars or Euros (Solana, 2007: p.7).

Ever since Great Britain led the way in opening the Middle East for oil production in the early 20th century, energy security has been understood as an exercise in geopolitical scheming and competition. This paradigm stands to this day, and defines analytical foci and policy prescriptions. So it has naturally shaped the national policies of the governments in the last century and it is assumed that this will continue in the same manner increasingly in the future.

2.1.1. Definition and Scope of Energy Security

Our increasing reliance on energy has heightened the importance of energy security. The first oil shock in the aftermath of the 1973 Arab–Israeli war put energy security, and more specifi cally security of supply, at the heart of the energy policy agenda of most industrialized nations. Since then, policymakers and analysts have sought to defi ne the concept of "energy security" and its implications. Modern society has grown more dependent on energy in almost all human activities. Different forms of energy are essential in the residential, industrial and transportation sectors. Energy is also crucial in carrying out military operations. Indeed, the attempt to control oil resources was a major reason for the Second World War (Bahgat, 2006: p.964).

Energy security is about the supply of and demand for energy. The definition by Belgrave is more elaborate;

"A state in which consumers and their governments believe, and have reason to believe, that there are adequate reserves and production and distribution facilities available to meet their requirements in the foreseeable future, from sources at home or abroad, at costs which do not put them at a competitive disadvantage or otherwise threaten their well-being. (Belgrave et al, 1987: p.2)

Kruger defines energy security as "adequate and safe supply of oil", and the International Energy Agency (IEA) explains "energy supply to be "secure" if it is adequate, affordable and reliable "foreign resources, energy security is the supply security and the stability of price". (Kruger, 1975).

As the above definitions suggest, energy security is dealt in 'security of supply' perspective and it is a state that "an economy is free from insecurity of supply of a specific energy". To be free from insecurity of supply, adequate quantity of energy supply should be guaranteed.

Bielecki defines energy security as "reliable and adequate supply of energy at reasonable prices", and he makes it clear that "it simply means uninterrupted supply that fully meets the needs of the global economy" (Bielecki, 2002: p.237). In this perspective the events of 1973 and 1979, when severe supply interruption occurred, are good examples that shows how important the supply of energy is.

Energy security consists of four conceptual components: adequate quantity (oil reserves), reasonable price, reliable supplier, and safe transportation. Adequate quantity (reserves) is the primary component, and it is the starting point of energy security. The next component is reasonable price. High prices make oil producing countries more richer. When energy resource is supplied at a reasonable price, consuming countries can continue economic activities without economic burdens. The third one is about reliable supplier. If a country fails to have reliable suppliers, its policy can not be free from the requests of suppliers as it happened when Arab oil producing countries demanded adoption of Arab-friendly policies during the first Oil Crisis.

The last component of energy security is safe transportation. Because energy resources are concentrated in specific areas and producers are not close to consumers, therefore transportation through pipeline or by oil tanker is common. Thus the security of transportation concern arises and the problem is intertwined with military affairs such as providing military support to producing countries or transportation routes. In other words, we need to consider both the economic aspect and international political factor such as geopolitical concern when we deal with energy security.

Energy is the blood that runs through the veins of every economy. It is to the survival of an economy what water is to the survival of the human body. The extent of the dependence on energy of any economy is dependent on the structure of that particular economy and the level of development of the economy and country. In some economies, availability is the only real concern whilst in others it is sustainable availability as well as affordability. The different country specific needs have to be included in the definition of the country's energy security.

Energy security is an umbrella term that covers many concerns linking energy, economic growth and political power. The energy security perspective varies depending upon one's position in the value chain. Consumers and energy-intensive industries desire reasonably-priced energy on demand and worry about disruptions.

Major oil producing countries consider security of revenue and of demand integral parts of any energy security discussion. Oil and gas companies consider access to new reserves, ability to develop new infrastructure, and stable investment regimes to be critical to ensuring energy security. Developing countries are concerned about the ability to pay for resources to drive their economies and fear balance of payment shocks. Power companies are concerned with the integrity of the entire network.

Policymakers focus on the risks of supply disruption and the security of infrastructure due to terrorism, war or natural disaster. They also consider the volumes of security margins – the amount of excess capacity, strategic reserves, and infrastructure redundancy. Throughout the value chain, prices and supply diversity are

critical components of energy security. In earlier periods, oil was used as a "weapon," and there is concern that natural gas could also be used to gain political leverage at some time in the future.

Figure 2.1. Energy Security: An Umbrella Term (Source: Cambridge Energy Research Associates - World Economic Forum, 2006)

The traditional elements of energy security include supply sources, demand centres, geopolitics and market structures (and responsiveness of related institutions). In the energy crises of the 1970s, the primary focus for the Western industrial countries was on oil supply sources and geopolitics. These two elements were the underlying causes of energy security concerns, and the demand centres, market structures and new institutions created the solutions to the two energy crises that occurred. In fact, the creation of the International Energy Agency (IEA) was a direct response to the 1973-74 oil disruption by the then-dominant energy-consuming economies.

Energy security refers to a resilient energy system. This resilient system would be capable of withstanding threats through a combination of active, direct security measures—such as surveillance and guards—and passive or more indirect measures-such as redundancy, duplication of critical equipment, diversity in fuel, other sources of energy, and reliance on less vulnerable infrastructure. The Kansas Energy Security Act defines security as " … measures that protect against criminal acts intended to intimidate or coerce the civilian population, influence government policy by intimidation or coercion or to affect the operation of government by disruption of public services, mass destruction, assassination or kidnapping" (Brown, at al., 2003). Traditionally the focus of energy security has been on accidents and natural disasters. After September 11, 2001, policymakers and industry have had to consider the threat of intentional damage to a much greater degree than before.

Energy security focuses on critical infrastructure; a term that is receiving increasing attention. The Homeland Security Act of 2002 and the USA Patriot Act define critical infrastructure as "systems and assets ... so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters" (Public Law 107-56 (e). Some of these systems include food, water, agriculture, health and emergency services, energy (electrical, gas and oil, dams), transportation (air, road, rail, ports, and waterways), information and telecommunications, banking and finance, postal and shipping, and national monuments and icons (Brown, at al., 2003).

The idea of energy security takes the concept of security beyond the dominant realist and liberal thinking on security. As such, energy security can be placed within the context of a larger debate on how security should be defined and what are the most important issues in security thinking. In this context energy security is often linked to environmental security, which deals with the threats caused by environmental degradation. The effects of large-scale burning of fossil fuels impact seriously on the global environment. Many consider this to be a greater threat than that of disruption of energy supplies, which is what this thesis primarily deals with. For this reason, some

have argued that the study of energy security should focus on how to provide for energy needs in an environmentally safer way or reduce consumption inorder to reduce the damage caused. However, we have chosen to emphasize the traditional understanding of energy security, "enjoying sufficient supplies at an acceptable cost" (Constantin, 2005), leaving out the related environmental issues, as they do not impact on our research questions. The concept has many different dimensions, ranging from political and military, to technical and economic (Bielecki, 2002). Having sufficient supplies "determines whether our lights will go on or off, our agriculture and industry will go forward or backward, our homes and offices will be habitable or become shells – and in fact whether or not we can defend ourselves" (Hamilton, 2005: p.xxi).

As long as oil is not available in abundant supply and the supply cannot be quickly increased, which is the case today, the uncertainty of oil supply might take on the same significance for energy security as the uncertainty of anarchy does for traditional security. Certainty is in limited supply for states seeking state survival in traditional realist thought, just as oil is in limited supply for oil importers. The fear of a sudden loss of supply, due to natural disasters, wars, revolutions, terrorism, conflicts with exporters, or other unexpected disruptions intensifies the uncertainty of the system, and means that for most importers a significant buffer of excess production and supply is desirable. These are the conditions, present in the contemporary world, which actualize realism and liberalism as theories potentially suitable for explaining energy security policies (Kelly and Leland, 2007).

There are several different types of events that may cause disruptions to energy supply or an increase in price. Normally one distinguishes between events that have a global impact and those that only have impact for one specific region or country. The most serious threat for importing countries today is the "policy discontinuity" caused by OPEC policy decisions concerning output levels. This is what OPEC does when it wants to change the price of crude oil and, furthermore, is something that is known to happen every few years and will continue to occur unless better information on production and stock levels is made available for importing countries. The consequence of such OPEC policies is a sudden change in oil prices that states are not prepared for.

An even worse scenario for oil importing countries is what is known as "fundamental discontinuity", which is a global shortage of production capacity. "A long-term failure to invest in production, transportation or processing capacity could result in an absolute shortage of supply of energy with respect to the demand."

Other global events that may cause disruptions in energy supply are events such as civil unrest, war, deliberate blockade of trade routes (so-called "force majeure" disruption), export disruption and embargo disruption. Export disruption is when a main exporter cuts back on exportation, whereas embargo disruption is when a specific exporting state is made victim of an embargo by importers, which is the case of Iran today.

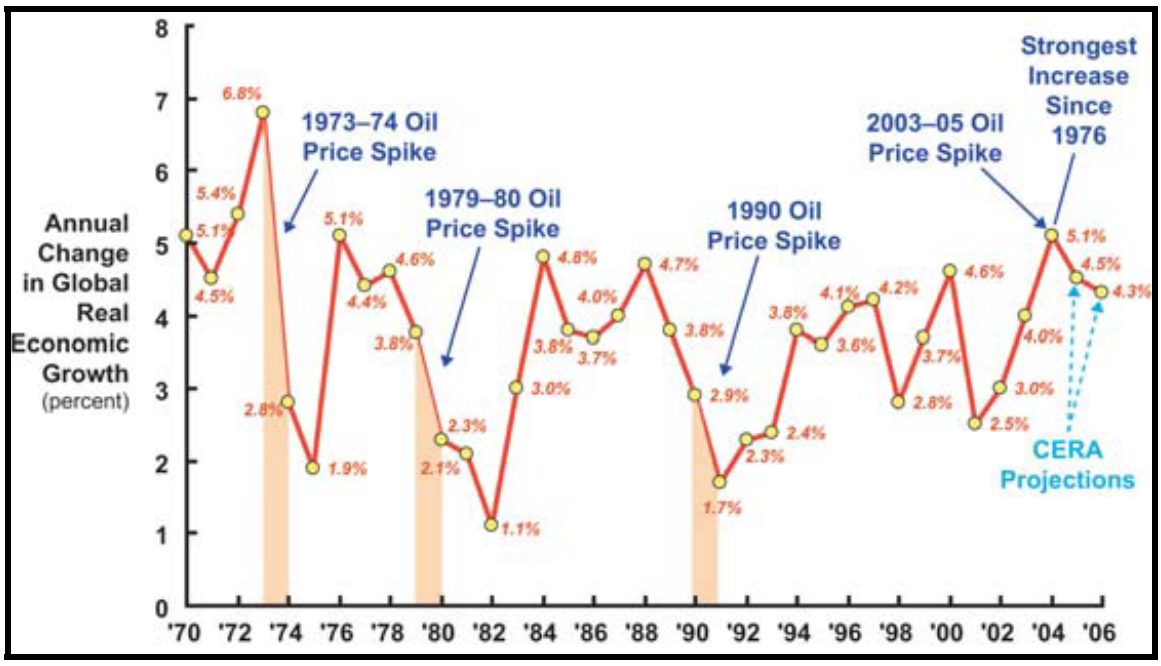

Figure 2.2. Oil Price Spikes and Global Economic Growth (Source: International Monetary Fund, Cambridge Energy Research Associates - World Economic Forum, 2006)

Local events that are a threat to a state's energy security may be embargo disruption, where one state suffers from a general embargo by one or several/all oil exporters, or logistical disruptions such as accidents or terrorism, especially along transportation infrastructures, such as oil-pipelines. Furthermore, states may also

experience local market disruptions by monopolist suppliers, pressure groups or through government mismanagement (Kelly and Leland, 2007).

The enhancement of energy security or energy power was defined as the control of:

(I) exploitable reserves,

(II) net export capacity,

(III) transportation routes and

(IV) pricing mechanisms (price elasticity) of hydrocarbon resources, has been a vital security challenge for all nations sincethe complete mechanization of their armed forces and the mature industrialisation of their economies.

Apart from being a critical factor (energy power) that defined the overall power-status of a nation, energy security policy as a form of statecraft has always been a powerful foreign policy-making instrument, which has been proven to be – under specific conditions - much more effective than the use of force or the threat of the use of force in enticing or coercing a state to "do something he would not otherwise do" (Tsakiris, 2004: p.309).

2.1.2. Importance of Energy Security

Even though the aspiration of a state to control the availability of resources considered to be vital for its military and economic security is as old as Pericles "Megarean Decree" (431 B.C.) and the painstaking attempts of the Peloponnesian-Sicilian Navy (413- 405 B.C.) to control the sea lines through which Athens imported the majority of its grain (Tsakiris, 2004: p.310).

The Megarean Decree, which was considered to be one of the most important immediate causes of the Second Peloponnesian War (431-404 B.C.), stands out as one of the first examples of economic statecraft, since it aspired to keep the city of Megara out of the impending clash by denying it access to all Atheniancontrolled harbours,

which at the time encompassed the entire Mediterranean and Black Sea regions. Megara was of immense geostrategic importance because it commanded the passes of Geraneia, namely the only road any Spartan army had to take in order to invade Attica.

As Robert Kagan has noted, "Control of the Megarid was of enormous strategic value to Athens. It made the invasion of Attica from the Peloponnese almost impossible" (Kagan, 1969: pp.80-81). In case Megara did not comply with the Athenian demand, the destruction of the Megarean economy would have delivered a serious blow to the Spartan League's economic reserves in general, thereby limiting the available resources necessary to finance an ambitious naval program. The Megarean blockade would unavoidably affect the other commercial cities of the League, namely Sicyon and Corinth.

As Kagan recognised, "However dependent on imports the Peloponnesians may have been, there can be no doubt that their economic prosperity would have been severely damaged if these areas were cut off from markets in the Aegean, Asiatic, and Hellespontic areas by Athenian domination" (Gilpin, 1991: pp.35-36).

"Ever since the Industrial Revolution, energy and the need to secure its supply have been fundamental to any position of power in the world". This statement by James R. Schlesinger, the U.S.' first Secretary of Energy and later Secretary of Defense, illustrates why realism may be able to contribute to the study of energy security. Energy is intimately linked to power, and without energy security national security will always remain elusive (Schlesinger, 2005).

The traditional realist conception of security is very much focused on power and the military/physical aspect of security. Power is taken to be a state's only guarantor of security, which is why the accumulation of power is assumed to be the main priority of all states in the international system. Even though most realists have not examined energy security very closely in their writings, most would agree that it is important, as it is normally taken for granted as an integrated part of their understanding of power. In times of conflict, or even war, sufficient energy supplies are vital to the ability of a country to utilize its military power.

No amount of warships or tanks will make a difference without the fuel to operate them. Indeed, the U.S. and British oil boycott of Japan is generally accepted as one of the main motivations for the Japanese attacks on the Dutch East Indies and Germany's lack of domestic natural resources for the German push toward the Caucasus during WW II. Adolf Hitler supposedly even told Field Marshal Erich von Manheim in a phone call: "Unless we get the Baku oil, the war is lost!" (Nur, 2004).

As will be discussed in greater detail later on, it also provided a major impetus for the establishment of the special relationship between the U.S. and Saudi Arabia near the end of the war. One of the main assumptions of this thesis will be that energy security is one of the pillars on which military power rests and that realist claims about how states act to ensure traditional security could therefore be relevant to the study of energy security and energy policy (Kelly and Leland, 2007: p.27).

Realists do tend to acknowledge that military power is dependent on other types of power, particularly economic and industrial power, as military power does not arise out of sheer will alone. It is thus important to note that even most realists recognize that economic power is a requirement and important determinant of military power. This means that oil influences military power both directly, in terms of fuel requirements for military machinery, and indirectly, through its importance to the economy, as illustrated in figure 2.1. For realists, economic and military power are often pursued simultaneously and in support of each other, with the overarching goal of creating a stronger, more powerful state. Economics is nonetheless always subordinated to politics and the pursuit of state security, should there be a conflict between the two (Kegley and Wittkoph, 1999).

While liberals tend to consider economics more important than realists, their acceptance of most fundamental realist assumptions means that the same arguments we have used to justify the application of realism to energy security questions also apply to liberalism.

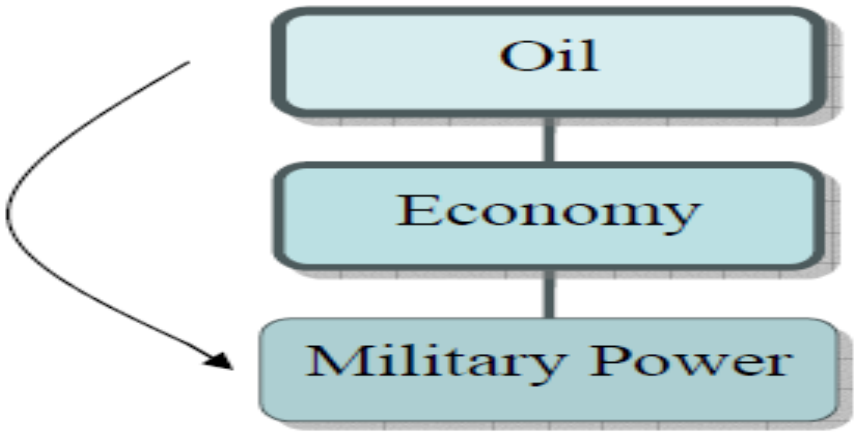

Figure 2.3. Relation Between Oil, Economy and Military Power (Source: Kelly, S.F. and Leland, S.G. (2007). "Oil Actually" - Chinese and U.S. Energy Security Policies in the Caspian Region - Master's Thesis in Political Science Faculty of Social Science University of Tromso)

As the typical definition of energy security suggests, however, energy security can also be interpreted in more economic terms than realists would, placing greater emphasis on acceptable price. What this means is that even though there can be no question that oil is a unique natural resource, liberals believe it is still fundamentally a trade good that can be the object of negotiation, unlike national security. If the acquisition of oil is in fact a question of economics, it could more easily be included in the kind of wide-ranging institutionalized cooperation that liberals tend to emphasize as a way out of the constraints of the system (Kelly and Leland, 2007: p.29).

Liberals point to the advantages of multilateral, institutionalized cooperation, which they believe will be obvious to rational state actors. Institutionalized cooperation will draw a greater number of states into a complex web of trade and interaction and if a successful regime can be established, where all involved states are willing to sanction those that withdraw from the regime, this web will be hard to get out of.

As has been mentioned, liberals believe the advantages of cooperating under an effective regime, and the disadvantages of remaining outside the regime, will ensure the regime's continuation and growth, as long as there is no major disruption. Furthermore, successful regimes allow for issue-linkage, where states are able to recuperate losses in one area by gains in another. If oil could be included in issue-linkage, it would reduce

uncertainty for all involved actors. Even though all states need oil, they would also prefer to get it through stable mechanisms and peaceful negotiation, rather than through forceful, and costly, means. Strategic policies, while arguably providing greater predictability, tend to be more expensive than a laissez-faire approach.

