TURUN KAUPPAKORKEAKOULU
Turku School of Economics

THE EUROPEAN UNION'S DEPENDENCY ON RUSSIAN NATURAL GAS AND OIL SUPPLIES FROM A SUPPLIER OBSTRUCTIONISM PERSPECTIVE

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Author:
Mikko Ali-Melkkilä

Supervisors:
Lic. Sc. (Econ.) Martti Salo
M. Sc. (Econ.) Taina Paju

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1 INTRODUCTION

1.1 The energy security of the European Union

Since the Soviet days natural gas and oil have been flowing steadily to Europe from Russia and Russia has been seen as a reliable energy supplier to the European countries. Although there was a decline from the Soviet levels of oil production in the 1990s, Russia has been considered a reliable supplier (Tiusanen and Keim 2006, 21) There were no major disruptions in natural gas supplies since the beginning of the Soviet exports in 1968 and the supplies were steady even during the break up of the Soviet Union (International Energy Agency 2004a, 365).

During the last few years, it has been questioned whether the EU might be too dependent on Russian energy supplies. The debate over the European energy security truly started after the events between Russia and Ukraine in January 2006. Russia cut off its gas supplies to Ukraine because of a price dispute. Although the reduction should not have affected supplies destined for Europe, it did. (Moscow says Kiev.. RIA Novosti 12.3.2008) Russia and Belarus got into a fight in the beginning of 2007, as Belarus demanded higher transit prices for the oil flowing through its soil. Russia in return accused Belarus of stealing its oil and halted its supplies to Belarus and simultaneously 30 % of its exports to the EU. (Russia halts oil.. Financial Times 8.1.2007) The latest incident occurred in the beginning of March 2008, as Russia and Ukraine could not agree over unpaid gas bills and again supplies to Ukraine were reduced (Gazprom increases cutoff.. The Moscow Times 5.3.2008). The bulk of the EU imports of natural gas and oil flow through the soils of the two countries. Russia's powerful weapon of cutting the energy supplies served as a wake-up call for the EU. The EU countries realized that the overdependence on Russian energy products might give Russia political leverage over them and new energy mix decisions are being drafted with less dependence on Russia.

The European Commission introduced a new energy policy for Europe in the beginning of 2007. Its three main goals are combating climate change, promoting jobs and growth and limiting the EU's external vulnerability to gas and oil imports. To achieve the three goals, the Commission proposed energy related measures as follows (European Commission 2007):

> *..improving energy efficiency; raising the share of renewable energy in the energy mix, as well as new measures to ensure that the benefits of the internal energy market reach everyone; reinforcing solidarity among Member States, with a more long term vision for energy technology*

> *development, a renewed focus on nuclear safety and security, and determined efforts for the EU to "speak with one voice" with its international partners, including energy producers, energy importers and developing countries.*

The focus of this study is on the third goal set by the Commission and especially on the natural gas and oil imports from Russia. Europe will have to import more and more of its hydrocarbon energy products, meaning oil and natural gas, in the future, as its own resources are becoming obsolete and its consumption is increasing. The EU is the second largest energy consumer and the largest energy importer in the world and it basically has very limited energy resources of its own. On average the EU-27[1] countries are more than 50 % dependent on imported energy products (Eurostat 2008). Besides natural gas and oil, coal also plays an important part in the EU's primary energy needs. But as it is a costly pollutant it can hardly be seen as the great future energy product, even though more research and investments are needed on clean coal technology. Renewable energy sources like wind, solar and bio fuels are widely discussed in the media, but no real actions have yet taken place to actually produce any significant amounts. Currently the production of renewable energy sources is far from being viable and remains undeveloped. (Hadfield 2007)

The biggest single issue in the EU-Russia relations is the energy issue, as Russia is the closest supplier of the vital hydrocarbon energy products, measured geographically and also culturally. Russia has repeatedly assured that it can be trusted and that the cut offs in supplies were due to separate disputes with the former USSR countries, which still paid notably under the world market price for the Russian hydrocarbon supplies because of historical reasons that do not apply anymore. In spite of the assurances, in the spring 2006 Aleksei Miller, the CEO of Gazprom, said after getting annoyed with the criticism from the EU that Russian energy products would have more than enough demand in the Asian market, mostly China, if the problems with the EU were not solved (Gazprom threat adds.. FT 20.4.2006). This outburst was quickly corrected by the Deputy CEO, the then First Deputy Prime Minister of Russia and Chairman of Gazprom's board, Dmitry Medvedev, who was elected the President of the Russian Federation in March 2008.

Russia and the EU have signed many energy agreements; the first one being the Energy Charter Treaty in 1994. In 1997 the Partnership & Cooperation Agreement and in 1999 Common Strategy were signed. Both sides revised the year 2000 EU-Russia Energy Dialogue annually until 2004 and in 2005 Permanent Partnership Council was

[1] EU-27 stands for the 27 member countries of the European Union, which are in the official order Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden and United Kingdom (European Union 2008)

established (Hadfield 2007). Even though many papers with catchy names have been drafted, the abovementioned Moscow's unilateral decisions to cut off energy supplies showed that no real mutual understanding exists between the sides. Because of its strategic importance to both parties, a true common policy and secured continuity in energy supplies have to be found.

1.2 Natural gas and oil defined

Getting natural gas and oil out of the ground to the final consumer is a multi-phased project and it requires large investments in every step of the process. What is extremely relevant to this study is the transportation of natural gas and oil, especially via pipelines. The pipelines are a good example of a transaction-specific investment, as the pipelines can not more or less be used for anything else and they can not be moved from one place to another. So there is a geographic linkage between the product and its final destination. The whole hydrocarbon business is labelled by asset specificity (Williamson 1986; Rubin 1990), which will be discussed in the following chapter. The products by definition give the business so many special requirements that it is necessary to explain the products; what they are and how they are delivered to the final customer and how important they really are as energy sources.

1.2.1 Natural gas

Natural gas is a fossil fuel like oil and coal, so it is essentially the remains of plants and micro-organisms that lived millions of years ago. Chemically, natural gas is considered to be a very uninteresting gas; it is colourless, odourless and shapeless in its pure form. Natural gas is combustible and it gives a great deal of energy when it is burned. It is a mixture of hydrocarbon gases, mostly methane. It may also include ethane, propane and butane. (NaturalGas.org 2006)

Natural gas is normally expressed in cubic meters, measuring the volume it takes up in normal temperature and pressure. Production and distribution companies measure it in thousands (Mcm), millions (MMcm), billions (Bcm) or trillions of cubic meters (Tcm). When delivered to for example households, it is billed in British thermal units (Btu), or "therms", expressing natural gas as a source of energy. (NaturalGas.org 2006)

Natural gas is usually found underground. Because it has low density, it can be found closer to surface than oil. Most of this methane, which does not come about any dense enough material eventually, dissipates into the air. Conventionally natural gas is drilled from locations where the gas is trapped under impermeable rock or other substance that

is dense enough to prevent the gas from coming through it. In these types of locations, it is normal to find oil under the gas, followed by water. These locations can be found at a few thousand feet from the surface. As technology develops, natural gas can be drilled from deeper depths, but naturally it becomes less economic the deeper the gas has to be drilled from. The formerly unconventional ways of drilling natural gas are becoming more conventional all the time. The latest form of natural gas discovered is the methane hydrates. Methane hydrates can be found inside ice, which has created a cage surrounding the molecules of methane. (NaturalGas.org 2006)

Natural gas is environmentally friendly compared to other fossil fuels. The main products of combustion are carbon dioxide and water vapour. As natural gas is less chemically complex with fewer impurities than other fossil fuels, it produces less pollution. The much more complex molecules of carbon and oil release higher amounts of harmful emissions, like greenhouse gases and ash particles, which do not burn and are carried out to the atmosphere and thus contribute to the pollution of the environment. (Natural Gas Issues and Trends 1998, 50; 58)

The transportation of natural gas is carried out through three major types of pipelines in the transportation route. These are the gathering system, the interstate pipeline and the distribution system.

The gathering system is composed of low pressure, low diameter pipelines which transport the gas from wellhead to the processing plant. If the gas is sour (high sulfur and carbon dioxide contents), it must be transported through a specialized sour gas gathering pipe to a sweetening plant and it must be processed, as sour gas is extremely corrosive and dangerous. The interstate pipelines could be described as the “highways” of natural gas. Through these pipes, the gas is transported from the producing regions to the demand. The gas travels in high pressure in these pipelines. The pressure reduces the volume of the gas up to six hundred times and the needed force to push the gas forward comes from the pressure itself. The interstate pipelines consist of special steel pipe and as the gas has to be transported in high pressure, there are compressor stations periodically in the route ensuring the required pressure. There are also metering stations for monitoring and managing the gas and valves, which can be used to stop the gas from going further in the pipeline for replacement or maintenance reasons. To ensure the delivery and the quality of the gas all along the pipeline, there are control stations with monitoring devices also. All natural gas that is transported from the producing regions is not consumed immediately, but natural gas is stored. This is done for two reasons; to meet the seasonal requirements (the demand varies between seasons, winter being the peak normally) and as insurance to unforeseen consequences as an alternative source of energy. Natural gas is usually stored underground. The final distribution of natural gas to the end-user is done very similarly to the interstate pipelines. However the gas is transported in smaller amounts and in smaller quantities and in shorter distances. The

pipes used for distribution can be made of flexible plastic or corrugated stainless steel with current technology. (NaturalGas.org 2006)

Liquefied natural gas (LNG) is produced in areas where the building of traditional pipelines is not economic because of distance or technical reasons, normally because it is transported from offshore. LNG is produced by cooling the natural gas to a temperature of –161°C at atmospheric pressure. The gas condensates to a liquid and it then only takes $1/600^{th}$ of the volume compared to the gaseous form. Its density is 45% that of waters and once it is vaporized it burns only in concentrations of 5% and 15% when mixed in air. Currently, LNG represents 14% of the EU's gas imports. (Eurogas annual report 2004–2005, 23)

1.2.2 Oil

When oil is extracted from the ground, it is called crude oil. It consists of the remains of tiny plants and animals that were decayed under layers of sand and mud millions of years ago. Like other fossil fuels, it is non-renewable, at least with current technology. Even though crude oil is usually imagined black, it can actually appear as colorless, depending where it is from. Before crude oil can be put in to use, it has to be processed in oil refineries. Sand, gases, water and sulphur are often mixed in crude oil and they have to be separated before the oil can be processed for transportation away from the oil refinery. Crude oil comes in different compositions. Some types of crude oil contain more of lighter hydrocarbons that are more valuable and some contain more of heavier hydrocarbons. The composition also defines the kinds of end-products that can be refined from crude oil. (Schoolscience.co.uk 2007)

Crude oil is measured in barrels, one barrel equaling 159 liters. Sometimes crude oil is also measured in tons and the average number of barrels per one ton of crude oil amounts to 7, 33 barrels. (OPEC 2007a)

To extract the maximum value from crude oil, it has to be refined, as burning crude oil is of limited use. Several thousands of different products can be derived from crude oil and the best known of these is gasoline, or petrol. Other products obtained include liquefied petroleum gas (LPG), naphtha, kerosene, gasoil and fuel oil. Many non-fuel products like lubricants and asphalt can also be derived from crude oil. (OPEC 2007a)

Compared to natural gas, oil is easier to transport as it is liquid by its nature. Basically crude oil and refined products are moved on water or on land. When oil is transported across water, barges and tankers are used and when the transportation takes place on land, pipelines, trucks and trains are used. The following table describes the characteristics of the different transportation modes.

Table 1 Petroleum Transportation (Dymock 2007)

	Pipeline	**Marine**	**Rail**	**Truck**
Volumes	Large	Large	Small	Large
Materials	Crude/Products	Crude/Products	Products	Products
Scale	2 ML+	10 ML+	100 kL	5-60 kL
Utilization	Capacity	High	Adequate	Adequate
Unit costs	Lowest	Low	Higher	High
Capital costs	High	Medium	Small	Low
Access	Very Limited	Very Limited	Limited	High
Responsiveness	1-4 Weeks	7 Days	2-4 Days	4-12 Hours
Flexibility	Limited	Fair	Good	High
Use	Long haul Refinery/Terminal	Long haul Refinery/Terminal	Medium hauls Refinery/Terminal	Short Hauls To customer

In international crude oil trade, Large Range and Very Large Crude Carriers are used for transportation of crude oil on water. Independent tanker companies owned 84 % of world's tanker fleets in 2006. The environmentally safer double hull ships are becoming the preferred type of tanker. 68 % of the vessels operating in the world in 2006 were double-hull ships. (PetroStrategies 2008)

The pipeline systems are the most efficient way to transport crude oil and crude oil products and the system has very similar principle to the natural gas pipeline system. The field gathering systems consists of pipelines that move the oil from wellhead to storage and treatment facilities. From the field gathering systems, oil is sent to pump stations and then to the pipelines used for transporting oil for longer distances. Oil may be collected from or delivered to the pipeline along route. Oil may be distributed to refining factories, where end products are produced, or to shipping ports for further maritime transportation. If crude oil was converted into for example gasoline in a refining factory, it is then moved to terminals for movement to gasoline stations via products pipelines. These pipelines can handle different kinds of refined oil products, which are shipped in batches to the customers. (PetroStrategies 2008)

1.2.3 Natural gas and oil as sources of energy in the world

As the world's oil resources are depleting fast, the demand for natural gas has increased. Natural gas is growing at about 3 % per annum (BP 2006b), which is clear evidence of the trend towards the use of low-carbon fuels. The consumption of natural gas is growing rapidly and it is the fastest growing primary energy source in the world. The

consumption of natural gas was projected to increase by 63 % from 2004 to 2030. (EIA 2007) Other forecasts indicate a growth of 50% from 2002 to 2030 (Gmyzin, 2003).

Natural gas can be exploited in a number of ways. The most common ways residentially and commercially are space heating, water cooking and cooling. Industrially natural gas has also a multitude of possibilities. It provides a base ingredient for products like plastic, anti-freeze, fertilizers and fabrics. There are more than 2,5 million Natural Gas Vehicles (NGVs) in the world and the transportation sector has grown very rapidly in recent years, especially in the fuel-intensive vehicle fleets, like taxicabs and public buses. Driving range, storage space and initial costs have been the main obstacles preventing mass production of NGVs so far. Natural gas is also very promising source of electricity for future, much because of its environmental benefits. (NaturalGas.org 2006)

In 2005, the global oil consumption rose by 1,3 %. This is below the 10-year average and especially low compared to the growth of 3, 6 % in 2004. The growth of Chinese consumption was also modest compared to 2004 and the oil consumption of United States declined. The total global consumption was 82, 5 million barrels per day. (BP 2006a)

OPEC[2] (Organization of the Petroleum Exporting Countries, accounts for 60 % of world's oil demand) forecasts that the global oil demand will rise from 83,3 million barrels per day (mb/d) in 2005 to 117,6 mb/d in 2030 (OPEC 2007b). This is a 41 % increase in oil demand in 25 years. In the forecast, developing countries account for most of the rise in demand, their demand doubling from 29 mb/d to 58 mb/d by 2030. Of the growth in developing countries, Asia represents two thirds. (OPEC 2007b) International Energy Outlook shares OPEC's vision of world's oil demand rise, as they forecast the demand of 118 mb/d for 2030 (EIA 2007).

Currently, transportation sector accounts for the greatest part of the world demand of oil. It is also seen as the main source of future rise in oil demand. This is due to potential growth in the stock of cars, buses and lorries in the developing countries. Besides transportation sector, also the industrial and residential sectors in the developing countries show great future potential for the oil industry. (OPEC 2007b)

1.3 Research problem formulation

This research is descriptive by nature. Descriptive research is considered to include the traditional functions of science; description, explanation and forecasting (Lukka 1986,

[2] Member countries of OPEC are Algeria, Angola, Ecuador, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi-Arabia, United Arab Emirates and Venezuela (OPEC 2008).

137). Also this research aims to include all the functions, the focus being on the first one. A comprehensive and thorough description should lead to greater understanding. Ghauri and Grönhaug (2002, 49) state that in descriptive research, the problem should be well structured and understood. In this study, the purpose is formulated as following:

The purpose of this study is to describe and thus understand the natural gas and oil supply flow from Russia to the EU-27 countries from a Supplier obstructionism perspective. This is accomplished through the following sub-objectives:

- By describing Russian natural gas and oil reserves, production and exports.
- By describing the European Union's use of natural gas and oil of Russian origin.
- By conceptualizing the elements of the natural gas and oil supply flow from Russia to the EU-27 countries using the Supplier Obstructionism framework.

The different research approaches are usually classified as being nomothetical, action-oriented, decision-oriented and conceptual (Neilimo and Näsi 1980). The approach in this study is mainly conceptual. The main characteristic for conceptual research is the method of reasoning. The starting point is an earlier doctrine. Using analysis and synthesis from the basis of the earlier doctrine, new concept systems and frameworks are created. The goal is to clarify, to give structure and to seize a problem (Lukka 1986, 136). An existing theoretical framework is introduced in this research. Then the reality, how things are, is described as accurately as possible. Finally, the theoretical framework is modified to meet the reality by reasoning, to conceptualize it.

The research was done as a desk research and only secondary data was used. Generally, secondary data already exists and has been collected in the past for some other purpose than for the research in question. The main problem with secondary data is that it was often collected using methods appropriate for primary data. (Jackson 1994, 20–21) The first basis for data collection was to get as much information as possible about the Russian natural gas and oil supplies to Europe. Because the research approach is mainly conceptual, the second basis for data collection was to gather enough data to justify the researcher's deductions. The main references used were different statistics and reports by international organizations operating in the energy sector. The statistics and reports were gathered from numerous well-known organizations to establish referential adequacy. Scientific journal articles and energy expert opinions were also referred to; to elaborate the actual dynamics behind the statistics. Recent newspaper articles were quoted in order for the research to be topical and practical as well. All the newspaper articles are from both Russian and Western well-known publications. The various statistics and reports used as reference in this study should present the best current information available freely. No statistics or reports were purchased due to the limited resources of the researcher.

A way to establish trustworthiness for a research is to consider the reliability and validity of the research. For a research to be reliable, it should be replicable. In qualitative research, the procedures that have led to a particular set of conclusions should be stated explicitly. (Seale 1999, 158) The reliability of this study is justified by using versatile references in order to give as realistic as possible a picture of the state of affairs in the natural gas and oil supplies from Russia to the EU. The goal was to provide the reader with all the relevant information for the conclusions to be reliable and thus replicable. Addressing validity issues ensures rigour in the research and there are many ways to validate qualitative research findings (Andersen and Skaates 2004, 475). Here, the internal and external validity are addressed. Internal validity means the internal logic and the absence of contradictions in the research (Koskinen, Alasuutari and Peltonen 2005, 254). The was to include all the essential fields of the natural gas and oil supplies from Russia to the EU in to the research to ensure internal logic and accurateness of analysis. The research findings should be the logical consequence of the information presented. To establish external validity, the research findings should be generalizable (Koskinen et al. 2005, 254). This research aims to give a rich description of the EU-Russia energy relations, thus increasing the knowledge about the situation at hand. The research findings are aimed to reflect the reality accurately and should thereby be generalizable.

