

THE FORCED ABOLISHMENT OF THE NORWEGIAN GAS SALES MONOPOLY

A curse or a blessing?

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Abstract

This thesis looks at the effects of the abolishment of the Norwegian gas sales monopoly 'GFU' in 2001. The conflicting interest between Norway as a gas exporting country and the European Union as mainly a gas importing region made the conflict over GFU "the biggest dispute between Norway and the EU since the signing of the EEA agreement". In this thesis, I study the characteristics of the European gas market (with the current ongoing liberalization) and the role of Norway as a gas exporting country. The former gas sales monopoly model is presented with its advantages and disadvantages. Subsequently, I look at the effects of abolishing GFU in terms of gas export price, internal sales, market structure, contractual agreements and resource management. Based on relevant literature, price data and industry sources, I conclude that the 'forced' abolishment of GFU has been largely beneficial for Norway. Firstly, the Norwegian government has managed to retain its control over the resource management of the Norwegian gas reserves. Secondly, an expected oversupply of Norwegian gas to the European market with a resulting lower gas export price has not materialized. Instead, the combination of increased flexibility of gas sales from the Norwegian Continental Shelf and the 'tight' gas market situation in Europe has made Norway able to reap advantages of the abolishment of GFU.

Preface

This paper is written as a part of my Master of Science in Economics and Business Administration at the Norwegian School of Economics and Business Administration. During the last years of my studies, I have experienced an increased interest in energy markets. Firstly, the oil and gas industry contributes to one quarter of Norway's GDP. Secondly, I have completed two internships in two different international gas companies which gave me the opportunity to learn more about the industry from the inside. Finally, it was my attendance in the classes of 'Energy Finance' at the University of St. Gallen during my 2008 exchange semester that triggered my interest in gas markets specifically.

After doing research on the topic, I learned more about the liberalization efforts of the European Union to change the complex and rigid structure of the European gas market. One issue that caught my attention was the abolishment of the Norwegian gas sales monopoly *Gas Negotiating Committee* (GFU) in 2001 by the Norwegian government after pressure from the European Union. I decided to write my thesis on this topic and see whether this 'forced abolishment' has turned out positive or negative for Norway.

I would like to thank my supervisor Rognvaldur Hannesson for his helpful and concrete advice, and his accessibility throughout the work on this thesis.

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1. Introduction

1.1 Why study the gas market

Exactly 40 years after the first petroleum discovery on the Norwegian Continental Shelf (NCS), Norway's importance in supplying Europe with energy has never been greater. According to the International Energy Agency (IEA, 2008) Norway today supplies 15 percent of all gas consumption in Europe and is likely to increase this share in the years to come. With oil production having already peaked, gas production is increasingly important for the petroleum industry in Norway. Because of the special industry structure in Norway with nearly 25 percent of GDP derived from oil and gas production (Statistics Norway, ssb.no), Norway as an energy exporter has developed divergent interests compared to our economic and political partners in Europe who are mainly energy importers. This has created difficulties for Norway when the EU has crafted legislation to liberalize the gas markets.

The political intervention from the EU to put pressure on Norway to end the gas sales monopoly (GFU) is one prime example of where Norway and EU have had diverging interests. Norway's interest in maintaining high and stable gas prices as a producer has contradicted the EU's interest in low energy prices for gas consumers. The conflict of interest culminated when the EU indirectly forced Norway to abandon its gas sales monopoly. In the biggest dispute between the EU and Norway since the signing of the EEA agreement in 1992, Norway abolished its gas sales monopoly in 2001 without any form for compensation. This act has still been mentioned in Norwegian media by certain politicians as yet another case where the EU with its power through the EEA agreement forces Norway to adapt legislation without any influence from Norway.

The leader of the Norwegian pressure group "No to the EU" Heming Olausen, writes in an article in the newspaper VG in 2008 (seven years after the GFU abolishment) that

*"[...] the Norwegian abandonment of the gas sales monopoly was a yearly billion Norwegian kroner gift to the European Union"*¹ (own translation)

¹ Ikke EU, men EØS-kamp. VG 17.12.08

A prominent member of the ruling Socialist Left Party of Norway, Hallgeir H. Langeland similarly cites unknown critics (three and six years after the GFU abolishment) in two newspaper articles that

“[...] the abolishment of the gas sales monopoly could cost Norway 10 billion NOK yearly”^{2,3} (own translation).

On the other hand, other sources claim that the abolishment of GFU has been beneficial for Norway. ECON Analysis (ECON, 2006), a consultancy, writes four years after the abolishment of GFU that

“[...] abolishing the GFU-FU system appears to have been broadly beneficial and being an early-mover in adapting to reform is, generally, a competitive advantage.”

Exactly eight years have passed since the abolishment of GFU. Literature within the area of EU and the liberalization of the gas market is abundant. At the time of the abolishment of GFU, a range of articles and scientific papers were written on the subject, but in the aftermath, literature that specifically addresses the consequences of the GFU abolishment has been, with a few good exceptions, scarce.

1.2 Research question

Throughout the work with this thesis I have sought to answer the following research question:

Eight years after - has the forced abolishment of GFU been a curse or a blessing for Norway?

The decision to abolish GFU was made entirely by the Norwegian government, but they were clearly pressured from the EU to do so, i.e. Norway was indirectly *forced* by the EU. With Norway, I mean first and foremost the economic activity on the NCS and thus, the Norwegian State and its economy. Has Norway suffered or gained from the abolishment of

² Ut av regjering? Klassekampen 03.07.07

³ Når dogmene koster oss milliarder. Dagens Næringsliv 11.10.04

GFU? Has Norway, as some suggest, been compromised in doing optimal resource management and value maximization of Norwegian gas? Or has Norway benefited from a more competitive business environment, as other suggest?

1.3 Theoretical approach and organization of chapters

The gas market is a theoretically challenging market to analyze. The market structure is complex, making it difficult to draw any causality statements. The market is and has been heavily regulated, and much of the price information in the market is confidential and not open for the public. This thesis is therefore strictly a *non-quantitative analysis* of the changes observed after the abolishment of GFU. The main sources of information for this thesis have been literature on the topic and interviews with relevant persons within the industry, the Norwegian authorities and scholars with specialization in the field. The interviewees have been more than willing to share information on the topic but have expressed interest in that they would not be quoted in this thesis. The list of the interviewees can be found in the appendix.

The organization of this thesis is as follows: The **second chapter** of this thesis discusses the European market for gas, the rigid market structure that has prevailed, and the demand and supply situation for gas in Europe. Furthermore, theory of gas price determination in different market structures, most notably monopoly and competition, is presented. Then introduction to long-term contracts and short term trade is introduced. The **third chapter** is much like the preceding chapter but with focus on Norway as a gas producing country. Special focus is given to the gas sales monopoly GFU with background for the establishment, and pro's and con's for such an organization of the gas sales. **Chapter four** discusses the background for the liberalization efforts of the EU with regard to the gas market. The conflict of interest between Norway and the EU when it comes to GFU is also presented. In **chapter five**, with chapters two, three and four in mind, I analyze whether the abolishment of GFU has been negative or positive for Norway as a gas exporting country whilst looking at developments in contractual agreements and market structure as well as price developments. Finally, I draw a few concluding remarks in **chapter six**.

1.4 Definition

Natural gas is defined by the Encyclopaedia Britannica as: “*colourless, highly flammable gaseous hydrocarbon consisting primarily of methane and ethane. It is a type of petroleum that commonly occurs in association with crude oil [...]*”⁴. Liquefied natural gas (LNG) is natural gas condensed into a liquid by cooling it down to a temperature of -163 ° C, compressed down to 1/600th of the volume of normal natural gas. Wherever the term ‘gas’ is used in this thesis used, it refers to natural gas if not specified otherwise. In this thesis, bcm (billion cubic meters) is the most common measurement of gas.