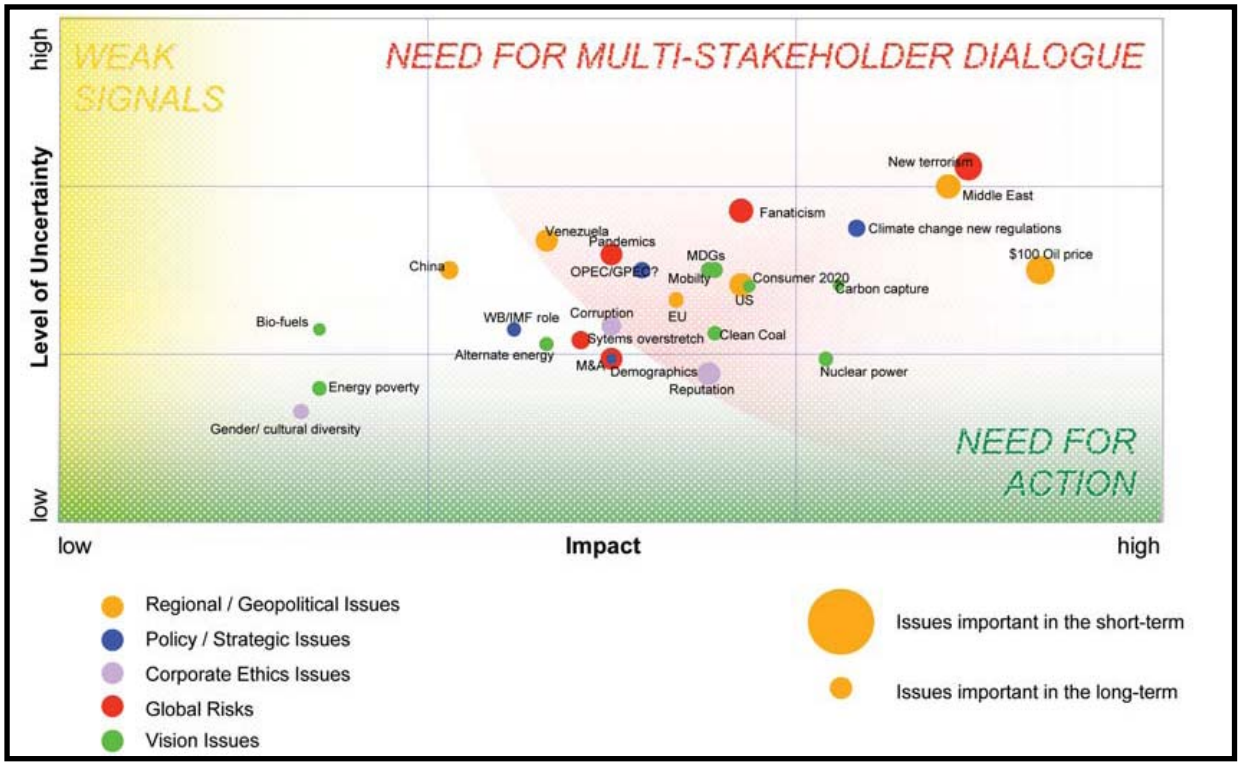

Figure 2.4. Energy Issue Map 2005-2006 (Source: World Economic Forum, Energy Industry Partnership Programme 2005 - World Economic Forum, 2006)

2.1.3. First Period: World Wars and Post World Wars Period

The energy - primarily petroleum - dimension was first illustrated in the aftermath of the Agadir Crisis during the late summer months of 1911. In August of that year, the newly appointed First Lord of the Admiralty decided to change the primary fuel of the British Navy from the easily accessible and politically secure "Welsh Coal" to the volatile "Persian Oil". As he perceptively recognised, "to commit the Navy irrevocably to oil was indeed "to take arms against a sea of troubles".

Winston Churchill's decision was initially met with great skepticism, yet the advantages in greater speed, maneuvering and operational range the British Fleet would gain were able to silence most of the criticism (Kelly and Leland, 2007: p.31).

2.1.3.1. First World War

British navalmastery during World War I exemplified by the battle of Jutland (1916) proved Churchill right. The German navy, which was still based on coal, was unable to challenge the wider operational range of the British High Seas Fleet. Even if it had won at Jutland, it would have been forced to remain around its major area of refueling that was none other than the German and central European coal mines. Its lack of speed and maneuvering flexibility significantly undermined its ability to overcome the British blockade in the North Sea and forced it to remain effectively "harbor-locked" for the rest of the War.

The revolutionary decision of the British government to re-build the foundation of its "naval supremacy upon oil" inextricably connected the security of oil supply – primarily in terms of physical availability - with the conduct and preparation of war as it has been repeatedly manifested in several seminal military and diplomatic events of World War I such as:

(i) the French Taxi "Armada" of General Gallieni in 1914 that helped to stop the German onslaught towards Paris during the First Battle of the Marne.

(ii) the Anglo-French Sykes-Picot Agreement of 1916 and its latter undermining by the British conquest of Mesopotamia in 1917 and 1918 that precipitated the demise of the Sévres Treaty (1920).

(iii) the German offensive against the oil fields of Ploesti in 1916 without which as General Ludendorff latter admitted Germany "would not have been able to exist, much less carry on the war".

(iv) the advent of tactical aerial bombardment that was instrumental in effectively curtailing the German onslaught after the initial breakdown of the British Front in March 1918 and most importantly.

(v) the launching of Germany's unrestricted submarine war (January 1917) whose prime target was to stop the refueling of the Allied forces in the Western Front with American Oil that then covered 67% of world production and

(vi) the emergence of the "tank" as the major component that penetrated the Lundendorff line, and ended the "Great War" through the allied victory in the battle of Amiens in August 1918 (Kelly and Leland, 2007: p.33).

2.1.3.2. Second World War

In the Second World War, the complete mechanisation of all Great Power armies during the interwar period simply made the critical nexus between the security of oil supply and warmaking more emphatic and even more vital for the success of the war effort, as it has been exhibited by some of the War's most important events such as:

(i) the U.S. oil embargo that precipitated the Japanese attack on Pearl Harbor.

(ii) German U-Boat attacks against U.S. petroleum convoys across the Atlantic and U.S. submarine attacks against Japanese oil tankers across the South China Sea that succeeded in paralysing the Japanese war economy by 1944.

(iii) the dramatic expansion of strategic air bombardment and above all

(iv) Hitler's grand design for the conquest of Caspian and Persian Gulf oil resources that precipitated his attacks against Soviet Russia - particularly the push towards the Volga and the Caspian Sea - as well as Rommel's Afrikan Corps Campaign in 1941-1943 (Kelly and Leland, 2007: p.35).

2.1.3.3. Post Second World War

Petroleum's strategic significance further increased during the Cold War as it went "hand in hand" with the emergence of Air Power all the way from the fueling of strategic B-52s to the development of misilse propulsion systems. Unfortunately, its political volatility also increased commensurably as the center of oil power was

transferred from America to the Persian Gulf States. The historical evolution of the Middle East, whose borders were artificially carved in order to serve Franco-British oil interests primarily inand around present day Iraq, did nothing to refute Churchill's worries regarding the inherent geopolitical risks associated with foreign oil dependence. The violent demise of European Colonialism and the emergence of the Arab-Israeli confrontation during most of the Cold War merely re-enhanced the validity of Churchill's conclusion back in 1911.

Yet what led to the current unavoidable dependency of the world economy on petroleum - and increasingly on natural gas - was the result of post-conflict reconstruction and peace time economic development. The inter-war period that witnessed the popularisation of automobile ownership on both sides of the Atlantic as well as the steady utilisation - primarily in the United States - of oil as a feedstock for electricity generation and heating, was but the mere prologue of the frantic rise in oil demand that followed in the aftermath of the Second World War.

The first three decades of the Cold War coincided with a period of unprecedented economic growth as Europe and Japan were able to resurrect their economies out of the rubbles of the World War. This economic resurrection that was primarily underpinned by America's financial assistance, was also founded on the dual pillar of cheap and available oil flowing from the Persian Gulf, Venezuela and of course the United States, which had been – apart from the arsenal - the "petroleum lifeline of democracy" during the Second World War (Kelly and Leland, 2007: p.37).

During that period the US controlled around 2/3 of world oil production and possessed a surplus capacity equal to around 30% of its actual production rate. That surplus capacity in combination with increased convoy protection won the Battle of the Atlantic and fueled the rest of Allied War effort in Europe as well as parts of the Russian advance in the Eastern front. During these 30 years oil not only consolidated its overwhelming dominance over the entire transportation sector of the economy, but expanded its hold over the economic sphere by deposing coal as the primary source for electricity generation, heating and industrial use.

As domestic coal became rarer, dirtier and more expensive, petroleum became cheaper, more environmentally friendly and more efficient in terms of its energy intensity, since you needed less oil to produce the same amount ofheat or electricity you could produce by using coal.

The speed of the conversion to a hydrocarbon based economy was indeed phenomenal. In 1955, coal covered 75% of Europe's total energy needs and more than half of Japan's energy demand. Within almost 15 years these vital statistics were completely reversed. By the late 1960s, oil covered 70% of Japanese energy needs whereas coal made up about only 7%. In 1972, oil covered 60% of European energy demand, and coal a mere 22% from the 75% it had a mere 17 years ago. This transformation meant that between 1948 and 1972, demand for oil had increased 15 times over in Europe and 137 times over in Japan (Kelly and Leland, 2007: p.37).

2.1.3.4. Middle East Wars

Throughout the 19-centrury nearly half of the world's crude oil supply came from the gushing oilfields surrounding the Azeri city of Baku. At that time, petroleum supplied only four percent of the world's energy, giving the Caspian region little strategic advantage in the international stage. But as the world economy embarked on a steep growth trajectory, dependence on petroleum grew significantly.

Today, oil supplies about 40 percent of the world's energy and 95 percent of its transportation energy. As a result, those who own the lion share of the reserves of this precious energy source are at the driver's seat of the world economy and their influence is steadily growing. Since the 1930s the Middle East has emerged as the world's most important source of energy and the key to the stability of global economy. This tumultuous region produces today 37 percent of the world's oil and 18 percent of its gas. When it comes to reserves, the Persian Gulf is king. It is home to 65 percent of global oil proven reserves and 45 percent of its natural gas. The Middle East also controls a significant portion of the hydrocarbons that are yet to be discovered. According to the U.S. Geological Survey over 50 percent of the undiscovered reserves

of oil and 30 percent of gas are concentrated in the region primarily in Saudi Arabia, Iran, Iraq, Kuwait, UAE and Libya.

The concentration of so much of the world's hydrocarbons in this geographical location means that as long as the modern economy depends on the supply of oil and natural gas, the Middle East will play a key role in global politics and economy. As it is, most of the world's countries are heavily dependent on Persian Gulf oil. In 2006, the Middle East supplied 22 percent of U.S. imports, 36 percent of OECD Europe's, 40 percent of China's, 60 percent of India's, and 80 percent of Japan's and South Korea's. Even oil- rich Canada is dependent on the Middle East. Forty five percent of Canada's oil imports originate in the region.

Barring a major technological transformation, global dependency on the Middle East is only going to grow. According to the International Energy Agency, from now to 2030, world oil consumption will rise by about 60 percent. Transportation will be the fastest growing oil-consuming sector. By 2030, the number of cars will increase to well over 1.25 billion from approximately 700 million today.

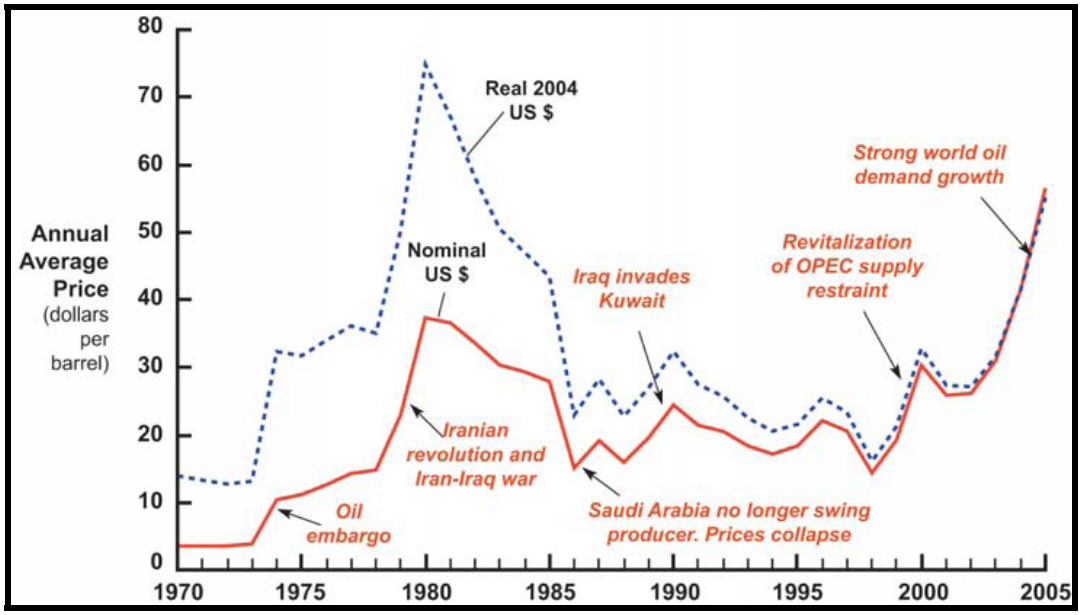

Figure 2.5. Crude Oil Prices in Nominal and Real US Dollars, 1970–2005 (Source: Cambridge Energy Research Associates - World Economic Forum, 2006)

Consequently, global consumption of gasoline could double. The two countries with the highest rate of growth in oil use are China and India, whose combined populations account for a third of humanity. In the next two decades, China's oil consumption is expected to grow at a rate of 7.5 percent per year and India's 5.5 percent. (Compare to a 1-3 percent growth for the industrialized countries). As a result, by 2030 Asia will import 80 percent of its total oil needs and 80 percent of this total will come from the Persian Gulf (http://www.eia.doe.gov/imp/imports.html).

Energy security issues have traditionally focused on crude oil supply disruptions in the Middle East. The instability of the Middle East during the 1970s led to rising prices for more than a decade. After oil prices collapsed in the mid-1980s, followed by the end of the Cold War and the resolution of the 1990-91 crisis, the world passed into a decade of lower oil prices and overconfidence about energy security – and, indeed, security overall. But turmoil in the Middle East – accentuated by demographic pressures, generational change and the rise of extremism; by the threat to political order and infrastructure posed by terrorist organizations; by regional conflict; and by rising demand, market pressure and price spikes – all these have brought the issue centre stage again (World Economic Forum, 2006: p.11).

2.1.4. Second Period: Gulf Wars

It would be better to start with the words of Secretary of United States of America, Condoleezza Rice, testimony before the U.S. Senate Foreign Relations Committee, April 5, 2006, in order to realize the Gulf Wars.

> *"We do have to do something about the energy problem. I can tell you that nothing has really taken me aback more, as Secretary of State, than the way that the politics of energy is […] 'warping' diplomacy around the world. It has given extraordinary power to some states that are using that power in not very good ways for the international system, states that would otherwise have very little power."*

Outside the Gulf, the crisis blew fresh life into the idea of a Western hemispheric energy alliance. It focused attention on the energy security of the United

States, Europe and Japan, and in so doing forced both Tokyo and the government of newly reunited Germany to reexamine their attitudes to overseas military challenges.

Oil played a curicial role during the buildup to Iraq's invasion of Kuwait on 2 August 1990. Three elements were involved (Roberts, 2010: p.5):

- Iraq was in a perilous financial situation, with oil revenues quite insufficient to pay for its ambitious schemes for military power and economic industrialization,

- Kuwait was pursuing an oil production policy which was helping to push oil prices down-wards, whereas Baghdad required higher oil prices to boost its revenues,

- Kuwait was allegedly pumping oil from the Rumailah oil field, which lies mainly within Iraq.

Energy security framework elaborates four conceptual components: "adequate quantity" (oil reserves), "reasonable price", "reliable supplier", and "safe transportation".

There are many explanations on the U.S. military intervention in the Persian Gulf War. The important point is that the U.S. military intervention was nothing new. It was rather the expansion of the U.S. military strategic transformations to secure oil from Persian Gulf region since the 1973 oil crisis, and we need "political economy" perspective to answer why the U.S. intervened the War with military forces and how the oil factor affected the intervention.

As 65% of the world proved oil reserves were concentrated in the Middle East, specifically in the Persian Gulf region, access to oil and the security of the region became an important national security goal for the U.S. since 1970s when foreign oil imports started to increase. Particularly, defending Saudi Arabia and the maritime route protection of Persian Gulf region were vital to oil security of the U.S. It was because US imported Persian Gulf oil by tankers which had to travel through the Strait of Hormuz, the world most important strategic chokepoint.

The Strait of Hormuz, located in the mouth of the Persian Gulf, is 48 to 80 km wide, however tanker navigation is not easy due to 3-km-wide narrow channels for navigation: one for inbound and the other for outbound traffic. In other words, it means "Circulation in and out of the Persian Gulf is therefore extremely confined, because the sizable number of tankers makes navigation difficult along the narrow channels" (Rodrigue, 2004: p.366).

The Strait of Hormuz is the strait where about 88% of all the oil exported from the Persian Gulf region including Saudi Arabia, Kuwait and Oman transits through, and the oil travels to Asia, Europe and the U.S. Therefore, the significance of the Strait of Hormuz in world oil transportation cannot be overemphasized, and its security has been a key national interest for all oil importing countries.

2.1.4.1. Oil Shocks

Nine times in the past 50 years global oil markets have experienced supply disruptions of at least 2.0 mbd. The most severe, in terms of gross supply loss at its peak, was during the Iranian Revolution. That disruption lasted around six months, from November 1978 until April 1979, and caused the then-largest crude oil price increase, until the most recent price run-up in late 2005.

In comparison, the maximum crude oil disruption from Hurricanes Katrina and Rita reached 1.5 mbd. There was an additional natural gas disruption equal to 1.6 mbd (9.5 billion cubic feet a day) at the peak of the crisis. Gulf of Mexico refining capacity losses rose to 4.0 mbd during the height of the crisis (World Economic Forum, 2006).

The 1973-4 oil price increase was a global economic shock. The magnitude of the price increase constituted a large negative supply shock for oil-importing countries and contributed to the dismal combination of stagnation and inflation that characterized the rest of the 1970s for the high-income countries. Oil exporters benefited from the higher prices, although in many cases inexperience in using the windfall led to "resource curse" outcomes and the world economy had trouble recycling the large new source of global savings (Pomfret, 2009: p.1).

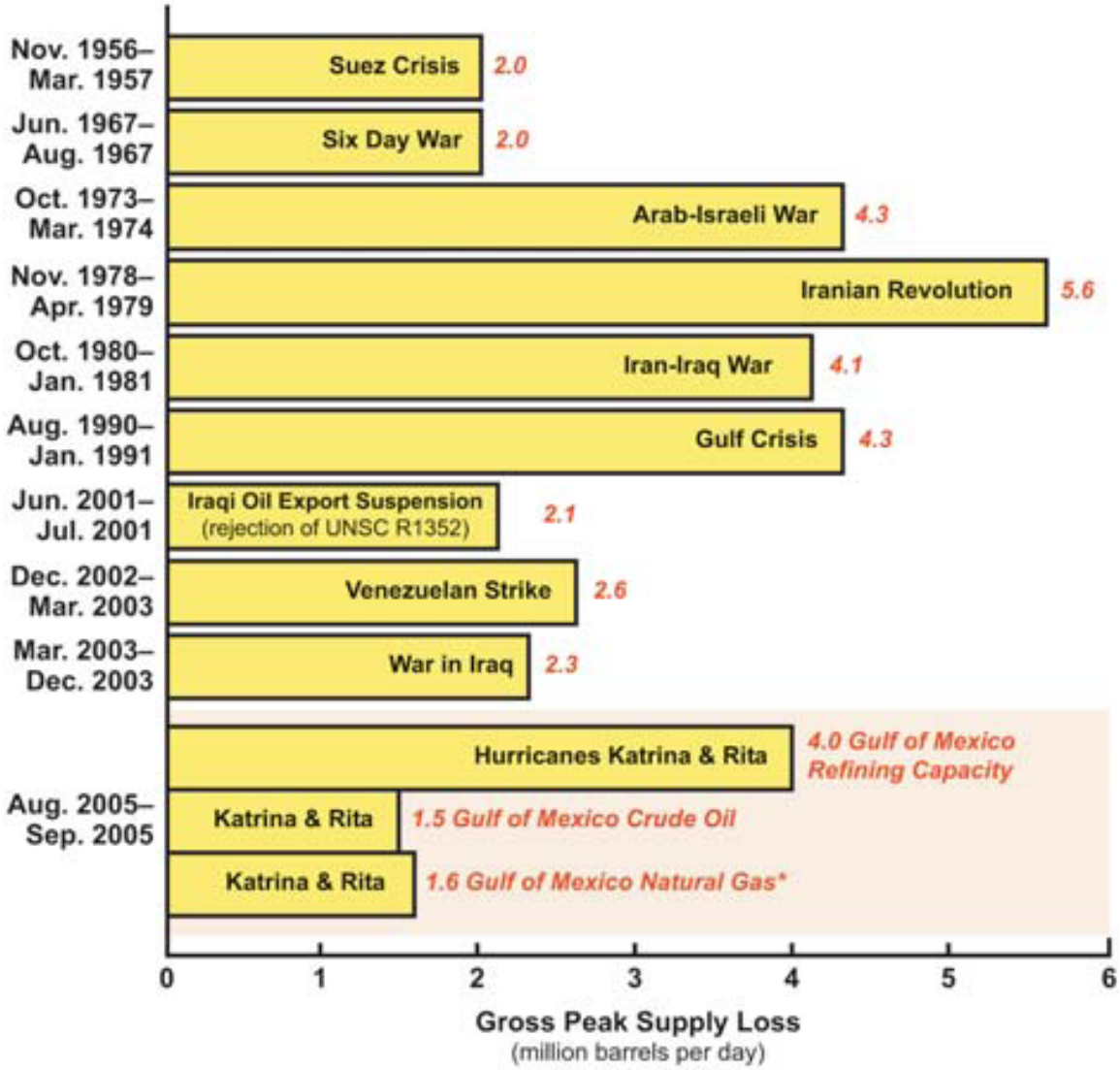

Figure 2.6. Global Oil Supply Disruptions (Source: International Energy Agency. US Minerals Management Service, and Cambridge Energy Research Associates - World Economic Forum, 2006)

In the energy security context, the most dramatic element of the post-1973 energy crisis was concern that the western countries could be held to ransom by a handful of oil-rich Middle Eastern countries. The situation was highlighted, despite its brevity, by the Arab oil embargo, and later in the decade and in the 1980s by the increased assertiveness of Iran and Libya (and of the Soviet Union, which invaded Afghanistan in December 1979). In the event, concerns about the new global power of oil producing nations proved to be exaggerated.