In chapter 2, the research will begin by introducing the theoretical framework in which the natural gas and oil supply flow from Russia to the EU-27 countries will be eventually conceptualized. The Supplier obstructionism framework is constructed out of two now classical theories, the Transaction cost economics and Resource dependence theory, which are discussed thoroughly before presenting the Supplier Obstructionism theory and framework. After the theoretical framework, the Russian natural gas and oil resources are defined in chapter 3. Firstly, the Russian resources are compared in a global context and then the most important companies, which are in control of the resources in Russia, are introduced. In chapter 4 the importance of the Russian natural gas and oil for the EU-27 countries will be distinguished. Also some implications concerning the future of the supplies are discussed. In chapter 5 the theoretical framework is implemented to the reality by using the information provided in chapters 3 and 4. Finally in chapter 6, conclusions are drawn.

2 THE THEORETICAL FOUNDATION FOR CONSTRUCTING THE SUPPLIER OBSTRUCTIONISM FRAMEWORK

2.1 Introduction to the theories

The situations described in the introduction between Russia, Ukraine, Belarus and the whole of the EU are extremely interesting in a number of ways. In this chapter, a theoretical framework, in which the situation between the two parties is analyzed, will be introduced.

Many now classical economic theories can be applied to these situations, where the supplier holds a superior position over the buyer. The choice of theories derived from the case itself. All the different components of the theories presented in this chapter can be adapted to the situation between the EU and Russia. The Supplier obstructionism framework is constructed eventually in chapter 2.4 and to understand its dynamics it is necessary to explain the theories it draws from.

The approach will begin with a glance to Transaction costs economics, starting from the work of Oliver E. Williamson (1975), and continue by introducing later applications and critique to TCE. My second approach to the situation is Resource dependence theory by Pfeffer and Salancik (1978). Finally I will combine the two and present the theory of Supplier obstructionism (Flynn & Flynn 2003).

2.2 Transaction costs economics

Transaction costs economics (TCE) has its roots in the seminal work of R.H. Coase (1937), as he outlined the choice between using the markets or whether to vertically integrate. There are costs in using the price mechanism and there are naturally also costs in self-production. So there is a cost for every transaction in the markets, ex ante costs like negotiating and contracting costs and ex post costs like monitoring and enforcing agreements. As there is a firm, both the ex ante and the ex post costs are not eliminated, but still greatly reduced. Thus, certain costs can be saved by forming an organization (Coase 1937). Firms and markets can be seen as alternative governance structures with different transaction costs (Rindfleisch & Heide 1997, 31).

Coase also formulates the size of the firm, in other words the optimal amount of vertical integration (Coase 1937, 395):

> *..A firm will tend to expand until the costs of organising an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organising in another firm.*

Oliver E. Williamson has played an important part in forming the Transaction costs economics, a branch of the New Institutional Economics. Williamson describes TCE being an interdisciplinary alliance of law, economics, and organization. In addition, he gives four descriptions of TCE (1996a, 25):

1. TCE is relentlessly comparative (organization forms in relation to alternative feasible forms)
2. Microanalytic
3. Discrete structural (alternative forms of governance differ in kind)
4. Preoccupied with economizing, rather in reference with organization than technology.

In other words, TCE could be seen as comparing different organizations and their governance at a microanalytical level. The goal of the comparison is to find out the lowest possible transaction costs for a certain transaction.

Williamson mentions three critical dimensions for characterizing transactions. The first is uncertainty, the second the frequency the transactions occur and the third the degree in which transaction-specific investments take place. He rests on two human behavioral assumptions in his microanalytical framework; bounded rationality and opportunism. For a transaction cost, the key constructs are uncertainty, asset specificity and fundamental transformation. (Williamson 1985; 1996a) The behavioral assumptions and the constructs of a transaction cost will be explained in the following.

2.2.1 Bounded rationality and opportunism

Probably the most often quoted explanation of the term **bounded rationality** was that of Simon's (1976, xxviii), as he phrases human behavior in organizations as "*intendedly* rational, but only *limitedly* so". So, all complex contracts are incomplete ex ante because of the impossibility to posses all the relevant information. The focus is thus on ex post governing of the contract. (Williamson 1996a, 56)

Williamson describes **opportunism** as a condition of "self-interest seeking with guile" and it can take such blatant forms as lying, stealing and cheating, but also more subtle forms of deceit. He distinguishes both ex ante and ex post opportunism, which can be recognized also from the terms adverse selection and moral hazard, respectively. More generally, it refers to "*the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise*

confuse". He also notes that opportunism should not be responded in kind, but to try to give and receive credible commitments and that opportunistic behavior is a behavioral source for uncertainty in transactions. (1985, 47–48)

Opportunistic behavior can occur in a situation in which an actor takes advantage of a situation it has obtained as a result of an exchange transaction (Rubin 1990, 169). According to Rubin (1990, 4–5), if a firm is subject to opportunistic behavior, buying an input will subject the firm to a holdup problem. This is when the supplier is in a position to increase prices with the threat of cutting off supplies. If there are transaction-specific investments, ex post opportunistic behavior leading to a possible holdup problem is especially possible to occur. If the parties of a contract are supposed to get all the advantages of their original situation, like a monopoly ownership of resources, there should be no ex post problems like opportunistic behavior if two conditions stand. Firstly, the parties promise to disclose all relevant information in the beginning and behave according to the contract through all its validity. Secondly, these promises have to be self-enforcing. (Williamson 1993, 97) A self-enforcing agreement will maintain itself with no need for outside interference. This applies to the majority of business transactions made, as most of them are on a relatively informal basis and the main sanction for opportunistic behavior is the loss of future business. (Rubin 1990, 29) If ex ante contracting is not comprehensive, ex post governing of the contract is needed.

In a situation, where one side of the contract has not performed according to ex ante contracting, gapfilling, dispute settlement and adaptation become organizational questions (Williamson 1996a, 56). Rubin states the most important safeguards being the preventive ones, like hostages or credible commitments. Also cash bonds may be used to ensure performance as agreed. Transaction-specific investments also promote obedience to the contract, as the investments are sunk; giving incentives to fulfilling the contract and continuing transactions. Mandatory licensing and price constraint are mentioned also. Third party enforcement is considered an inferior way. (Rubin 1990, 31–34) Jap & Anderson (2003, 1696) conducted a study about safeguards, covering over 300 buyers and suppliers and found that bilateral idiosyncratic investments enhance performance.

2.2.2 Uncertainty, asset specificity and fundamental transformation

Williamson (1985, 57; 1996a, 60) quotes Tjalling Koopmans' (1957) descriptions of primary and secondary uncertainties and adds a behavioral dimension to **uncertainty**. Koopmans' primary uncertainty is of a state-contingent kind that arises from random acts of nature and the unpredictability of a consumer. His secondary uncertainty is concerned with the lack of communication and the lack of information between the

decision makers about the decisions and plans made by others. Williamson's behavioral uncertainty is of a strategic kind and can be attributed to opportunism with references to strategic nondisclosure, disguise or distortion of information that are unavoidably present especially in a condition of bilateral dependency.

Many assets may not be redeployed for different kinds of alternative transactions. The transferability of assets might become a problem if for example a business relationship ends and there are investments made especially for these specific transactions between these specific actors. In TCE, this is called **asset specificity**. Williamson lists six most important variations of asset specificity: (1996a, 59–60)

1. Site specificity, as when successive parts of for example a production chain are located geographically close to each other to economize on inventory and transportation expenses
2. Physical asset specificity, such as specialized dies that are needed for certain production
3. Human asset specificity arising from learning-by-doing; tacit knowledge
4. Dedicated assets, as discrete investments made for a particular customer
5. Brand name capital
6. Temporal specificity.

Asset specificity is emphasized in conjunction with bounded rationality and opportunism and in the presence of uncertainty and is a big part of the predictive content of TCE (Williamson 1985, 56). Extremely important in asset specificity is that it does not only create complex ex ante incentives but more importantly gives rise to complex ex post governance structures (Williamson 1996a, 59). So the importance of contracts and safeguards in the possibility of opportunistic behavior becomes highlighted. Rubin (1990, 12) points that site specificity, or geographic linkage, between parts of a production chain could create holdup problems without common ownership. This is thus another reason behind vertical integration. Williamson's (1986, 144) choice of governance structure lies on efficiency, as the governing of recurring transactions will be most efficient through classical market contracting when there are no specific assets. As assets become semi-specific, bilateral market contracting will appear and an internal organization will appear when assets become highly specific.

The final construct for TCE is **fundamental transformation**. It occurs in conjunction with contracts that are supported by transaction-specific investments and it highlights the economic value of the continuity of a trading relation. (Williamson 1986, 180) Say, there is bidding over a contract. The one with the successful bid and the supplier make agreements and invest on relation-specific assets. This transforms the situation fundamentally as the transaction specific assets create an advantage for the winning bidder over the competitors through the new bilateral market contracting situation between the supplier and the winning bidder. Both of the parties are

encouraged to continue the ongoing supply relation in order to not to sacrifice economic values. (Williamson 1996a, 60–61; Rubin 1990, 10–11)

2.2.3 Williamson's simple contractual schema

Williamson has used a contractual example in many of his articles (see e.g. 2007, 20–22; 1996a, 61–63; 1993, 99–100; 1986, 181–183; 1985, 32–35) to explain Transaction costs economics in practice. The schema will be briefly introduced in the following.

Vertical integration (the make-or-buy decision) is the typical transaction for TCE. Williamson's schema studies the make-or-buy decision from the TCE perspective and is also applicable for the study of transactions more generally. (Williamson 2007, 20) In the schema, a good or a service can be supplied by either general-purpose technology (no transaction-specific assets) or by special purpose technology (that includes transaction-specific assets). There are four contracting outcomes and associated with each node is a price. We assume that the suppliers 1) are risk-neutral, 2) are prepared for either technology and 3) will accept any safeguards as long as a breakeven point can be projected. The transactions concerning goods or services that include transaction-specific assets give the buyer and the supplier incentives to promote safeguards. The safeguards can include a payment or a penalty for terminating the contract, information disclosure and verification procedures and private ordering like arbitration. Finally, the transactions can be embedded in a more complex governance structure, such as moving from unilateral trade to bilateral, thus creating incentives for continuity of the trading relationship, or even unified ownership. In the schema *K* stands for technology, S stands for safeguards and *p* for price.

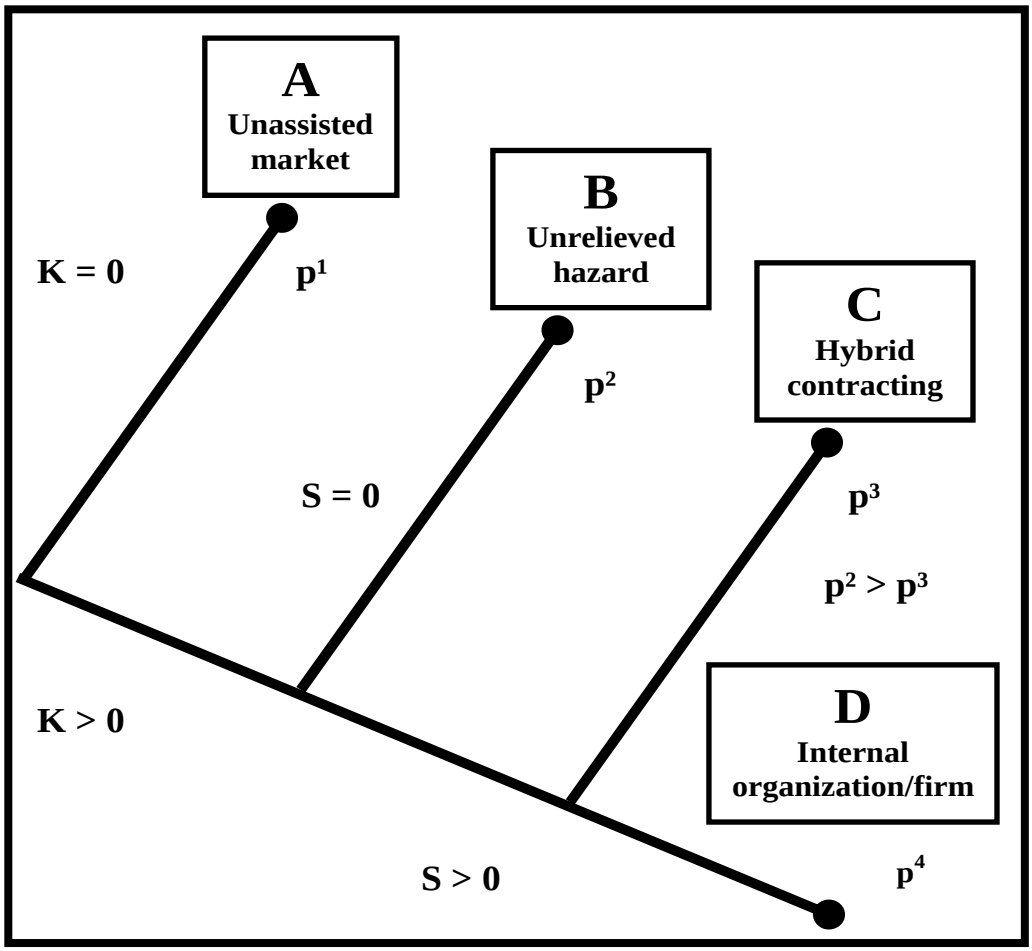

Figure 1 The Simple contractual schema (Williamson 2007, 22)

Node A represents transactions that take place through classical market exchange, where there are no dependencies between the parties and the possible disputes are settled by court awarded damages. The good or the service is produced with general-purpose technology and thus no safeguards are needed. So K=0, S=0 and p^1 stands for market price.

At node B, the production of the good or the service requires special-purpose technology and is not protected by any safeguards. Because of opportunism, the transactions at node B are exposed to hazards and are likely to be produced using general-purpose technology (node A) or they are to be protected and carried out through a more complex governance structure, which brings us to node C. At node B, K>0, S=0 and p^2 is probably higher than p^1, because a hazard premium is added to the price.

The transactions at node C are protected by safeguards, because the parties are dependent on each other because of the transaction-specific investments made and it is in their interest to secure the continuity of the transactions. K>0, S>0 and $p^2>p^3$, which is elementary, as continuity of transactions is lowering the contracting costs and no premium for hazards is included in the price.

Only in his later work has Williamson included node D to the schema (2007). It represents the last organizational form for the transaction to take place. When greater asset specificity and uncertainty are present, there is a need for internal organization. In other words the good or the service is self-produced. As the transaction is taken out of the market, greater bureaucratic costs are also accrued.

It can also be stated, that both ex ante terms and the way contracts are thereafter executed are interconnected with the investment characteristics and the associate governance structures.

2.2.4 Transaction costs economics – Further applications and critique

Transaction costs economics, or TCE, (also called Transaction costs theory, TCT, and Transaction costs analysis, TCA) has become a classical theory with many scholars studying it further both theoretically and empirically from the days Oliver E. Williamson originally formulated (1975) it on the foundation of Coase (1937). In this chapter I will try to cover some of the academic discussion that has taken place in last thirty years or so.

Rindfleisch and Heide (1997) have provided a synthesis and integration of literature concerning TCE, covering both contribution to the theory and critique as well and some future implications for research. They find two problems with the development of TCE. Firstly, TCE is considered synonymous with Williamson's original work and secondly, its empirical research is not well integrated. They list 45 empirical TCE studies in their article. Their work thoroughly covers TCE field, especially the empirical side, till 1997. The main fields of empirical studies of TCE are classified as:

1. Vertical integration
2. Vertical interorganizational relationships (how governance can be managed without complete integration)
3. Horizontal interorganizational relationships (explaining the relationships between firms in same point of the value chain)
4. Tests of the assumptions of TCE (opportunism, bounded rationality etc.).

Williamson's original concept of TCE did not explain properly the concept of transaction costs. Table 2 identifies the sources and types of transaction costs.

Table 2 Sources and types of transaction costs (Modified from Rindfleisch & Heide 1997)

	Source of transaction costs	Type of transaction costs	
		Direct costs	**Opportunity costs**
Asset specificity	Safeguarding	Costs of crafting a safeguard	Failure to invest in productive assets
Environmental Uncertainty	Adaptation	Communication, negotiation and coordination costs	Maladaptation: failure to adapt
Behavioral uncertainty	Performance evaluation	Screening and selection costs (ex ante) Measurement costs (ex post)	Failure to identify appropriate partners (ex ante) Productivity losses through effort adjustments (ex post)

In table 2, three primary reasons and three corresponding sources are given to transaction costs which are then divided into direct and opportunity costs. As assets become specific, safeguarding is required and the direct costs accrue from crafting the safeguards. Opportunity costs come from the failure to invest in productive assets, i.e. using general purpose technology in production. The source of transaction costs for environmental uncertainty is adaptation, including all the communication, negotiation and coordination and the associated costs that accrue ex ante contract. The opportunity costs are described as the failure in the adaptation. Transaction costs for behavioural uncertainty have their source in performance evaluation, direct costs being the screening and selection costs ex ante and for measurement costs ex post. For opportunity costs, Rindfleisch and Heide (1997) mention failure to identify the correct partners and productivity losses through effort adjustment as a result of the monitoring.

TCE has refined over time. Williamson originally mentions only two governance structures for transactions, markets and hierarchies (1975). Later, (1996b, 51) he mentions two more; hybrids and bureaus. Networks have also been added to available governance structures (Jarillo 1988), but as Seppälä (2003, 67) and Blois (1990) argue, TCE is not the optimal tool for assessing networks. "*The object of transaction costs economics is to assess the strengths and weaknesses of all modes of organization.*" (Williamson 1996b, 52)

The much-criticized concept of opportunism has been the most controversial concept of TCE. Williamson's description of opportunism was covered earlier. To most of the critics, it seems, Williamson's description has been giving too savage a portrait of

human nature. Williamson's point of the *possibility* of opportunism has escaped some of the critics. In other words, not all of the actors at all possibilities will behave opportunistically in a situation where there is financial interest to be gained by behaving opportunistically. There is a possibility that some do and that is a reason to provide safeguards (Barney 1990, 384). In his answers to criticism, Williamson has stated this also (1996a, 49; 1993, 98).