⁴ <http://www.britannica.com/EBchecked/topic/406163/natural-gas>

2. The European gas market

2.1 Special characteristics of gas markets

Gas markets differ from other commodity markets such as oil for a number of reasons. As Hannesson (1998) puts it: compared to crude oil, gas is bulky, difficult to handle and expensive to transport. Whereas one tonne of oil takes up one cubic meter of space, the equivalent energy content of gas takes up one thousand cubic meters of space. The gas is either transported in pipelines where gas flows from a high-pressure end to a low-pressure end, or in LNG tankers. According to OECD/IEA (1994), LNG transportation is with its high capital cost and low marginal cost, economically superior to offshore pipelines at distances over 1500km and onshore pipelines at distances over 3500km.

The high transportation cost in the gas market has contributed to the fact that there is no world market for gas, but three regional markets with different prices for gas; (i) North America, (ii) Europe including Russia, and (iii) Asia. Although interregional trade with LNG is increasing, it is still not large enough to create one world market price (IEA, 2008). The large geographical imbalance of countries with gas reserves and countries which consume gas makes transportation an important issue. The EU has grown to become a major gas consumer but has low indigenous gas reserves and is thus reliant on gas imports to cover the demand for gas.

2.2 Supply and demand

2.2.1 Demand

Since the discovery of the Groningen gas field in the Netherlands in the late 1950's, the role of gas in the energy mix of European countries has increased considerably. In Europe, gas is mainly used for residential and commercial heating and cooling, and recently as a source of energy for power generation. Growing from 10 percent of the total primary energy supply (TPES) in Europe in 1975, the use of gas has grown to cover 25 percent of the TPES in Europe in 2005 (IEA, 2005). Today, gas is one of the most important sources of energy in Europe, covering one third of the energy needs in the residential and commercial sector in the EU, and close to a third of the energy needs in the industrial sector in the EU.

Germany and Italy are, according to the IEA (2008), the largest gas-consuming countries of the EU with 23 percent and 38 percent respectively, of the TPES being covered by gas. Another important market is the United Kingdom with 35 percent of TPES covered by gas. Eastern European Union Member States such as Hungary, Romania, Slovakia and the Baltic countries have due to their former influence of the Soviet Union, a high TPES of gas close to 40 percent. For Europe as a whole, TPES of gas was 24 percent in 2007 (see figure below).

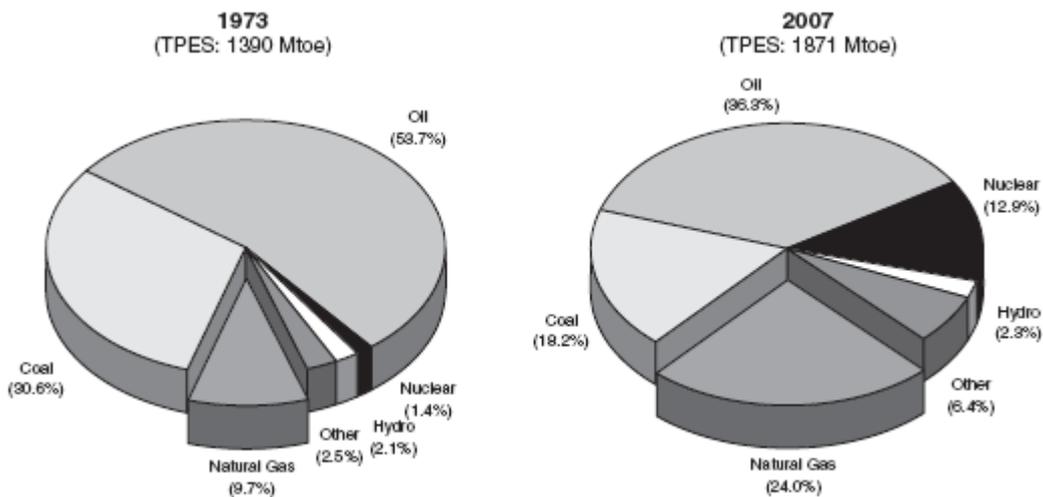


Figure 1: Europe's fuel shares (IEA, 2007)

The increasingly important role of gas as a source in power generation with the introduction of the combined cycle gas turbines has made the IEA (2008) predict that gas will be the second most important source of power behind coal in the EU in 2020. As for now, gas-fired power generators stand for 20 percent of the energy produced in the EU, an increase from just 7 percent in 1990 (IEA, 2008). Gas-fired power generators are favoured by many countries, due to their flexibility in power generating, and economic and environmental efficiency. In addition, the constructions of new nuclear plants and coal-fired power plants have either become politically prohibited or difficult. The relatively lower emissions from the usage of gas compared to other fuels such as oil and coal has also made gas-fired power plants the preferred choice for many European countries.

The demand for natural gas is, in the short-term, quite inelastic. Many end-users do not have an alternative source of energy in the short-term. Additionally, the demand for gas is highly dependent on weather conditions. In countries where gas is used for heating, demand for gas in the winter can be substantially higher than in the summer.

2.2.2 Supply

As previously mentioned, the EU is heavily reliant on imports to meet its demand for gas. The largest domestic producers of gas in the EU are the United Kingdom and the Netherlands with more than 70 percent of the indigenous gas output within the EU (IEA, 2007). The remaining 30 percent comes mainly from countries such as Germany, Italy and Denmark. With declining gas reserves, the indigenous gas production of the EU in 2020 is likely to have decreased by 50 percent compared to the 2004 level (IEA, 2008). The figure below shows a forecast for Europe's increased dependency on gas imports.

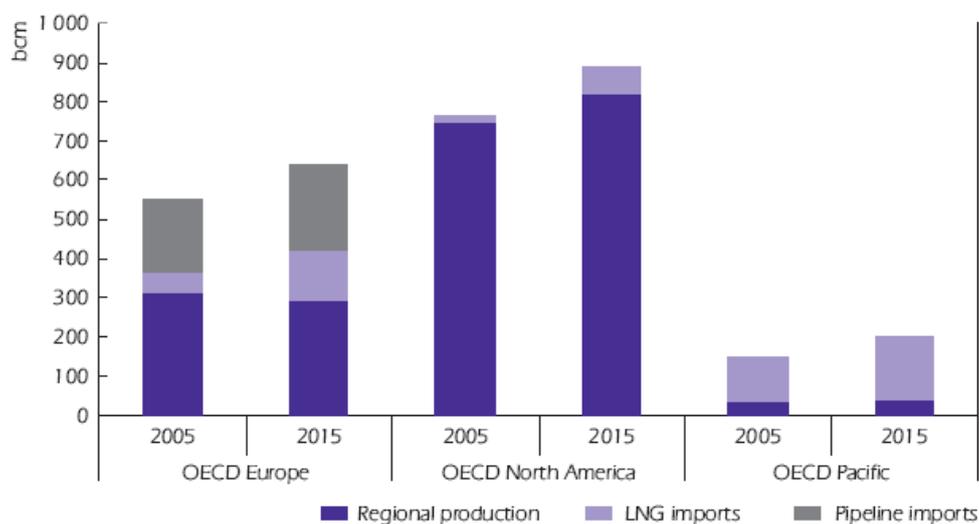


Figure 2 Demand and supply outlook (IEA, 2008)

Today, the EU countries import gas from surrounding countries such as Russia, Norway and Algeria. Russia covers almost a quarter of the gas consumption in the EU, followed by Norway and Algeria with 15 percent and 11 percent, respectively (IEA, 2008). New pipelines are being built from surrounding gas exporting countries to the EU, but a recent trend is the investments in LNG infrastructure in Europe to accommodate LNG imports from the Middle East and Africa. In 2008, the LNG import capacity in the EU was a little over 100 bcm, a quarter of the total pipeline import capacity of 380 bcm. In ten years time, the LNG import capacity is expected to double, leaving the EU with a more diverse supply portfolio (IEA, 2008).