Oil consumers responded by adopting oil-saving technologies as their factories or equipment were renovated and by buying more fuel-efficient cars when it came time to trade in their car. The historically high oil prices provided an incentive to find new deposits, and to develop techniques to better recover oil in adverse conditions, asin Alaska or beneath the North Sea or the Gulf of Mexico (the Canadian tar sands also entered the picture, although the combination of technology and price has yet to make them really economical). By 1986 there was an oil glut; prices dropped to around $10 per barrel and remained there until 1998. The important point is that market forces worked, but because of the nature of both demand and supply the time lags are measured in years (Pomfret, 2009: p.2).

With lower prices, there was less incentive to invest in oil, and eventually a new cycle began as demand outstripped supply. The extent of the sustained price increase over the next decade was unforeseen; oil prices peaked at over $140 in spring 2008. However, there was no security of supply issue. All oil-users could obtain as much oil as they wanted as long as they were prepared to pay the price. There were some concerns about over-dependence on the Middle East and on increasingly important Russian oil, reflected in pipeline projects to access oil supply from Central Asia and the Caucasus; notably the Baku-Tbilisi-Ceyhan pipeline which opened in 2005 and the pipeline across Kazakhstan to China, but these could be economically justified at the high oil prices, and the former was as much about reducing the CIS oil exporting countries' dependence on transiting Russia as about security of supply for the West; indeed once oil reaches the Turkish port of Ceyhan it can be shipped by tanker to anywhere.

In sum, the 1998-2008 oil boom was an important economic event with winners and losers, but less drastic than the 1973-4 and 1979-80 oil booms because both buyers and sellers were better prepared for the challenges involved. It was neither an oil crisis nor a security challenge, because by 1998 OPEC supplied less than half of the world's oil and transport by tanker meant that no country could hold another hostage by controlling the transport routes.

2.1.4.2. Greater Middle East Initiative

The George W. Bush Administration launched the Greater Middle East Initiative (GMEI) as "a forward strategy of freedom in the Middle East" in November 2003. The policy emerged as a central plank in the "war on terrorism" just as Operation Iraqi Freedom began to encounter stiff resistance to the US occupation of Iraq. Marketed as a "brand nevv strategy" of "ending autocracy" in the region and bringing democracy to those deprived of freedom, officials clainned the policy vvas designed to "clean up the messy fart of the world."

It is good idea to remember what was expressed by different politicians related with this issue, prior to making an analysis over Greater Middle East Initiative (GMEI):

> *"...The United States has adopted a ııew policy, a fonvard strategy offreedom in the Middle East. " (George W. Bush, 6 November, 2003)*
>
> *"We are always threatening the Middle East with Democracy... But there is another kind of freedom they would like, and that is freedom from us. " (Robert Fisk, 24 November, 2005)*
>
> *"The Alternative to the old realpolitik is a brand new strategy oriented tovvard ending the entire apparatus of autocracy and creating in its place the conditions for future political legitimacy and economic growth. " (Victor Davis Hanson, 21 October 2002)*
>
> *".../ don 't thitık in any reasoııable time frame the objective of democratizing the Middle East can be successful... and in the process of trying to do it you can make the Middle East a lot worse." (Brent Scowcroft, National Security Advisor under George H. W. Bush)*
>
> *"Where democracy appears to fit in well with US security and economic interests, the United States promotes democracy. Where democracy clashes with other significant interests, it is downplayed or even ignored." (Thomas Carotlıers)*(Girdner, 2005)

Prior to the US invasion and occupation of Iraq in March 2003, and following the destruction of the Twin Tovvers in New York, some of the neo-conservatives in the Bush Administration declared that the US policy of appeasement of authoritarian regimes in the Middle East had failed and that the US must move quickly to remove these regimes and establish democracy across the region. Regime change emerged as a nevv buzz word (Hanson, 2002).

The idea of Greater Middle East Initiative (GMEI), developed by the US State Department was to be another tool of imperialist control which could be used to secure the resources, labor and markets of the region to beef up US global hegemony and secure corporate profits in the region, while theoretically, ending any incentives for terrorism. It is not clear if the neo-conservative ideologues took this argument seriously, but the rational of "democratization" went forward under the same rubric as the invasion of Iraq, that of the "War on Terrorism."

The priority of the “free and safe access to the energy resources”, as a much used framework for any kind of conceptualization in the Middle East during the 1990s, was changed by the extended terminology about “fighting against international terrorism” after the terrorist attacks of September 11, 2001, in the United States. Apart from the concrete economic and humanitarian problems of the Middle Eastern people, Western “capitals” put their own priorities to the top of the “concerns list”. For instance, according to the United States strategy documents the essential problem in the Middle East is the continuous production of threats targeting the Western nations (Erhan, 2005).

In brief, the initiative was based upon five core components. First, the initiative would provide a venue for discussion of reform goals and programs; encourage cooperation between states; and bring business and civil society leaders into the process. Secondly, there would be a Greater Middle East Democracy Assistance Group to coordinate the American and European groups "promoting democracy."

On the American side, this would include the National Endowment for Democracy (NED), and its four majör organizations (discussed belovv). In Europe it vvould involve the affiliated *stiftungs* associated with German political parties and the

Westminister Foundation in the UK. Thirdly, the initiative would establish a multilateral foundation modeled on the NED to focus on political change in the Middle East. Fourthly, there would be a Greater Middle East Literacy Corps. Fifthly, it would establish a G-8 microfinance pilot project, based upon an existing French proposal, fund new small businesses, and contribute to building an Arab "middle class."

Other elements of the program included "civic education" programs, technical assistance with voter registration, parliamentary exchanges and training, women's leadership vvorkshops, legal aid, media training, "anti-corruption" efforts, strengthening NGO's (which may actually only masquerade as NGOs), and support for certain labor unions (Hanson, 2002).

In order to deter threats to Western interests, the American policy makers built up a new set of strategic concerns. Although some of these concerns were already mentioned in the National Strategy documents during the Clinton era, the so called “Bush Doctrine” of 2002 enlarged the list and clearly described a new method to overcome the risks: “preemptive strike”.

We can summarize the current strategic goals of the US in the region as follows:

- Preventing the asymmetric threat towards the Western, American or allied citizens, possessions, and interests, posed by the radical and the fundamental terrorist networks; To destroy all kinds of possibilities for new “September 11”- type incidents.

- To deter Syria and Iran to support terrorist networks;

- To stop the spread of weapons of mass destruction;

- To block Iran's efforts to built its nuclear facilities;

- To deter countries trying to improve middle and long range misilse launching capabilities;

- To guarantee free and secure flow of oil and natural gas from the region to the world markets.

- To sustain survival of Israel within recognized and secured borders; and,

- To control energy flow to China, an emerging possible challenger forthe US global leadership (The National Security Strategy of the United States of America, Washington D.C., The White House, 2002).

2.1.4.3. The September 11 Attacks

Friedman defines the founders of al-Qaeda "a political phenomenon more than a religious one. I like to call them Islamo-Leninists." (Freidman, 2004: pp. 63-64). President Bush recently called them "Muslim fascists". Their way to approach the masses is the same used decades ago by Soviet Communist, Fascism, and Nazism, with the same purpose to create "the new man".

At the beginning of his terrorist activities Bin Laden's propaganda/message was addressed to the western audience, now his target are the young Muslims as an ideological answer to their sensation of humiliation and confused lost of identity: a "born again conversion". Despite Al-Qaida has justified, mythicized, and represented its terrorist attacks in name of a Muslim Jihad against western countries, its very essence is an economic war.

In his geopolitical discourse Bin Laden overlaps:

- The territory of Dar al Islam;

- The idea of a hypothetical Caliphate that from Morocco stretches to Indonesia (Mahbubani, 2005: pp. 7-18);

- The cybercaliphate's Networks (Jones and Smith, 2005: 925-950);

- Energy resources;

- All those geographical regions where a sensation of humiliation/frustration is lived by Muslim population. Territories that include all those western "ghettos" ("index wars", "index of segregation").

> "In clear terms, it is a religious-economic war (…..) The big powers believe that the Gulf states are the key to controlling the world, due to the presence of the largest oil reserves there (…..) I would like to say a few words to Muslim youths (…..) Ibeseech you to strengthen the mujahidin everywhere, particularly in Palestine, Iraq, Kashmir, Chechnya, and Afghanistan" (Lawrence, 2005: pp. 212-232).

In a videotape sent to Al-Jazeera (November 1st 2004), bin Laden while addressing his message to the American audience few days before the presidential elections, explains the "four pillars" of his Jihad:

1. Revenge: because in 1982, the USA "permitted the Israelis to invade Lebanon and the American Sixth Fleet helped them in that. This bombardment began and many were killed and injured and others were terrorised and displaced".

2. The aim is to "continue this policy in bleeding America to the point of bankruptcy".

3. The targets are "the American people and their economy (…..) the various corporations – whether they are working in the field of arms or oil or reconstruction (…..) (and) the Bush administration-linked mega corporations, like Halliburton and its kind".

4. Produce a further damage by: "send(ing) two mujhaddin to the furthest point east to raise a piece of cloth on which is written Al-Qaeda, in order to make the generals race there to cause America to suffer human, economic, and political losses (…..) In addition to our having experience in using guerrilla warfare and the war of attrition to fight tyrannical superpowers".

Three methods comprise Al Qaeda's economic war against America:

1. Destruction of “high qualitative targets by low cost qualitative means” (“Every dollar of Al Qaeda defeated a million dollars”)

2. Forcing the U.S. to sink unsustainable amounts of funding into its defense agencies.

3. Oil, by cutting the “provision line and the feeding to the artery of the life of the crusader’s nation”.

Energy resources are the Achille’s heel not only of American economy but of the world’s, and damages on their distribution system will create serious problem to our societies. On this geopolitical dimension it is not possible to forget that “the Islamic world is sitting on oil”.

Daniel Yergin, Chair of Cambridge Energy Research Associates, recently wrote “Energy security will be the number one topic on the agenda when the group of eight industrialized countries (G-8) meets in St. Petersburg in July”. But despite his expectations, the industrialized countries were more prone to accommodate their own energy interests than seeking cooperation.

Just few days before the inaugural ceremony for the opening of the Baku-Tbilisi-Ceyhan (BTC) pipeline, and during the G8 summit, Condoleeza Riza was signing a security agreement with Turkey, putting a practical start to the QDR 2006. As the world economy at the moment can not be but addict to oil, overlapping the last representations, the original area is confirmed as a constant of interests: from the Aegean to China.

CHAPTER III

ENERGY POLICIES OF EUROPEAN UNION

3.1. HISTORICAL DEVELOPMENT OF EUROPEAN ENERGY POLICIES

The EU has traditionally exerted little if any influence over individual member state energy policy. However, in March 2007, in the face of increasing concern about Europe's reliance on Russian energy, and growing public pressure to address global climate change, EU member states agreed to forge an "Energy Policy for Europe."

They have agreed on a set of EU-wide targets — some legally binding — to increase the use of renewable energy, and reduce carbon emissions. However, member states continue to pursue divergent external energy policies, particularly toward Russia, and some European countries remain reluctant to cede national control over energy markets.

3.1.1. Why European Union Need to Develop a Common Energy Policy

Several geopolitical and economic developments in the first decade of the twentyfirst century have heightened Europe's sense of vulnerability in respect of its energy supplies. On the supply side of the energy equation, the continuous fi ghting and rising ethnic and sectarian tension in Iraq, and the diplomatic confrontation over Iran's nuclear programme, have intensifi ed concern over the stability of supplies from the Persian Gulf.

On the demand side, China's and India's skyrocketing energy consumption and their eff orts to secure supplies have intensified global competition over scarce hydrocarbon resources. These changes in the landscape of the global energy market, in conjunction with diminishing refinery capacity, shrinking spare capacity and a low level of investment, have driven oil and natural gas prices higher. Currently, the European Union's oil bill (for imported and domestically produced oil) stands at around €250 billion a year, or roughly 2.3 percent of gross domestic product (GDP). These soaring

prices have exerted tremendous pressure on European economies and underscored the need for a common European energy policy (Bahgat, 2006).

In 2006, in the wake of Russia's cut-off of natural gas to Ukraine and Moldova, the European Commission (EC) issued a Green Paper entitled "A European Strategy for Sustainable, Competitive and Secure Energy." This paper identifies weaknesses in EU internal energy policy, and calls for a coherent external energy policy that includes diversification of supply, yet never provides a precise definition of energy security (Winchester, 2007: p.16).

Part of the problem is that Western leaders tend to view energy extraction, transport and sale as free market issues rather than a proper topics for security studies. In 1999, Neil MacFarlane observed that "the traditional focus of security studies has been how states (and groups of states) address external military threats." (MacFarlane, 1999).

To demonstrate how little this thinking has advanced, it is enough to look at the words of Friedemann Muller that pointed out in "continental European tradition energy policy is considered part of economic policy," and that only recently has it become clear to political leaders that energy markets "are prone to crisis-like development in certain regions, threatening security."

Despite these historical positions, the EU must accept the necessity of using its political and economic influence to prevent or ameliorate threats to its imported natural gas supply; the market alone will not address energy security concerns. If MacFarlane is correct in defining security as related to the "presence or absence of threats," then the EU must begin to examine both the implicit and explicit threats posed by its dependency on imported Russian gas. Jonathan Stern provides a useful definition of the risks associated with import dependence, namely source dependence, transit dependence, and facility dependence.

Facility dependence is largely a technical issue, but Stern's first two risks bear restating in security terms: countries that import natural gas must diversify their sources of imported natural gas, as well as diversifying transit routes along which the energy

travels from those regions, in order to minimize the risk of disruption to those imports (Winchester, 2007: p.17).

On 8 March 2006 the European Commission issued a new Green Paper entitled *A European strategy for sustainable, competitive and secure energy*. At the Green Paper's launch, José Manuel Barrosa, the President of the European Commission, highlighted the need for a common strategy for energy: 'We are in a new energy century. Demand is rising and Europe's reserves are declining. There is underinvestment and our climate is changing. The Green Paper puts forward suggestions and options that could form the basis for the shape and direction of the EU's future energy policy.

This important document was intensely debated by European heads of state and government in their spring summit in March and by various European institutions in the following months.

The Green Paper identifies six areas as priorities:

• completing the internal European electricity and gas markets;

• encouraging solidarity among member states;

• establishing a more sustainable, effi cient and diverse energy mix;

• supporting an integrated approach to tackling climate change;

• encouraging a strategic energy technology plan;

• creating a coherent external energy policy (Bahgat, 2006).

3.1.2. The International Energy Agency and Its Role in Energy Security

The IEA was founded during the 1973-74 oil crisis that was precipitated by the 1973 Arab-Israeli War and the oil embargo. The initial purpose of the IEA, established by members of the Organization for Economic Cooperation and Development (OECD), was to coordinate activities during oil supply emergencies. The 26 member countries of

the IEA are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States. Poland and Slovakia have applied for IEA membership, and the European Commission also participates in IEA activities. Notably, China, India and Russia are not currently part of the IEA system.

IEA member countries are required to hold oil stocks that can be shared in case of an oil supply emergency. These stocks fall into three categories: company stocks, government stocks and agency stocks; the total volume of these three categories is approximately 4.1 billion barrels. Company stocks are both mandatory and commercial, and represent about two-thirds of total IEA stocks. Government stocks are financed by national governments and are held exclusively for emergency purposes. Additional agency stocks are maintained by a combination of public and private organizations.

An emergency response team has been activated four times: during the 1991 Gulf War when a supply shortfall of 4.3 million barrels a day (mbd) occurred at one point, during the millennium (Y2K) when there were concerns that computer systems might fail as we moved from 1999 to 2000, during the Venezuelan shutdown at the end of 2002 and the beginning of 2003, and most recently in response to the loss of oil supplies in the Gulf of Mexico due to Hurricane Katrina. The only actual release of emergency stocks occurred twice – during the 1990-91 Gulf crisis and in the immediate aftermath of Hurricane Katrina in late 2005 (World Economic Forum, 2006).

3.1.3. The Last Situation at Energy

Oil production from OPEC member states accounted for 54% of global oil production in 1974. It fell to a 30% low in 1985, and currently stands at around 40%. In terms of oil production capacity, 15 countries dominate the future growth in long-term oil supplies (See Table 3.1).

Table 3.1. Oil Production Capacity Increases: 15 Countries Dominate Long-term Oil Supply Growth (million barrels per day of production capacity)

Rank	Countr	1995	2005	2015
1	Saudi Arabia	**10.2**	**11.1**	**13.2**
2	Russia	**6.2**	**9.5**	**11.3**
3	Iran	**3.7**	**4.2**	**5.2**
4	Iraq	**2.1**	**2.3**	**4.0**
5	Canada	**2.4**	**3.5**	**5.3**
6	Venezuela	**3.0**	**2.9**	**3.4**
7	UAE	**2.3**	**2.9**	**3.5**
8	Kuwait	**1.6**	**2.5**	**3.2**
9	Nigeria	**2.1**	**2.9**	**3.7**
10	Kazakhistan	**0.4**	**1.2**	**3.3**
11	Algeria	**1.4**	**2.2**	**3.1**
12	Libya	**1.5**	**1.8**	**2.6**
13	Brazil	**0.8**	**1.8**	**2.7**
14	Angola	**0.6**	**1.3**	**2.5**
15	Azerbaijan	**0.2**	**0.4**	**1.1**
Total Top15		**35.9**	**47.0**	**62.8**
Share of World Liquid Capacity		**50%**	**54%**	**58%**

(Source: Cambridge Energy Research Associates - World Economic Forum, 2006)

This growing concentration is occurring at the same time that competition for these resources has become more intense. National oil companies have joined international oil companies in competing for resources to feed economies. Developing the oil reserves will require new infrastructure to refine the oil and deliver products to market (World Economic Forum, 2006).

The changes are not limited to oil. The natural gas story is even more remarkable. In 1973, total world natural gas production was approximately 43.3 trillion

cubic feet. There was minimal natural gas production in Africa, Norway, the Asia Pacific and the Middle East. The Caspian region was largely undeveloped in terms of natural gas. Today, all of these regions are teeming with natural gas exploration and production projects, and demand has more than doubled.

Table 3.2. World Natural Gas Production

Country	1973	2004
Canada	75'341	182'564
Mexico	12'428	41'467
United States	615'085	531'951
OECD North America	**702'854**	**755'982**
Austria	2'242	1'963
Belgium	48	-
Czech Republic	474	216
Denmark	-	9'430
Finland	-	-
France	8'046	1'390
Germany	23'124	20'559
Greece	-	23
Hungary	4'879	2'963
Ireland	-	855
Italy	15'407	12'961
Luxembourg	-	-
Netherlands	75'064	85'983
Norway	-	82'340
Poland	6'458	5'957
Portugal	-	-
Slovak Republic	496	165
Spain	1	339
Sweden	-	-
Switzerland	-	-
Turkey	-	688
United Kingdom	29'210	101'182
OECD Europe	**165'449**	**327'014**
Australia	4'048	37'025
Japan	2'595	2'957
Korea	-	
New Zealand	481	4'350
OECD Pacific	**7'124**	**44'332**
OECD Total	**875'427**	**1'127'328**
Argentina	6'629	46'728
Bolivia	2'036	7'638
Brazil	198	11'886
Chile	625	1'113
Colombia	1'903	7'560
Cuba	15	658
Peru	409	1'144
Trinidad and Tobago	1'900	27'943
Venezuela	11'268	25'827
Other	51	501
Latin America	**25'034**	**130'998**
Albania	191	14
Bulgaria	212	320
Romania	30'069	13'102
Croatia	-	1'941
Serbia, Montenegro	-	299
Slovenia	-	5
Former Yugoslavia	1'561	2'245
Non-OECD Europe	**32'033**	**15'681**
Azerbaijan	-	4'870
Belarus	-	244
Georgia	-	19
Kazakhstan	-	21'855
Kyrgyzstan	-	27
Russia	-	620'095
Tajikistan	-	33
Turkmenistan	-	59'296

Country	1973	2004
Ukraine	-	19'977
Uzbekistan	-	59'487
Former USSR	**241'183**	**706'439**
Algeria	4'478	88'337
Angola	67	720
Congo	2	
Cote d'Ivoire	-	1'422
Egypt	89	31'632
Gabon	490	117
Libya	4'185	6'994
Morocco	72	43
Mozambique	-	3
Nigeria	434	21'142
Senegal	-	13
South Africa	-	2'252
Tunisia	125	2'278
Other	1	
Africa	**9'943**	**154'953**
Bahrain	1'645	7'036
Iraq	1'210	1'560
Islamic Republic of Iran	11'884	81'332
Israel	54	351
Jordan	-	261
Kuwait	6'069	10'195
Oman	-	20'589
Qatar	1'580	41'463
Saudi Arabia	1'880	63'999
Syria	-	6'950
UAE	1'284	44'899
Middle East	**25'606**	**278'635**
Bangladesh	639	12'753
Brunei	1'871	12'355
Chinese Taipei	1'505	770
India	721	27'393
Indonesia	381	79'498
Malaysia	118	52'387
Myanmar	107	8'391
Pakistan	3'827	32'579
Philippines	-	2'779
Thailand	-	22'170
Vietnam	-	3'263
Other	2'687	205
Asia	**11'856**	**254'543**
China, People's Republic	**5'380**	**46'475**
Non-OECD	**351'035**	**1'587'724**
World	**1'226'462**	**2'715'052**
World Totals in Other Units	**1'973**	**2'004**
Billion cubic metres	***1'226.5***	***2'794.5***
Trillion cubic feet	***43.3***	***98.6***
Billion cubic feet per day	***118.6***	***270.3***

Source: International Energy Agency and CERA
2004 data are provisional for the OECD and are estimates for the Non-OECD countries.