The lack of the concept trust (being central for a business relationship besides opportunism) in Williamson's theory has also raised critique, mainly from sociologists. Williamson covers sociological critique in his answer and contends that calculated trust is a contradiction in terms and it cannot be used in the context of studying a complex economic organization (1993, 98–99). According to a resource-based–knowledge-based theory (Conner & Prahalad 1996) knowledge-based considerations can outweigh opportunism-related ones. Transaction costs can arise from knowledge based reasons and can produce a firm to control them, even when opportunism is non-existent (1996, 483).

Ghoshal & Moran (1996) find the TCE foundations "*bad for practice*", as its normative implications are dangerous to corporate managers. According to them, TCE fails to see that markets and organizations are not mere substitutes, but organizations possess unique advantages governing certain kinds of transactions. The absence of the distinction between opportunism (attitude) and opportunistic behavior (behavioral manifestation) in Williamson's theorizing makes it "*independent of context and an outcome that is not*". Williamson responds to this stating that opportunism is relevant, because it avoids the contractual naïveté that comes from taking contracts as mere promises and that it invites the identification, explication and safeguarding of hazards that exist because of opportunism. Williamson comments Ghoshal & Moran's understatement of opportunism being "*simply incorrect*" (1996b, 50). Ghoshal & Moran (1996, 27) also state that the logic of Williamson is wrong. The increase of rational control reducing opportunistic behavior does not apply, as it is the opposite in reality. The authors state that the increase use of rational controls A) increase organization's dependency on those controls, B) kills voluntary action as everything is compulsory, and C) encourages to behave opportunistically, all the time increasing the costs of safeguarding.

Love sees a reason to develop an opportunistic-independent theory of the firm, because Williamson's work suggests that a holdup problem can only arise out of opportunistic behavior. A holdup problem can also rise from a small numbers conditions, free of rent-seeking opportunism and specific assets. An example would be a time-critical production, where a delay in the supply of a component could lead to significant losses. Self-production is favoured in this situation regardless of the number

of potential suppliers or the possibility to be subject to opportunistic behavior (Love 2005).

2.3 Resource dependence theory

Resource dependence theory (RDT) was introduced in 1978 by Pfeffer and Salancik in their classic book The External Control of Organizations. The theory draws from organizations' requirement for resources. Organizations are constrained and affected by their environments and they attempt to manage resource dependencies (Pfeffer 2003, xxiii). Without the control over the resources it requires, an organization must interact with the ones who do control the resources. Especially when the resources are scarce, the suppliers may become undependable. This could be connected with Williamson's (discussed earlier) concept of opportunism. So control over resources provides the suppliers with power over the organizations that require the resources. So much of organizational action is focused on ensuring the continuity of the needed resources (Pfeffer & Salancik 2003, 258).

In the resource dependence perspective, organizational success is defined as organizations maximizing their power (Pfeffer 1981). Control, the source of power, is the ability to initiate or terminate actions at one's will. The most important sources of control for an organization are the ability to empower individuals to act on its behalf and to regulate the access, allocation and use of resources generated organizationally. So power is, according to resource dependency perspective (Pfeffer & Salancik 2003, 259):

> ..*determined by the definition of social reality created by participants as well as by their control over resources.*

As was stated, control over scarce resources creates power over the ones who require the resources. All these actors form the social environment and some have more control and are in the position to influence the others. Pfeffer and Salancik call this the social control of organizations, which is facilitated by these conditions (2003, 259–260):

1. The possession of some resource by the social actor
2. The significance of the resource to the focal organization
3. The inability to obtain the resource from elsewhere
4. The visibility of the behavior or activity that is controlled
5. The discretion the actor uses in the access, allocation and use of the resource
6. The discretion and capability of the focal organization to take the desired action
7. The lack of focal organization's control over the resource to the social actor

8. The ability of the social actor to make its preferences known to the focal organization.

Basically, all organizations need other organizations and the extent of the need or dependency may be controlled. Organizations seek to make themselves important and thus needed and also try to control their own dependencies. The relations between the organizations in the social environment are the outcome of the dependencies.

Organizations operate within dependencies, contingencies and external demands. Organizations restrict the information flows about them and their activities, in order to avoid influence and constraints. Other ways for an organization to gain control and increase its legitimacy are to deny the legitimacy of demands made upon it, diversify dependencies and manipulate information. Interestingly, as organizations try to achieve control over others, they sometimes have to surrender some of their own autonomy at the same time. (Pfeffer & Salancik 2003, 260–261) This could be the case in bilateral exchange.

2.4 Supplier obstructionism

Supplier obstructionism has its beginnings in the theories presented above; Transaction costs economics and Resource dependence theory. With the help of these two constructs the theory assesses the ways power is used in an imbalanced situation between a larger, more powerful supplier and a buyer. The types of behaviors may include lying, cheating and overcharging buyers and more subtle behaviors like threatening to withdraw business and sharing secrets with competitors (Flynn & Flynn 2003).

In a model based on the theory it is hypothesized that supplier obstructionism has the following six direct antecedents (Flynn & Flynn 2003):

1) Supplier power
2) Dependence on suppliers
3) Transaction-specific assets
4) Internal uncertainty
5) External uncertainty
6) Organization.

The model bases the relationship of supplier power and supplier obstructionism on the punitive capability a supplier has. The assumption of opportunism also exists and as the supplier’s power increases, it may more easily be tempted to use its punitive capability and a supplier has more power the scarcer the resources are it is providing. Dependence on suppliers is related to the number of possible suppliers; if there are few, the supplier is more likely to act obstructively. External uncertainty comes from buyer’s inability to obtain information about the schedules and capabilities of the supplier.

Internal uncertainty may be related to supplier obstructionism if the supplier abuses the difficulty to distinguish the difference between for example unintentional and intentional delays in supplies. Supplier power is hypothesized to be a result of internal uncertainty and dependence on suppliers. Investments on transaction-specific assets are a result of supplier power, dependence on suppliers and external uncertainty. As resources are scarce, buyers want to secure their supplies and obtain more information from the supplier by creating a long-term relationship with the supplier.

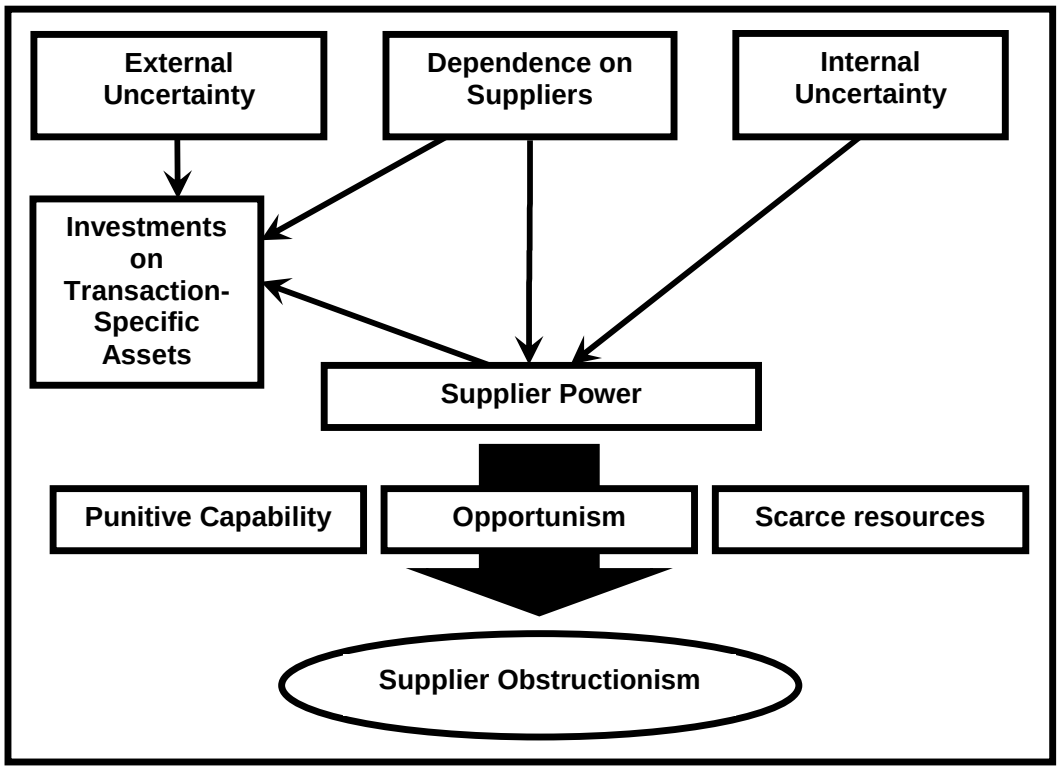

Figure 2 Supplier Obstructionism (constructed from Flynn & Flynn 2003)

The figure above describes the antecedents and their relations in Supplier Obstructionism. The buyer organization's internal uncertainty and its dependence on the supplier create supplier power. Flynn & Flynn (2003) describe the investments on transaction-specific assets to be a result of the buyer organization's external uncertainty and dependence on the supplier and also from supplier power. Supplier power can transform in to supplier obstructionism when three things stand; supplier has punitive capability over the buyer, it controls scarce resources that are hard to obtain from elsewhere and opportunism.

With the above-mentioned hypotheses, Flynn & Flynn (2003) investigated 38 product development projects in five organizations in the electronics industry. The most relevant results for this study were in many ways surprising, especially when comparing them to TCE implications. Supplier power was not directly or even indirectly related to supplier obstructionism. According to them, this is the opposite that TCE implies by

opportunism, if opportunism is taken literally the way Williamson (1975, 47) originally put it (see discussion earlier). The results indicate that supplier power might be tempted to use its position, but it will not *necessarily* do it. In the author's opinion, this is exactly what Williamson stated; there is always a *possibility* of opportunistic behavior (Williamson 1996b, 49). This is where Flynn & Flynn see connection rather to RDT than TCE, and supply chain management literature also, which sees the benefits of a strong relationship with suppliers. It is also noted that the empirical work on RDT supports the strong inverse relationship between supplier power and transaction-specific assets. So buyers would invest less in transaction-specific assets when dealing with a powerful supplier. If the suppliers are not overly powerful, transaction specific investments can take place to extend the control over the supplier organization (Flynn & Flynn 2003). This is similar to the statements of Pfeffer (1981), who saw organizational success defined as maximizing their power in a resource dependence perspective. The authors' statement in the end, that their prediction of buyer's dependency of a supplier to increase the supplier's power might actually be the opposite, as greater supplier power could cause the buyers to be more dependent on suppliers (Flynn & Flynn 2003).

In the previous figure the relations between the different components of Supplier obstructionism are described as the authors originally hypothesized them. Even though the framework was originally applied to the American electronics industry, it can also be utilized in a far greater context. Later in this study, the components from the work of Flynn & Flynn (2003) will be redefined. Also, new relations between the components are constructed to describe the natural gas and oil supplies from Russia to the EU.

3 THE RUSSIAN NATURAL GAS AND OIL RESOURCES, PRODUCTION AND EXPORTS

3.1 Russian natural gas

3.1.1 An overview of the Russian natural gas reserves, production and exports

Russia's proved resources of natural gas[3] at the end of 2005 were measured 47,82 trillion cubic meters (Tcm). The share of 26,6 % amounts to over a quarter of world's total proven reserves. After Russia, Iran and Qatar held the second and the third place, with shares of 14,9 % and 14,3 %, respectively. Saudi-Arabia held the fourth place with a share of 3,8 %. (BP 2006b) So compared to oil, which will be discussed later in this chapter, the majority of world's natural gas resources are spread in a fewer number of countries.

In 2005, Russia ranked 1st also in natural gas production and exports in the world. It produced 598 billion cubic meters (Bcm) in 2005. Interestingly, Russia was followed by very different countries compared to proved resources. USA held the second place with 19,0 % share of world's total production, followed by Canada (6,7 %), Algeria (3,2 %), United Kingdom (3,2 %), Norway (3,1 %) and Iran (3,1 %). (BP 2006b) Russia exported 203 Bcm of natural gas in 2006, which was 22,9 % of world's total exports. It was followed by Canada (11,5 %), Norway (9,7 %), Algeria (7,3 %) and Netherlands (6,2 %). (IEA 2007a) The differences and more importantly their consequences in world's rankings in proved reserves and produced amounts are discussed in greater detail later.

[3] Proved reserves of natural gas – "*Generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions*" (BP 2006).

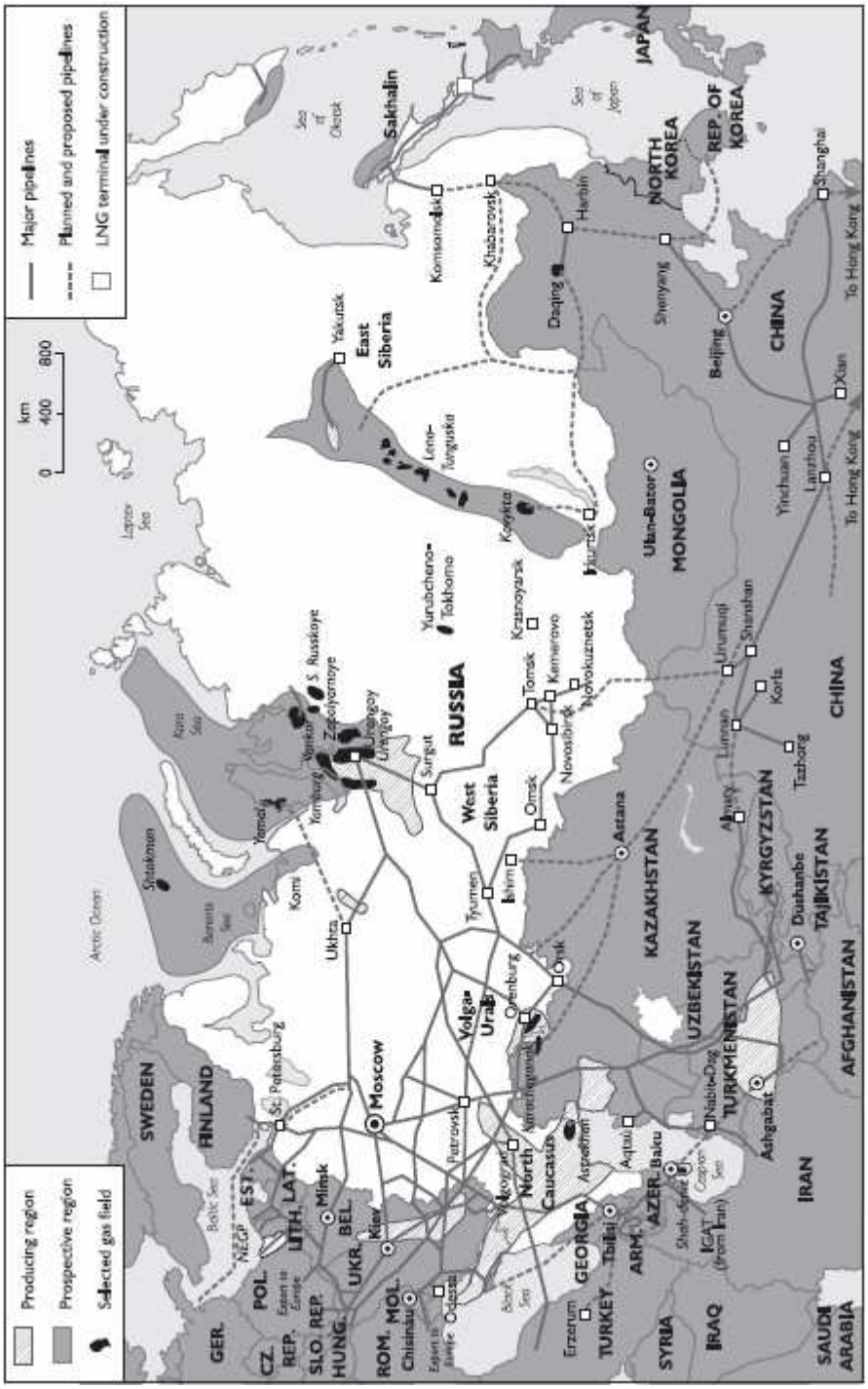

Figure 3 Major natural gas producing and prospecting regions and pipelines (IEA 2006, 30)

Figure 3 presents the currently producing regions, the still unexploited resources and the pipeline infrastructure. As will be covered in this chapter, all the easily accessible regions are already producing and most off them have already peaked. Also worth noticing in figure 3 is the direction of the pipeline system. No currently operating Russian pipeline is transporting gas to East, but all pipelines are towards West.

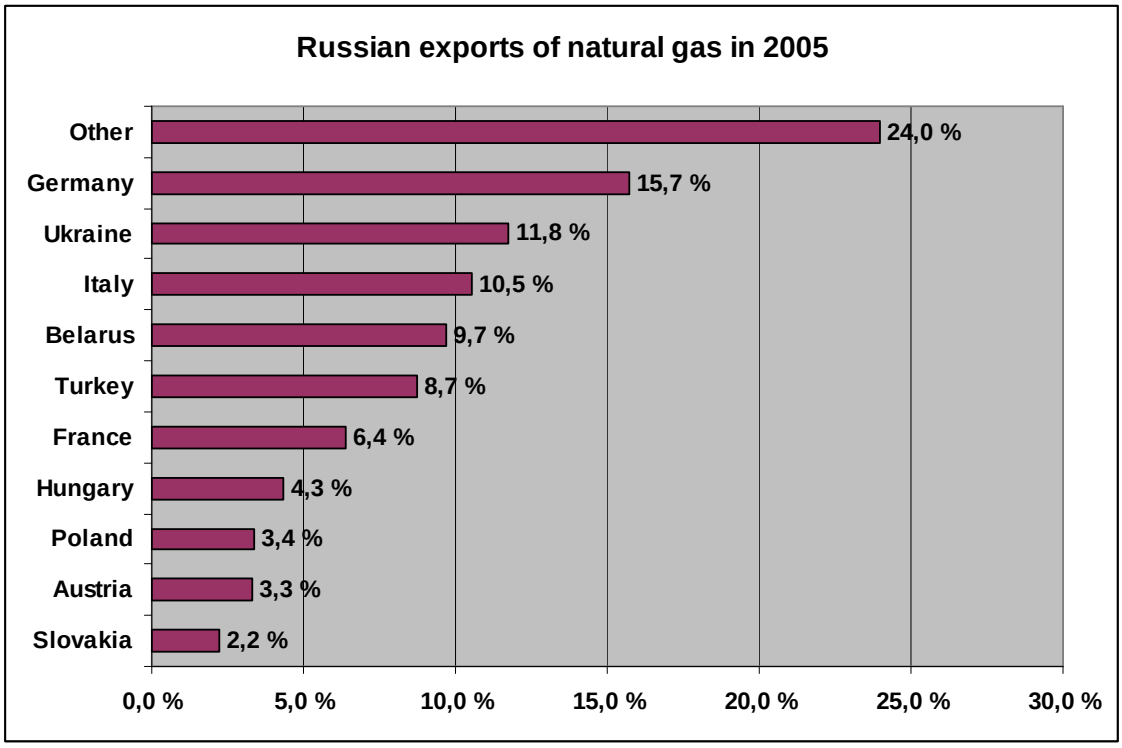

Figure 4 Russian exports of natural gas in 2005 (Eurostat 2007, 29)

The destinations for Russian natural gas exports are presented in figure 4. Of the biggest ten importers of Russian natural gas seven belong to the EU-27. Almost half (45,9 %) of all exported Russian natural gas goes to these seven countries, still excluding among others the smaller EU importers and for example the United States. Natural gas is the most important source of energy in the Russian Federation, as some 54 % of the primary energy supply is natural gas (IEA 2007b). So most of the natural gas produced in Russia is consumed in Russia also and about 32 % is exported (EIA 2008).