Contrary to the electricity market, gas can be stored to meet the seasonal fluctuations in demand. Producers of gas operate on a constant rate to utilize the production infrastructure at very high load factors. Due to seasonal fluctuations in demand storage can act as a swing

supply. When demand is higher than supply, gas from storage is withdrawn and vice versa, gas is injected into storage in periods where supply exceeds demand.

Because of the geographical imbalance between producers and consumers of gas, the European gas market has become heavily politicised. The intrinsic value of gas and the importance of gas (and oil) for economic growth easily makes the gas delivery and transportation systems focal points in conflicts. Security of gas supply is currently an important part of the political agenda with the supply dispute between Russia and Ukraine in early 2009 as a prime example. According to Pirani et al. (2009), the dispute caused significant economic problems for Hungary and Slovakia, and showed the vulnerability of the EU when it comes to gas supplies.

2.2.3 Market structure

Since the start of the European gas era in the late 1950's and up until recently, there has been a mutual agreement between European governments and the gas transmission operators to have a rigid market structure with concentrated gas sales to certain high-value end user markets. In the 1990's, the national and international policy agendas shifted towards an open market structure with more market participants. Policy makers became more aware of the environmental benefits of gas compared to other fossil fuels and the importance of low fuel prices for the countries' competitiveness (Stern, 1998).

Thus, because of this mutual agreement there have traditionally existed monopolies in all parts of the gas value chain from producer to end-user in Europe. The gas exporting countries have sold gas to Europe through monopoly companies, and transmission companies (import and regional distribution companies) and local distribution companies in the consumer countries have enjoyed monopoly status because of legislation and economies of scale and scope. Additionally, producing countries have wanted to secure the economic rent with their producing companies.

Building gas infrastructure is costly, and the inefficiencies of having competing gas networks due to these high capital costs make gas infrastructure a natural monopoly case (Hannesson, 1998). Pindyck and Rubinfeld (2008) define natural monopoly as "a firm that can produce the entire output of the market at a cost that is lower than what it would be if there were several firms". To ensure the large investments needed to build the necessary infrastructure to transport gas to the markets, gas producers have made bilateral long-term

contracts with buyers of gas to ensure that their produced gas will be marketed and sold. This way, the risk was shared between producers and importers of gas.

The main suppliers of gas to the European market are listed in the figure below together with the main European transmission companies (Radetzki, 1999). Consumers of gas have had only one seller of gas to relate to, namely the transmission company who often enjoyed monopoly status in their respective countries. Likewise, the seller of gas from the NCS had only one buyer in each country to relate to. To balance this, producer countries established monopoly organizations to market all gas (see figure below). According to Pindyck and Rubinfeld (2008), an oligopoly is a market form where only a few companies compete with each other and entry by new firms is impeded. The EU has only had a few suppliers of gas, and entry of new supplies from new countries has been difficult due to large investments in gas infrastructure needed. The seller side (suppliers) could therefore be considered an oligopoly.

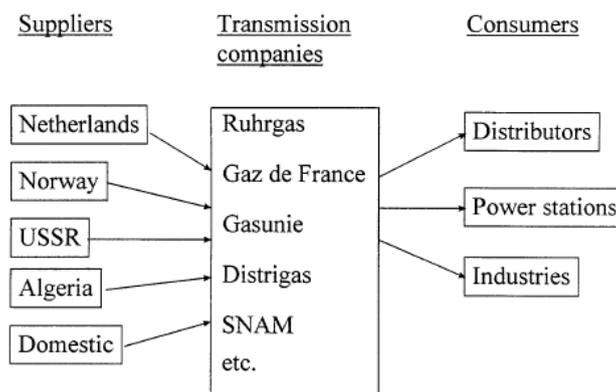


Figure 3: European market structure (Radetzki, 1999)

The buyer side (transmission companies) has resembled an oligopsony because of a limited number of buyers of gas in Europe due to regulation. In Germany for instance, the German Consortium consisting of transmission companies Ruhrgas (now E.ON Ruhrgas), Thyssen Gas and BEB (former joint venture between Exxon and Shell) undertook all negotiations on German gas imports from Norway with the suppliers (Asche et al. 2000).

Because of this market structure, suppliers of gas could not sell gas directly to end users. The gas extracted from the Norwegian Continental Shelf (NCS) has been sold and resold several times before it reached the end customer (see figure 4). For the last 30 years, Norwegian gas has first been sold to the large transmission and distribution companies of Europe as Ruhrgas

of Germany or Gaz de France. These companies sell this gas through their pipelines to their industrial customers, gas-fired power plants and local gas distribution companies (LDC) who in turn sell the gas to households and smaller industrial customers. For instance, gas sold from Norway to a power station in France was first sold to the transmission company Gaz de France before being sold to the end customer.

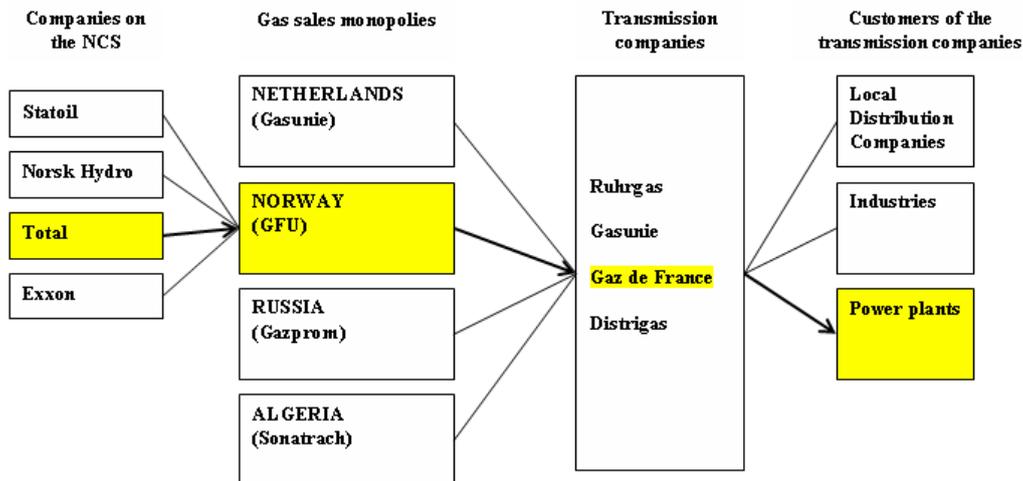


Figure 4: European gas market structure

2.3 European gas prices

2.3.1 Price components

The average end-user price of gas entails different cost components, regardless of market structure (competition or oligopoly). The size of the components differ in each country and are among others dependent on the degree of gas-to-gas competition, distance from producing field to end customer, type of regulation and cost allocation. The components can be summarised in the figure below.