(Source: Cambridge Energy Research Associates - World Economic Forum, 2006)

Table 3.3. World Natural Gas Consumption

Country	1973	2004
Canada	43'386	89'934
Mexico	12'371	50'454
United States	624'088	631'002
OECD North America	**679'845**	**771'390**
Austria	3'787	8'981
Belgium	8'257	17'063
Czech Republic	1'279	9'600
Denmark	-	5'171
Finland	-	4'860
France	17'136	45'582
Germany	41'301	101'252
Greece	-	2'693
Hungary	5'049	14'464
Ireland	-	4'295
Italy	17'095	80'608
Luxembourg	289	1'361
Netherlands	40'382	51'302
Norway	-	5'545
Poland	8'138	15'668
Portugal	-	3'737
Slovak Republic	2'001	6'719
Spain	1'009	27'012
Sweden	-	979
Switzerland	180	3'311
Turkey	-	22'443
United Kingdom	30'027	102'550
OECD Europe	**175'930**	**535'196**
Australia	3'839	26'370
Japan	6'777	83'548
Korea	-	27'844
New Zealand	481	4'349
OECD Pacific	**11'097**	**142'111**
OECD Total	**866'872**	**1'448'697**
Argentina	8'265	39'500
Bolivia	103	1'171
Brazil	198	19'972
Chile	625	8'368
Colombia	1'903	7'564
Cuba	15	658
Peru	404	1'175
Trinidad and Tobago	1'900	12'749
Venezuela	11'268	25'827
Other	52	1'489
Latin America	**24'733**	**118'473**
Albania	191	14
Bulgaria	212	3'773
Romania	29'868	18'886
Bosnia-Herzegovina	-	621
Croatia	-	2'600
FYROM	-	81
Serbia, Montenegro	-	2'085
Slovenia	-	1'104
Former Yugoslavia	1'551	6'491
Non-OECD Europe	**31'822**	**29'164**
Armenia	-	1'561
Azerbaijan	-	6'001
Belarus	-	20'009
Estonia	-	847
Georgia	-	1'123
Kazakhstan	-	19'198
Kyrgyzstan	-	731
Latvia	-	1'750
Lithuania	-	2'944
Republic of Moldova	-	3'401
Russia	-	427'305

Country	1973	2004
Tajikistan	-	563
Turkmenistan	-	15'205
Ukraine	-	70'116
Uzbekistan	-	55'956
Former USSR	**255'748**	**626'710**
Algeria	1'906	23'689
Angola	67	720
Congo	2	-
Cote d'Ivoire	-	1'422
Egypt	89	30'941
Gabon	-	132
Libya	1'033	5'894
Morocco	72	43
Mozambique	-	3
Nigeria	434	8'221
Senegal	-	13
South Africa	-	2'252
Tunisia	125	3'420
Other	1	-
Africa	**3'729**	**76'750**
Bahrain	1'645	7'036
Iraq	1'210	1'560
Islamic Republic of Iran	3'794	83'929
Israel	54	312
Jordan	-	1'100
Kuwait	6'069	10'195
Oman	-	10'360
Qatar	1'580	17'032
Saudi Arabia	1'880	63'999
Syria	-	6'950
UAE	1'284	38'594
Middle East	**17'516**	**241'067**
Bangladesh	611	12'753
Brunei	357	2'575
Chinese Taipei	1'505	9'788
India	721	30'399
Indonesia	226	40'210
Malaysia	118	27'739
Myanmar	107	1'773
Pakistan	3'827	32'587
Philippines	-	2'779
Singapore	-	7'998
Thailand	-	30'674
Vietnam	-	3'263
Other	178	205
Asia	**7'650**	**202'743**
Hong Kong, China	**-**	**1'515**
China, People's Republic	**5'380**	**45'179**
Non-OECD	**346'578**	**1'341'601**
World	**1'213'450**	**2'790'298**

World Totals in Other Units	**1'973**	**2'004**
Billion cubic metres	***1'213.5***	***2'790.3***
Trillion cubic feet	***42.8***	***98.5***
Billion cubic feet per day	***117.4***	***269.9***

Source: International Energy Agency and CERA
2004 data are provisional for the OECD and are estimates for the Non-OECD countries.

(Source: Cambridge Energy Research Associates - World Economic Forum, 2006)

Global natural gas demand more than doubled in the past 30 years, driven largely by new technology. The most remarkable growth, in terms of volumes, has

occurred in the Asia-Pacific, the Former Soviet Union (FSU), Europe and the Middle East.

Expectations of strong growth in natural gas demand have led to a push to develop previously discovered natural gas reserves and search for new sources as well. Annual additions to natural gas resources have remained above production rates throughout most of the past 45 years. Also, many of the fields that have been discovered have not been developed because they lack a market. One of the attractions of the growing LNG trade is to enable the development of those fields, often referred to as "stranded gas".

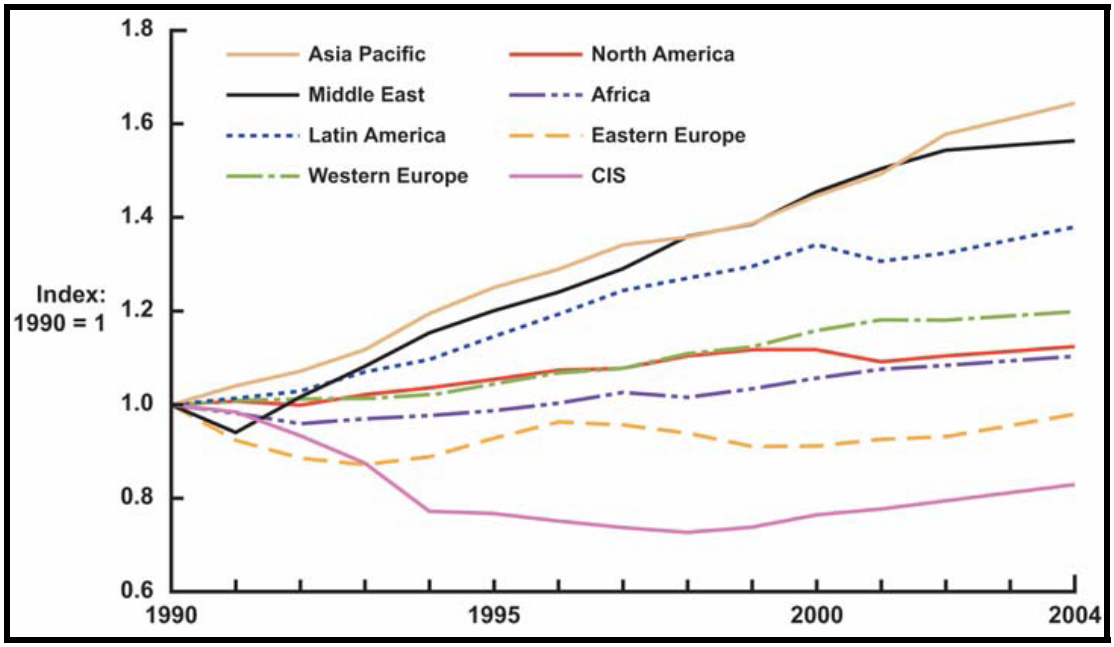

Figure 3.1. Index of Per Capita Power Consumption by World Region, 1990-2004 (Source: Cambridge Energy Research Associates - World Economic Forum, 2006)

As it is seen at the tables above, Europe's energy mix is strongly dominated by fossil fuels. In 2005 oil constituted approximately 37 per cent of the EU's energy consumption, natural gas 24 per cent, solid fuels 18 per cent,4 nuclear power 15 per cent and renewables 6 per cent. This heavy European dependence on fossil fuels refl ects the pattern of global usage, which is unlikely to alter substantially. According to the International Energy Agency (IEA), fossil fuels will continue to dominate global energy use. Oil will remain the single largest fuel in the primary energy mix, even though its

percentage share will fall marginally. Meanwhile, demand for natural gas will grow most rapidly, mainly due to strong demand from power generation (Bahgat, 2006).

About half of the energy consumed in the EU is produced domestically, while the other half is imported. The underlying reason for this large and growing dependence on foreign supplies is Europe's limited indigenous energy production capacity. The EU members possess only approximately 0.6 per cent of the world's proven oil reserves and 2.0 per cent of proven natural gas reserves,7 and these limited reserves are largely concentrated in the North Sea. Norway, the Netherlands and the United Kingdom hold the bulk of Europe's proven natural gas reserves.

3.1.4. Oil

Europe's energy sector is currently dominated by oil, natural gas and coal, with lesser contributions from nuclear power and renewables. Europe's heavy dependence on fossil fuels is predicted to continue for the foreseeable future. By 2030 oil is projected to maintain its dominant share of total energy consumption at 33.8 percent, with natural gas at 27.3 per cent, solid fuels 15.5 per cent, and renewables and nuclear contributing 12.2 per cent and 11.1 per cent respectively.

In responding to the volatility of oil prices in the mid-1970s the Europeans, like the Americans, were able to replace oil with other sources of energy in several sectors. However, despite substantial investment and technological advances, oil still is by far the dominant fuel in the transportation sector. The EU's heavy dependence on oil to meet its member states' energy needs is costly. In 2004 oil imports accounted for 4 per cent of the Union's GDP. Europe imports most of its oil from Russia, the Middle East, Norway and North Africa (Report on the Green Paper on energy, 15 Dec. 2004).

3.1.5. Natural Gas

Use of natural gas, the second most prominent fuel in the mix, is growing most rapidly. Natural gas is very much cleaner and more environment-friendly than oil or coal. It is consumed in the industrial and residential sectors and increasingly in electricity generation. Europe receives most of its natural gas needs via pipelines from

two main sources, Russia and Algeria. In addition, Libya, Egypt, Qatar, Iran and Azerbaijan are at diff erent stages in negotiating natural gas export deals to the EU (Bahgat, 2006).

3.1.6. Coal

Deposits of coal, unlike those of oil and natural gas, are plentiful in Europe as well as elsewhere across the globe. Furthermore, for a long time coal prices have been stable at a low level compared with other sources of energy. These are the main advantages of coal. However, coal consumption has been restrained because of its high contribution to pollution. Simply stated, coal is a dirty fuel: when burned, it releases considerably more CO2 than its competitors. Accordingly, both production and consumption of coal in the EU have fallen in recent decades.

3.1.7. Nuclear Energy

Early in the second half of the twentieth century high expectations were generated that nuclear power would be widely used for civilian purposes. Half a century later, it is clear that these expectations have not been realized. Health hazards and the problem of managing nuclear waste have acted as severe constraints on largescale expansion of nuclear power. The Three Mile Island accident in the United States (1979) and particularly the Chernobyl accident in the Soviet Union (1986) have turned European public opinion away from nuclear energy.

The European Commission has taken a neutral view of nuclear power; the decision on whether or not to use nuclear power is governed by the energy policy of the individual member states. Nevertheless, the Commission must ensure that existing installations have a very high level of security and that both radioactive waste and the fuels used are managed safely and without damage to the environment. In the 1990s several EU members, including Spain, the Netherlands, Germany, Sweden and Belgium, opted to force the early closure of existing nuclear plants. France, on the other hand, is still dependent on nuclear power to meet its energy needs, particularly in generating electricity. High oil prices in the early 2000s and substantially improved technology and safety measures have renewed interest in nuclear energy, and several

European countries are currently re-evaluating their position on nuclear power (Bahgat, 2006).

CHAPTER IV

ENERGY SECURITY AND CLIMATE CHANGE POLICY INTERACTIONS: NEW AND RENEWABLE ENERGY RESOURCES

4.1. CLIMATE CHANGE POLICY

Since the emergence of climate change as a new and increasingly important element in energy policy, more attention has been given to the need to adopt integrated approaches to energy policy making, with climate change and energy security appearing as important drivers for future energy policy. This is reflected in the energy policy strategies of most, if not all, IEA member countries and their insistence on finding ways to balance the so-called '3 Es': energy security, economic efficiency, and environmental acceptability. However few efforts have gone beyond a qualitative assessment of interactions between these policy drivers.

Climate change is a very different energy policy driver from security. Along with ozone depletion, it is one of the first truly global environmental concerns, and the first with major energy implications. Compared to the energy security policy drivers it has emerged relatively recently as an energy policy driver of potentially great importance. The accumulation over the course of the 70s and 80s of scientific evidence pointing towards the risks of enhanced climate change due to increasing anthropogenic greenhouse gas emissions led to a first international policy response in 1992 with the adoption of the United Nations Framework Convention on Climate Change. The Convention's ultimate objective is to stabilise "greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". This was subsequently backed in 1997 by the Kyoto Protocol to the Convention which sets a timeframe for emission reductions in industrialised countries (Blyth and Lefevre, 2004).

Although a decade after its adoption the Convention is now approaching universal membership, there is still much scientific uncertainty around what the

appropriate level of greenhouse gas concentration in the atmosphere should ultimately be. What we do know, is that to stabilise CO_2 concentration in the atmosphere at any given level, emissions will ultimately have to be reduced to the level of persistent natural sinks (IPCC, 2001). Representing over 80 per cent of anthropogenic greenhouse gas emissions, the production and use of fossil fuels is at the heart of both the problem and the solution. Although IEA Member countries are increasingly active in trying to reduce energy-related emissions, achieving the goals of the Convention will require more actions, with growing repercussions on our energy system.

4.2.ENERGY SECURITY AND CLIMATE CHANGE POLICY INTERACTIONS: NEW AND RENEWABLE ENERGY RESOURCES

Energy security is now a commanding priority. The emerging energy system is far more complex and global than the industrial era system that it is slowly replacing. Today when security planners talk about energy security, they are as likely to be referring to carbon emissions and diminishing water supplies as energy self-reliance and affordable oil. Moreover, emerging energy and environmental security problems are increasingly beyond the ability of any single country to control.

Energy has become one of the most pressing problems in national and global security. Significant increases in the price of oil have weakenedthe global economy, contributed to a sharp rise in global food prices, and transferred trillions of dollars to autocratic oil-exporting regimes. At the same time, rapid fluctuations in the price of oil-from around $25 per barrel in 2001 to as much as $150 in 2008 and back to below $50 in 2009—have increased risk and discouraged investment in energy technology and infrastructure ensuring that global markets will not be prepared for the next cycle of high prices. Internationally, energy diplomacy has become increasingly confrontational as states jockey for control of gas and oil markets and pipelines (Global Strategic Assessment, 2009: p.71).

Meanwhile, concerns about pollution and greenhouse gases have strained diplomatic relations with other nations and are forcing fundamental changes in energy policy. The emerging crises are symptoms of a gradual transformation in the underlying

geopolitical and economic system that has supplied the world withcheap energy for over a century. Since the 1800s, cheap fossil fuels have powered the rise of industrialization and globalization. During this period, free-market mechanisms ensured that world markets had access to petroleum and other sources of energy.

This system relied on market competition to drive the price of energy commodities toward the price of extraction and depended on a liberal trading order in which governments generally left energy transportation, supply, and demand to the market. Over the life of the energy market, the fundamental threat to cheap and reliable energy commodities has been that government intervention in the supply, transport, and demand for energy would transform the global distribution system from one adjudicated mainly by markets to one based on politics and force.

Threats to the market-based system have always been possible. States with diplomatic or military influence on the global lines of communication by which energy is transported have frequently been tempted to further their interests by charging rents for access. Supplying states have regularly attempted to band together to increase market prices. At least since the 1970s, environmental groups have put pressure on governments in rich states to look beyond the market and consider externalities when setting energy policy.

Despite these pressures, until recently, the world has generally maintained a global free-market energy economy in which the prices of energy commodities have hovered around the cost of extraction and supply has been dependable. Historically, this system has rested on three pillars: a reliance on freedom of the seas for most international energy trade; a multiplicity of energy-exporting nations and multinational corporations that made collusion and nationalization difficult; and the preference given by oil-importing nations to energy supply and price, over other considerations such as the environment. Each of these pillars, and hence the basic energy system, is increasingly uncertain (Global Strategic Assessment, 2009: p.73).

One of the dynamics altering the current global energy market is the increasing importance of environmental concerns in determining importing states' energy policies.

Whereas energy policies in rich states were once determined mainly with an eye to reducing price, price today is becoming decreasingly important vis-à-vis fears of pollution and particularly of global warming.

For several decades, the governments of rich countries have been under mounting pressure to modify energy policies to account for environmental factors. The success at influencing governments over the environment has varied across countries and time. But the contemporary era is particularly green, and the influence of environmental groups is growing rapidly. While clashes once mainly pitted naturalists against economic interests, as concerns about global climate change grow, the number and political influence of groups committed to environmental policies will expand.

Today, many governments and nongovernmental organizations are lobbying the other states for more eco-friendly policies, and EU energy policy has become a major point of diplomatic, as well as domestic, friction.

It is difficult to predict the effect of environmental concerns on energy markets. In general, environmentalists argue for higher prices on carbon-based fuels to reduce demand. However, environmental science is too young and lobbying too disparate to make prediction easy. In the EU region, conflicting interests sometimes pit one environmental interest against another. For instance, lobbies aimed at reducing radioactive waste and preserving natural ecosystems currently restrict the construction of EU countries nuclear and hydroelectric plants. In the process, however, they have caused the countries to increase the number of dirty, carbon-producing coal plants (Global Strategic Assessment, 2009: p.74). Also, some policies are self-defeating. To reduce greenhouse gases, the EU funds research on electric cars.

In the meantime, environmentalists and energy suppliers both hold out hope that new technology will eventually solve current problems. Environmental concerns, and particularly global climate change, may prove to be this century's greatest security challenge. Whatever the eventual outcome, however, they are fundamentally changing the way the global system extracts, transports, and uses energy and injecting uncertainty into global markets. As concerns over climate change increase with time and

governments search among myriad proposed solutions, the price and volatility of energy are likely to increase and incentives for privately funded research and infrastructure development are likely to be adversely affected.

As the global energy economy transitions toward a more statist and mercantilist system, policymakers are likely to find themselves operating in *terra incognita*. In the old system, private companies absorbed most of the risk; in the emerging system, states will bear a larger portion of the risk as they pioneer new policies. Many of the policies that will set the tenor for the next century will be developed and implemented in the next decade. Global leadership is needed, and difficult national choices will have to be made. The world is changing and the dynamics that facilitated a world powered by cheap fossil fuels arediminishing. Leaders face the question of whether they can overcome inertia and adapt and change with it.

The states of the European Union (EU) face significant challenges to their energy security because of dependence on a limited number of oil and gas suppliers and serious concerns about Europe's contributions to global carbon emissions and climate change. Because EU members are mostly net energy importers, and because most energy-related policies are left to individual member states to negotiate, suppliers in the Organization of the Petroleum Exporting Countries (OPEC), and especially Russia with its nationalized oil and gas industries, hold a significant advantage in negotiations with European states. Europeans are well aware that energy security requires diversified suppliers and transit routes. However, this awareness has not yet resulted in the creation of a common energy policy enabling coordination of EU relations with international energy suppliers.