Even though practically every oil company operates also in the natural gas sector, as natural gas is found in the same resource sites as oil, only Gazprom will be covered. This is because of the dominant position Gazprom is enjoying in the Russian natural gas market, which is demonstrated in figure 5.

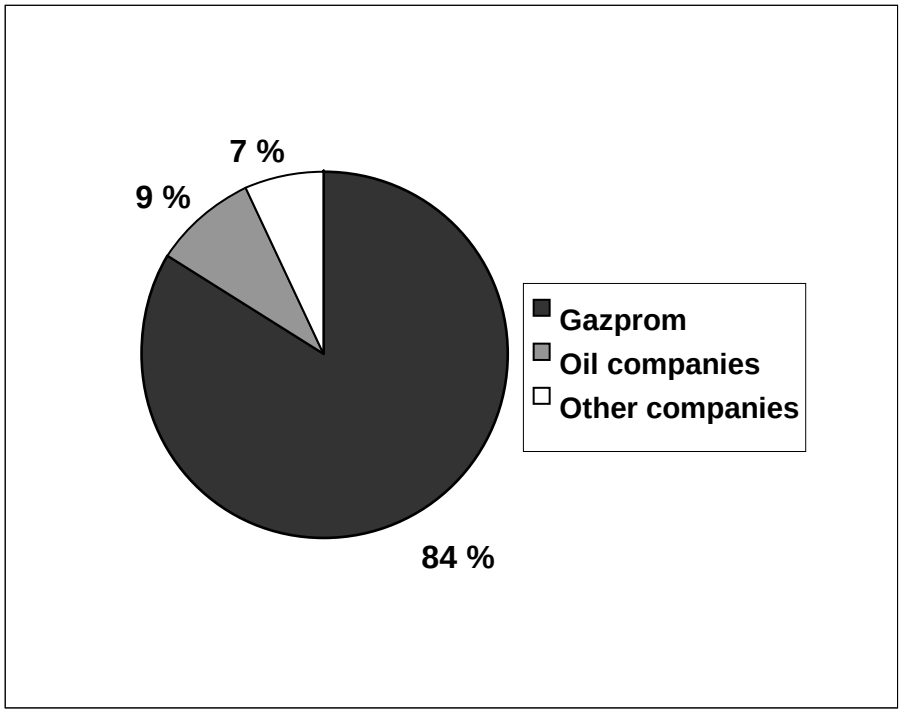

Figure 5 Gas production by Russian companies in 2006 (Surgutneftegaz 2006)

Gazprom's dominance in natural gas production in Russia combined to the fact that the whole natural gas pipeline system in Russia is run by Gazprom leaves little reason to cover other operators in the sector in this study. Gazprom will also be the first Russian company producing LNG, which is basically the only natural gas energy product that can be transported by other means than via pipelines. The pipelines carrying the gas to the soil of the EU are discussed in chapter 4.

3.1.2 Gazprom

3.1.2.1 General information and the lines of business

Gazprom is the biggest company in Russia and the largest natural gas company in the world in terms of reserves, transportation and production volumes. It is thus extremely important to the Russian Federation, as it is the majority owner of the company with a 50,002% share (Gazprom 2008). Even though the shares of Gazprom are now being sold openly to both Russians and foreigners, the state is still very much dictating the course of Gazprom. E.On Ruhrgas has recently acquired a 20% share of the company,

being an important owner also. Gazprom's tax payments cover around 25 % of the federal tax revenues (EIA 2008). These figures are likely to go up as the world's energy prices are at all time record levels and export revenues are Gazprom's main source of income. Also, Gazprom is growing all the time. The acquisition of Sibneft, which changed its name to Gazprom Neft, gave Gazprom a strong foothold in the Russian oil sector. Chapter 3.1.2 will concentrate mostly in the natural gas business; Gazprom Neft is discussed later in the Russian oil section.

Gazprom employs 430 000 people (Gazprom 2008) and it accounted for 10 % of Russia's GNP in 2006 (Gazprom 2007a). It has vertically integrated its operations to a huge variety of businesses, but the main sources of income for Gazprom are the sales of natural gas to Western and Central Europe, Russia and other former Soviet Union countries. The company states to be basically focused on six different aspects of gas and other hydrocarbons (Gazprom 2008):

- Geological exploration; making hydrocarbon reserves available for production and preparing the raw-material base in promising regions
- Production
- Transmission; transportation of natural gas through world's largest high-pressure trunk pipeline system. Gazprom owns and operates a single centrally controlled system, UGSS, for natural gas production, processing, transportation, storage and deliveries. Gazprom owns all the pipelines going over the borders of Russia, creating a monopoly for natural gas exports and being perhaps the most valuable asset of Gazprom. UGTS provided more than 98% of gas transports and 100% of exports and transit in 2003 (NIIgazekonomika Institute 2004)
- Storage; storing natural gas in underground gas storage facilities, situated in main gas consumption regions to even out the seasonal demand fluctuations
- Processing; gas and oil processing
- Marketing; distribution of Gazprom's products.

Gazprom's vertical integration covers the whole natural gas production chain and also basically all supporting industries surrounding the above-mentioned core-businesses. In its web site, Gazprom lists 96 fully owned subsidiaries and it has a majority of shares in 41 companies and a minority in 55 companies. Besides being active in all stages of gas and oil production from exploration to deliveries, the other activities include aviation, space technology, banking, media, construction, electricity, oil etc. Gazprombank is the third biggest bank in Russia, giving a good picture of Gazprom's scale. (Gazprom 2007b)

Gazprom has recently voiced plans to become a more diversified energy player. It is taking part in the oil and electricity business as well as in the gas production and transportation businesses. The future will show just how big Gazprom will grow and

simultaneously how big a grip does Kremlin wish to get from the energy business in Russia and abroad also through energy exports. Experts have stated Gazprom's sliding to other lines of business as distractive to the core business, because of the lower return on capital invested (Mulling purchase of… Aton Daily 14.2.2006). President Putin has said that Kremlin has no plans to further nationalization of the energy sector (Ryazanov says Sibneft… The Moscow Times 15.2.2006). The acquisition of Sibneft (Gazprom now holds 75% of Sibneft shares), Gazprom buying the national electricity company UES' shares (UES head casts.. FT 11.9.2007) and for example incidents in Sakhalin (Sakhalin receives green.. FT 8.10.2007) would indicate the opposite. The Kremlin has certainly strengthened its already powerful grip over the globally important Russian energy sector in the last years through Gazprom operations.

3.1.2.2 Production and resources

In 2005, Gazprom was responsible for (Surgutneftegaz 2006):

- 84 % of the total Russian gas output
- Controlled virtually all the gas transported in Russia
- Controlled all gas exports to Europe.

Russian reserves were estimated in 2005 at 47 trillion cubic meters (Tcm). 3/4 of the reserves are in the Nadym-Pur-Taz region in the Northern Urals and partly in western Siberia. 16 % of the reserves are in European Russia and the rest in East Siberia and Far East (IEA 2006, 25). Gazprom holds nearly 60 % of the Russian reserves with 28 Tcm. This is 16% of the total gas reserves of the world, which will at the current rate of production, last for 78 years (BP 2007). Table 3 shows the production of Gazprom. The company produced 555 billion cubic meters (Bcm) in 2005 (Gazprom 2007d), and the forecasts for the years 2010, 2020 and 2030 are 560 Bcm, 580–590 Bcm and 610–630 Bcm, respectively (Gazprom 2008b).

Table 3 The reserves, production and sales of Gazprom Group in Bcm (Gazprom 2007d)

	2005	**2006**
Proved gas reserves	29 131	29 854
Gas production	555,0	556,0
Production of independent producers	114,9	115,0
Sales of gas in Russia	307,0	316,3
Sales of gas in Europe	156,1	161,5
Sales of gas in CIS countries and the Baltic States	76,6	101,0

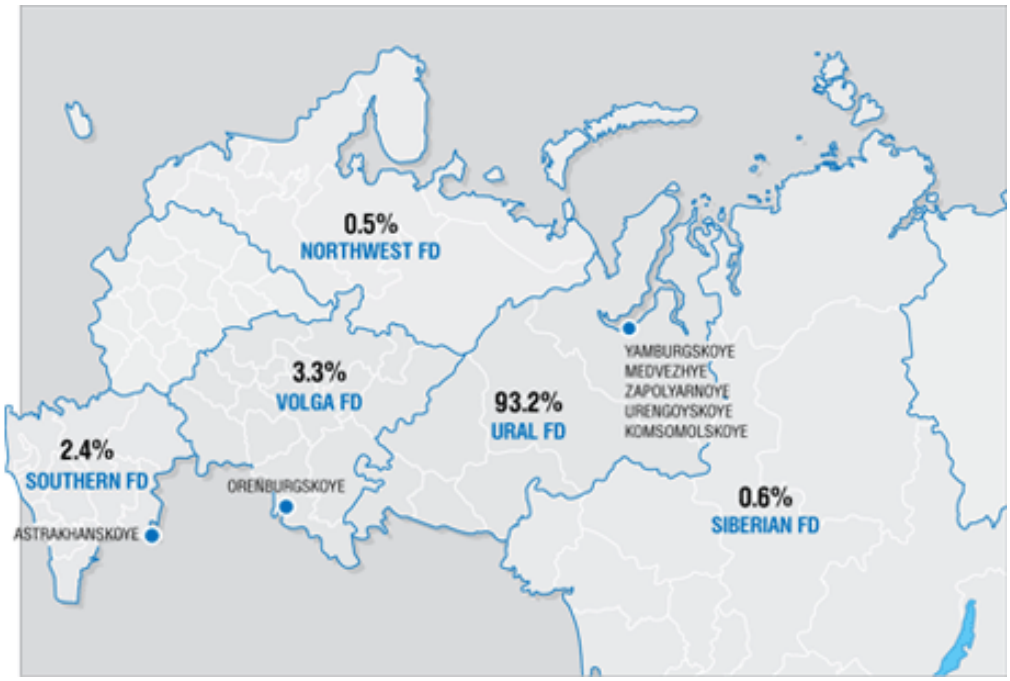

Figure 6 Gas productions by region in Russia (Gazprom 2008c)

Figure 6 illustrates the production of natural gas by region in Russia. The Ural federal District is superior to other regions, accounting for 93,2 % of the current production. Gazprom's production is highly dependent on the three giant fields of Urengoi, Yamburg and Medvezhye. All of the fields are already past their peak production and accounted for 80% of Gazprom's production in 1999 and only 62% in 2003 (IEA 2004a, 368). The Zapolyarnoye gas fields with gas reserves of 3,3 Tcm came in to production in 2001 (IEA 2006, 27). It is projected that this field is the last giant field with relatively low production costs, so further investments are required and the prices will eventually go up. The Zapolyarnoye field has already peaked in 2005 and so far Gazprom has not invested in new fields enough to cover for the declining output in the near future.

IEA (2006, 25) saw Gazprom at a crossroads because of the following challenges:

- Development of the smaller gas fields in Russia would require a competitive gas sector.
- The investments to large fields in Yamal peninsula have been delayed by 10–12 years. Although Yamal is very rich in resources, the production costs are much higher compared to the current large fields.
- The Shtokman field in the Barents Sea requires offshore technology and experience and Gazprom has neither of them (Currently, Gazprom has two partners for the project, see discussion later). This was to be Gazprom's first LNG project, but it seems now that the first LNG production will start in Sakhalin in the Far East, as Gazprom took Shell's place in the project.

- The development of gas fields including the transportation system in East Siberia will be very expensive.
- Gazprom continues to limit the pipeline access to independent gas producers and oil producers. As was discussed earlier, oil and gas are often found in same locations. The associated gas with oil production can not be exploited because of the limited access to the pipeline system.
- Importing gas from Central Asian countries is becoming more problematic, because the pipeline network from Soviet times needs refurbishment and expansion.

As could be seen in table 3, the share of independent gas producers in Russia is relatively small. The growth of their share could ease off the pressure from Gazprom to fulfil the domestic consumption and allow it to invest in new locations, thus securing the future production and export capability. It has to be remembered that Gazprom's fist and most important obligation is to cover the Russian demand of natural gas. This is stated in the first sentence of the annual report as Gazprom's mission. (Gazprom 2007d) Since 2000, Gazprom's average annual natural gas production growth has been mere 0,1 %. During the same period, independent producers have recorded average annual production growth of 12,7 %. So, instead of concentrating on its core business, Gazprom has been investing in media groups, hotels and banks (Feller 2007, 90) However, as long as Gazprom has a monopoly the independent producers will suffer from artificially low domestic prices and limited pipeline system access.

Presented in the next figure is an outlook of Russian gas supply until 2020 (IEA 2006, 34), which is based on Energy Strategy of the Russian Federation to the Year 2020. The share of non-Gazprom production was to increase to cover about 20 % of the total supply. According to the outlook, Gazprom has to come up with approximately the same amount of gas from new fields in 2020 that it is supplying from the current giant fields in the Ural Federal District.

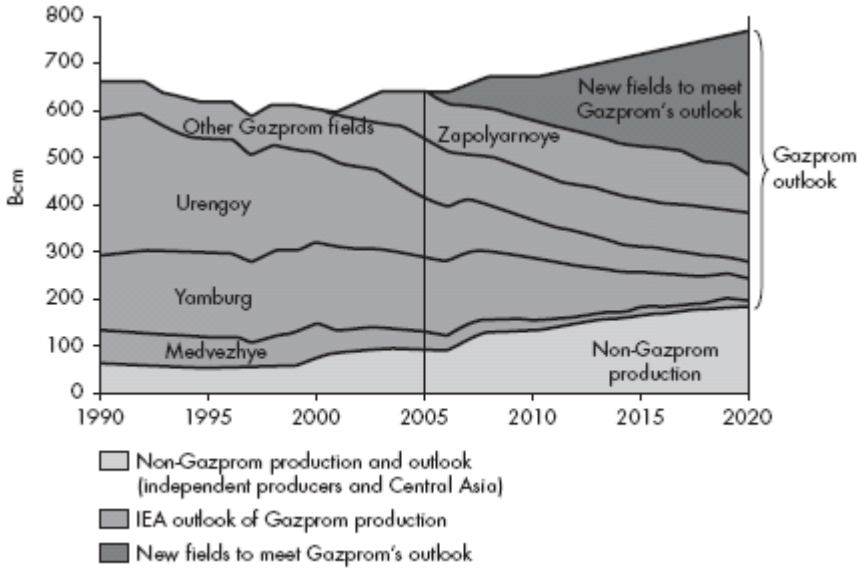

Figure 7 Russian gas supply outlook (IEA 2006, 34)

In the following table 4, the financials of Gazprom are presented. The sales of Gazprom have risen 109 % from 2003 to 2006. Also the net profits are up by incredible 165 % from 2003 to 2006. (Gazprom 2007d) This is mostly explained by the high world market prices of natural gas. The removal of barriers to foreign ownership has lifted the value of the company tremendously, as its share price soared 55,3 % in 2006. (Gazprom 2007c).

Table 4 Financials of OAO Gazprom (Gazprom 2007d)

	Unit	**2003**	**2004**	**2005**	**2006**
Sales of goods, products, work, services (net of VAT, excise taxes and other obligatory payments)	Million roubles	780 613	887 231	1 231 262	1 632 653
Sales profit	Million roubles	207 555	211 593	358 144	517 896
Net profit	Million roubles	129 671	161 084	203 439	343 680
Earnings per share	Roubles	6,02	6,80	8,58	14,52

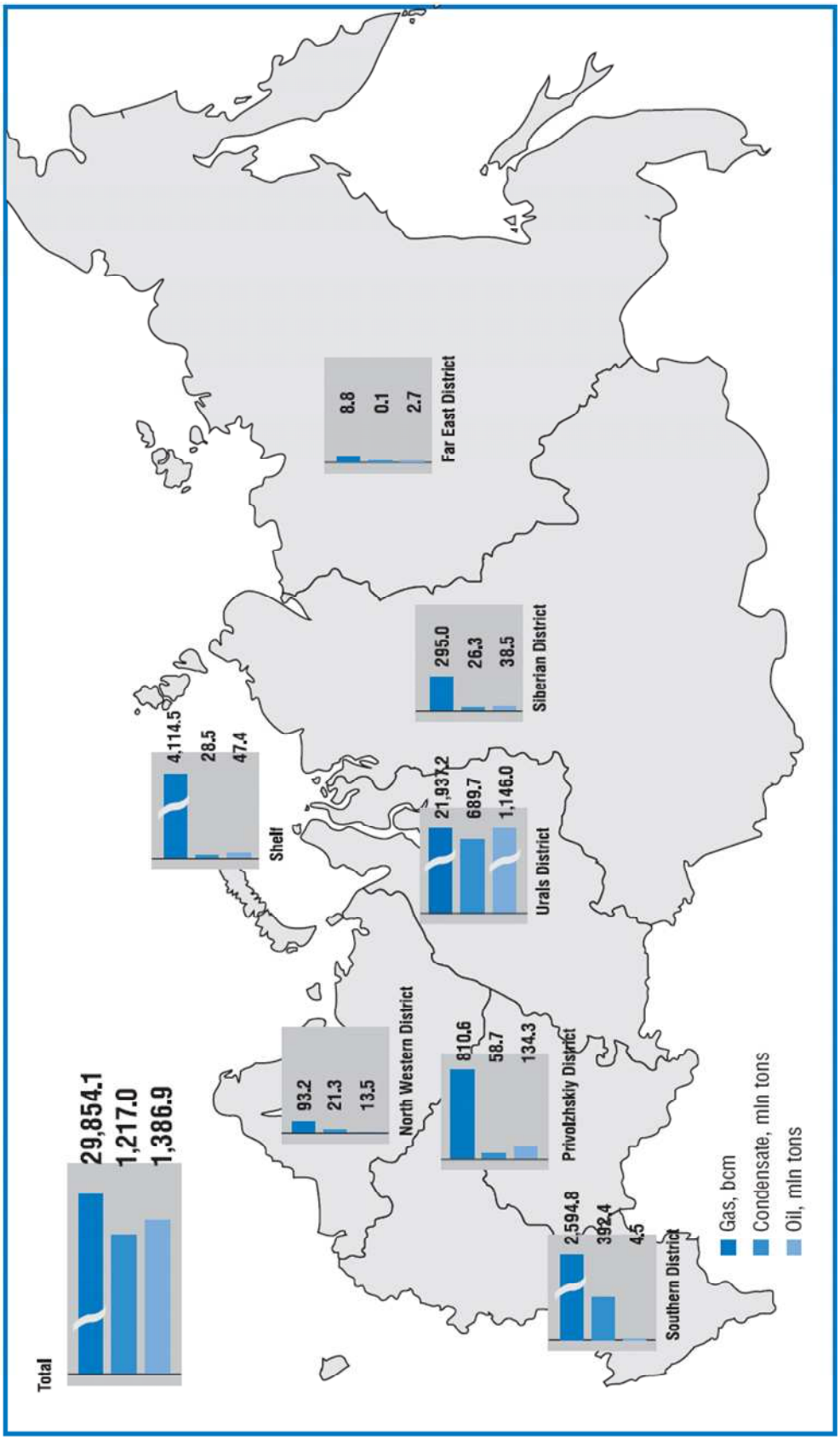

Figure 8 Distribution of Gazprom Group's hydrocarbon reserves in the Russian Federation (Gazprom 2007d)