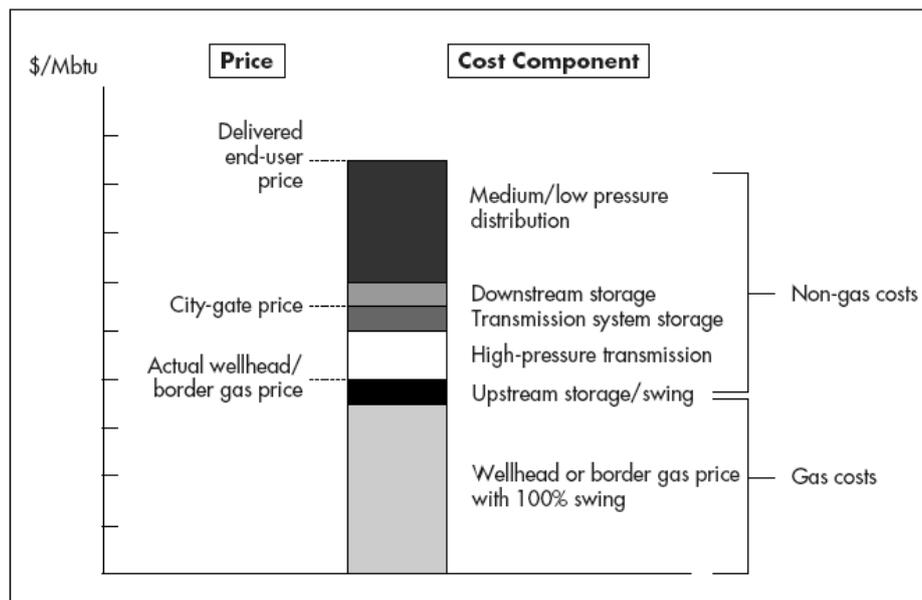


Figure 5: Cost structure (IEA, 1998)

The border gas price, i.e. the producer price, is observed at the landfall sites of the pipelines reaching the UK and the European continent from the NCS. The price that the producers on the NCS receive is the end-user prices adjusted for the non-gas costs (transmission, storage, distribution and taxes). If we assume that gas taxes stay the same and that the margins to the distribution and transmission stay the same due to long-term contractual agreements, the producer is taking the price risk with eventual price movements. Hence, if the end-user prices go down the producer price also goes down as all other components such as taxes and non-gas costs stay the same.

2.3.2 Oil price linkage

The price for gas in Europe has historically been linked to other competing sources of energy, i.e. mainly fuel oils. Gas competes with fuel oils in the residential and commercial market for heating purposes, and in the industrial market for heating and steam generation. When gas was introduced as a source of energy, the price was put below the oil price to capture market shares from oil. Whereas customers in the longer run can change to or from gas as a source of energy, most consumers of gas have no alternative source of energy in the short run due to switching costs. The gas market price reflects the customers' opportunity cost which is their weighted average value of gas in competition with other fuels (Austvik 2003). Thus, if the competing fuels' prices change, the price of gas changes too. This price linkage between oil and gas still prevail in many areas of the world, including Europe. The

figure below shows the trend of oil and gas prices sold from the NCS between 1981 and 2008.

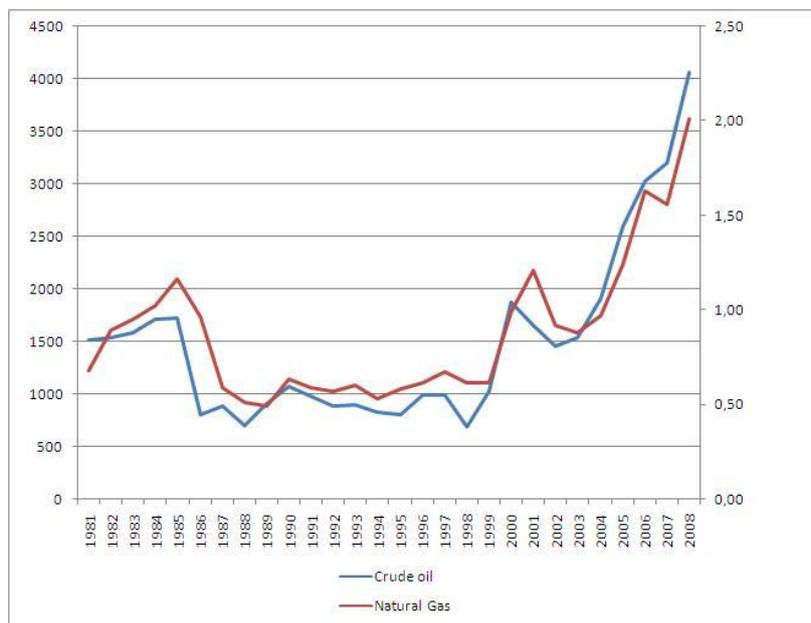


Figure 6: Average prices of exports of Norwegian produced crude oil and natural gas. 1981 – 2008 (Statistics Norway).

From the figure a very high correlation between the crude oil price and the gas price can easily be identified. The slight time lag that gas price seems to have is explained by the IEA (2006) as price adjustments of gas to oil averaged over periods of 6-9 months, and lagged by 1-3 months.

Contrary to the oil market, there exists no world gas price. The regional structure of the gas market due to the infrastructure constraints has made the regional markets for gas up until now relatively independent from each other. According to the IEA (1998), each region has its own distinctive price formation process due to low interregional trade. In Europe (except UK), one of the three regional markets for gas, the gas is still by and large linked to the oil price.

2.3.3 Monopolistic pricing

Monopolistic pricing of gas is to either set prices at cost-plus basis (acquisition cost of the gas plus a mark-up for non-gas costs and a return on capital) or on the basis of the market value with competing fuels, i.e. oil price linkage (IEA, 1998). The latter approach was used by the Gas Negotiating Committee (GFU) of Norway when it acted as a single seller of gas

to Europe. This approach of monopolistic pricing involves price discrimination towards the customers, depending on their profiles and their alternatives to and the cost of using other fuels.

For instance, a customer wanting to buy gas in Europe negotiates a price with the gas producer based on the *netback market value* of the gas. The netback market value is the weighted average value of the gas in competition with other fuels (with energy efficiency and environmental standards taken into account) adjusted for costs involving with storage (for flexibility) and transportation. Any taxes on the gas would also be included in this price formula.

Up until the current liberalization efforts of the European Union, the monopolistic structure of many parts of the European gas market has meant that the price negotiated between gas producer and customer has been on the basis of the netback market value. The gas fields on the NCS with their proximity to the European market have lower transportation costs than gas fields farther away (e.g. Siberian gas fields), and as a result, a considerable economic rent could (in theory) be earned between the average netback market value and the supply cost.

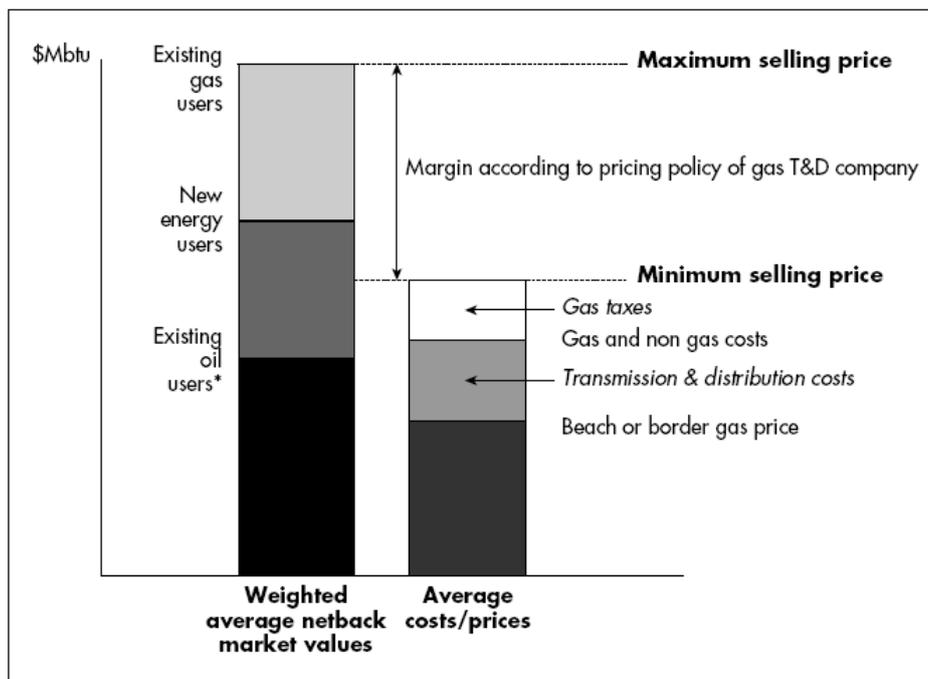


Figure 7: Monopolistic price discrimination (IEA, 1998)