In 2007, the Council of the European Union proposed an energy policy for Europe to address the security of energy supply, climate change, and the creation of a single EU market for energy. The EU has done a better job of addressing climate change and its internal energy market than it has of solving the problem of supply diversity. As a cornerstone of a climate change policy, the EU introduced a "cap-and-trade system" for carbon dioxide (a concept also under consideration by the U.S. Congress). The EU is currently in a second round of cap-and-trade programs based on

lessons learned from the initial round, which resulted in low emissions prices and little mitigation. The EU also introduced energy competition for electricity and natural gas by requiring member states to allow all residential, commercial, and industrial customers the right to choose energy suppliers. This competition policy came under pressure as consumers continued to see energy prices rise in spite of this liberalization.

The EU is aware of the growing problem of its energy security. A 2006 *Green Paper: A European Strategy for Sustainable, Competitive and Secure Energy*, for example, recommended the following trio of priorities: establish a functioning internal energy market; move energy conversion to low-carbon technologies, with renewable energy producing 20 percent of supply by 2020; and achieve end-use energy efficiency improvements, achieving a 20 percent reduction in energy consumption by 2020. These actions continue the EU's aggressive moves toward diversification in energy as a mechanism for creating competitive economies and mitigating climate change through programs fostering environmental sustainability (Global Strategic Assessment, 2009: p.73).

The current European energy supply portfolio reflects a desultory track record of independent decisions made by the organization's 27 individual member states. These past decisions, involving the role of nuclear power, coal, and imported natural gas, have led to divergent energy portfolios. For instance, nuclear power accounts for 40 percent of France's energy needs, but it provides only 9 percent of the United Kingdom's power supply and none of Austria's. Similarly, coal has no role in electricity generation in France, but coal represents 92 percent of Poland's supply, 65 percent of the Czech Republic's supply, 62 percent of Greece's supply, and 50 percent of Germany's supply. The EU is moving ahead in some areas with EU-wide policies on energy supply using the issue of climate change as the policy driver. Thus, a January 2008 proposed directive on renewable energy requires that 20 percent of member state energy come from renewable sources by 2020, as recommended in the earlier Green Paper.

The EU is most vulnerable in the oil and gas sectors, with oil providing between 40 and 50 percent of primary energy needs for most EU members and natural

gas sales dominated by Russia's Gazprom. More worrisome, forecasts suggest that the trend is toward greater EU foreign dependence, with the EU projected to import 90 percent of its oil and 80 percent of its natural gas by the year 2030. At present, 45 percent of EU oil imports are from the Middle East and 40 percent from OPEC members. Increased dependence on a small number of suppliers and supply routes will make the EU more susceptible to energy disruption.

Given the reluctance of individual EU member states to cede greater authority to the Union, members must rely on the hope that individual states will display solidarity in the event of a supply crisis. The EU is promoting the diversification of supply, analyzing stockpiling, and improving transparency through the establishment of an EU Energy Observatory to collect and verify energy data. The EU also plans to use its partnership mechanisms to enhance ties with energy suppliers in the Caspian Sea, Black Sea, and North Africa regions.

If the states of Europe were to relinquish more sovereignty to permit the European Union to make critical decisions on energy policy, the result might well provide greater energy security for the EU. In the near term, however, it appears that individual member states will continue to pursue their own national energy policies.

Renewable sources of energy (such as biomass, wind, solar power and geothermal) provide the EU members with a signifi cant potential to diversify their energy mix and reduce their dependence on foreign supplies. In the last several decades Sweden, Austria, Finland and Portugal have taken the lead in using these resources.

This broad picture of Europe's energy mix suggests that no single source can meet the EU's growing demand for energy. Changes in this energy mix will depend on several factors including energy effi ciency, volatility of prices, environmental concerns and means of managing nuclear waste. One inescapable fact will continue to shape Europe's energy policy: the EU members lack suffi cient indigenous energy deposits to meet their growing demand and maintain their high standard of living. Put diff erently, Europe will continue to be heavily dependent on foreign supplies to meet its energy needs. Given this geological reality, the EU has sought to establish and consolidate

energy partnerships with major producing regions and transit countries—Russia, the Caspian Sea and the Middle East. The goal is to make best possible use of the EU's economic and political leverage in tackling common problems with energy partners worldwide (Bahgat, 2006: p.975).

The realities of modern life are dependent upon reliable, clean and affordable energy. From the long gas lines and rationing experienced in the United States in the 1970s to last winter's interruption in the EU of natural gas supplies from Russia, the costs of energy dependence have been making headlines for decades. Energy supply vulnerability in the current age is linked primarily to fossil fuels and the need for countries without sufficient supply to import what they require, subject to the ebb and flow of international politics and pricing. Although the increasing demands of climate change mandate a significantly decreased environmental impact from the use of traditional energy sources, reliance on fossil fuels is unlikely to decline significantly in the near future without dramatic changes in policies and energy use and production.

To tackle the energy challenges of the 21st century, the EU has developed a comprehensive energy and climate change package designed to increase the security and sustainability of energy supply by mitigating the environmental impact of fosil fuels, catalyzing advances in renewable energy, and increasing energy efficiency.

The EU is also working closely with its main energy suppliers, as well as key transit nations for oil and natural gas, to ensure a continuous, uninterrupted flow of required fossil fuels. It is also developing contingency plans to weather energy supply disruptions resulting from geopolitical, natural, or accidental causes. As part of these contingency plans, the EU is promoting investment in new energy networks and technologies.

EU support for technology and innovation is spurring the development of clean, renewable, home-grown energy. The EU's European Technology Platforms bring together stakeholders including industry, research organizations, and academia to stimulate investment in and development of renewable technologies like offshore wind farms, photovoltaic and concentrated solar power, second generation biofuels, and the

carbon capture and storage technology that promises clean coal possibilities. These policies will serve the EU well as it undertakes the next industrial revolution: the transition to a low-carbon economy that retains the secure, reliable energy supply vital to a thriving, modern economy (EuFocus, November 2009).

Hydro, wind, solar and bio-mass energy currently account for just under 7% of Europe's total energy consumption and 15% of its electricity generation. In March 2007, EU member states agreed to a legally binding target mandating that 20% of total European energy consumption be fueled by renewable energy sources by 2020. In January 2008, the European Commission proposed individual national renewable energy targets intended to realize the EU wide goal. Under the Commission proposal, countries with advanced renewable energy sectors like Austria, Sweden, and Denmark would be expected to achieve significantly more ambitious targets than newer member states in Central and Eastern Europe. Member states would also be given the option to invest in renewable energy projects in other EU countries. Individual heads of states are expected to consider the proposed national targets at their spring 2008 summit.

Although EU-wide support for renewable energy is strong, individual member states' renewable energy portfolios vary. For instance, Austria and Latvia promote hydro power, while the Czech Republic and Portugal have committed financial support to large solar energy facilities. Germany, Sweden and the UK are home to major wind farms off their coasts. Bio-mass and biofuel programs are becoming more attractive. Given that Europe's oil-dependent transport sector accounts for roughly a quarter of the EU's total carbon emissions, the EU has mandated that biofuels make up a 10% share of all European transport fuel by 2020 (Belkin, 2008: p.23).

Whether the EU meets its renewable energy targets will likely depend on cost of production and the extent to which member states are willing to subsidize their development on a large scale. As noted earlier, a March 2007 McKinsey and Company report estimates that EU member states will need to invest approximately $1.5 trillion (1.1 trillion Euros) in new technologies over the next 14 years in order to achieve their carbon emissions and accompanying renewable and energy efficiency targets. It appears that the Commission, the European Investment Bank, and individual member states are

poised to substantially increase their investment in these sectors, although specific amounts are difficult to estimate. Some member states have announced programs to subsidize and provide low-interest loans to fund research and development on renewable energies, with countries like Germany hoping to create the industrial capacity to supply what German officials believe will become an increasingly lucrative global market for renewable energy (Belkin, 2008: p.24).

EU leaders reached agreement in principle in March 2007 that 20 percent of the bloc's energy should be produced from renewable fuels and by 2020 as part of its drive to cut emissions of carbon dioxide. Renewables now account for less than 7 percent of the EU energy mix. In a special report, the European Parliament said that to give the legislation teeth, it should contain binding renewable energy targets for particular sectors – electricity, heating and transport -- rather than just a general goal. The parliament said it would resist any attempt to treat nuclear energy as a substitute for renewables.

In September 2008, leaked documents from the council of the European Union reveals "member states want the aviation sector to be excluded from... the overall target." Luxembourg MEP Claude Turmes criticised the UK's approach (Vidal, 2008):

“Britain is leading the attempt to undermine the climate change directive. Gordon Brown promised that the UK would not attempt to cut the EU 20% renewables target... Now UK civil servants from the Department for Business, Enterprise and Regulatory Reform have a different strategy and are pushing for cuts. A government that is supposedly committed to tackle climate change must not try to kill the essence of this directive”.

On the other hand, European Renewable Energy Council (EREC) launched in 2004 the idea of a binding target of 20% EU energy to come from renewable energy sources by 2020. This idea was taken over by the European Commission in January 2007 in its Renewable Energy Roadmap. European Heads of State and of Governments gave their green light to this binding target two months later at the March 2007 Summit (European Renewable Energy Council, www.erec.org, accessed June 30, 2010).

On 23 January 2008 the Commission released the Renewable Energy Framework Directive. In December 2008, an agreement was reached on the Renewable Energy Directive between the European Parliament, the French Presidency on behalf of the Council and the European Commission.

The European Renewable Energy Council very much welcomes the outcome of these long-standing negotiations. “This European Directive will be the most important piece of legislation on renewable energy in the world” says EREC President Arthouros Zervos.

This piece of legislation will cover the whole renewable energy sector and will also provide the much-needed investor confidence in the sector, thereby enabling the European Union to achieve its binding 20% renewable energy target by 2020 in the most cost-efficient way possible.

4.2.1. Solar Energy

The need for the strategic development of photovoltaic systems in the EU has led to the creation of PV-NET, a network that gathers representatives from all the sectors of the research and development community concerned with the photovoltaic solar energy industry. The network promotes communication between speakers through the organisation of specialised conferences, workshops and congresses.

This interaction has led to the editing of a waybill, finished in 2003 with the aim of providing a solid basis for EU leaders and European citizens to base their decisions and policy making and in order to help reach the objective set by the European Commission to multiply the use of photovoltaic systems by thirty times by 2010. In 2002, the world production of photovoltaic modules surpassed 550 MW, of which more than the 50% was produced in the EU. At the end of 2004, 79% of all European capacity was in Germany, where 794 MWp had been installed.

As of 2010, Spain has the largest photovoltaic power station in the world - 60 MWp Olmedilla Photovoltaic Park, which was completed in 2008. Germany is on the

top of installed capacity with 9,830 MW (two thirds of whole EU27 capacity) and also for installed capacity per capita with 120 W (See Table 4.1).

Table 4.1. Photovoltaic Solar Power in Europe

PV in Europe (MW_{power})					
Country	**2005**	**2006**	**2007**	**2008**	**2009**
Germany	1,910	3,063	3,846	6,019	9,830
Spain	58	118	733	3,421	3,520
Italy	46	58	120	458	1,032
Czech Republic	0	1	4	55	468
Belgium	2	4	22	71	363
France	26	33	47	104	289
Portugal	3	4	18	68	102
Netherlands	51	51	53	57	64
Greece	5	7	9	19	55
Austria	24	29	27	32	37
United Kingdom	11	14	19	23	33
Luxembourg	24	24	24	25	26
Sweden	4	5	6	8	9
Slovenia	0.2	0.4	1	2	8
Finland	4	4	5	6	8
Bulgaria			0.8	1	6
Denmark	3	3	3	3	5
Cyprus	0.5	1	1	2	3
Malta	0.1	0.1	0.1	0.2	2
Poland	0.3	0.4	0.6	1	1
Hungary	0.2	0.2	0.4	0.5	0.7
Romania		0.2	0.3	0.5	0.6
Ireland	0.3	0.3	0.4	0.4	0.4
Slovakia	0	0	0	0.07	0.2
Estonia	0	0	0	0.01	0.06
Lithuania	0	0	0	0.06	0.06
Latvia	0	0	0	0.004	0.004
EU27 (GW_p)	**2.17**	**3.42**	**4.94**	**10.38**	**15.86**

(Source: Photovoltaic energy barometer 2009 - EurObserv'ER Systèmes solaires Le journal des énergies renouvelables no. 190, p. 72-102, 3/2009)

Solar heating is the usage of solar energy to provide space or water heating. Worldwide the use in 2005 was 88 $GW_{thermal}$. Growth potential is enormous. At present the EU is second after China in the installations. If all EU countries used solar thermal as enthusiastically as the Austria, the EU's installed capacity would already be 91 GWth (130 million m^2 today, far beyond the target of 100 million m^2 by 2010, set by the

White Paper in 1997. In 2005 solar heating in the EU was equivalent to more than 686,000 tons of oil. ESTIF's minimum target is to produce solar heating equivalent to 5,600,000 tons of oil (2020). A more ambitious, but feasible, target is 73 millions tons of oil per year (2020) – a lorry row spanning 1,5 times around the globe.

The European Photovoltaic Industry Association (EPIA) is the world's largest industry association devoted to the solar electricity market. The association aims to promote photovoltaics at the national, European and worldwide levels.

4.2.2. Wind Energy

The world's first commercial wave farm is located at the *Aguçadora Wave Park* near Povoa de Varzim in Portugal. The farm which uses three Pelamis P-750 machines was officially opened in 2008 by the Portuguese minister for the economy. A second phase of the project is now planned to increase the installed capacity from 2.25MW to 21MW using a further 25 machines (http://www.portugal. gov.pt/portal/pt/comunicacao/agenda/ 20080923.htm, accessed June 27, 2010).

EEA's (European Environment Agency) *Europe's onshore and offshore wind energy potential* report, confirms wind energy could power Europe many times over. The report highlights wind power's potential in 2020 as three times greater than Europe's expected electricity demand, rising to a factor of seven by 2030 (http://www.eea.europa.eu/publications/europes-onshore-and-offshore-wind-energy-potential, accessed June 27, 2010).

The implementation of wind power is especially widespread in Germany, Spain, Denmark, Portugal and Ireland. The results of the investigation carried out by *EUWINet* (a project financed partly by the European Commission) indicated that the annual median growth of the European wind power market is 35%, and that EU Members contribute around 75% of the world's wind power. Thanks to the growth that has resulted from the use and development of this energy source, the wind power market has helped to generate more than 25,000 jobs within the EU.

Table 4.2. Installed Wind Power Capacity in Europe

Wind Energy Capacity in Europe (MW)					
Country	**2005**	**2006**	**2007**	**2008**	**2009**
Germany	18,415	20,622	22,247	23,897	25,777
Spain	10,028	11,623	15,131	16,689	19,149
Italy	1,718	2,123	2,726	3,736	4,850
Czech Republic	28	54	116	150	192
Belgium	167	194	287	415	563
France	757	1,567	2,454	3,404	4,492
Portugal	1,022	1,716	2,150	2,862	3,535
Netherlands	1,219	1,558	1,747	2,225	2,229
Greece	573	746	871	985	1,087
Austria	819	965	982	995	995
United Kingdom	1,332	1,962	2,406	2,974	4,051
Luxembourg	35	35	35	35	35
Sweden	509	571	788	1,048	1,560
Slovenia	0	0	0	0	0
Finland	82	86	110	143	146
Bulgaria	10	36	57	120	177
Denmark	3,128	3,136	3,125	3,163	3,465
Cyprus	0	0	0	0	0
Malta	0	0	0	0	0
Poland	83	153	276	544	725
Hungary	17	61	65	127	201
Romania	2	3	8	11	14
Ireland	496	746	795	1,027	1,260
Slovakia	5	5	5	3	3
Estonia	32	32	59	78	142
Lithuania	48	51	54	54	91
Latvia	27	27	27	27	28
EU 27 (GW_p)	**40,511**	**48,069**	**56,517**	**64,712**	**74,767**

(Source: EWEA Staff (2010), "Cumulative installed capacity per EU Member State 1998-2009 (MW)". European Wind Energy Association, http://www.ewea.org/fileadmin/ewea_documents/documents/statistics/cumulative_wind_per_ms_1998_2009_ws.xls, accessed June 27, 2010.)

4.2.3. Geothermal Energy

Per definition, geothermal energy is the energy stored in the form of heat below the earth's surface. It has been used since ancient times for heating, and for about 100 years also for electricity generation. Its potential is inexhaustible in human terms, comparable to that of the sun. Beside electric power generation, geothermal energy is today used for district heating, as well as for the heating (and cooling) of individual buildings, including offices, shops, small residential houses, etc.

Geothermal-generated electricity was first produced at Larderello, Italy, in 1904. Iceland, Italy, Turkey and France are the leading countries in Europe today.

The largest geothermal district heating systems within Europe can be found in the Paris area in France, with Austria, Germany, Hungary, Italy, Poland, Slovakia and others showing a substantial number of interesting geothermal district heating systems. Sweden, Switzerland, Germany and Austria are the leading countries in terms of market for geothermal heat pumps in Europe.

Today, geothermal power plants exist on every continent, at any place were reservoirs of steam or hot water can be found. They produce, with conventional technology, 820 MW of electric power in the EU, around the clock. The relevant resources are far from being fully developed, also in Europe. The concept of Enhanced Geothermal Systems (including the classical Hot-Dry-Rock-idea) is going to tremendously increase the potential (European Renewable Energy Council, www.erec.org, accessed June 30, 2010).

4.2.4. Biomass Energy

Bioenergy are diversified systems to convert biomass resources into heat, power and transportation fuels. Biomass is the biodegradable fraction of products, waste and residues from agriculture (including vegetable and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste. Conventional crops for non-food use: starch crops (maize, wheat, corn, barley), oil crops (rape seed, sunflower) and sugar crops (sugar beet, sweet sorghum...) Dedicated crops: short rotation forestry (willow, poplar) and herbaceous (grasses) Forestry by-products: logging residues, thinnings, etc. Agricultural by-products: straw, animal manure, etc. Industrial by-products: residues from food, and wood-based industries Biomass Waste: demolition wood waste, sewage sludge and organic fraction of municipal solid waste (European Renewable Energy Council, www.erec.org, accessed June 30, 2010).

Three ways of using the biomass resources constitute the bioenergy sector: Biomass for heating purposes (bio-heating), Biomass for electricity production (bio-electricity), Biomass for transport fuels (transportation biofuels)

All these processes enable to take profit of the CO2 mitigation potential of biomass. The CO2 released is equivalent to the amount of CO2 absorbed by the biomass (photosynthesis) in the growing phase.

Practically, the equivalent of 10 to 30% of the energy content of the raw biomass is used in cropping, transport, conversion and upgrading. This amount of energy can partially come from the biomass itself, which makes the overall CO2-balance nearly neutral. Therefore, biomass can substantially contribute to reach the targets of the Kyoto protocol and to reduce long-term greenhouse gas emissions.

Key Advantages of Biomass are;

- Widespread availability in Europe and abroad,
- Contribute to the security of energy supply,
- Low fuel cost compared to fossil fuels,
- Can be stored and used on demand,
- Stable employment opportunities, especially in rural areas,
- Good opportunities for technology exports,
- Reduced CO2 and other emissions,
- Source of many business opportunities,
- Contribution to a balanced growth of agriculture

The potential for Bioenergy is very large and widely distributed throughout the world. Today, biomass is already the major contributor to the total world energy needs of all renewable energy technologies available, and reaches 12 % (50 EJ/y) of the total

world need (406 EJ/y). The use is essentially based on agro-forestry residues and natural forest. Because bioenergy can be implemented at small, medium and large scale, it is applicable to a wide variety of resources and processing/utilisation schemes (European Renewable Energy Council, www.erec.org, accessed June 30, 2010).

There is a need for wider availability of modern and efficient technologies of bioenergy, and great efforts are being made to promote the contribution they can make towards environmentally, technically and economically sustainable use of resources. In the future, a large contribution to Bioenergy production may also derive from dedicated crops (Short Rotation Forestry plantation, herbaceous crops).

Bioenergy production creates new and stable jobs, mostly in rural areas. It contributes to a balanced growth of agriculture. High demand for biomass conversion and utilisation technologies can be expected in the future in both industrialised and developing countries. This means major export opportunities for European technologies, know-how and services, particularly for small and medium capacity plants. The table below shows that the implementation of the Biomass Action Plan would involve the creation of 182.000 additional jobs in the EU.

Biomass Action Plan of the European Commission for a coordinated approach to biomass policy sets out measures to increase the development of biomass energy from wood, wastes and agricultural crops by creating market-based incentives to its use and removing barriers to the development of the market.

The Biomass Action Plan is a coordinated programme for community action, including measures to improve demand for biomass; improve supply; overcome technical barriers; and develop research. In this way Europe can cut its dependence on fossil fuels, cut greenhouse gas emissions and stimulate economic activity in rural areas. Cost effective measures in favour of biomass need to be developed at European level to: Draw maximum advantage from national & local innovation and Provide a clear way forward for major industries organised on a European scale Share burdens fairly (European Renewable Energy Council, www.erec.org, accessed June 30, 2010).