Figure 8 presents the geography of the natural gas resources of Gazprom. Not included in the picture is Gazprom's most recent conquest in the Sakhalin Island in the Far East, called Sakhalin II project. Gazprom gained control of the world's largest oil and natural gas project from Shell, as Shell faced too many bureaucratic and environmental problems and was forced to give Gazprom the majority share in the project. With Gazprom in lead, the project quickly met the legislative requirements for environmental and safety issues. Gazprom has 50 % plus one share stake, Shell 27,5 %, Mitsui 12,5 % and Mitsubishi 10 % of the project. (Gazprom 2008d)

Also presented in figure 8 above is the extremely interesting Shtokman field in the Barents Sea north of Murmansk. Gazprom originally narrowed the list of possible future partners to 5, them being Chevron, ConocoPhillips, StatOil, Norsk Hydro and Total. Gazprom announced that it will hold a 51% share of the project, despite which the partner(s) will be. Gazprom repeatedly postponed the announcement of the partners. (Shtokman linked to… The Moscow Times 13.4.2006) Finally in autumn 2006, Gazprom announced that it would not take any partners to the project, as none of them had offered good enough stakes in their own resources and productions. Gazprom does not have any experience in offshore activities, so the announcement of not taking any partners was surprising. Finally, in July 2007 Gazprom and Total signed a *Framework Agreement for Cooperation in the Development of the First Phase of the Shtokman Gas Condensate field.* Gazprom holds 75 % of the project and Total 25 %. (Gazprom and Total sign.. OilVoice 13.7.2007) In the autumn 2007, the Norwegian Statoil became the third partner with a 24 % share (Statoil 2007). What makes the Shtokman project so important is that the field will be producing liquefied natural gas (LNG) that will be shipped to the U.K. and U.S. markets in the future. The Shtokman field would also produce gas for the Nordstream pipeline from Vyborg to Greifswald, Germany.

Gazprom has been eager to gain downstream access to the consumer markets of Europe. It already swapped assets with energy companies in Italy, Hungary and Germany and shown considerable interest in other European markets also (UK must tackle.. Telegraph.co.uk 24.5.2007).

3.2 Russian oil

3.2.1 An overview of the Russian oil reserves, production and exports

Russia's proved oil reserves at the end of 2005 were measured 74,4 billion barrels, which was 6,2 % of world's total reserves. Greater proved resources were found in

Saudi-Arabia (22,0 %), Iran (11,5 %), Iraq (9,6 %), Kuwait (8,5 %), United Arab Emirates (8,1 %) and Venezuela (6,6 %). (BP 2006b)

Even though Russia ranked only 7th in proven resources at the end of 2005, it was the second largest producer and exporter of oil, only beaten by Saudi-Arabia in both categories in 2005. Russia's share of the world production in 2005 was 12,1 % and Saudi-Arabia's 13,5 %. (BP 2006b) Of world's total oil exports in 2005, Russia exported 12,0 % and Saudi-Arabia 16,1 % (IEA 2007a).

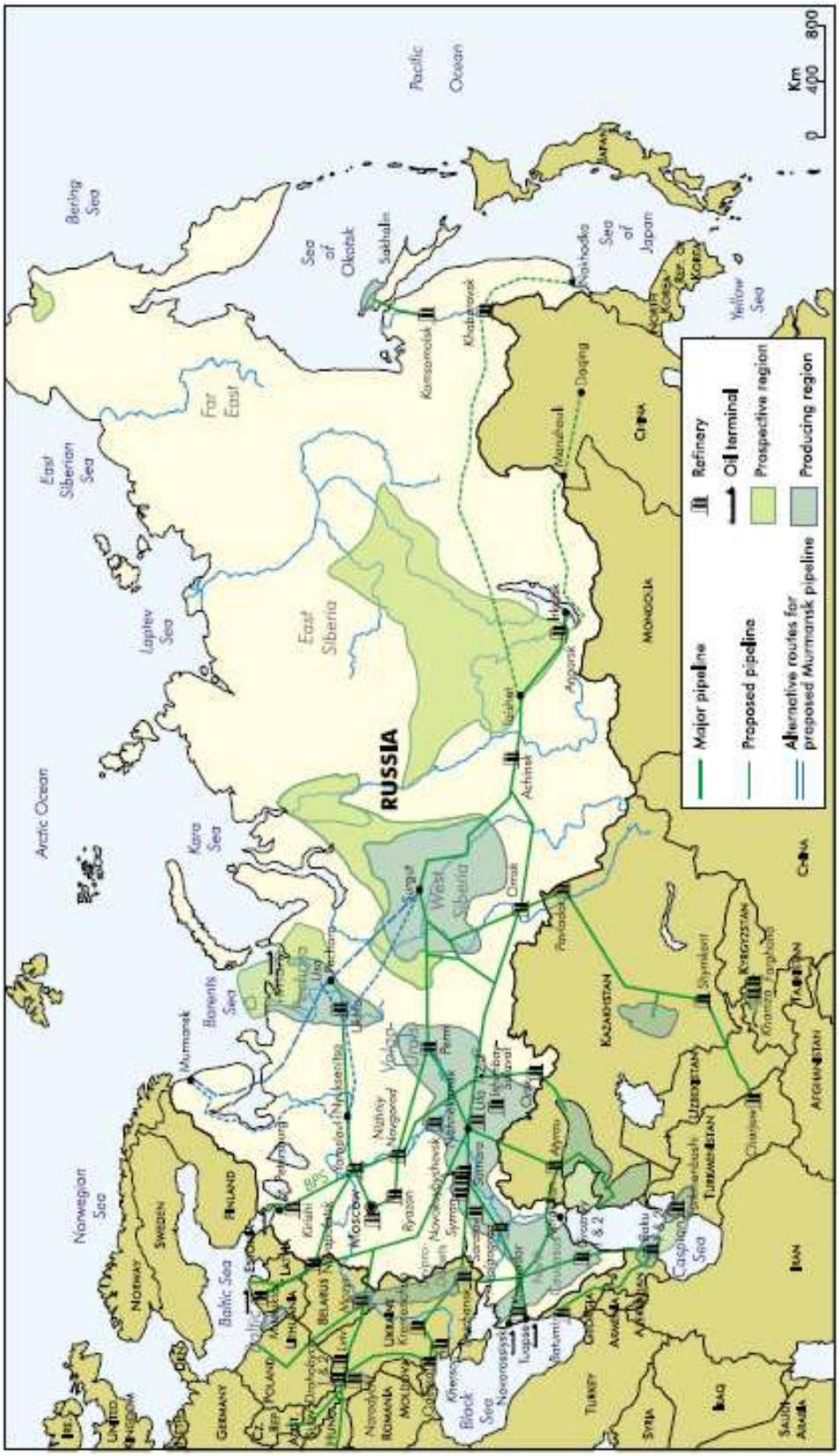

Figure 9 Russian oil basins and pipelines (IEA 2004b, 302)

As presented in figure 9, Russia's main oil resources are located in Western Siberia and Volga-Ural. The problem lies in the measuring of the resources. Many investment

decisions are made on the basis of information concerning the accessible resources. The British Petroleum figures (presented earlier) are considered as one of the most reliable, but as the following table demonstrates, there are as many views as there are viewers.

Table 5 Estimated Russian oil reserves by different sources (Janssen 2005, 4)

Source	**Reserves, billion barrels**
Oil & Gas Journal	60 (proven SPE)
World Oil	69 (proven SPE)
BP	72 (proven SPE)
10 largest Russian oil companies combined	82 (ABC1)
E. Khartukov (Russian oil expert)	110 (ABC1)
United States Geological Survey	116 (proven SPE)
Wood Mackenzie	120 (proven SPE)
M. Khodorkovsky (former CEO of Yukos)	150
Brunswick UBS (Consultants)	180 (proven, probable, possible SPE)
Russian Government[4]	322 (ABCD)

The SPE stands for Society of Petroleum Engineers, which is a generally accepted classification method system[5]. ABC1 consists of proven reserves, while ABCD stands for proven and probable reserves. So, the true Russian oil resources are hard to piece together. What is certain though, is that the remaining resources are in areas where production is much more difficult and capital-intensive than it is on the currently producing regions.

[4] *The Russian government still regards reserves as a state secret and does not publish official records, although they do speak of prognosed reserves of 44 billion tonnes (322 billion barrels) in their latest version of the Energy Strategy up to 2020* (Janssen 2005, 4)

[5] See www.spe.org for the definition of SPE or Janssen (2005) for further details on reserves.

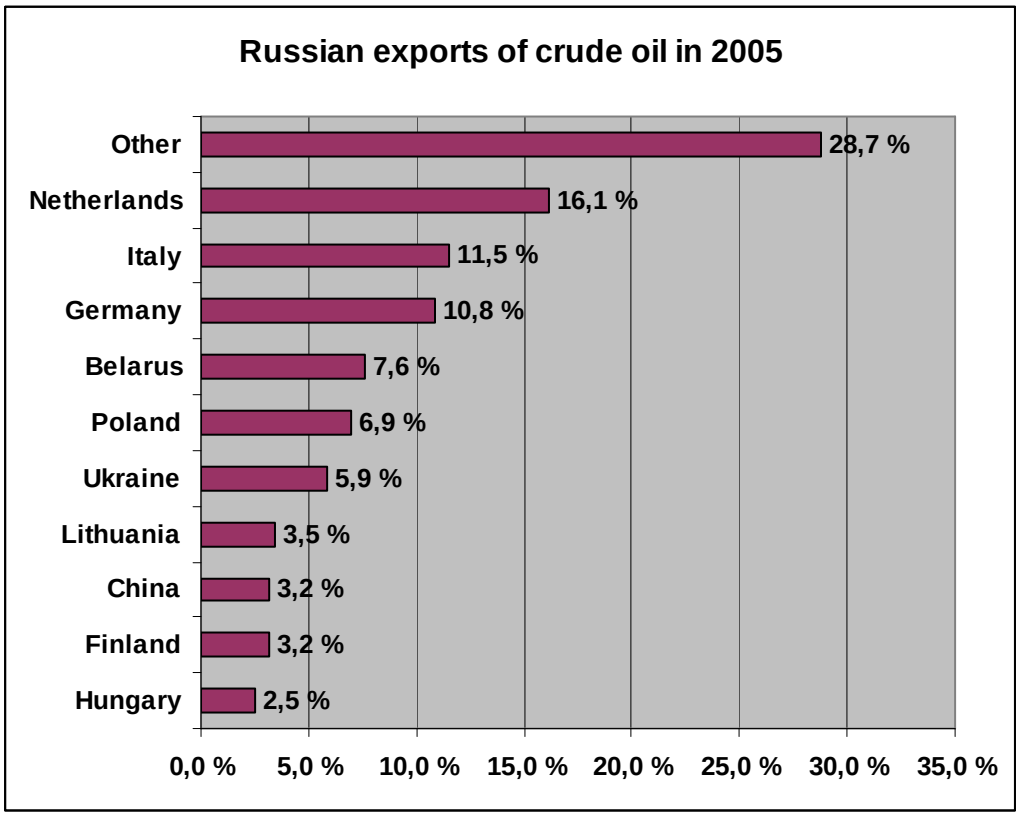

Figure 10 Russian exports of crude oil in 2005 (Eurostat 2007, 27)

The destinations of the Russian oil exports are presented in figure 10. Some 55 % of Russia's crude oil exports go to the seven biggest EU-27 customers. Over 70 % of the crude oil produced in Russia is exported (EIA 2008), so the EU-27 consumes a lion's share of all Russian oil. Of the total crude oil exports of 4 million barrels/day (bbl/d), 1,3 million bbl/d was exported via the Druzhba pipeline to Belarus, Ukraine, Germany, Poland and such Central and Eastern European countries as Hungary, Slovakia and Czech Republic. Oil exports from Primorsk port near St. Petersburg amounted to 1,3 million bbl/d. This amount could double, if the proposed pipeline spur from the border of Belarus to Primorsk is built. (EIA 2008) Transneft, the Russian state-owned pipeline company, voiced these plans after the dispute with Belarus in January 2007 (Rise in Transneft.. RIA Novosti 15.2.2007). The spur would thus bypass Belarus as a transit country, allowing Russia to have greater direct contact to its customers. The growing oil transportation across the Baltic Sea has already worried many countries because of environmental issues and Russia would face tough resistance, if it was to double its shipments from the Primorsk port.

Almost 1 million bbl/d of Russian oil is exported via tankers in the Black Sea, mostly from the great port of Novorossiysk. Exports via rail cover the rest of Russia's oil exports. Although the amount of 170 000 bbl/d is small compared to pipeline and maritime exports, the share of rail exports have grown due to the high oil prices.

Currently Russia has no pipeline connection to China, so rail exports have been the only option. (IEA 2008)

3.2.2 The biggest Russian oil companies

During the last years, the Russian state's control of the oil industry has increased. Of the five largest oil companies in Russia, the state has a majority share in two, Rosneft and Gazprom Neft. Rosneft took control of the now bankrupt Yukos' main production unit Yuganskneftegaz in 2004 (Rosneft's purchase.. RIA Novosti 25.12.2004). In 2005, Gazprom acquired 73 % of Sibneft from Roman Abramovich and thus the other state-owned oil giant Gazprom Neft was created (European commission.. RIA Novosti 21.11.2005). Interestingly, at the same week Abramovich got his $13 billion, the former CEO of Yukos was sent to Southern Siberia to serve his sentence for fraud and tax-evasion. Just two years ago the men were discussing a possible merger between the two companies. (Winners and losers.. FT 2005) The Yukos case was the first demonstration of Kremlin's new grip on energy issues. Since then, the growing state control in the energy has influenced negatively the investment climate for non-state owned companies, both Russian and foreign. Due to insufficient investments, the future production capability in Russia is questionable.

Table 6 Proved resources, production and exports of the 5 major Russian oil companies (Companies' annual reports from 2006, own conversions)

	Proved resources (SPE, Million tons of oil equivalent)	Production (Million tons)	% of oil production by Russian oil companies	Crude oil exports (Million tons)	% of crude oil exports from Russia to non-CIS countries
Lukoil	2722	95	19 %	44	17 %
Rosneft	2686	80	18 %	57	20 %
TNK-BP	1190	74	14 %	43	16 %
Surgutneftegaz	n/a	66	14 %	n/a	14 %
Gazprom Neft	621	33	7 %	17	7 %

Table 6 presents the five largest Russian oil companies at the end of 2006, based on the companies' own information. Lukoil and Rosneft are battling for the number one spot. At the end of 2005, Lukoil controlled the greatest resources and had the biggest production volume. In exports, Rosneft was the leader. There were talks about a possible merger between Rosneft and Gazprom (Gazprom – Rosneft merger.. RIA Novosti 28.3.2005), but eventually Gazprom acquired Sibneft to form its own major oil

company and the merger was cancelled. So at the end of 2005, the state directly controlled a quarter of the country's oil production. The federal budget dependence on energy exports and associated foreign currency income and the capability to supply the domestic market serve of course as good arguments for state ownership (Janssen 2005, 7).

The future of Russia's oil production seems to be similar to natural gas production. The biggest and most easily accessible resources are already declining. Areas such as the Timan-Pechora oil province, the Arctic region, Eastern Siberia and Sakhalin are much more capital-intensive than the current production areas, due to harsh climate conditions. (Janssen 2005, 8) Huge investments are needed to keep the production up and probably foreign money would be needed. Unfortunately, the unclear amount of remaining oil reserves and Kremlin's increasing involvement (the Yukos-affair and Shell's problems at Sakhalin Island) do not promote good investment climate and it remains to be seen how Russia can fulfill its export duties.

4 THE EU-27 IMPORTS OF RUSSIAN NATURAL GAS AND OIL

4.1 The current situation

Figure 11 presents the gross inland consumptions of the EU-27 in 1995 and 2005. The consumptions of 1995 are located in the inner circle and the 2005 consumptions in the outer one. The total consumption grew by 10 % in ten years. Oil remains the most important source of energy for the EU, followed by natural gas, nuclear power and hard coal. The biggest increase was in renewable energy sources (RES)[6], as their consumption grew by 41 %, but their share still remained modest 7 % of the total consumption in 2005. Gas is gaining on oil consumption, with gas growing 33 % and oil only 4 % during the time period. (Eurostat 2008) The total import dependency for all energy products was 52,3 % in 2005 and 43,3 % in 1995 (Eurostat 2008), so the clear tendency is that the EU is becoming more dependent on imports. The growing import dependencies of natural gas and oil are demonstrated in the following figure.

[6] *The definition of renewable energy sources (RES) includes energy generated from solar, wind, biomass (wood, municipal wastes, biofuels and biogas), geothermal, hydropower, and ocean resources* (Eurostat 2008).