The importer of gas could then negotiate with the gas producer to share the economic rent. Monopolistic pricing offers an opportunity for the importer to price discriminate between new and existing customers, as well as between large customers and households. By offering lower end-user prices than competing fuels to new gas customers, these customers are encouraged to switch to gas for their energy demand (Austvik, 2009).

2.3.4 Price determination in a liberalized market

In a liberalized market envisaged by the EU, the price determination, as opposed to monopolistic pricing, is determined by supply and demand. The demand for natural gas is influenced by the seasonal fluctuations in heating and cooling in the residential and commercial sector, fluctuations in demand for gas power generation and the ability of end-users to switch between competing fuels and the price of those fuels. The supply for gas is given by the production policy of the gas producers, and the amount of gas released to the market from storage. If there were to be no capacity constraints on the gas infrastructure, economic theory of homogeneous products tells us that the price between two points A and B in a market should equal each other, adjusted for the cost of transportation from one point to the other. The cost of transportation in a liberalized market envisaged by the EU is either regulated (gas infrastructure is considered a natural monopoly) or determined by the market price of released capacity.

2.4 Contractual agreements

2.4.1 Long-term contracts

In the European gas market, prices have been set in long-term contracts through negotiations. These long-term contracts have been necessary mainly due to the high investments needed in production and gas infrastructure. To ensure a return on their investments, producers have forged long-term agreements with customers, e.g. gas importers in consuming countries. The long-term contracts have clauses with regard to price, volume and changing circumstances (Austvik, 2003). The clauses ensure that gas prices:

- evolve with economic development, and
- correlate positively with competing fuels (in particular oil)

Additionally, the contracts may include the following clauses about the volume:

- take-or-pay (TOP): the supplier of gas is guaranteed payment, regardless of whether the gas is delivered or not
- deliver-or-pay: same as TOP, except it is the buyer who benefits
- load factor: ensure that a given load factor in the pipelines will be fulfilled

Lastly, the contracts have renegotiation and force majeure clauses in the event of changed circumstances. Two contracts may have the same gas price but because of different clauses one of the contracts may be more beneficial for the buyer than the other.

The TOP clause has been quite common in long-term contracts between producers on the NCS and European transmission companies. It has ensured income for gas producers on the NCS, regardless of whether the gas was taken or not. A contract between a gas producer on the NCS and a European transmission company could last for 20 years or more. The contracts between the transmission companies and their customers have typically been shorter (1-5 years) (Austvik, 2003). Thus, whereas the producers assume the price risk as previously mentioned, the buyers of gas, i.e. the transmission companies, assume the volume risk by contractually agreeing to market a certain volume of gas, regardless of the demand they are facing. Austvik (2009) suggests that transmission companies also take a certain price risk. In the event of a potential oversupply of gas in the market, prices could decrease, leaving producers with a lower producer price. If the transmission companies have problems marketing their gas volumes to the local distribution companies, they may have to lower their prices and take potential losses.

A new trend has recently been that new infrastructure projects in the Netherlands and Norway have entailed price clauses linked to spot prices instead of the usual oil price linkage. The companies selling gas from the Ormen Lange field on the NCS to the UK have for instance linked the gas price to the spot price in the UK.

2.4.2 Short-term trading

Whereas European gas prices historically have been linked to oil prices in long-term contractual agreements, gas prices in a liberalized market are determined by supply and demand at a market area, e.g. a 'hub'. A hub is where buyers and sellers of gas meet. This

can for instance be the landfall site of a pipeline, or a virtual platform such as the UK's National Balancing Point (NBP). In 2007, 60% of the gas sold in the UK was sold at the NBP price (IEA, 2008). The UK has been Europe's forerunner in liberalizing its gas market with the unbundling of the local gas monopolist British Gas into three companies (upstream, transmission and downstream) and the establishment of an independent gas market regulator.

The IEA (2008) describes some important minimum requirements for a short-term trading market in the paper 'Development of competitive gas trading in Europe':

- Access to gas resources and customers
- Possibility of managing volume risk for all market participants at a competitive cost
- Low barriers to entry for new players, known contractual setup and access to possible clearing services, with low transportation costs
- Managing price risk through the market (existence of a forward/futures market)
- Fairness and transparency, leading to confidence and liquidity

One hub that has gained significant importance in Europe and that is already mentioned is the virtual NBP hub in the UK. Most of the gas supplied to UK comes from the North Sea through five border terminals. The capacities at these terminals are allocated in auctions with both long-term and short-term capacity on offer. If the capacity price rises, it may give an indication that the market is tighter with a capacity constraint. There are other trading hubs in Europe as well, but none of them have yet to rival NBP as the dominant trading hub for gas in Europe. The UK has been more susceptible for a liberalized gas market because it has for a long period been self-sufficient in gas, and thus not dependant on gas imports to meet its demand for gas. Additionally, the UK has had a well built gas infrastructure network to accommodate this type of market.

3. The Norwegian gas market

3.1 Gas production in Norway

3.1.1 Background

With the discoveries of oil and gas on the Norwegian Continental Shelf (NCS) in the early 1970's, a new economic era began for Norway. Norwegian gas exports to the European continent began in 1977 with the deliveries from the Ekofisk field in the southern part of the NCS. With the start-up of the huge Troll field, Norway significantly increased its position as a major gas exporter to Europe. With opening of new fields, Norway today supplies approximately 15 percent of the European demand for gas (IEA, 2008). Some countries are heavily dependent on Norwegian gas such as Germany, which covers 25 percent of its demand from Norway (E.ON Ruhrgas AG, 2007). Through pipelines, gas from the NCS is now delivered to Germany, the Netherlands, Belgium and France (see figure 8). The oil production on the NCS peaked around 2000-2001 and is expected to decline further. The role of gas will therefore increase as the gas production is forecasted to grow from approximately 90 billion bcm per year to 116 billion bcm in 2011 (NPD, 2008). The Norwegian Petroleum Directorate (NPD) predicted in 2008 that only 36 percent of the expected total resources on the NCS had been produced, thus making activity on the NCS important for the Norwegian economy for many years to come. Although Norway is the third-largest gas exporter in the world and the sixth largest gas producer in the world, proven reserves on the NCS account for only 1.7 percent of the world total proved reserves (BP, 2008).