4.2.5. Marine Resource Based Energy

The oceans cover 75% of the world's surface and as such ocean energy represents one of the largest renewable energy sources available to contribute to the security of energy supply and reduce greenhouse gas emissions, while enhancing the competitiveness of European industries when ocean energy conversion devices reach commercial stage.

Major achievements have taken place over the last few years with various ocean energy systems having been deployed at sea in several countries and these technologies are making the transition from research to demonstration to market penetration.

Though ocean energy technologies are not yet economically competitive with more mature renewable energy technologies such as wind, in the medium term these technologies will become significant contributors to those markets adjacent to the resource.

In the longer term, ocean energy could become a much more important part of the world's energy portfolio. The potential worldwide wave energy contribution to the electricity market is estimated to be of the order of 1-10 TW, which is the same order of magnitude as world electrical energy production capacity. Wave energy has the highest density among all renewable energy sources. The best resource is found between 40 - 60 degrees of latitude where the available resource is 30 to 70 kW/m with peaks up to 100 kW/m. The supply potential is estimated to be 7 TWh/y from ~200000 MW installed wave and tidal energy power by 2050 with a load factor of 0.35 (DTI and Carbon Trust estimates) (European Renewable Energy Council, www.erec.org, accessed June 30, 2010).

One can distinguish 5 different types of ocean energy systems : wave energy, tidal energy, marine current energy, salinity energy, thermal energy. To date, wave and tidal energy are the most advanced types of ocean energy systems under development.

CHAPTER V

ENERGY SUPPLY POLICIES OF EUROPEAN UNION AND AFFECTS OVER TURKEY

Turkey is different from other countries currently queuing for EU entry: it is big, fast-growing and strategically placed. Turkish politicians like to stress that their country's accession would add to the EU in many ways: its young, dynamic economy could give a boost to an ageing, sclerotic EU market; it could help the EU to bring stability to the Middle East, the Caspian and the Caucasus; and it could add to the EU's energy security by acting as a bridge to the resource-rich regions in its neighbourhood. Turkey's development as a European energy hub looks natural, given its lucky location between countries that harbour 70 per cent of the world's oil and gas reserve to its east, north and south, and one of the world's biggest energy markets in the west (Barysch, 2007: p.1).

Turkey and the EU could benefit a lot from working together in the energy field. The EU would gain a reliable alternative supply route. Turkey would gain transit fees and other energy-related business; and, perhaps more importantly, the opportunity to prove that it is an indispensable partner for, and eventually part of, the European Union. But at the moment, the fact that Turkey is a candidate for EU accession appears to hinder rather than help EU-Turkey energy co-operation. Even technical co-operation becomes politicised because non-energy related issues tend to intrude. So the EU and Turkey need to work out a more strategic plan for collaborating in energy. Otherwise Turkey's potential as an energy hub may well be wasted.

5.1. DEFINING ENERGY DOMESTIC MARKET

Like in most countries, Turkey's energy policy is driven by domestic needs. And these are pressing.

A looming power crisis: Power demand in Turkey is growing faster than anywhere else in the world bar China, according to Hilmi Güler, the country's energy minister. He estimates that the electricity sector alone will need $100 billion in new

investment by 2020. As the government is still struggling to reduce its debt, much, if not most, of this money will have to come from the private sector. However, a lack of market opening and tightly controlled energy prices have long put off potential investors. Although plans for new power plants, wind farms and even a nuclear power station are now being worked out, these will take time to materialise. In the meantime, blackouts seem almost inevitable. If they persisted, they could do serious damage to Turkey's fast-growing economy. They could also destabilise politics: the government of Bülent Ecevit was forced out in 1979 partly because much of Turkey was affected by severe power cuts.

Aware of the need for change, the Turkish government passed ambitious plans for energy market liberalisation and privatisation in 2001. If implemented, these would go further even than the EU's own current liberalisation plans, for example by fully separating the supply of energy from its transportation and sale (a process the EU refers to as ownership unbundling). In practice, however, there has been little progress. Planned privatisations have been put off time and again, although the sale of distribution networks is now scheduled for 2008 (Barysch, 2007).

The gas conundrum: Turkey's own oil and gas reserves account for only a tiny fraction of its rapidly rising demand. So as global oil prices have risen, Turkey's bill for energy imports has spiralled, to more than $30 billion in 2007. While Turkey gets oil from a variety of sources, 60 per cent of its gas needs are met by just one supplier: Russia's Gazprom. So Turkey is keen to maintain good relations with Russia. But at the same time it is exploring ways of lessening its dependence on Gazprom (Torbakov, 2007).

Turkey's demand for natural gas has grown more than three-fold in the last decade. Scant rainfall in recent years has forced power stations to rely more on gas rather than hydropower, of which Turkey usually has plenty. At the moment, Turkey is not short of gas. On the contrary, the long-term contracts that it has signed with Russia, Iran and other suppliers commit it to buying more than it actually needs. This leaves it potentially liable to pay penalties for breaching these contracts. So Turkey needs to build infrastructure for storing gas, for re-exporting surpluses to the EU and, most

importantly, to distribute the gas imports around the country so that factories and households can use it.

However, Botas, the state-owned gas company, has little money for investment. On the contrary, it has piled up more than $8 billion in debt, as gas import bills have risen (gas prices tend to follow oil prices up and down). At the same time, electricity price caps have made state-owned power stations and municipalities unwilling or unable to pay for the gas they use. The cash crisis has made the government reluctant to follow through on pledges to subject Botas to more competition at home. In principle, Botas is obliged to reduce its domestic market share to 20 per cent by 2009. In practice, it keeps a tight grip on imports and distribution (Tonge, 2007).

Following its re-election in July 2007, the government of Recep Tayyip Erdogan has been making encouraging noises about energy market reform. Investors, however, will remain cautious after so many years of muddle, delays and reversals. Independent power producers that tried to enter the market in the past have struggled with tariffs that were set too low for them to recover their costs. The EU's energy market laws – which Turkey will eventually have to put in place before it can join – would be an ideal framework to give investors much-needed certainty. However, as explained later, accession preparations in the energy sector are stuck because of political disagreements (Barysch, 2007).

Every year, some 10,000 tankers pass through the Bosphorus strait, which connects the Black Sea with the Mediterranean. Traffic keeps growing rapidly, and today a tanker manoeuvres through these narrow, busy waterways every 20 minutes during daytime. Although Turkey has spent billions on high-tech navigation systems and other safety features, maritime experts say that it is only a matter of time before one of them spills its toxic cargo. This would be a disaster for Istanbul's 13 million residents. And a big headache for the transporting companies that run up costs of tens of thousands of dollars for every day that one of their tankers' crossings is delayed (Daly, 2007).

Turkey and the other Black Sea countries have been looking at a number of bypass options. So far, only one – a Russia-backed pipeline from Bulgaria's Black Sea port of Burgas to the Greek port of Alexandropolis – is under serious consideration. Other projects, such as Turkey's preferred option of a line running northsouth across Anatolia, will only stand a chance of being built if sufficient supplies can be guaranteed. Turkey only levies very limited charges on tankers transiting the Bosphorus. So there is little incentive for the oil companies to invest in an expensive bypass pipeline.

Nevertheless, Turkey has the potential to become an important hub for oil and gas transported through pipelines. Some important connections are already in place:

Blue Stream for Russian gas: The 'Blue Stream' gas pipeline from Russia snakes along the bottom of the Black Sea and resurfaces in the Turkish port of Samsun. Opened in 2003, Blue Stream was due to deliver 10 billion cubic metres of gas in 2007, with its full capacity of 16 billion cubic metres scheduled to be reached in 2010. Russia has been exploring the option of doubling Blue Stream's capacity, to 32 billion cubic metres a year, with the aim of selling the gas on to Europe – and perhaps forestalling the Nabucco pipeline through which the Europeans want to import Caspian, Central Asian and perhaps one day Iranian gas without crossing Russian territory (of which more later).

BTC for Caspian oil and gas: Turkey's profile as an energy hub rose considerably with the opening of the Baku-Tbilisi-Ceyhan (BTC) oil pipeline in May 2006. The US had been pushing hard for BTC, as the first pipeline specifically designed to export Caspian oil without going through Russia. BTC can transport 1 million barrels of oil a day from Azerbaijan via Georgia to the Turkish port of Ceyhan. Alongside BTC runs the Baku-Tbilisi-Erzurum (or South Caucasus) gas pipeline through which Turkey imports gas from Azerbaijan.

The interconnector to Greece: The recently completed 'interconnector' pipeline between Turkey and Greece will for the first time allow the delivery of Caspian gas to Europe without crossing Russian territory. In its current shape, the interconnector

will transport only limited amounts. But there are ambitious plans to link it to a mooted Greek-Italian sub-sea line and boost its capacity.

Links to Iran and Iraq: Turkey also has smaller pipelines to import oil from Iraq and gas from Iran, although both have been used only intermittently in recent years. Limited amounts of gas come from Algeria and Nigeria through an LNG terminal on Turkey's Mediterranean coast. And Turkey would like to add Egypt to the list of its gas suppliers, although it is not yet clear whether this will make commercial sense. If all the oil and gas pipelines that are currently under discussion were built, Turkey would see 10 per cent of global oil exports and up to 15 per cent of global pipeline gas deliveries go through its territory (Roberts, 2007).

5.2. THE EUROPEAN UNION'S ENERGY SECURITY CHALLENGES

The EU's 27 member states account for approximately 17% of the world's total energy consumption. In 2005, about 80% of the energy consumed within the EU was from fossil fuels.

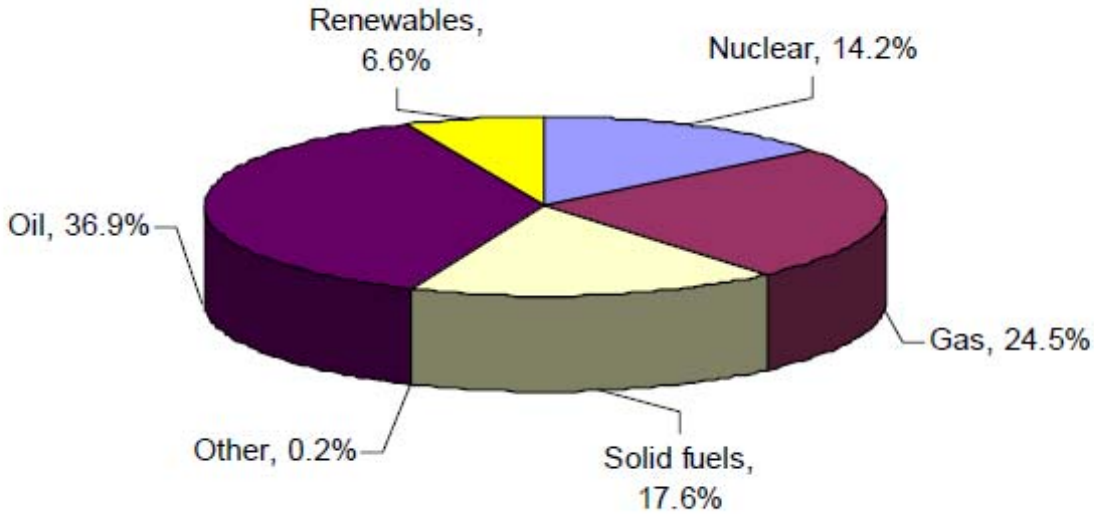

Figure 5.1. EU-27 Energy Mix - 2005 (Source: European Commission, "Energy and Transport in Figures, Statistical Pocket Book 2007)

Figure 5.1 provides an overview of the EU's energy consumption by fuel source. Europe imports about 50% of its total energy supply — slightly over 80% of its oil and close to 57% of its natural gas. Its dependence on imported energy sources, particularly natural gas, is expected to grow substantially in the coming decades.

Commission estimates suggest that if current trends continue, Europe will import 65% of its total energy requirements by 2030. Russia, Norway, the Middle East, and North Africa are the largest suppliers of EU energy. In 2005, Russia accounted for 45% of the EU's natural gas imports and about 29% of its oil imports.

Forecasters predict that natural gas consumption in the EU will double over the next 25 years, and gas has rapidly become Europe's fuel of choice for power generation. European natural gas consumption currently represents 18% of world consumption. European gas imports are expected to reach slightly over 80% of total consumption by 2030.17 In 2004, EU member states and Norway accounted for just over half of the EU's natural gas supply. The other half was imported primarily from Russia (29%) and Algeria (13%). Several EU member states are totally dependent on Russian natural gas for their domestic energy consumption. Fig. 5.1 illustrates the levels of dependency on Russian natural gas in selected nations of the EU (Belkin, 2007).

A 2005 German-Russian gas pipeline agreement and more recent Russian manipulation of gas and oil flows to the European market have sparked a newfound sense of urgency among European leaders regarding the need for a more coordinated strategy. These events correspond with growing concern among the European public and political classes regarding the link between energy production and consumption and global climate change.

In 2005, Germany and Russia agreed to build a gas pipeline connecting the countries under the Baltic Sea, the so-called North European Gas Pipeline (NEGP). While Germany maintains that the pipeline will significantly enhance German and therefore European energy supply and security, a number of EU member states, including Poland and Lithuania, have protested the decision. They counter that by running the pipeline under sea so it bypasses both countries, and that by failing to

coordinate with EU neighbors when negotiating with Russia, Germany's actions pose a threat to their and broader European energy security. Furthermore, prominent Swedish officials have voiced concerns that the pipeline will provide Russia with a platform to increase both military surveillance and its military presence in the strategically important Baltic Sea. The German-Russian agreement and subsequent responses from Poland, Lithuania, and more recently, Sweden, have reignited calls for a more coordinated European energy strategy.

As internal strife over the German pipeline decision continues, disputes between Russia and Ukraine and Russia and Belarus have exposed some undesirable consequences of European dependence on Russian energy resources. In late December 2005, Russia's gas monopoly, Gazprom, temporarily suspended gas flows to Ukraine as part of a dispute over gas price increases. Within hours of the shut off, several European countries, including Austria, Italy, Poland, and Germany, reported drops in their own pipeline pressure by as much as 30%. The gas crisis lasted only a few days, and after Russia and Ukraine reached an agreement on gas prices, gas was flowing again.

An almost identical dispute between Russia and Belarus with similar consequences for European countries, particularly Germany, occurred in early January 2007. This time, Russian oil pipeline operator Transneft shut down the Druzhba oil pipeline through which Germany receives 20% of its oil imports. Germany and the EU sharply rebuked Russia's decision, and Russia resumed oil delivery after three days of price negotiations with Belarus (Belkin, 2007).

Many European observers have characterized the Russia-Ukraine and Russia-Belarus gas and oil crises as "wake up" calls exposing Europe's energy security vulnerability even to unintended supply disruptions. More importantly, however, the crises raised the dual questions of Russia's reliability as an energy partner and Moscow's willingness to use its energy power as a political weapon. In response, European leaders have advocated coordinating decisions on energy supply so as to present a unified front to producer nations like Russia, and have promoted energy efficiency and more efficient energy use. Despite these calls, some European countries and energy companies have continued to pursue long-term energy deals bilaterally. In

the past year, companies from Italy, Austria, Bulgaria, and Serbia have signed contracts with Russian energy companies which some observers contend could pose a threat to collective European energy security.

Growing energy demand within the EU's 27 member states is mirrored in regions throughout the world. Growth in China and India has added considerably to global demand, as has rising population growth and economic modernization in Latin America, Africa, and even the energy-rich Middle East. In the face of this strain on limited supplies, Europeans must compete for existing and new energy sources.

Projections for European energy consumption indicate that one of the most important energy security challenges facing the EU over the next 20 years will be Europe's ability to diversify the sources and modes of transit of its energy imports.

The bulk of the world's energy resources, located in Russia, the Caspian Sea region, the Middle East and North Africa, are all well within geographic reach of the European Union. In fact, Europe already receives energy supplies from each of these regions. However, Europe's growing dependence on Russia and Russia's apparent willingness to use its energy resources for political purposes have spurred calls from some member states and the United States for a more cohesive EU-wide strategy to further diversify supply. The key for Europe may be to determine the equilibrium point for supply from each region and how to best manage relations with the governments in those regions. By strengthening political relations with these governments, the EU opens additional options for its external energy strategy.

According to some, the EU strategy in this regard differs from the stated aim of many U.S. politicians and Administration officials in that Europeans acknowledge they can never gain complete energy independence and therefore seek to better manage their energy dependence rather than achieve outright energy independence.

Some of the EU's newer member states in Central and Eastern Europe appear skeptical of Russia's reliability as an energy partner, and therefore call on EU member states work collectively to prevent Russia from exploiting long-term dependencies for political purposes. At the same time, other member states continue to pursue long-term

bilateral supply contracts with Russia's state-run energy companies, increasing both their energy and, according to some, their political dependence on Russia.

Russia is a major player in world energy markets. In 2004, its 1,700 trillion cubic feet (tcf) of natural gas reserves were the largest of any country, making it both the world's largest gas producer and exporter. Russia is also the world's second largest oil exporter. According to the European Commission, EU member states imported 29% of their natural gas and 26% of their oil from Russia in 2004. With gas consumption expected to rise more dramatically than oil consumption in the future, some experts predict that Europe could rely on Russia for more than 40% of its natural gas by 2020. While Russia's resources and proximity to Europe make Euro-Russian collaboration a necessity, Russia's apparent willingness to use its energy wealth to achieve controversial foreign policy objectives has fueled debate within Europe on how best to manage energy relations with Russia (Smith, 2006).

Most observers contend that Russian president Vladimir Putin views his country's vast energy resources as a tool to regain Russia's stature as a major force in global affairs. Thus, Putin sees energy as an important political force as much as it is the force driving Russia's economic development. Some experts believe that Russia seeks to control as much of Europe's energy infrastructure as possible in return for its delivery of reliable energy supplies. From this perspective, Moscow knows that if the EU is successful in creating a Europe-wide single market for electricity and gas, "[Russia] will be presented with opportunities to become part of the world's largest and most integrated energy market right on its border." According to analyst Daniel Yergin, "Putin believes that energy security is about [Russia's] retaking control of the 'commanding heights' of the energy industry and extending that control downstream...." (Monagham, 2006).

Rather than rely on significant outside investment in its energy infrastructure, observers believe Russia intends to satisfy its long-term gas contracts with European nations through its near monopoly on gas from Central Asia (Kazakhstan, Turkmenistan, and Uzbekistan). Russia currently controls the overwhelming majority of oil and gas transportation routes from Central Asia and, according to analysts, intends to

exploit this control and its political leverage over central Asian governments and European countries to impede European and U.S. efforts to develop alternative pipelines that bypass Russia. For example, critics of Gazprom activities, such as analyst Vladimir Socor, believe that Gazprom's strategy is to "establish permanent control of the [Hungary/Balkans] markets before Caspian gas can reach them through the proposed Nabucco pipeline...."

Specifically, Socor and others point to Gazprom's proposed South Stream gas pipeline, intended to transport Caspian and Central Asian gas to Europe via an almost identical route as the EU's planned Nabucco pipeline. Deals struck between Gazprom and Italian, Bulgarian, and Serbian energy companies in 2007 and January 2008 appear to confirm the view that Gazprom may seek to convince nations that agreed to fund the Nabucco pipeline to withdraw their commitments and rely on the South Stream pipeline instead. These critics also warn that Russia's state-owned energy companies aim to increasetheir influence in the face of further European diversification by seeking to acquire controlling stakes in natural gas concerns in North Africa.

One of the focal points of European energy diversification strategies is Central Asia and the Caspian and Black Sea regions. Indeed, the EU's January 2007 energy policy paper recommends strengthening the EU's so-called Neighborhood Policy with these areas, and European leaders have sought to bolster ties with countries in these regions (Youngs, 2007).

The Caspian Sea in Central Asia is bordered by Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan. After the collapse of the Soviet Union, the international community took an active interest in the region because of the potential oil and gas reserves thought to be located in at least six identified hydrocarbon fields beneath the Caspian Sea.

Presently, the Caspian Sea region is a significant, but not major supplier of crude oil to world markets The untapped reserves held by four of these nations might offer Europe an opportunity to move away from increased dependence on Russian energy. Estimates of the Caspian Sea region's proven oil reserves range between 40 and

50 billion barrels. Production levels in 2005 were estimated to be around 2 million barrels per day. The Caspian Sea region's natural gas reserves are estimated at 232 trillion cubic feet (Tcf). Natural gas production in 2004 was approximately 5 Tcf.