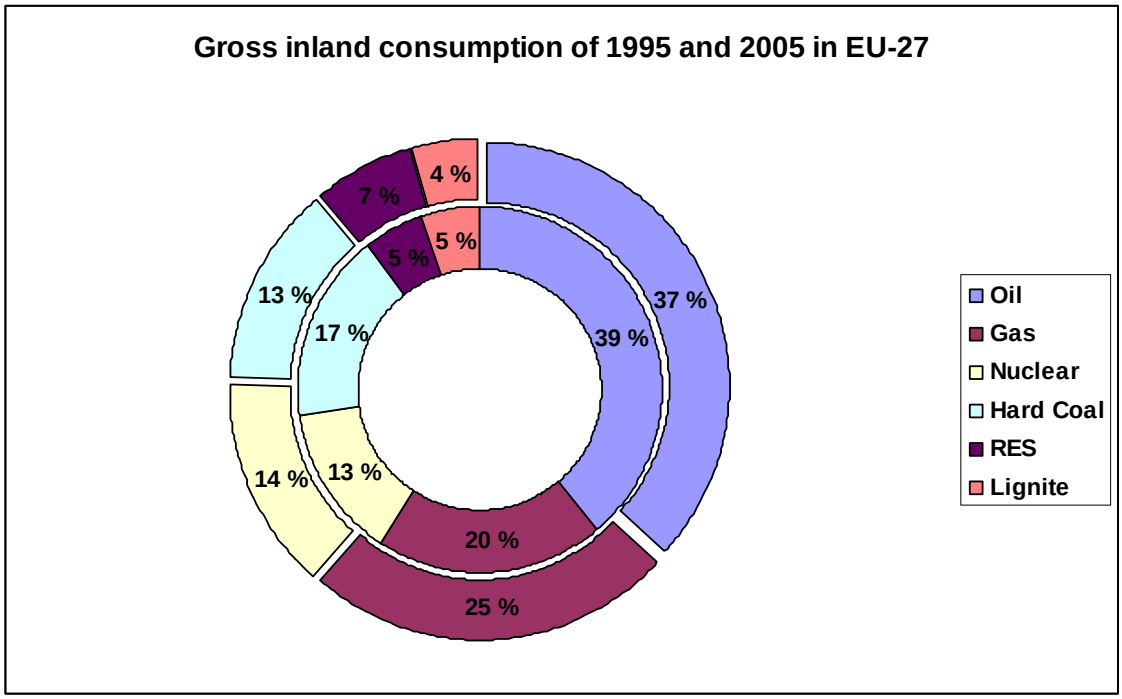

Figure 11 The EU-27 gross inland consumption[7] of 1995 and 2005, breakdown by fuel (Eurostat 2008)

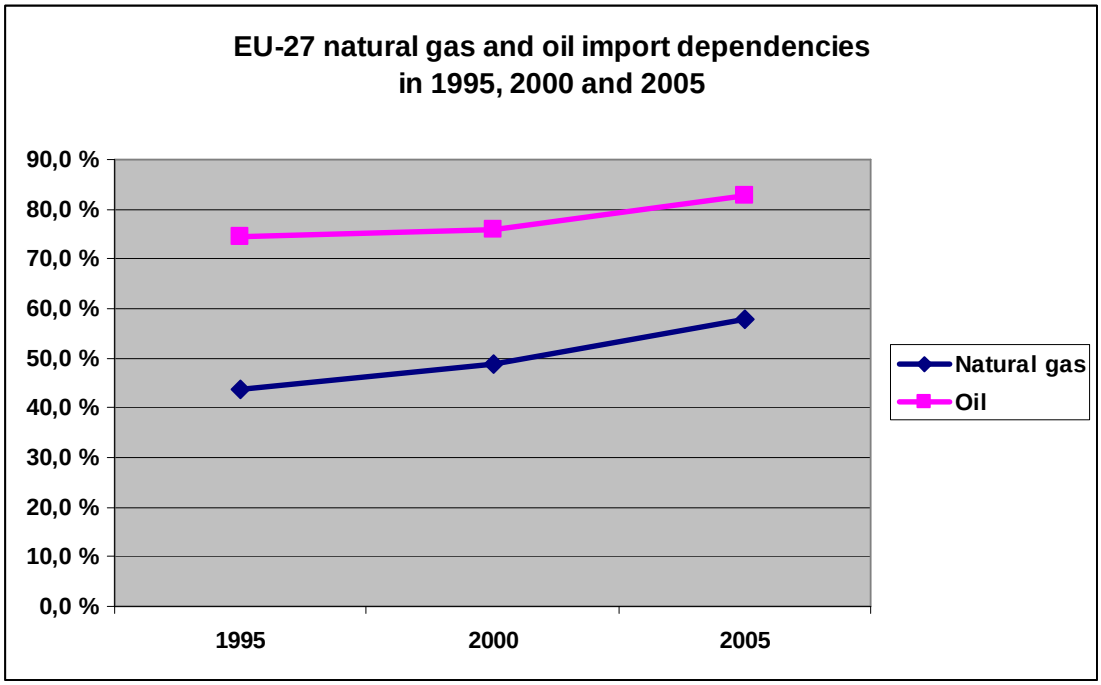

Figure 12 The EU-27 natural gas and oil import dependencies in 1995, 2000 and 2005 (Eurostat 2008)

[7] *Gross inland energy consumption is a measure of the energy inputs to the economy, calculated by adding total domestic energy production plus energy imports minus energy exports, plus net withdrawals from existing stocks* (EEA 2008).

In figure 12, the EU's import dependency in natural gas and oil grew 14,1 and 8,3 points respectively during the time period. This has happened for two reasons. The first obvious reason is the increase in consumption. Secondly, the EU's own production has not been able to follow the increase in consumption. There was 0 % change in the EU-27 natural gas production and a 23 % decrease in oil production between 1995 and 2005 (Eurostat 2008).

The EU-27 had only two net exporters of natural gas in 2005, them being Denmark and the Netherlands. Other than these net exporters and excluding United Kingdom, Romania and Poland, all other member states are over 80 % dependent on imported natural gas. Denmark is also a net exporter of oil, as well as United Kingdom. All other member states are oil importers. When excluding the net exporters and Romania, Estonia, Hungary and Slovakia, the remaining states have an oil dependency rate greater than 90 %. (Eurostat 2008)

Roughly 2/3s of the EU-27's energy consumption was oil and gas in 2005. The EU heavily relies on imported oil and gas, as the EU-27's own production covered only 37 % of natural gas origin and 18 % of oil origin in 2004 according to the Commission of the European Communities (2007). So, the EU has to import the majority of natural gas and oil it needs. In the following two figures, the import origins will be displayed.

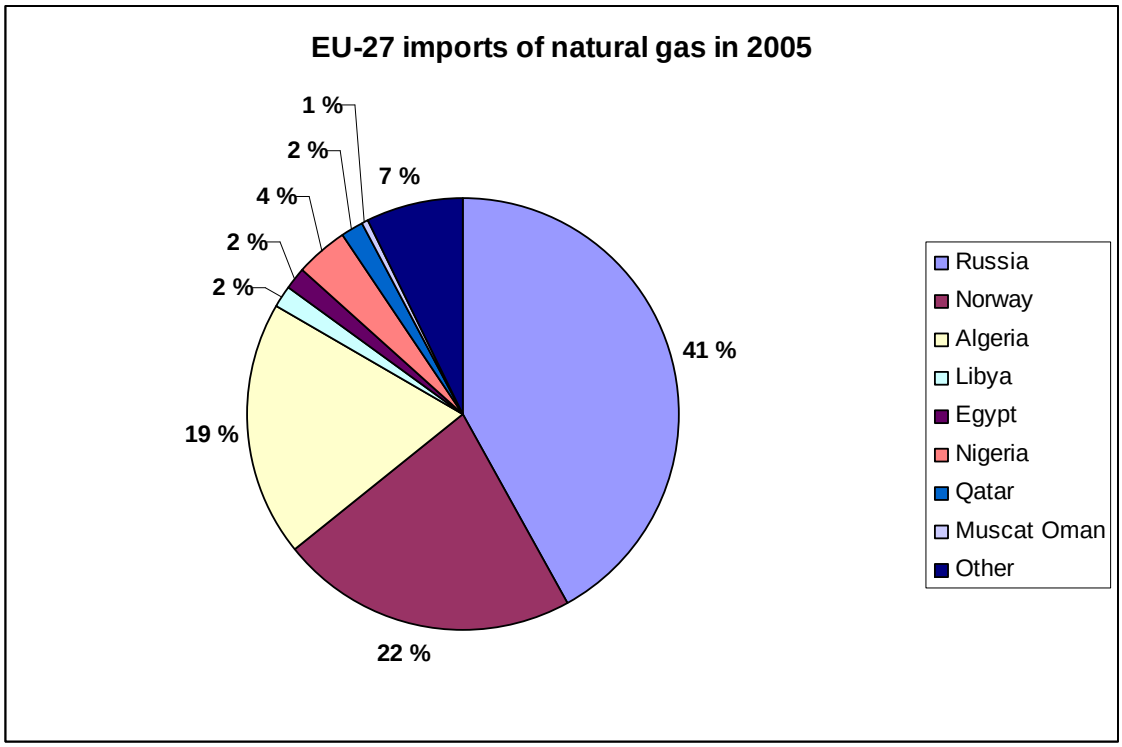

Figure 13 The EU-27 imports of natural gas in 2005 (Eurostat 2007, 28)

As presented in figure 13, in 2005 Russia covered 41 % of the EU-27 natural gas imports. Her share is likely to grow, as the number two Norway's resources will

become obsolete before Russia's. Norway's reserves-to-production (R/P) ratio[8] is 33,0 and Russia's 77,8 (BP 2007). In practise, this is how many more years a country has resources left at current production levels. One can see that the natural gas import portfolio points towards problems for the EU, if steep problems were to arise with Russia and supplies were reduced or cut permanently. Because the transportation of natural gas is extremely capital-intensive, there would be no fast way to find alternative suppliers.

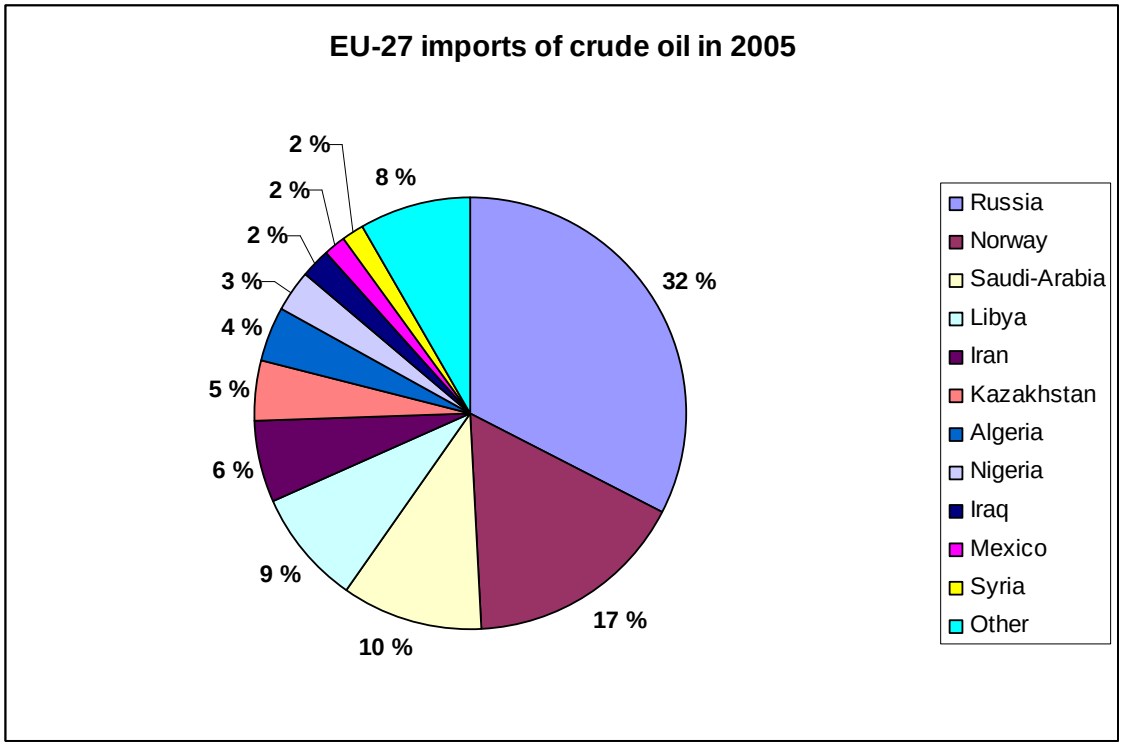

Figure 14 The EU-27 imports of crude oil in 2005 (Eurostat 2007, 26)

The import portfolio in figure 14 for oil seems much healthier than for natural gas. Even though 1/3 of the EU-27 oil is imported from Russia, there are more supplying countries with decent shares of the portfolio for oil than there are for natural gas. But, according to the current information, the Earth will run out of oil before natural gas. World's R/P ratio for oil is 40,5 and for natural gas 63,3 at the end of 2006 (BP 2007). During the next few decades, the price of oil should rise to the extent that natural gas will be the preferred option, when excluding other alternative sources of energy.

The Russian natural gas and a bulk of oil are transported to the EU via pipelines going through Eastern European transit countries, namely Belarus and Ukraine. The

[8] Reserves-to-production (R/P) ratio – *If the reserves remaining at the end of any year are divided by the production in that year, the result is the length of time that those remaining reserves would last if production were to continue at that rate* (BP 2007).

problem with these transit routes, especially the ones that go through Ukraine, is that the infrastructure is old and needs investments to maintain the current levels of supplies. Also, instead of being controlled by market forces, they are operated by state-owned companies; Beltransgaz and Naftogaz Ukrainy. (IEA 2004a, 378)

The northern natural gas pipeline in figure 15, Yamal-Europe (4 196 km), which goes through Belarus, carries some 20 % of the Russian gas exports to the EU. It is the only Russian export pipeline heading for the EU-27 countries that does not go through Ukraine. The main market for the natural gas flowing in the Yamal-Europe besides Belarus is Germany. Almost 80 % of Russian exports to the EU go through Ukraine. The supplies through the Brotherhood pipeline (2 750 km), which is the Southern one starting from Yamal-Nenets region, have been the heart of Russia-Ukraine disputes, which served as a wake-up call for the EU and its energy security. The pipeline connects Russia to Ukraine, Slovakia and Western Europe and its supplies stand for 25 % of the consumption in the Western Europe. The Northern Lights pipeline (4 500 km) joins the Brotherhood in Ukraine and brings a third of the gas destined for Europe to the Brotherhood. The Blue Stream pipeline (1250 km) between Russia and Turkey bypasses Ukraine and Belarus and gives Russia straight access to Turkish market. It is built at the bottom of the Black Sea, similarly to the proposed Nord Stream pipeline from Vyborg to Greifswald. (Borisocheva 2007, 7–8)

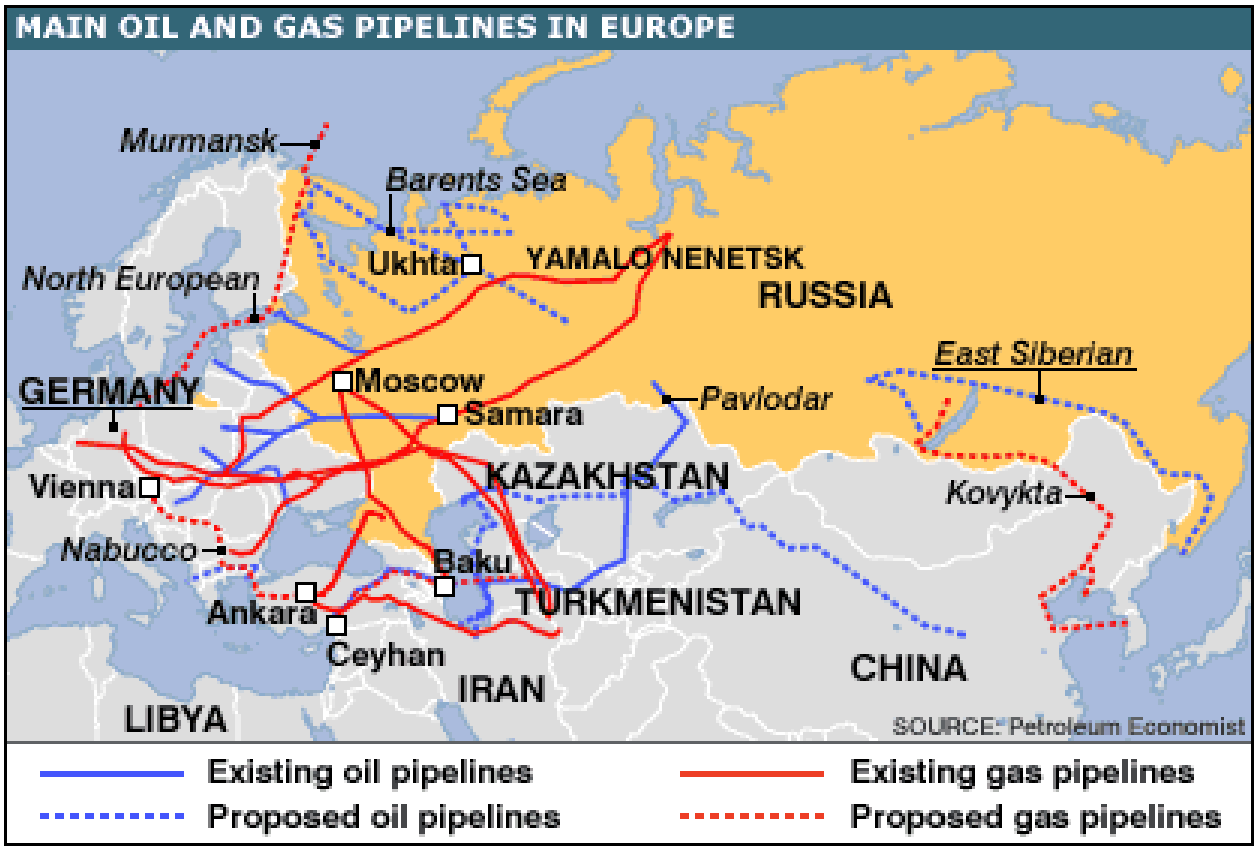

Figure 15 Main oil and gas pipelines in Europe (BBC 2008[9])

The world's longest oil pipeline Druzhba, Friendship, begins from Samara in Southeastern Russia and collects oil from the Urals, Caspian Sea and Western Siberia. It is divided in southern Belarus to the northern Druzhba I and southern Druzhba II. Another split is in the Russian territory and the southern branch heads to the Ukrainian city Odessa by the Black Sea. Built already in 1964, it is in dire need of renovation as it has been working on full capacity for some time now. (Borisocheva 2007, 5) Druzhba accounts for one third of Russia's total exports of crude oil (EIA 2008). The Baltic Pipeline System (BPS) carries oil from West-Siberia, Timan–Pechora and Ural-Povoljye regions to the Baltic Sea to Primorsk Port. It was completed in 2001 and supplies among others the Nordic European Countries. Because the pipeline never leaves Russian territory, Russia is spared from the problems with the transit countries because of maritime transports from Primorsk. (Borisocheva 2007, 6)

The Nord Stream pipeline project would somewhat change the balance in the natural gas supplies to the EU. Pipeline's route from Vyborg to Greifswald across the Baltic Sea bypasses all the Baltic States and Poland allowing Russia supply the German market without any transit countries (Nord Stream 2008). So far, all the supply

[9] Original source The Petroleum Economist 2008

disruptions have occurred due to problems with the current transit countries. The avoidance of transit countries has been seen as a factor for building the pipeline (IEA 2004a, 378). Nord Stream would serve natural gas besides Germany to Denmark, the UK, the Netherlands, Belgium, France, the Czech Republic and other countries. Once again, Gazprom is in control of the project with 51 %. E.ON Ruhrgas has 20 %, BASF/Wintershall 20 % and N.V. Nederlandse Gasunie 9 %. By 2015, Nord Stream should cover 11 % of the EU-27 imports of natural gas. (Nord Stream 2008)

Other significant natural gas pipeline project is Nabucco. It would bring Central-Asian natural gas from eastern Turkey to the EU, bypassing Russia. Nabucco is planned to be connected to the Trans-Caspian Gas Pipeline, which is to supply natural gas mainly from Turkmenistan and Azerbaijan and also eventually from Uzbekistan and Kazakhstan to the European markets. (Borisocheva 2007, 14) Nabucco was to diversify the EU's energy supplies and thus partly reduce the dependence on Russian supplies. Gazprom acted quickly and managed to sign a contract with Turkmenistan and Kazakhstan. Gazprom's pipelines will transport all of the two countries exports in the near future. Currently there are doubts if Nabucco will be built at all because of insufficient supplies. (Turkki pelaa energiapeliä.. Tekniikka & Talous 2007) Feller (2007, 90) described the situation quite accurately by stating that "*Gazprom has convincingly outmaneuvered the EU*".