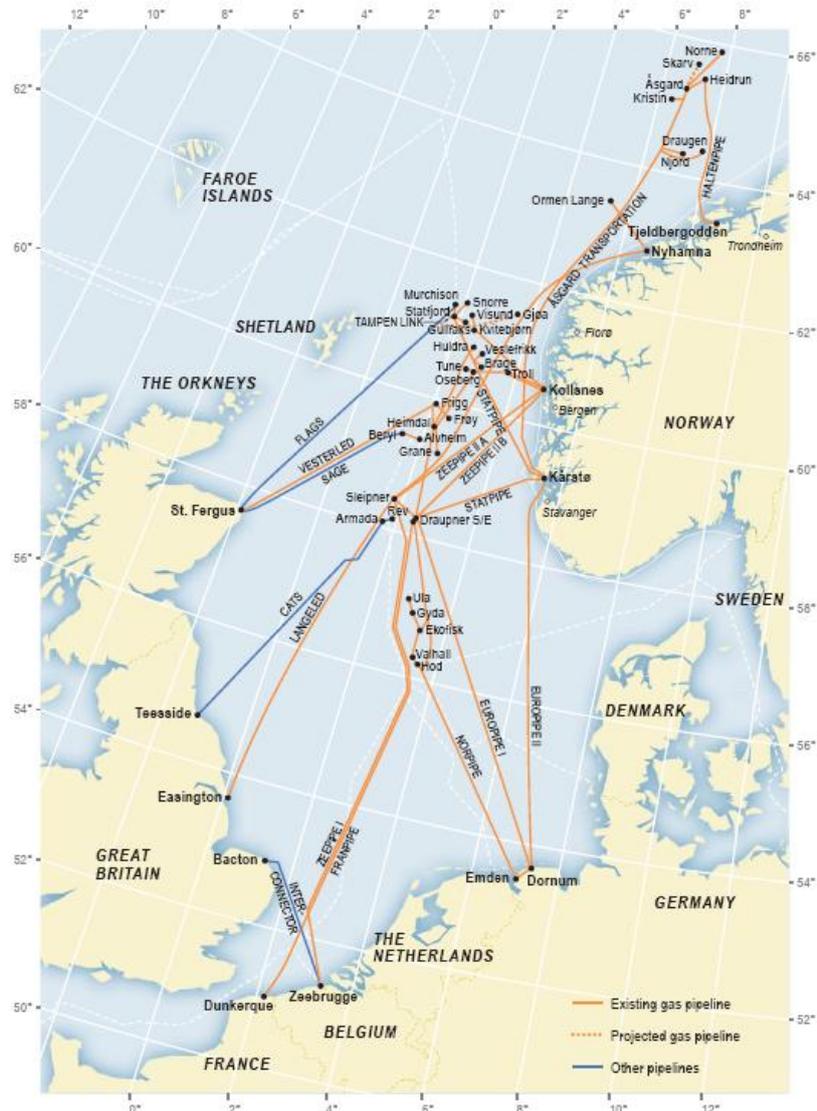


Figure 8: Pipelines on the Norwegian Continental Shelf (www.npd.no)

3.1.2 Market structure on the Norwegian Continental Shelf

When the first exploration activities on the NCS started in the 1960's, foreign companies carried out all the activities. The fully state-owned Statoil was first established in 1971, two years after the first petroleum discovery on the NCS. Statoil was established to ensure that the resource development on the NCS was done in the socio-economically optimal manner, and that most of the economic rent from the petroleum reserves would go to the Norwegian society⁵. The Norwegian Ministry of Petroleum and Energy (MPE) engaged itself directly on

⁵ NOU 2006:6, Når sikkerheten er viktigst

the NCS through the establishment of State's Direct Financial Interest (SDFI) in 1985 by making SDFI acquire parts of Statoil's oil and gas assets on the NCS.

To nurture field developments on the NCS, coordination and risk sharing has been promoted by the Norwegian authorities. Production licenses on the NCS have been and are awarded to a licensee group of companies which helps them exchange ideas and experience, and share cost, revenues and risks. In each licensee group, there is one company appointed as the field operator with the responsibility to operate the field on behalf of the group of field licensees.

3.1.3 Supply and demand

In 2008, Norway produced 90 bcm of natural gas. With the discoveries of new fields, gas production is not expected to decline until 2015. Covering 15 percent of the EU's demand for gas, Norway contributes significantly to the energy supply of the EU. Contrary to other European countries, Norway has virtually no domestic consumption of gas. The low demand for gas may be a result of the difficulty in building gas infrastructure in a country with low population density, difficult topography and abundance of other sources of energy such as hydro. Almost all of the gas extracted from the NCS is processed in onshore facilities before being exported to buyers in the UK and on the European continent. The most significant importers of Norwegian gas include Germany, France and recently the UK.

3.2 Regulation

3.2.1 The government as a regulator

The petroleum sector has through 40 years of operations created values of NOK 6000 billion (in current terms) for the Norwegian society and generated NOK 3000 billion (in current terms) in net revenues to the Norwegian state (NPD, 2008). With almost 25 percent of Norwegian GDP in 2007, the petroleum sector has grown to become *the* biggest industry in Norway. From the beginning, Norwegian authorities claimed administration and control over the petroleum resources on the NCS. Companies operating on the NCS are in charge of the actual operations but have to get approval from the Norwegian authorities in all stages of the petroleum activities. Companies make sure that the technical solutions to extract the petroleum reserves are put in place, whereas the Norwegian state makes sure that these operations are in line with maximising the petroleum wealth for the Norwegian society

(NPD, 2008). The Norwegian government says that its commitment to global security of supply is (i) good resource management on the NCS and (ii) stable and predictable exports of petroleum.⁶

The Ministry of Petroleum and Energy (MPE) has the overall responsibility of the resource management on the NCS. The MPE receives recommendations from the Norwegian Petroleum Directorate (NPD), and monitors the state's involvement in relevant companies, e.g. StatoilHydro, Petoro (managing the SDFI) and Gassco (managing the gas infrastructure). MPE has periodical licensing rounds where a limited number of licenses on the NCS are issued for petroleum search and exploration.

3.2.2 EU as a policy maker

Norway is not part of the European Union (EU), but the European Free Trade Association (EFTA). The European Economic Area (EEA) agreement between EFTA and the EU was signed in 1992 and implemented in 1994. It allowed the EFTA countries (excluding Switzerland) to participate in the Single Market policy of the EU. All sectors, including energy but excluding agriculture and fishery, were part of the EEA agreement. Thus, EU legislation in the energy sector affects Norway. With the EEA, Norway can participate in the preliminary work with EU legislation but has as a non-Member State no voting rights. Since the introduction of the EEA in 1994, Norway has passed approximately 3000-4000 legal acts from the EU (Austvik, 2003). Although Norway has the right to veto against implementation of EU legislation in Norway, this right has yet to be used.

3.3 The Gas Negotiating Committee (GFU)

3.3.1 Background

When the Ekofisk field was discovered in 1969, companies were drilling for oil. Gas was at that time seen as a problem and not a resource. The Norwegian authorities' reluctance in the practice of flaring the gas from the fields made it necessary of exporting the gas to European buyers. The gas fields were sold under field-specific depletion contracts from the operators and the licensees to their European counterparts. When the gigantic Troll field was

⁶ St.meld. nr. 15 (2008-2009) Interesser, ansvar og muligheter

discovered ten years later in 1979, the way of organizing gas sales from the NCS seemed out-of-date. No European buyer could commit itself to buy the whole amount of gas through a depletion contract (Sunnevåg, 1999). To justify the large investments needed to extract the resources from the Troll field, a portfolio of sales to major gas and energy companies in Europe was established with the GFU.

The Norwegian authorities became worried that the size of Troll would saturate the European demand for Norwegian gas for a longer period of time with a resulting decline in investment incentives for other gas fields on the NCS. Norway thus had found more gas than the European market at that time needed. A framework was therefore made to make the Troll field the enabler of optimal resource management on the NCS by providing associated gas fields with modular and back-up services.