Europe's formal interest in the energy resources of the region dates back to 1995 with the creation of the Interstate Oil and Gas Transport to Europe program (Inogate), This EU initiative (currently with 21 member countries) was designed to promote the construction of regional pipeline systems in order to facilitate the transport of oil and gas to Europe. This was followed by another EU proposal, the "Baku Initiative," which was launched in November 2004 with the participation of the European Commission and the Black Sea and Caspian littoral states. The Baku Initiative was designed to facilitate the progressive integration of the energy markets of the region into the EU market as well as the transportation of the extensive Caspian oil and gas resources toward Europe.

Changing the region's energy flow from the existing North-South axis to an East-West axis toward Europe could be integral to Europe's energy strategy. Currently, three big pipeline projects serve to reduce the region's dependence on Russia:

- The Caspian Pipeline Consortium (CPC) project connects Kazakhstan's Caspian Sea area oil deposits with Russia's Black Sea port of Novorossiysk. Oil loaded at Novorossiysk is then taken by tanker to world markets via the congested Bosporus Straits.

- The Baku-Tbilisi-Ceyhan oil pipeline (BTC), which opened in July 2006, exports oil from Azerbaijan and up to 600,000 bl/d from Kazakhstan along a 1,040-mile route from Baku, Azerbaijan via Georgia to the Turkish Mediterranean port of Ceyhan. This will allow oil to bypass the Bosporus Straits.

- The South Caucasus Gas Pipeline (SCGP), a new gas pipeline venture completed in December 2006, runs parallel to the BTC oil pipeline for most of its route before connecting to the Turkish energy infrastructure and on to Europe via a transit pipeline through Greece.

In addition to these pipelines already in service, several additional projects in Europe could be involved. One option for additional oil transport would be to upgrade the existing oil pipeline which runs from Bakû in Azerbaijan to Supsa in Georgia. That line could be extended under the Black Sea or the oil could be loaded onto tankers and shipped to Odessa, Ukraine. The oil could then be pumped through the Odessa-Brody pipeline into Poland. Some, including the Poles, have suggested that the Brody line be extended to northern Poland and possibly into the Baltic states for use at the Mazeikai refinery in Lithuania.

EU efforts to diversify European energy supplies and decrease dependence on Russia have heightened calls within Europe for stronger political and economic engagement in the Middle East and North Africa. However, political instability in the region and strong competition for its energy resources from countries in Asia and North America present challenges to European efforts.

The Persian Gulf countries (Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates) alone hold over half (57%) of the world's oil reserves, and the Middle East Region produces about 31% of the world's oil. In addition, Libya is estimated to hold 40bb and Algeria 12bb. The Persian Gulf region also holds an estimated 2,400 trillion cubic feet (tcf) of natural gas reserves, representing 45% of the world's total gas. Algeria is estimated to hold (161tcf), and Libya (52tcf) (Statistical Review of World Energy, British Petroleum (BP), June 2006) .

Europe already depends on the Middle East/North Africa region for close to 30% of its oil imports and approximately 15% of its piped gas. In 2005, Europe imported approximately 3.1million b/day of oil from the region. The largest portion of that oil comes from Saudi Arabia, followed by Libya and Iran.49 Europe's primary supplier of natural gas has been Algeria, via two pipelines that enter Europe through Italy and Spain. A smaller amount comes from Libya via pipelines to Italy. Two additional gas pipelines from Algeria to Spain and Italy are under construction.

Perhaps the most important development for Europe in this region has been the growing availability of liquified natural gas (LNG). Today, Europe accounts for

approximately 8% of the world's total consumption of LNG, and in 2005, LNG represented 15% of European gas imports — a 21% increase from 2004. Spain, where 65% of gas imports are LNG, leads Europe in LNG imports, followed by Portugal (39%) and France (27%). The principal suppliers of LNG to Europe include Algeria, Egypt, Oman and Qatar. Algeria is the world's third largest exporter of LNG, with almost all of its gas (25b cubic meters) going to Europe. In 2006, the Algerian national oil company, Sonatrach, signed a 20-year LNG supply contract with the Spanish power company Endessa (Statistics from Eurogas, [http://www.eurogas.org]).

The potential for growth in Europe's energy diversification strategy with respect to the Middle East and North Africa is significant. However, European competition with Asia and North America and long-term political instability throughout the region will likely temper the degree to which Europe seeks to increase its reliance on the region. Nevertheless, as with the Caspian region, if the EU is serious about lowering its dependency on any one source, it must turn more and more to the Middle East and North Africa.

Parenthetically, Europe's growing interest in energy resources in North Africa has not gone unnoticed by Russia and Gazprom. Just as in the Caspian region, Russia appears to be bolstering its efforts to influence Europe's energy plans. In March 2006, President Putin, along with Gazprom officials, traveled to Algeria to discuss Russian participation in Algeria's future oil and gas projects, including its LNG export markets. Some contend that because Russia intends to make Europe a major market for LNG produced from its Shtockman gas field in the Barents Sea, Russia is seeking to position itself to influence Algeria's future role as a major supplier of energy to Europe.

5.3. AFFECTS OF THE EU ENERGY POLICIES OVER TURKEY

Turkey is different from other countries currently queuing for EU entry: it is big, fast-growing and strategically placed. Turkish politicians like to stress that their country's accession would add to the EU in many ways: its young, dynamic economy could give a boost to an ageing, sclerotic EU market; it could help the EU to bring stability to the Middle East, the Caspian and the Caucasus; and it could add to the EU's

energy security by acting as a bridge to the resource-rich regions in its neighbourhood. Turkey's development as a European energy hub looks natural, given its lucky location between countries that harbour 70 per cent of the world's oil and gas reserve to its east, north and south, and one of the world's biggest energy markets in the west.

However, whether Turkey will in fact be able to fulfil this potential depends on a mind-bogglingly complicated array of factors. Some are within Turkey's control, such as the speed with which it opens up its own energy market, and how it supports the Nabucco pipeline project (see Fig. 5.2). But many depend on outside developments, ranging from the cohesion of the EU's own emerging energy policy to the political and commercial isolation of Iran. At times it seems that Turkey is in the middle of a great European energy game: the EU wants to build new pipelines for importing non-Russian gas, including one (or more) through Turkey; the Russians will do their utmost to keep their grip on the continent's gas transport; Turkmenistan and other gas producers want access to new markets, but without alienating Russia (Barysch, 2007: p.1).

Turkey and the EU could benefit a lot from working together in the energy field. The EU would gain a reliable alternative supply route. Turkey would gain transit fees and other energy-related business; and, perhaps more importantly, the opportunity to prove that it is an indispensable partner for, and eventually part of, the European Union. But at the moment, the fact that Turkey is a candidate for EU accession appears to hinder rather than help EU-Turkey energy co-operation.

Even technical co-operation becomes politicised because non-energy related issues tend to intrude. So the EU and Turkey need to work out a more strategic plan for collaborating in energy. Otherwise Turkey's potential as an energy hub may well be wasted.

Turkey has ambitions to become a major Eurasian energy hub. Better connections with supplier countries and energy consumers would not only increase Turkey's geopolitical standing. They would also bring lucrative business, in the form of transit fees or through new refineries, LNG terminals and trading facilities. And they could make it easier for Turkey to diversify its own energy supplies and to re-export any

surplus gas it may have. In many ways, Turkey already fulfils the role of an energy hub. It does so through the Bosphorus strait and through several new pipelines that link it to Russia and the Caspian.

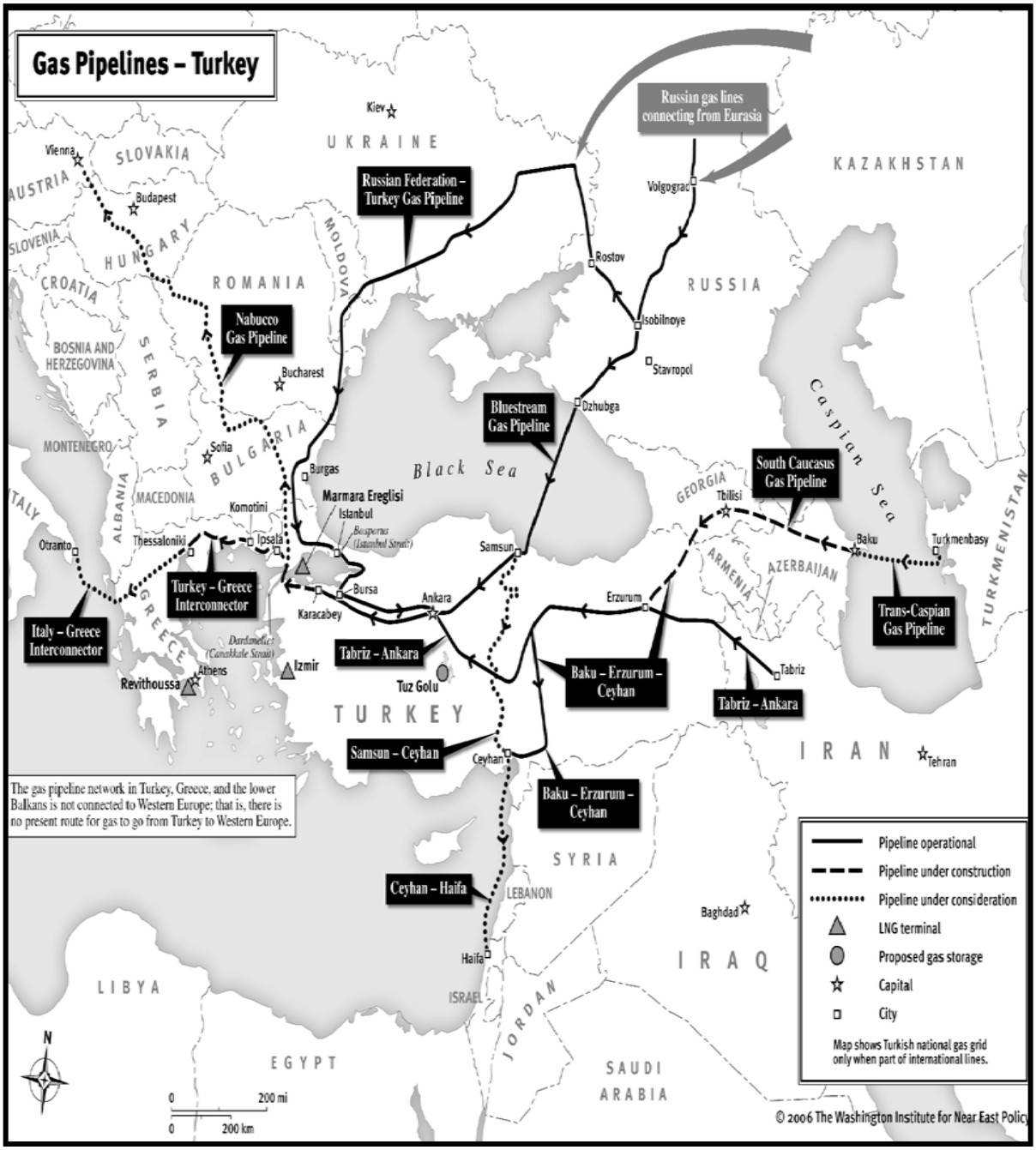

Figure 5.2. Gas Pipelines - Turkey (Source: Barysch, K. (2007). Turkey's role in European energy security, Centre for European Reform Essays, 4th CER/British Council/TESEV Bosphorus conference, October 2007.)

Every year, some 10,000 tankers pass through the Bosphorus strait, which connects the Black Sea with the Mediterranean. Traffic keeps growing rapidly, and today a tanker manoeuvres through these narrow, busy waterways every 20 minutes during daytime.3 Although Turkey has spent billions on high-tech navigation systems and other safety features, maritime experts say that it is only a matter of time before one of them spills its toxic cargo. This would be a disaster for Istanbul's 13 million residents. And a big headache for the transporting companies that run up costs of tens of thousands of dollars for every day that one of their tankers' crossings is delayed (Barysch, 2007: p.3).

Turkey and the other Black Sea countries have been looking at a number of bypass options. So far, only one – a Russia-backed pipeline from Bulgaria's Black Sea port of Burgas to the Greek port of Alexandropolis – is under serious consideration. Other projects, such as Turkey's preferred option of a line running northsouth across Anatolia, will only stand a chance of being built if sufficient supplies can be guaranteed. Turkey only levies very limited charges on tankers transiting the Bosphorus. So there is little incentive for the oil companies to invest in an expensive bypass pipeline. Nevertheless, Turkey has the potential to become an important hub for oil and gas transported through pipelines.

Turkey's plans for becoming a major energy hub tally with the EU's need to find new suppliers of, and routes for, oil and gas. The EU's gas needs are forecast to rise by a quarter by 2050. And because gas fields within the EU are being depleted, the share of gas imported from outside the Union is expected to rise from around half today to as much as 80 per cent by 2030. But where will these massive amounts of gas come from? At present, around a quarter of the EU's gas (or 40 per cent of imports) comes from Russia. The EU never worried much about its dependence on Russian gas – until January 2006, when Gazprom temporarily cut off supplies going through Ukraine (Barysch, 2007: p.3).

As the pressure dropped in gas pipelines in Hungary, Austria and other EU countries, the Europeans launched into a panicky debate about how to secure their future energy. Even those who do not worry that the Kremlin may one day use gas as a

political weapon against EU countries are increasingly concerned about persistent underinvestment within Russia. Any growth in Russia's gas output is gobbled up by a fast-growing domestic market. Although this is already limiting Russia's export capacity, it has ambitious plans to sell more energy to China, Japan and the US.

Russia is bound to remain the EU's single biggest gas supplier for decades to come. But the Europeans want their additional future demand to be met by a broader range of other producers. So when the European Commission published its energy policy package in January 2007, it put the diversification of sources of supply right at the top of the priority list.6 The Caspian and Central Asian regions are central to the Commission's diversification plans. Although exploration is still at an early stage, analysts say that the region contains 4-5 per cent of global oil and gas reserves. It also offers Western oil majors reasonably good access, in contrast to the Gulf states and (increasingly) Russia, which prefer to exploit their natural resources through statecontrolled companies.

Until now, Europe has only been able to import gas from Central Asia and the Caspian via Russian territory (the Turkey-Greece interconnector breaks this monopoly, but the quantities are small so far). Gazprom, Russia's state-controlled gas giant, has a monopoly over all gas pipelines, which turns gas imports from other countries into Russian gas at the border. This set-up provides the Kremlin with political clout and Gazprom with windfall profits: it buys Turkmen gas for $100 per 1,000 cubic meters and sells it to Europe at 2.6 times that. For Russia, the transport monopoly will get more important if and when its own gas production falls short of domestic and European demand. It could then use Turkmen and other Central Asian gas to make up for shortfalls – but not if these countries have good alternative outlets.

The Europeans have been exploring various options for accessing Central Asian and Caspian energy without relying on Russia. The Turkey-Greece interconnector is a small first step. But the project that could make a bigger difference to Europe's energy security, and to Turkey's role as an energy hub, is Nabucco. This 3,300 kilometre pipeline would run from eastern Turkey via Bulgaria, Romania and Hungary into Austria. Once it reaches full capacity, it could transport 31 billion cubic metres of

gas to the EU every year. Critics say that this would be insignificant compared with the EU's overall gas needs, and with the amounts that it is still likely to buy from Russia. But for John Roberts, an energy expert at Platts, the doubters are missing a point. He argues that the mere existence of an alternative supply route would strengthen the EU's hand in negotiations with Russia, and thus force Gazprom to sell gas on a more competitive basis. "If Nabucco prompted Russia to drop its prices by as little as S1 per thousand cubic metres" he claims, "then – even if not a single cubic meter of gas ever flowed through Nabucco – it would provide a good return on its S5 billion investment." (Barysch, 2007: p.4)

The new political geography of the Caucasus and Central Asia following the dissolution of the Soviet Union led to a power struggle between Russia, Iran and Turkey. More importantly, the growing demand for energy worldwide directed the attention of the developed countries seeking to diversify their suppliers to the vast energy resources in these regions. The discussions concerning the transportation of Azerbaijan's energy resources to the world markets brought Turkey to the forefront, agitating Iran and Russia (Ozcan, N.A. 1999: pp.222-237).

The BTC route emerged as the most efficient option for the transportation of Azeri gas and oil to the West. It was eventually expected to be expanded to carry the rest of the Caspian basin resources. Since the lynchpin of these developments was the transportation of Azeri and Caspian resources to the West in circumvention of Russian-controlled lines, preventing or delaying the BTC project was in the interests of Russia, Iran and Armenia. Russia was concerned about losing its influence in the region and being left outside the calculations concerning the Caspian region. Iran was worried that oil revenues might boost Azerbaijan's power and increase separatist sentiments among Azeris in Iran. Armenia was naturally irked by the close relations between Azerbaijan and Turkey and by the likely increase in Azerbaijan's power.

Nabucco would not only be good for European consumers. It is also a test case for the EU's emerging energy policy; an important ingredient in Turkey's plan to expand its role as a Eurasian energy hub; and a priceless opportunity for the EU and Turkey to prove that co-operation and integration are good for both sides. However, the

planned pipeline has suffered from setbacks and delays. The potential start of construction has already been pushed back from 2007 to 2009. And even in the best-case scenario, gas will not start flowing before 2012.

Additional gas could come from Turkmenistan and Iran but both have big problems as potential suppliers. Iran has the world's second biggest gas reserves after Russia. However, their exploitation has been held up by domestic political wrangles, misguided investment policies, and the threat of US sanctions against any foreign company that invests more than token sums in the Iranian energy sector (although these have not yet been enforced). In 2007, Turkey's Botas signed a memorandum of understanding with Tehran for investment of up to $3.5 billion in a giant gas field called South Pars, and for shipping Turkmen gas through Iran into Turkey. The US administration called the move "unwise" at a time when Washington was tightening economic sanctions on Iran to prevent it from proceeding with its alleged nuclear weapons programme. By investing in Iran, Ankara would risk a renewed deterioration in its relations with the US, recently strained over attacks in Turkey by PKK terrorists based in northern Iraq.

While the EU side now looks a little more united and determined, problems persist on the Turkish side. At present, Turkey does not allow foreign companies to use Botas' pipeline network. With regard to Nabucco this means that Turkey would buy gas from Azerbaijan (and Iran and Turkmenistan), transport it across its territory and sell it on at the border with Bulgaria. The other companies in the consortium (and the EIB) say that they will only invest in Nabucco if Turkey moves to a different regime which would allow the ultimate customer (say, Germany's RWE or Austria's OMV) to buy the gas directly from Azerbaijan and pay Turkey, and the other countries along the route, a fixed fee for using the pipelines on their territory. The consortium members say that relying on Botas to transport the gas would entail too much commercial and political uncertainty. In Ukraine, a similar transit regime has brought huge profits for murky intermediaries and encouraged political corruption. Moreover, some in the EU think that leaving Turkey with such strong control over EU gas imports is not a good idea,

especially as the enlargement negotiations are not going as well as they should (Barysch, 2007: p.6).

EU law requires all member-states to open their pipelines for companies from other countries. Although Turkey has implemented certain parts of the *acquis* under its 1995 customs union agreement with the EU, its alignment with EU rules for the electricity and gas sectors is limited. The EU is now trying to persuade Turkey to align itself with the energy *acquis* through joining the Energy Community Treaty (ECT).

The ECT, signed in October 2005 and in force since June 2006, is aimed at creating an integrated energy market in potential accession states on the basis of the *acquis*.9 All the Balkan states have joined the initiative. But Turkey has so far contented itself with observer status. The EU argues that Turkey would benefit from full membership through a more open and predictable investment climate in its energy sector; by gaining access to EU expertise and new funding options (for example from the European Investment Bank or Germany's KfW, a state-controlled investment vehicle); and by giving Turkey a say in the EU's external energy policy, so allowing the two to co-operate in the Caucasus and Central Asia (Barysch, 2007: p.6).

Turkey says that there are technical problems with some of the ECT's provisions. But more fundamentally, it does not like the idea of unilaterally signing up to a big chunk of the *acquis* without being able to ask anything in return. Turkish officials say that such an arrangement may suit countries that are not eligible for membership. But Turkey is already an EU candidate and it does not want to be fobbed off with what it sees as a 'privileged partnership' in the energy field.

EU officials never tire of stressing that the ECT has nothing to do with accession, and that one does not prejudge the other. They point out that two of the original ECT signatories, Bulgaria and Romania, have joined the EU, and a third one, Croatia, is well on its way. But Turkey has a point when it says that it wants the EU energy *acquis* as part of its accession negotiations, not as part of some alternative process that is also available to countries that have not yet achieved official candidate

status. The fact the EU is now offering the ECT to Ukraine and Moldova as part of its neighbourhood policy has only reinforced Turkey's argument.