The Russian state-owned pipeline company Transneft has designed a pipeline to reach the Asian customers. The Eastern Siberia-Pacific Ocean pipeline is to be built in two parts; the first part from Taishet, West from Lake Baikal, to Skovorodino, which is just north of the Chinese border. Eventually, the pipeline should head for the Pacific Coast to an export terminal at Kozmino Bay. (Stone 2007) The problem with the project is that it is questionable whether there are enough supplies for the pipeline. The Eastern Siberian oil resources seem to amount to only half of what was originally planned. The plan now is to borrow oil from the Western Siberian production sites, adding some 2000 kilometers to the pipeline, and thus raising the production costs of a barrel considerably. (Aron 2006)

4.2 The future of the natural gas and oil supplies to the EU-27 countries

There are three issues that rise above others in the natural gas and oil supplies from Russia to the EU. Firstly, the EU needs energy imports. More importantly, it will need them increasingly in the future. Secondly, Russia's economy is very dependent on income from energy exports. Thirdly, Russia's future capability in fulfilling its production and export obligations is questionable. By simple deduction, the first and the

second issue can be combined to state that the EU and Russia have a mutual need for each other. The third issue can be seen as very problematic for both parties.

The total import dependency for the EU for all energy products is 52,3 %. Natural gas and oil cover 2/3 of the EU's primary energy needs. Currently, 41 % of the natural gas consumed in the EU region is imported from Russia. In oil, 32 % is imported from Russia. (Eurostat 2008) The EU can be stated to be dependent on Russian natural gas and oil exports. There are only limited resources of natural gas and oil in the world, as both of them are fossil fuels. So how do the vast Russian resources do against the other suppliers of the EU and also in world comparison? The following table presents the reserves to production ratios of oil and gas for a few selected countries.

Table 7 Reserves to production ratios of natural gas and oil in selected countries (BP 2007)

Country	R/P ratio of natural gas	Share of total natural gas production in 2006	R/P ratio of oil	Share of total oil production in 2006
Russia	77,8	26,30 %	22,3	6,60 %
Norway	33	1,60 %	8,4	0,70 %
Saudi-Arabia	96	3,90 %	66,7	21,90 %
Libya	88,9	0,70 %	61,9	3,40 %
Iran	> 100	15,50 %	86,7	11,40 %
Algeria	53,3	2,50 %	16,8	1,00 %
Iraq	> 100	1,70 %	> 100	9,50 %
Kuwait	> 100	1,00 %	> 100	8,40 %
United Arab Emirates	> 100	3,30 %	90,2	8,10 %
Qatar	> 100	14,00 %	36,8	1,30 %
Nigeria	> 100	2,90 %	40,3	3,00 %
USA	11,3	3,30 %	11,9	2,50 %
Kazakhstan	> 100	1,70 %	76,5	3,30 %
Azerbaijan	> 100	0,70 %	29,3	0,60 %
Turkmenistan	46	1,60 %	9,2	< 0,05 %
Uzbekistan	33,7	1,00 %	13	< 0,05 %

82 % of total the EU-27 natural gas imports come from Russia, Norway and Algeria (Eurostat 2007, 28). Currently it seems that Russia will in the course of time compensate for Norway's declining output, because of the lack of alternatives. If the EU wishes to diversify its natural gas suppliers, in order not to allow the Russian share grow even further, the way to go is either south to Africa or east to the Caspian region and of course to the countries of Middle East and Arabian peninsula. About ¾ of the EU-27 oil imports come from Russia, Norway, Saudi-Arabia, Libya and Iran (Eurostat 2007, 26). In a not too distant future, the EU has to come up with a way to increase the oil imports from Middle East and the Arabian Peninsula. As was mentioned before in

chapter 3.2, the true Russian oil resources might be considerably larger than the figures presented above. So, Russia could possibly supply the EU for more than a few decades. What goes for all the resources mentioned in the table above is that there will surely be more than enough buyers for these resources and there will be a fierce global competition. Besides Russia, the EU should start building trade relations with new suppliers in order to secure long-term supply of natural gas and oil to buy more time for developing alternative sources of energy, such as renewable energy sources.

The share of energy resources in Russia's export of goods was 61,1 % in 2006 and the share has since grown (World Bank 2006, 24). To manage the windfall in energy export revenues, the Russian government set up a stabilization fund in 2004. By the end of January 2008, it was worth $157 billion (Russian Finance Ministry.. RIA Novosti 2008). It has been calculated that a one dollar per barrel increase in the Urals blend price for a year would raise the federal tax revenues by 0,4 % (Spilimbergo 2005, 7). This calculation was based on barrel prices of only $24 or higher and the average price for Urals blend in 2007 was $69,68 a barrel (Lukoil 2007 profits.. Bloomberg 2008).

Over 70 % of the Russian oil production is exported (EIA 2008) and 55 % of the exports go to the seven biggest EU-27 customers (Eurostat 2007, 27). 32 % of the produced natural gas in Russia is exported (EIA 2008) and almost half of this goes to its seven biggest EU-27 customers (Eurostat 2007, 29). The numbers prove that natural gas and oil export revenues are very important to the Russian Federation. Because the European market is so lucrative, Feller (2007, 92) states that it is hard to see what political goals would compensate for not selling natural gas there.

It is not only due to political reasons, why the natural gas and oil exports to Europe could be in danger. Goldthau (2008) has perhaps quite accurately perceived the need to redirect the public awareness from Russia's geo-strategical exercises to the real underlying issues; markets and investments. By markets, he means Russia's domestic energy prices, which are heavily subsidized and should be allowed to rise to market levels. Low cost energy does not encourage energy efficiency and Russia is currently one of the biggest wasters of energy in the world. Investments are needed in the Russian energy sector, because Russia will not likely be able to keep up with current production levels unless significant new investments are made to new resource sites. Besides production, Gelb (2006, 3–4) has discovered another bottleneck in Russia's capability to fulfil its domestic supply and export duties. The state-owned pipeline company Transneft has not been able to develop the pipeline system to keep up with the oil production growth (which actually hasn't grown since 2004) and more and more oil is exported by more expensive means, such as via rail and river routes.

According to Russian government, the oil industry needs investments up to $250 billion by 2020. A quarter of this ($62,5 billion) should come from foreign investors. The problem lies in the investment climate. After the Khodorkovsky case, the incidents

at Sakhalin and now TNK-BP being forced out of the Kovytka field have certainly discouraged foreign oil companies in entering the Russian markets. (Janssen 2005) Janssen (2005) summarizes the greatest challenges for the future oil growth in Russia to be the confusion about the amount of reserves, investment climate, limited export capability and that the growing control of the state could become counter-productive. In the natural gas production, the only production growth we have seen since 2000 is from the independent producers (Feller 2007, 90). The future natural gas production sites in Russia, as well as oil, are located in areas with extremely harsh conditions and production costs will be considerable higher than in the currently producing areas.

It was suggested already in 2002 that the EU-Russian partnership should start with energy cooperation, because the EU is Russia's main trade-partner, investor and buyer of Russia's natural gas and oil. Also the oil and gas pipeline network is already towards west and the European energy companies have the capability to take part in the unavoidable massive energy infrastructure projects in Russia. (Liuhto 2002, 26) The executive director of International Energy Agency, Claude Mandil, sees a counter-balance between the growing European natural gas and oil imports from Russia and the Russian reliance on natural gas and oil revenues. The only way to an energy-secure future for both parties is in market reforms and competition as the Eurasian markets are integrating (IEA 2005). A very important point made by Tiusanen and Keim (2006, 30) is that the EU has plenty of know-how in energy saving methods and it would be in mutual interests to cut down Russia's energy intensity. This would allow Russia to sell more natural gas and oil to the EU and the EU could enjoy from Russian supplies for a longer time. All in all, it is safe to conclude that the business basis for the energy trade between Russia and the EU is solid. Both parties complement each other in both current and also future needs. But in energy trade, politics is often mixed with business.

It was presented above that Russia and the EU need each other and could benefit from each other more than they currently do. Russia's recent cut-offs of both natural gas and oil supplies to Ukraine and Belarus have somewhat changed the attitude towards Russia. Russia has been said to be an aggressive power that does not share the EU's values (EIU 2007, 18). The actions of Gazprom have also been perceived differently. Goldthau (2008, 690) states that the natural gas supply cut-offs are not that much a part of Kremlin's geopolitics, but rather Gazprom has to compensate for a loss-generating domestic market and thus the demanded price increases are justified. Russia is merely looking after itself (Feller 2007, 90). Anyhow, the relations between Russia and the EU have never been this tense.

So how should the EU manage its relations with Russia? For many experts, a united front is the answer. The EU should act as a single unit and speak with a single voice. The bilateral relations of a single EU country with Russia should never challenge the common policy, but only aid it (Liuhto 2008). Because the EU wants to have a common

foreign policy, the dealing with Russia is seen as the EU's toughest challenge (EIU 2007, 18). So far, the challenge has not been met and the dialogue with Russia remains on a very abstract level (Tiusanen and Keim 2006, 26). The Nord Stream pipeline is basically a project involving Russia and mainly Germany and to some extent the other countries that are destined to be supplied with gas from the pipeline. The EU countries with the most difficult relations with Russia at the moment, the Baltic States and Poland, were completely bypassed in the project and this has caused internal problems within the EU (Liuhto 2008). With all the talk about the EU's united front, also France signed a bilateral deal with Gazprom for 30 years and after this, so did Hungary and Bulgaria (Feller 2007, 91). Although Russia has not been very keen on signing a new legal framework to govern the EU-Russia relations, it should be sought after and it would reduce incentives for bilateral contracts between a single EU country and Russia (EIU 2007,19). But the EU doesn't have the luxury of giving ultimatums to Russia, because of the risks associated. There would be no way for the EU to find alternative sources of energy if the supplies from Russia ceased. As Feller (2007, 91) puts it: "*Diversification is worthy goal, but not if it leads to scarcity of supplies"*. The EU should diversify its suppliers to some extent and also seek substitution for other sources of energy, not least of all because of the uncertainty of Russia's capability to supply the EU in the future.

To conclude, because of Russia's and the EU's clear need for each other and because Russia has been somewhat assertive towards the EU lately, the EU has to act in unison, but at the same time it should seek ways to make itself important to Russia. Although the income from oil and gas is binding the EU to Russia, it is not enough. Investments from Russia to the EU and vice versa should be encouraged. The EU's know-how in energy saving methods could be the starting point.

5 SUPPLIER OBSTRUCTIONISM FRAMEWORK IN THE EU-27 – RUSSIA NATURAL GAS AND OIL SUPPLIES CONTEXT

In this chapter the components of the Supplier obstructionism framework will be redefined and applied to the context of this research to conceptualize the situation. The numbers, statistics and opinions presented earlier are put into use in the theoretical context introduced in chapter 2. The conceptual approach is used to describe and illustrate the Russian energy supplies to the EU-27 countries at a practical level.

First in chapter 5.1, the original descriptions (Flynn & Flynn 2003) for the different components of the framework are stated. After this, the components are redefined in the context of this study and also future implications for the EU are stated. The new relations of the redefined components will be illustrated in chapter 5.2.

5.1 The components of Supplier obstructionism framework in the context of this research

Table 8 summarizes the conceptualizations of the different components of the Supplier obstructionism framework in the EU–Russia natural gas and oil trade context and also states the future implications for the EU. More comprehensive descriptions for each component are presented after the table.

Table 8 Summary of the redefined components of the Supplier obstructionism framework

Component of the Supplier obstructionism framework	**Redefinition in the context of this research**	**Future implications for the EU**
External uncertainty	Uncertainty about Russia's true hydrocarbon resources and future production capability, Russia's disagreements with the transit countries.	Mutual investment projects of both the EU and Russian energy companies in each other's domestic markets, transparency for the whole supply chain.
Internal uncertainty	Unclear motives behind Russia's punitive actions.	A new legal framework to govern the EU-Russia relations.
Dependence on suppliers	Russia the biggest supplier of natural gas and oil to the EU-27 countries.	The need for a united EU to diversify suppliers and also sources of energy.
Punitive capability	The supply cut-offs to Ukraine and Belarus.	A new legal framework, encouragement for long-term transit agreements.
Investments on transaction-specific assets	Pipeline systems in the transit countries, Russia's investments on its own pipeline system.	New pipeline projects, mutual EU-Russia investment on transaction-specific assets.
Scarce resources	Russia very rich in globally scarce natural gas and oil.	Untangling the true Russian natural gas and oil resources, tackling the Russian energy efficiency.
Opportunism	The assumption and fear of Russia's opportunism, the supply cut-offs.	Creating transparency for the whole supply chain; reducing the speculation.
Supplier power	Russia's possession of scarce resources, its punitive capability and the EU dependence on Russian supplies.	Reducing the dependence on Russian supplies by diversification.
Supplier obstructionism	Russia's punitive actions viewed as foreign policy to gain political leverage.	All the above.

External uncertainty was the buyer's inability to obtain information about the schedules and capabilities of the supplier. There is considerable disagreement with the true remaining natural gas and especially oil resources of Russia. Partly because of the true resources are not either revealed or known, the EU has difficulties in planning its future supplies. The question of how long can Russia supply the EU is indeed very relevant and currently unclear. Besides the uncertainty about the true remaining resources, Russia's capability to keep producing even the current amounts of natural gas and oil can be questioned. So far, Russia has failed to invest enough in new production areas. Because the future production areas in Russia are situated in harsh conditions, the production costs will be considerably higher compared to the current costs. Russia might be tempted to put the increased costs on top of the current price and without the possibility to obtain the resources elsewhere; the EU has to comply with the price. Another way external uncertainty appears in this context is in the recent supply disruptions. The latest spat of early 2008 between Russia and Ukraine is a good example of this. Russia reduced the supplies to Ukraine due to another dispute over unpaid gas bills. This time the supplies to the EU were not reduced, but Ukraine threatened to reduce them in order to secure its own energy needs. The EU has very few weapons to deal with the recurrent disagreements Russia has with the transit countries.

To reduce the external uncertainty, the EU could aim to get Western energy companies to take part in the Russian energy projects in greater extent. So far, only a few European-Russian projects are underway in Russian soil. In return, the EU might have to let Russian energy companies, mainly Gazprom, enter the European downstream markets and thus give Russia more power in the EU market. But if Gazprom was allowed to participate in investment projects within the EU area, without allowing Gazprom to get a too dominant position, it would also give Gazprom economical incentives to keep on operating in the west. This would be a way to decrease the chance of the worst outcome of all; the redirection of energy supplies to east. The investment climate in the Russian energy sector is to some extent dubious. But if the Western and Russian energy companies could participate in common projects in each other's domestic markets, they would have mutual interests and the continuation of business would have a steady basis. The EU could partly also enhance the diminishing Russian production levels by providing capital for the much needed investment to new producing areas. To reduce the various disputes between Russia and the transit countries, the EU could encourage Russia and the transit countries to develop transparent, long-term transit agreements to create stability. The means to reduce external uncertainty is closely linked to the concept of transaction-specific investments, which is discussed later in this chapter.

Internal uncertainty related to Supplier obstructionism if the supplier abuses the difficulty to distinguish the difference between for example unintentional and

intentional delays in supplies. Again, the supply reductions to the transit countries can be viewed as a reason for internal uncertainty. During the several disputes, Russia has been in a position to accuse the transit countries of stealing its natural gas and oil and blaming them for the supply disruptions to the EU. It remains unclear, whether Russia's punitive actions were purely business decisions or were politics involved. And more importantly, if this was a part of Russia's foreign policy, was it carried out to straighten out the transit countries or to show the EU and the rest of the world that Russia should be taken seriously again. It has to be said that Russia has little business reasons to cut the supplies to the EU because of their critical financial significance to the Russian state.

A new legal framework to govern the EU-Russia relations could be signed. A comprehensive guideline for the natural gas and oil supply security should be added to the framework. But as long as the EU cannot put up a united front in its relations towards Russia, there is little reason for Russia to sign any kind of agreement, as it apparently gets more benefits by maintaining bilateral relations with individual member states.

Dependence on suppliers was related to supplier obstructionism, when there are only a few suppliers. With only a few possible suppliers, the supplier is more likely to act obstructively. Russia is the biggest supplier of both natural gas and oil to the EU (41 and 32 % respectively of total imports) and in total, only a handful of countries are responsible for the bulk of the EU's imports. Norway's reserves will become depleted before Russia's, so currently it seems that Russia's share of the EU's natural gas and oil imports will become even greater. Even though the EU hopes to diversify its suppliers, it takes a lot of time and money, because of the infrastructural requirements of transportation. This is especially the case with natural gas, which can currently be supplied in great amounts only via pipelines, because of the lack of available LNG supplies.