The intention of the Norwegian authorities to optimize the investments on the NCS and the Troll field made them worry that they had conflict of interests with some of the gas producers on the NCS with downstream interests in Europe. To counteract this possibility, all gas sold from the NCS was coordinated and negotiated in the newly appointed *Gassforhandlingsutvalget* (GFU) in 1986. This “Gas Negotiating Committee” had three members; fully-state owned Statoil, partially-state owned Norsk Hydro and wholly privately owned Saga. None of these companies had downstream interests in Europe. These three companies together forming the GFU were to sell all gas from the NCS on a field-neutral basis. Together, they accounted for as much as three-quarters of the total discovered gas reserves at that time (Heyerdahl, 2003). The role of the GFU was to evaluate the market, and to undertake all negotiations on the sale of Norwegian gas to Europe on behalf of the companies on the NCS. Thus, an international company operating on the NCS could not market its own gas to Europe, but had to market it through GFU.

In 1993, a new Statoil-chaired committee was established to ensure the optimal resource development of gas reserves on the NCS. The FU, *Forsyningsutvalget*, consisted of the three members of the GFU and all other companies on the NCS that had considerable gas reserves. This “Supply Committee” was to act as an advisory committee to the Ministry of Petroleum and Energy (MPE) on matters such as sequencing of field development, utilisation and development of new infrastructure (Heyerdahl, 2003).

3.3.2 Organization of the GFU/FU

Together with the Norwegian government, GFU and FU made an integrated resource management system for the Norwegian state. The whole process from initial sales to a gas buyer to the actual delivery of that gas under the GFU-FU regime can be summarised in the figure below.

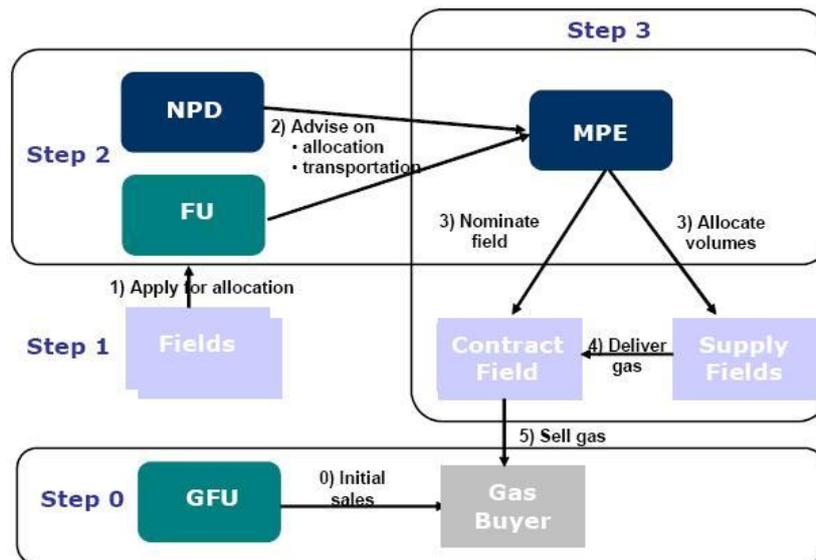


Figure 9: Organization of the GFU/FU system (ECON, 2006)

GFU, chaired by Statoil, would initially enter a deal with a European counterpart, e.g. a transmission company, to sell an amount of gas. Companies with gas reserves on the NCS had to apply to the FU for allocation for gas from their fields to supply gas to the contractual buyer. Based on gas allocation application from companies operating on the NCS, FU, together with the Norwegian Petroleum Directorate (NPD), advised the MPE on allocation and transportation. The MPE would then nominate the fields that were to deliver gas to the European buyer, and allocate volumes from additional supply fields to the same contract field which then was sold to the European gas buyer. Every deal that the GFU made with European buyers had to be approved by the government. The government could also ask the GFU to renegotiate price and volumes on existing contracts with the European counterparts. Thus, GFU worked under the control and instructions by the government.

3.3.3 Arguments in favor of GFU

The main objectives of the GFU were to fulfil two objectives of the Norwegian government:

1. To maximise the value of Norwegian gas
2. To secure an optimal resource development of gas reserves on the NCS

The GFU was to ensure that “no single company or licensee group, through their sales activities, would effectively bind the Government’s decision-making by creating commitments in the markets” (Sunnevåg, 1999).

The European gas market structure at the time when the GFU was established was dominated by a few gas buyers on the European continent. These were, both in concentration, size and power, superior to the individual gas producers on the NCS. Ruhrgas and the German Consortium had a dominating role in Germany; Gaz de France had a similar position in France. Due to their concentration and resulting negotiating position, the European buyers could achieve a lower market price than in a situation with perfect market competition. The powerful European companies could play the producers of gas on the NCS against each other, thereby pressing the market price down. To prevent that few buyers on the European continent would meet with a greater number of producers on the NCS, GFU was established so that all producing companies on the NCS appeared as one. This way, the European buyers would meet only one negotiation partner from Norway, GFU. In other words, *size mattered* in the European gas market. With GFU, Norway’s gas sales supplemented an oligopsony with a more level-playing-field oligopoly (ECON, 2006). Also, with GFU Norway responded to a market structure that prevailed in other gas exporting countries such as Algeria, the Netherlands and Russia with their gas sales monopolies Sonatrach, Gasunie and Gazprom.

The other argument for establishing the GFU was to ensure that the gas field development on the NCS was done in the best socio-economical manner. If all companies on the NCS were to do their own field developments, the sequencing of field developments would be suboptimal. Free production could lead to larger supply of gas and thereby put a downward pressure on prices. Because gas is a non-renewable resource, the long-term interest of a country extracting gas is to regulate the gas production. Supply coordination would prevent suboptimal field development and make the Norwegian authorities achieve their objective number 2: “by making important decisions on individual developments according to overall plans, the Government can ensure more flexibility at lower cost than if development

decisions remained uncoordinated”⁷. Additionally, pipelines must have a substantial capacity to keep unit costs down. Through GFU, the development of pipelines could be coordinated and thus create economies of scale.

3.3.4 Arguments against GFU

When the GFU was established, the European gas market was fundamentally different from now. 15 years after, the market has matured with more extensive infrastructure and growth, and a market that requires more variable conditions than long-term contracts. Although the GFU system clearly had its advantages, it also had its flaws. Sunnevåg (1999) identifies an externality related to the GFU system. For instance, when a company had to sell its gas from the NCS through GFU, it had no guarantee that the gas found by the company would be marketed, even if the gas was commercially viable. Thus, a company had to bear the risk that its gas volumes would be put aside as other companies’ gas was marketed, without any form for compensation. This inefficiency may induce distortions in incentives for exploration and development of gas fields on the NCS. The gas that eventually gets marketed is the gas with the lowest unit production costs. This may also create incentives amongst the companies to underestimate development costs.

Golombek et al. (1998) write in a study that producers on the NCS would *gain* from an abolishment of the gas sales monopoly model on the assumption of a competitive demand side. The model assumes Cournot competition where a more aggressive behaviour can be beneficial as long the competitors do not respond in the same way. Assuming that the Gas Directive is implemented and the European gas market turns into a fully liberalized market, Golombek et al. argued that an abolishment of GFU would increase the total profits of Norway, given that competitors such as Russia and Algeria did not respond in the same way.

When Saga was acquired by Statoil and Norsk Hydro in 1999, GFU consisted of only the two remaining members. Statoil and Norsk Hydro had at that time also acquired downstream interests in the European market. Thus, when a conflict of interest arose due to a company’s downstream interests, the same company had to step out of GFU. With two member companies, this left one company managing GFU on behalf of all the companies on the NCS. This proved to be no ideal situation, even for the members. Statoil as the leader of a

⁷ MPE, 1997, Memorandum on the establishment and functioning of the GFU

two-member committee understood this and expressed a wish to abolish the system as it was preventing Statoil from capturing business opportunities in the downstream market (ECON, 2006).