Figure 5.3: The Position of the Kirkuk-Ceyhan Pipeline (Source: Nilgun S. Acikalin, "Energy Corridor: Turkey," International Energy Agency Roundtable onCaspian Oil & Gas Scenarios Presentation, http://etd.lib.metu.edu.tr/upload/12607216/index.pdf, accessed June 21, 2010)

Ankara says that it is ready to go ahead with accession negotiations in the energy sector. It has finished the 'screening' of its energy laws against the *acquis*, it has prepared its negotiating position and it has received a go-ahead from the European Commission. Unlike in most other parts of the *acquis*, energy does not have 'opening benchmarks' (steps that Turkey needs to take before the talks can begin in earnest) so the negotiations could start in principle. The main reason why they have not is that Cyprus is blocking them because it objects to Turkish plans to look for oil near its coastline. The energy talks are also being held hostage to the wider debate surrounding Turkish accession, in particular Nicolas Sarkozy's reluctance to let accession negotiations progress until the EU has set up an expert group on the future of Europe.

Besides these regarding the energy security of Turkey and EU, there is another aspect of the subject: It is PKK terrorism. Turkey has two strategically important trans-border pipelines, aside from the ones serving domestic needs: Kirkuk-Yumurtalik and Baku-Tbilisi-Ceyhan. When the Nabucco pipeline project is finalized it will connect the Baku-Tbilisi-Erzurum (Turkey) and the Tabriz (Iran)-Erzurum gas pipelines to Austria, feeding extensive European gas networks (see nabucco-pipeline.com). During the deliberations over the selection of these projects, their implementation, and the administration of pipelines, multinational companies had to factor the instability caused by the PKK's terror campaign into their calculations, making the PKK an indirect player in the game.

Turkey completed the construction of the first strategic oil pipeline, Kirkuk-Yumurtalik, between 1978 and 1984. It was completed in 1984, the year when the center of gravity of the Iran-Iraq war shifted from the Persian Gulf to northern Iraq. Having benefited enormously from oil revenues in financing the war, Iraq negotiated with Turkey to build a parallel line. To undermine the feasibility of Kirkuk-Yumurtalik pipeline, Iran supported the Kurdish peshmerga forces in Northern Iraq and the PKK in Turkey. Coincidentally, the PKK initiated its terror campaign around the same time (Hurriyet, Milliyet, Cumhuriyet, August 18, 1984).

Turkey is also interested in the development of Iraqi natural gas reserves. Iraqi natural gas could easily be connected to the Turkish national grid through a pipeline to be constructed parallel to the Kirkuk-Ceyhan oil pipeline using the right of way of the latter. Within this framework, a Memorandum of Understanding was signed between Turkey and Iraq on August 7, 2007 in Ankara in order to supply Iraqi natural gas to Turkey and via Turkey to Europe.

The extension of the Blue Stream Gas Pipeline to Ceyhan and hence to Ashkelon with a view to supplying Israel with Russian natural gas is also under consideration. Turkey continues to import natural gas from Iran through the existing natural gas pipeline, which has a capacity of 10 billion m3 /y. Moreover, a Memorandum of Understanding related to cooperation in the fields of oil and gas was signed between Turkey and Iran in Ankara on July 14, 2007. Technical discussions

continue among the relevant authorities. Turkey's objective is to become Europe's fourth main artery of energy supply following Norway, Russia and Algeria through the realization of these projects. This will open up a new avenue for cooperation between Turkey and the EU that will also reinforce Europe's ties to Asia.

These developments attest to the strategic role Turkey will increasingly assume as a major transit energy highway between the world's economic centers and sources of energy. In this context, President Abdullah Gul's statements at the Baku Energy Summit held on November 14, 2008 emphasizes the importance of the energy projects of Turkey:

> *"Nowadays, the concept of "energy supply security" which is gradually gaining importance, is often being associated with "foreign policy," "national security," "economic welfare" and "global stability." Meanwhile, energy security also compels the energy producer, consumer and transit countries to adopt a cooperative approach amongst them. This is a situation of interdependency.*
>
> *Therefore, with respect to some significant regional energy projects, we have to embrace an approach based on cooperation and mutual trust. With such projects, as it was the case with Baku-Tbilisi-Ceyhan, we have to transform our interdependency into a productive cooperation, which would bring together regional powers, big companies and players. I strongly believe that regional cooperation in the field of energy, beyond addressing the energy supply security, will make significant contributions to the regional stability, peace and prosperity. The crisis which broke out last August in Georgia confirmed that the unsolved conflicts in the region constitute a major threat from the perspectives of security and stability in the South Caucasus.*
>
> *We see that these conflicts represent a difficulty which should be overcome also in terms energy security. Undoubtly, the secure transport of Caspian energy sources to European markets is linked to the continuity of regional stability and establishment of good neighbourly relations in the region. We*

believe that the existing problems can be solved through establishing mutual trust among the peoples who for centuries have been living together a common life in the South Caucasus. With such an understanding, among other issues, the necessary conditions to deepen and expand the existing cooperation in the field of energy, may also be established.

Our proposal related to the Caucasus Stability and Cooperation Platform, which we brought up again last August, is in fact a result of this understanding. Our ideal is to transform the South Caucasus from a geography remembered for its conflicts and disagreements into a region which would set an example to the world with its common understanding and solidarity.

Our ideal is the transformation of the South Caucasus into a region which would greatly contribute to Europe's energy security and whose name would be mentioned together with welfare, stability and peace, through the expansion and development of the productive cooperation started in the field of energy. With the belief that the region harbors the necessary potential to reach this objective, we are determined to pursue our endeavours with the neighbour countries. Turkey's energy strategy is multi-dimensional.

Our main policy objectives are diversification of sources and routes as well as of our energy mix and to contribute to Europe's energy security. The Middle East and the Caspian Basin being the foremost examples, Turkey is located in a region where almost two thirds of world's proven gas and oil reserves lie. Moreover, given the fact that the countries in Caucasia and Central Asia, to achieve economic welfare, need to exploit their energy resources in the most rational manner as they also need those resources to be transported to the Western markets, Turkey, together with Azerbaijan, Georgia and the U.S., developed the idea of the East-West Energy Corridor concept.

The Baku-Tbilisi-Ceyhan Oil Pipeline (BTC) and the Baku-Tbilisi-Erzurum Natural Gas Pipeline are the two main components of the East-West Energy Corridor. As of 10 November 2008, more than 480 million barrels of oil has

been carried through the BTC pipeline to the consumer countries. Kazakhstan has participated in the said pipeline in 2006 and for the first time, Kazakh oil has been transported to Baku by tankers and then to the world markets through this pipeline early this month. We deem this as a significant development. The BTE natural gas pipeline, the second component of the East-West Energy Corridor, has become operational as of July 2007.

The Turkish National Petroleum Company TPAO, which also participates in "upstream" projects along the BTC and BTE, has invested more than 3 billion dollars in the Caspian region. In terms of the North-South Axis, in cooperation with Russia and Italy, Turkey has developed the Blue Stream Project, launched in 2003. Following the implementation of the BTC and BTE projects, the Southern Gas Corridor has been placed at the top of our agenda. Within the framework of this corridor, the NABUCCO, Turkey-Greece-Italy and the Trans-Adriatic natural gas pipelines are being developed.

The Turkey-Greece Interconnector, the first leg of the Turkey-Greece-Italy Natural Gas Pipeline has become operational in 2007. For the first time, the Azeri gas has been carried to Europe through Turkey by way of implementation of the said project. In line with our objective to connect the Turkish energy grid with Europe, this project bears great importance. For moving gas further towards Austria over Bulgaria, Romania and Hungary, technical and legal studies are also underway to realize the Nabucco Natural Gas Pipeline Project.

The Turkish Government has the necessary determination and the political will for the realization of this project. Above all, the success of the Nabucco project depends on the gas supply. In this respect, we are in close contact with Azerbaijan and Turkmenistan. We are of the opinion that in the years to come, Uzbek gas can also be carried to Europe through the Southern Corridor. I hope that one day we will be able to transport natural gas from the East shore of the Caspian Sea to its West shore the same way the Kazakh oil has been carried through BTC.

On the other hand, we continue to be in contact with the Iraqi Government with a view to enabling the Iraqi gas to be connected to the Turkish grid and the Southern Corridor by a pipeline to be constructed in South-North axis. Important steps were taken with respect to the realization of the Egypt-Syria-Turkey pipeline. Once in the future we have the suitable international political environment, I hope that the Iranian gas will be taken on board as well. While transporting the energy sources from producer to the consumer countries, the environment and the other social assets shall be given utmost care.

The drawbacks of transporting the Caspian Basin energy resources through the Turkish Straits and the increasing tanker traffic as well as the consequences on environmental and human security are well known. Taking into account the situation in the Turkish Straits, our country is pursuing work related to projects which would present additional alternatives. To lighten the traffic in the Straits, we attach importance to the realization of the Samsun-Ceyhan oil pipeline.

The realization of this pipeline is as important for environmental and human security as it is for the strengthening of the North-South Corridor. Consequently, as I have stressed at the beginning of my speech, Turkey wishes to transform the interdependency in the field of energy into a productive cooperation among the regional countries. I am totally convinced that beyond our energy needs, in the years to come we will gradually contribute more to the energy security of European countries. In this respect we will continue our endeavours in cooperation with all our neighbours, friends and partners. I hope that the Baku Energy Summit will give impetus to our endeavours" (Statement of H.E. Abdullah Gül President of the Republic of Turkey at the Baku Energy Summit, November 14, 2008, http://www.tccb.gov.tr/basin /konusma /konusmaDetay.aspx?id=3846&dil=en, accessed June 20, 2010).

CONCLUSION

Today, in addition to their high economic value, energy pipelines play important roles in diplomatic, economic, military and ecological terms. In addition to offering immediate economic benefits to transit and terminal countries, pipelines may act as the building blocks of alliances and boost cooperation among states. Likewise, pipelines may shape domestic politics in countries that are increasingly dependent on imported energy for heating or power.

Social and economic development anywhere depends inevitably on some primary resource of energy. In the first part of the 21st century the well-being of the developed world will depend substantially on free access to the oil and gas of the Caspian basin. In turn, that access will depend on a strong and healthy Turkey playing the decisive role in securing that access.

A case in point is the changing relationship between western Europe and Russia. From the 1960s to the 1990s one of America's greatest worries was that the Soviet Union would gain influence over Europe's sources of oil and gas in the Middle East. But in recent years, the leading members of the European Union, especially Germany and Italy, have been making themselves dependent on Russia directly by subsidizing Russian oil, gas, and pipelines. Changes in basic economic dependencies inevitably undermine old alignments and lead to new strategic flirtations, if not alliances. There is every reason to question to what extent the E.U. can maintain an alignment with the United States when it gets nearly half of its energy directly from Russia. Moreover, if alignment with the U.S. were to become an obstacle to Europe obtaining oil and gas from its non-Russian sources, mainly in the Persian Gulf, the U.S.-European alliance would be on shaky ground indeed. This easily could happen due to possible, even likely, shifts in government power in the Persian Gulf region in favor of anti-American trends.

Some EU officials say that energy is too pressing an issue to wait for the accession talks to make progress. They add another argument for decoupling energy from the enlargement process, namely that Turkey should not be allowed to use its

strategic location to get concessions from the EU. This, they fear, could set a dangerous precedent: once Nabucco and other energy links are in place, Turkey could try to use them to get ahead in negotiations with its EU partners in unrelated areas.

Such fears are probably overdone. They certainly should not be used as an argument for not opening the energy chapter. If the EU is serious about the diversification of its energy supplies, it needs to do its utmost to unblock the accession talks in this area. Cyprus will hopefully take a more co-operative stance after its presidential election in February 2008. The EU should continue prodding Turkey to improve the investment climate in its energy sector and thus make it easier to attract funding. And it should systematically include Turkey in developing its energy strategy, not only on diversification but also on energy foreign policy more generally, as well as on plans for energy efficiency, renewables and so forth.

Turkey, in turn, must do more to prove that it is looking for a genuine energy partnership with the EU, rather than mere short-term political advantages. It could do so by showing how it fits in with the EU's emerging energy policy: it could explain how its own plans to liberalise electricity and gas markets fit those of the EU. It could outline its contribution to the EU's plans for building a strong post-Kyoto regime for fighting climate change (Turkey did not sign up to the original Kyoto protocol). It could align its own ambitious plans for reducing energy consumption with the EU's plan to raise energy efficiency by 20 per cent by 2020. And it could highlight the contribution it could make to the EU's ambition to increase the share of renewables in total power consumption to 20 per cent by 2020. Many Europeans would be surprised to learn that Turkey already gets 12 per cent of its energy from renewables. With the right policies, it could become one Europe's leaders in geothermal energy and hydropower, and it has lots of unexploited potential in solar and wind power.

Turkey's accession to the EU will only make progress if both sides keep reminding themselves of the benefits that deeper integration and closer co-operation would bring for both sides. Energy is an area where early gains are available. The fact that Turkey is negotiating for membership should help, not hinder, progress in this area.

The evolving nature of the EU's energy policy gives Turkey a great opportunity to make sure that its own energy policy contributes to Europe's energy security.

In the coming days, the debate on energy security and alternative energy corridors is likely to intensify. If Turkey cannot counter economically and politically costly attacks on pipelines in its territory and prevent instability in the surrounding regions, it will face enormous consequences. Not willing to incur billion dollar losses in every attack, multilateral corporations might explore alternative routes, and seek compromise with the PKK to cease its attacks on the pipelines. As a country aspiring to become a major transportation hub connecting Middle Eastern and Caspian hydrocarbon reserves to Europe, Turkey will come under pressure to ensure security at home and in its neighborhood. Through its diplomatic initiatives, such as the proposal for a Caucasus Stability and Cooperation Platform, it has sought to stabilize relations in the Caucasus region. Likewise, it has to restore the credibility of its territory as a secure route, especially given its plans to push for the Nabucco pipeline and discussions on the integration of trans-Caspian pipelines into the BTC.

Russian foreign and security policies in the Putin era were centered on a new doctrine that sought to channel energy revenues to the realization of Russia's strategic priorities. Rising energy prices after the Iraq war and the increasing demand for oil worldwide provided perfect conditions for implementing this project. The sustainability of this approach depends on the maintenance of Russia's influence over ex-Soviet countries, and the continuation of the West's dependence on hydrocarbons and continuing high energy prices.

Russia's interest in the production, marketing and transportation of oil and natural gas is particularly visible in the case of the BTC, hence in its policies as well toward Azerbaijan, Georgia and Turkey. Anxious to diversify energy supply routes and break down Russia's dominance, the United States and the European countries have grown increasingly interested in the BTC as well as other routes through Turkey. Although, the BTC and the Baku-Tbilisi-Erzurum gas pipeline are buried underground, concerns over their security never fully disappeared.

If Turkey cannot counter economically and politically costly attacks on pipelines in its territory and prevent instability in the surrounding regions, it will face enormous consequences. Not willing to incur billion dollar losses in every attack, multilateral corporations might explore alternative routes, and seek compromise with the PKK to cease its attacks on the pipelines. "As a country aspiring to become a major transportation hub connecting Middle Eastern and Caspian hydrocarbon reserves to Europe, Turkey will come under pressure to ensure security at home and in its neighborhood." Through its diplomatic initiatives, such as the proposal for a Caucasus Stability and Cooperation Platform, it has sought to stabilize relations in the Caucasus region. Likewise, it has to restore the credibility of its territory as a secure route, especially given its plans to push for the Nabucco pipeline and discussions on the integration of trans-Caspian pipelines into the BTC.

The European Union is currently assessing its energy dependency and trying to diversify its energy sources as well as ensuring future supplies. Other great powers, too, are seeking to generate alternative strategies to halt the continuation of high oil and gas prices. The Finnish Presidency of the European Union [in 2006] actively promoted development of bio-energies.

The events of recent decade emphasized the EU's dramatic dependence on Russia and Middle Eastern countries for crucial hydrocarbon energy supplies. Nevertheless, the EU member states have so far failed to launch a well-coordinated and comprehensive common energy policy, mainly becausenational strategies in recent years have been planned independently from one another. However, the mainstream opinion in Europe is to pursue an effective common energy policy, so that Russia cannot play one European player against the other and cannot generate an inner competition within the EU.

There are no more easy oil discoveries. Ultra deep waters and unconventional geographies are the new frontiers for oil companies. In this case, technology is the most important element for successful extraction. The record high oil prices led to increased activity in upstream sector, resulting in soaring costs and lack of resources. In terms of

supply and demand balance, which is believed to be controlling the long term price in the markets, geopolitics emerged as the key factor for short and even midterm trends.

The demand for energy resources will continue to increase in coming years. European Environment Agency reports indicate that EU energy import dependence will jump from 50% of total EU energy consumption today to 65% in 2030. It's reliance on imports of gas is expected to increase from 57% to 84% by 2030, and of oil from 82% to 93%.

On the supplier side, increasing government control, resource nationalism and related political/fiscal issues are the main drivers of policies. Yet, at the same time shortage in human resources and equipment are also important. For the industry, competitors face some barriers for entry including limited acreage and data access, technological and environmental constraints, NOC ownership of most of the reserves and ever increasing costs. NOCs hold reserves equivalent to more than 10 times those of IOCs, whereas production from NOCs represent only 2.3 times the output from IOCs.

During the EU Summits, EU leaders formally agreed upon a European Energy Policy, which is mainly built upon effective diversification of energy sources and transport routes. Turkey has the ability to play an important role concerning all of the three key words; (energy diversification, energy sources, transportation routes).

On the other hand, sustainable energy supply is necessary to guarantee economic development and quality of life. For the EU, maturity of Turkey as a transit route fosters promotion of energy security through diversification of supply routes. Turkey has the potential to be an energy hub with its special strategic location. Turkey as an energy hub is capable of bringing energy resources from the Caspian, Central Asia through southern corridor and potentially from Iraq to the world markets and to Europe. Standing right in the middle of this reserve bearing geography, Turkey has a distinctive and significant role. Turkey has proved to be agiant and reliable market of the region in terms of its current level of consumption which is rapidly increasing. The market is not only huge and growing but also very well defined and profound in terms of transparent and EU compliant legislation and regulations. The role of Turkey as a transit country is

also recently had proved itself by realization of giant pipeline projects and the ongoing ones.

Therefore, this role is quite significant in terms of its importance in contribution to security of supply. The cost for switching to another resource like hydrogen energy is quite high. Ethanol and solar power however, have shown considerable improvement in some countries. The energy security problem for gas necessitates most of the governments to take a look at their nuclear plans as well.

Turkey as an energy market, there is a need to have a regulatory investment framework that provides transparent and stable rules and that promotes trading and competition. That way Turkey can become a place where a vigorous trade in gas can actually develop. By hosting such a market, Turkey can secure its energy needs and competitive energy prices can be provided to consumers. Referring to UK example; the characteristics of a successful energy trading hub consists of an infrastructure which has a capacity to make arrangements allowing many buyers and sellers to meet.

Along with the infrastructure, a storage capacity is crucial that can be accessed by both sellers and buyers. Regulations need to be formulated as stable but light touched to oversee simple access arrangements which encourage market liquidity. For instance, while regulations set low barriers of trade, they should allow high degree of transparency.

If it is managed to generate a competitive market, Turkey's energy supplies will be competitively priced. Price will be determined by supply and demand. Furthermore Energy needs will be secured because that market will be on its territory.

Since the EU foresees an increasing dependence on external energy sources, improving energy diversification and the issue of supply security are crucial in the EU agenda. EU has been seeking for alternatives to promote diversification of resources and supply routes.

Regarding the energy mix, Europe's energy mix is changing; this is largely because of Europe's leadership in climate change. It is deploying more renewable

energy, and it is using more gas in power generation. EU has set an ambitious target. During the Spring European Council in 2007, one of the fundamental conclusions that the leaders drew was binding 20% target by 2020 in renewable energy. It is mainly designed to show political leadership.

As result of this analysis we can say that, Turkey should put in practice some effective policies to improve energy efficiency. This seems to be too fundament and significant to reduce consumption of energy. To prevent rising trend in dependency on imported energy sources and to satisfy increasing energy demand, Turkey should restructure coal sector and encourage to using clean coal technologies that will help to improve indigenous coal reserves. Only, in such a way the production of energy and consumption of energy gap will be closed down. Otherwise one can say that Turkey will live serious energy security problems in case if it faces with any shortage in oil or natural gas.

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VITAE

Emine Ebru BAYDAK

Personal Information :

Date of Birth	:	1980
Place of Birth	:	Gaziantep
Marital Status	:	Married

Education :

High School	:	Anatolia Foreing Trade High Schol Gaziantep
Undergraduate	:	University of İstanbul, Foreing Trade and European Union - 2002 Graduated from Anadolu University, Business Administration - 2004 (Undergraduate Program)

Work Experiences: **:** She currently works in Public Sector (The Ministry of Family and Social Policies)