The EU could seek to diversify both its primary energy mix and also its suppliers. Currently some 2/3's of the EU's primary energy consumption is natural gas and oil. Although the use of renewable energy sources has increased considerably during the last years, they still only cover about 7 % of the total primary energy consumption. More and more attention should be paid to research and development of viable renewable energy sources, because the world will eventually run out of fossil fuels. If the EU was to diversify its energy suppliers, it has to do it discreetly. Gazprom has already aggressively defended its position, as it signed the deals for natural gas from the Caucasus and Caspian regions before the EU managed to do that. Now there seems to be no sufficient supplies available for the planned Nabucco pipeline, which would bypass Russian territory and thus diversify the EU's suppliers. So, when supplier

diversification is considered, the EU firstly has to act in unison and secondly, should not do it at great cost to Russia.

Punitive capability was the basis of the relationship between supplier power and supplier obstructionism. Russia has demonstrated its punitive capability several times now by reducing the supplies to the transit countries due to price disputes and unpaid debts. Because of energy's vital and strategic nature, no country without own resources can endure a situation long where its supplies are held-up by its biggest supplier. If the EU were to face hold-up situation of Russian natural gas and oil supplies, it could not operate for very long at full capacity.

The legal framework for the EU-Russia relations should prevent Russia from cutting of supplies. Measures for a more transparent and simple natural gas and oil transit should be sought after and encouraged by the EU. Long-term agreements between Russia and the transit countries would benefit all parties. Because of Russia's importance to the EU, any means necessary should be taken to prevent Russia from reducing its supplies to west.

Investments on transaction-specific assets were seen as a result of supplier power, dependence on suppliers and external uncertainty. In the context of this study, transaction specific assets can be seen as preconditions for the supplies, because of the products' special nature and form. The majority of the pipelines that carry the natural gas and oil supplies from Ukraine and Belarus to the EU-27 countries date back to the days of Soviet Union. The pipeline system can be viewed as a transaction-specific asset. The pipelines exist only to deliver gas or oil. If the Russian supplies were directed away from Europe and no supplies would go through the pipelines, they would only be worth the scrap metal they were made of, because they cannot be redirected by any economically viable way. So, the pipelines are dedicated to these transactions only. Russia has also invested in pipelines that are located within its own borders. It has refurbished the existing pipelines and built new ones from the producing regions to supply the European market. It has economical interests to keep on utilizing the pipelines, because of the investments made. So it is in Russia's interest to keep on supplying Europe. Also, because all of Gazprom's profits come from the European market, it is dependent on the supplies going through the pipelines that run through the transit countries.

The pipeline network supplying the EU with Russian natural gas and oil through transit countries has become a bit of a headache for Russia. Much of its oil supplies to Northern Europe are now being transported across the Baltic Sea from the Primorsk port, thus bypassing the transit countries and allowing a direct access to the big EU customers. The new Nord Stream natural gas pipeline is planned to travel on the bottom of the Baltic Sea from Vyborg to Greifswald, Germany. The positive aspect is that the EU would get more natural gas supplies. The downside can be seen as the EU once

again not acting in unison, as Poland and the Baltic States were completely bypassed in the project despite their protests. By building the new pipeline, Russia would furthermore have economic interests to carry on supplying the EU. The problem lies in the nature of the project. It brings countries such as Germany and the Netherlands closer to Russia, but in the same time the Baltic States and Poland are diverged from Russia and the participating EU countries as well. The already proposed means to reduce external uncertainty also apply here. By mutual investment projects on transaction-specific assets, shared bilateral interests should keep the business running.

Scarce resources were seen as a possible reason for supplier power, as the scarcer the resources are, the more the supplier has power. Scarce resources, in this case natural gas and oil, can be seen as the driving force behind the whole of the research. The fossil fuels will run out in the future and are becoming scarcer day-by-day, also further underlining their importance because currently there is no alternative technology that could be used in the scale of natural gas and oil. Russia possesses very scarce resources; the kind of resources the EU does not have and is in need of, basically giving more supplier power to Russia. The majority of the remaining natural gas and oil resources in the world are spread very unevenly and Russia has control over a big part of them. It has the greatest natural gas resources in the world and the seventh largest oil resources. Especially the oil resources can be much more substantial, as there is great uncertainty about the true extent of them.

The EU has very limited or no influence on the scarcity of natural gas and oil. The true remaining exploitable Russian oil resources should be found out, for the EU to be able to plan its future sources of oil. If the Russian R/P ratio for oil is truly 22 years, the EU should quickly seek alternative oil suppliers to cover for Russia's possibly declining share. Because the fossil fuels are exhaustible resources, they should be used wisely. Russia has a lot to improve in energy efficiency and the EU has plenty of knowledge on how to improve it, so cooperation would be desirable for both parties.

Opportunism was described as varying from subtle forms of deceit to blatant forms such as lying, stealing and cheating and was related to the manifestation of punitive actions. Someone might call Russia's natural gas and oil cut-offs opportunism, someone else pure business decisions. In any case, the assumption of Russia's opportunism looms behind all the time. It is feared in the EU that Russia might threat to cut-off supplies to the EU for to gain political leverage. It seems that the threat of it, the assumption of Russia's possible opportunism has frightened the EU. Russia has been the EU-27's most important, and reliable, energy supplier for long, but the recent supply disruptions have made the EU question this.

The fear of Russia's opportunism has strengthened since the first supply disruptions. The supply flow from Russia to the EU markets should be made as transparent as possible, to reduce the unnecessary speculation. Talks about Russia's new kind of

aggressive foreign policy might actually divert the discussion from the real underlying issues which should be discussed; the need for market change in Russia and the dire need for investments in the Russian energy sector.

Supplier power was described to be a direct result of internal uncertainty and dependence on suppliers and its relation to supplier obstructionism is based on the punitive capability the supplier has combined with the assumption of opportunism. In this context, Russia's supplier power can be seen to derive from the scarce resources it possesses and thus from the dependence the EU has on the Russian natural gas and oil supplies. Because the scarce resources, natural gas and oil, are so essential for the people of the world, it further emphasizes their importance and thus the supplier power of Russia. Because Russia needs to use the pipelines going through the transit countries, these transaction specific assets can be seen to decrease Russia's supplier power because of the limited control it has on them.

The EU could reduce Russia's supplier power in same ways it could reduce the dependence on Russia. By diversifying both the primary energy mix to reduce the share of natural gas and oil and also by diversifying suppliers to some extent to reduce the dependence on supplies from Russia, the EU could reduce Russia's supplier power.

Supplier obstructionism had six direct antecedents; supplier power, dependence on suppliers, transaction-specific assets, internal uncertainty, external uncertainty and organization. As a supplier's power increases in the assumption of opportunism, it may be more tempted to use its punitive capability and thus act obstructively. Depending how one looks at Russia's behavior, one might see it acting obstructively. If its supply cut-offs are considered as foreign policy to gain political leverage, as opportunism, one might say Russia is practicing Supplier obstructionism.

5.2 The new Supplier obstructionism framework

The components of the Supplier obstructionism theory were redefined to fit the context of this study in the previous subchapter. The relations of components are demonstrated in the figure 16.

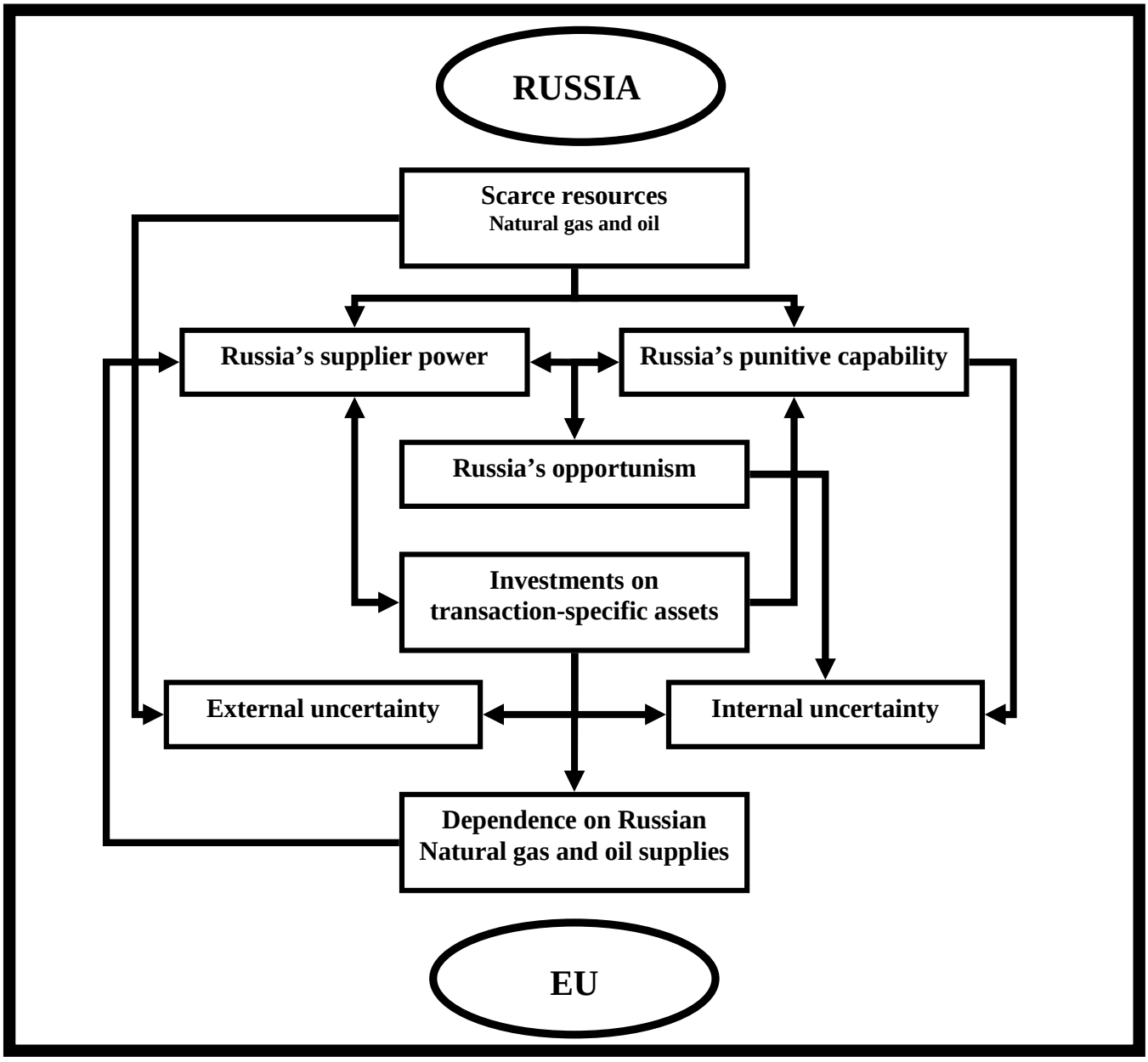

Figure 16 The redefined components of the Supplier obstructionism framework in relation to each other

In the figure, the relations between the components are illustrated with arrows. The relations between the components are very different from the original ones hypothesized by Flynn & Flynn (2003) and were presented in figure 2. The dominant force of the framework are the scarce resources Russia possesses and the EU does not; natural gas and oil. Because of their strategic nature, they give Russia supplier power and thus also punitive capability. Also contributing to Russia's supplier power is the EU's dependence on Russian natural gas and oil supplies. Scarce resources also create external uncertainty for the EU because Russia's true remaining resources are not

entirely known and its future production capability can be questioned. Russia's punitive capability and the fact that it has had the boldness to use it increase Russia's supplier power. Punitive capability combined to the assumption of opportunism are affecting each other. It is debatable whether Russia's punitive actions can be seen as opportunistic behavior or for example just trying to get a fair price from its customers. Much because of same reasons is Russia's punitive capability indirectly the cause for the EU's internal uncertainty.

Transaction specific assets and investments on them are greatly a necessity for the supplies. Russia would be unable to supply and the EU would be unable to purchase the amounts of oil and especially natural gas it needs without the existence of the transaction-specific assets; the pipeline networks. So, the pipeline system increases the EU's dependence on Russian natural gas and oil supplies. This is where the new framework largely contradicts with Flynn & Flynn's (2003) hypotheses. According to them, investments on transaction specific assets are a result of supplier power, dependence on suppliers and external uncertainty, which is hardly the case here. As was mentioned, the transaction specific assets have to be there because they enable the transactions. The pipeline system is not a result, but rather a prerequisite. Here the pipeline system partly gives Russia supplier power and also EU's dependence on Russian supplies is closely linked to the pipelines, as there is no easy way to get supplies from other suppliers because of the huge infrastructural requirements of natural gas and oil transportation. Because Russia does not control the whole of the pipeline system, it also actually partly decreases its supplier power as it only has limited control over the system. Also the investments Russia has made on the pipelines on its own territory provide incentives to carry on supplying Europe, also decreasing its supplier power. On the other hand, the part of the pipeline system that is on the Russian territory gives Russia the punitive capability, because it has complete control of the supplies in its own territory and can cut the supplies before the borders of the transit countries. This can also be viewed as increasing Russia's supplier power. When considering the planned Nord Stream pipeline, the dynamics remain the same, although a bit changed in their relations. Both Russia's supplier power increases because of the lack of transit countries and also EU's dependence becomes even more highlighted due to the increased Russian share of the total EU supplies. But Russia also has to finance the investment it has made with future cash flow from the natural gas sales via the pipeline and this again creates incentives to keep the supplies steady in the future. As European companies also invest in the pipeline, they share the same need for future business.

Transaction-specific assets create both internal and external uncertainty. The fact that it has been nearly impossible to trace the real underlying problems between Russia and the transit countries has caused a lot of internal uncertainty in the EU. Because the supplies have been more than once disrupted because of reasons largely beyond the

EU’s control, the pipeline network and thus the transaction-specific assets can also cause external uncertainty. The Nord Stream pipeline would clear some of the uncertainty because of the lack of the transit countries.

Supplier obstructionism in the context of the natural gas and oil supplies from Russia to EU can be seen as the negative outcome of all the components of the framework, mainly from EU’s point of view but also from Russia’s, because of its dependence on the EU. This would be when Russia would use opportunistically its supplier power gained from the scarce resources, punitive capability and control over the transaction-specific assets in the presence of both internal and external uncertainty. Whether this has already happened, is left for the research of other sciences.

6 CONCLUSIONS AND SUMMARY

In this chapter, the major findings of the research will be concluded. The purpose of this study was to describe and thus understand the natural gas and oil supply flow from Russia to the EU-27 countries from a Supplier obstructionism perspective. The research problem was divided in to three sub-objectives. The first one was to describe Russian natural gas and oil reserves, production and exports. The second one was to describe the European Union's use of natural gas and oil of Russian origin. The final sub-objective of the research was to conceptualize the elements of the natural gas and oil supply flow from Russia to the EU-27 countries using the Supplier Obstructionism framework.

In the relation between the European Union and Russia, the most important issues concern energy, namely natural gas and oil. Russia has been considered as a reliable supplier of natural gas and oil, but due to several incidents in the past few years, Russia's reputation as a reliable supplier has suffered. As was mentioned, the goal in this research was to gather all the relevant information together to better describe the supply flow. The three sub-objectives combined together answer the research problem and the main findings are presented in the same order.

Russia is one of the richest countries in the world measured in natural resources. It has a quarter of the natural gas reserves of the world and the seventh largest resources of oil. It is also the largest natural gas and the second largest oil producer and exporter in the world. The Russian energy sector has become increasingly state-owned lately. The state-owned Gazprom virtually controls the whole natural gas business in Russia and the state owns directly a quarter of the oil sector. The resources in the easily accessible natural gas and oil regions have almost been depleted. Future productions areas are situated in tough conditions and huge investments are needed. So far, the energy companies have failed to invest enough and there is great concern whether Russia can keep up with the current production levels for long. The true remaining resources are also unclear, further emphasizing the unclarity of the future. The EU is the most important export destination for Russian natural gas and oil. The Russian economy is very dependent on energy export revenues and because the bulk of Russia's energy exports go to the EU, Russia can be stated to be dependent on the EU.

Natural gas and oil account for 2/3's of the EU primary energy needs, oil covering 37 % and natural gas 25 %. The share of natural gas is growing rapidly and it is gaining on oil every year. The EU has very limited natural gas and oil resources and its consumption is growing all the time. It is very dependent on energy imports and Russia is by far the most important supplier. 41 % of the imported natural gas and 32 % of the imported oil are of Russian origin. Russia's share is expected to grow even further, because Norway's, which is the second largest supplier of natural gas and oil to the EU,

reserves are becoming depleted in the near future. All of the Russian natural gas and much of Russian oil travels from the producing regions to the EU via pipelines. The biggest pipelines arrive to the EU's territory from Ukraine and Belarus. Russia has had numerous disputes with the transit countries because of transit prices, unpaid debts and Russia has also tried to raise the price of natural gas and oil destined for these countries to world market price. The pipeline network in the transit countries is in need of large investments, as they are already often operating at full capacity. Because of the transit problems, Russia has sought after alternative routes to supply the European countries without any transit problems. Much of the oil shipments now travel across the Baltic Sea from the new Primorsk port. The planned Nord Stream pipeline travelling in the bottom of the Baltic Sea would directly supply natural gas to German market among others.

The EU wants to diversify its natural gas and oil suppliers, in order to reduce the dependence on Russia. But because Russia needs the income from the European market, it has tried to prevent this. Often politics is involved in the Russian energy exports and this is considered a problem. The greatest problem might however be in the subsidized Russian domestic energy prices and in the lack of needed investments made in Russia. The low domestic prices discouraging energy efficiency and the declining production rates might lead to insufficient supplies. The state-owned companies will supply primarily the domestic market, so exports are the first ones to decline. Foreign knowledge and capital are needed in the Russian energy sector, but the investment climate is suboptimal because of numerous state interventions.

In order for the EU to secure its supplies from Russia, a new legal framework governing the natural gas and oil supplies is needed. The EU has to act as one to accomplish in this. So far the EU has continuously failed to do this. Even though diversification of suppliers is needed, the EU should better its relations with Russia, because Russia will be its most important energy supplier also in the future. Besides suppliers, also the sources of energy should be diversified and move from fossil fuels to renewable energy sources, because the fossil fuels will eventually run out in the world.

The components of the Supplier obstructionism framework were redefined to fit the context of this study and implications for the future for the EU were given. The main findings were to increase the cooperation between Russia and the EU. A deeper cooperation could possibly solve many of the problems stated above. A united EU combined with a new legal framework and bilateral investment projects could provide security for both of the parties. The redefined components found new relations. The dominant force of the supply flow was found to be the scarce resources; natural gas and oil. Also the transaction-specific investment played a major part in the new relations, much because neither the EU nor Russia has complete control of them. Supplier obstructionism was seen as the negative outcome of all the components. For an energy

secure future, it would be beneficial for both the EU and Russia to dissociate from the obstructionist attitude.

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