Furthermore, the arguments used to justify GFU did no longer work. The buyer side got more fragmented, and third-party access was being introduced in Europe through the Gas Directive. Most of the new gas fields found on the NCS were small and the existing infrastructure needed to transport gas from new fields had already been built. The coordination efforts needed when GFU was established were not that apparent anymore.

From an EU point of view, GFU violated EU competition law. In a statement of objections (SO) from 2001, EU stated that

*“The Commission has sent a statement of objections to Norwegian companies Statoil and Norsk Hydro, the current members of the GFU, warning them that the joint sales of Norwegian gas through the GFU infringe Article 81(1) of the EC Treaty and Article 53(1) of the European Economic Area (EEA) Agreement.”*⁸

It further claimed that

*“A statement of objections is a legal step in proceedings under Article 81 of the EC Treaty and Article 53 of the EEA Agreement, which ban cartels and other damaging concerted business practices.”*⁹

Thus, the GFU was clearly violating both the EEA agreement and EU competition law. GFU set the price, volume and clauses on behalf of all producers. Pindyck and Rubinfeld (2008) define cartel as a “market in which some or all firms explicitly collude, coordinating prices and output levels to maximize joint profits”. Thus, GFU could be characterized as a cartel. The EU was at the time of the SO liberalizing the European gas market. According to the SO, the long-term contractual agreements between GFU and European buyers led to a significant rigidity and lack of liquidity in the European gas market.

8

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/01/830&format=HTML&aged=0&language=EN&guiLanguage=en>

4. THE LIBERALIZATION OF THE EUROPEAN GAS MARKET

4.1 The European Union and the Single Market

The idea with the European single market is to create a set of common rules to ensure that companies enjoy economies of scale of operating in a large market. Müller-Graff and Selvig (2008) quote Article 14 of the EC treaty which defines the single market as:

“an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured in accordance with the provisions of this Treaty”

The aim is to increase companies' competitiveness and thereby increased welfare for the society. Prior to the signing of the Treaty of Maastricht in 1992, energy was not part of the European Union's (EU) policy agenda regarding the single market. The member countries signalled a strong interest in keeping the energy markets under national control, and argued alongside representatives of the gas and electricity industries that liberalization of the energy markets would incur bigger losses than benefits to the community. The perceived advantages by European governments of having natural monopolies in the gas market were⁹:

- Lower financial costs (better loan conditions for the companies)
- Economies of scale
- Centralized decisions to strike a balance between government's need for taxes, end users' need for low tariffs, and producers' need for profits

However, although gas markets can be considered natural monopolies, a one-firm market is not necessarily optimal if it abuses its market power (Austvik, 2003). The EU shared this view, and was concerned that the rigid market structures of the gas markets would be harmful for the European economies. In general, the EU favours competition as a prerequisite for cost effectiveness, market sustainability and energy security (Austvik, 2003).

⁹ World Energy Council, Energy Market Reform

It was therefore natural that the EU wanted to liberalize the gas market by splitting up existing market structures and making the market more susceptible for competition.

4.2 Competitive gas markets

To understand what competition means in a gas market, a clarification is necessary. The IEA (1998) defines a truly competitive gas market as “one in which there is mandatory and non-discriminatory open access to the pipeline infrastructure, at least at the transmission level”. In the market for gas, there are different competitive models; pipeline-to-pipeline competition and third-party access (TPA) to the network. The former is only to some extent possible in Germany, the only country in Europe where there are competing infrastructure gas networks. The latter however means giving non-discriminatory TPA to all pipelines in the system so that end customers of gas (mainly local distribution companies, large industrial companies and power plants) can choose their supplier of gas. This form for mandatory, non-discriminatory TPA is the form for competition that the EU wants to establish in the European gas market. With TPA, companies wanting to transport gas from a producing field to a customer do not have to own the infrastructure themselves, making gas sales and import monopolies obsolete.

However, regulation has been considered necessary to achieve an efficient market. The inefficiencies of having competing pipeline networks makes the gas market a natural monopoly. Regulation is therefore needed to ensure that the monopolist owning the gas network is prevented from making excessive profits from its network. Additionally, security of supply of gas is important in many European countries due to the role of gas an important part of the energy mix. Regulating the gas market will create options for either the government or the regulator to intervene in cases where the market does not balance the demand and supply adequately. Then there are more typical concerns as to why the gas market is regulated. The need to protect household customers, e.g. preventing unreasonably high prices for the poor and disadvantaged, and the need to prevent predatory behaviour in the market make governments want to regulate the gas market. The EU has clearly studied the resulting effects from the UK and the US in their efforts of liberalizing their gas markets. Lower prices for end customers have been the initial effect, with a resulting weakening of the oil price linkage (The Emirates Center for Strategic Studies and Research, 2001).

Making a single market for gas in Europe has in many articles and books been dubbed ‘liberalization’ or ‘deregulation’. Austvik (2003) explains that the term ‘liberalization’ when used in gas markets, is to be interpreted as a means to increase competition by introducing force or incentives in a regulatory process in order to reach social goals in a better manner than before. Deregulation on the other hand does not necessary entail less regulation, but rather different regulation. The US market deregulation of the gas market and the establishment of TPA could thus be called ‘reregulation’, according to Austvik.

4.3 The introduction of the Gas Directive

As the gas market has matured with market growth, more storage facilities and the investments in new pipelines, the gas market has become more suitable for a Single European gas market. The work for a single energy market started with discussions in 1990’s and culminated with the Electricity Directive of 1996 (96/92/EC), and later the Gas Directive of 1998 (98/30/EC). These two directives introduced a common set of rules for the EU energy markets. Key content included:

- Full market opening for all customers by July 2007
- Legal unbundling of transmission and (large) distribution companies
- Third-party access to transmission and distribution networks based on regulated tariffs
- Establishment of an independent regulatory authority in each Member State

The underlying reason for the Gas Directive was to lower the gas prices for European customers, and especially for industries exposed to competition (Sagen, 2001). The EU wanted to transfer the economic rent from the gas producers and the transmission companies to the benefit of the gas customers.

4.3.1 Third-party access

The core of the Gas Directive was to enhance and nurture competition in the European market for gas by opening up the gas pipelines for third parties. Hannesson (1998) defines the principle of third-party access (TPA) as “[...] a pipeline company must allow any buyer and seller of gas access to its pipeline at a reasonable tariff, provided there is capacity

available”. To ensure that the companies operate the pipelines on a neutral, non-discriminatory basis, unbundling of the vertical integrated companies owning gas infrastructure was put forward as a requirement from the EU. Additionally, the tariffs were to be regulated by an independent authority. The purpose with TPA is to provide gas customers, e.g. large industrial customers and power plants, with the opportunity to choose their own supplier of gas. Thus, a seller and a buyer of gas should be allowed to use gas infrastructure if capacity is available, even if the infrastructure is owned by another party.

In the figure below, we see the monopolistic European gas market structure prior to the abolishment of GFU and the implementation of TPA. If for instance the French company Total wanted to sell gas from its assets on the NCS to a power plant in France, it first had to apply to the Supply Committee FU to get its assets dispatched to supply a contract with the transmission company Gaz de France. If the Norwegian Ministry of Petroleum and Energy approved to dispatch gas from Total’s NCS assets, the gas would then be marketed with gas from other fields through GFU, chaired by Statoil. GFU would then negotiate a deal with its French counterpart, the gas import monopoly Gaz de France, who in turn would sell the gas to the power plant.

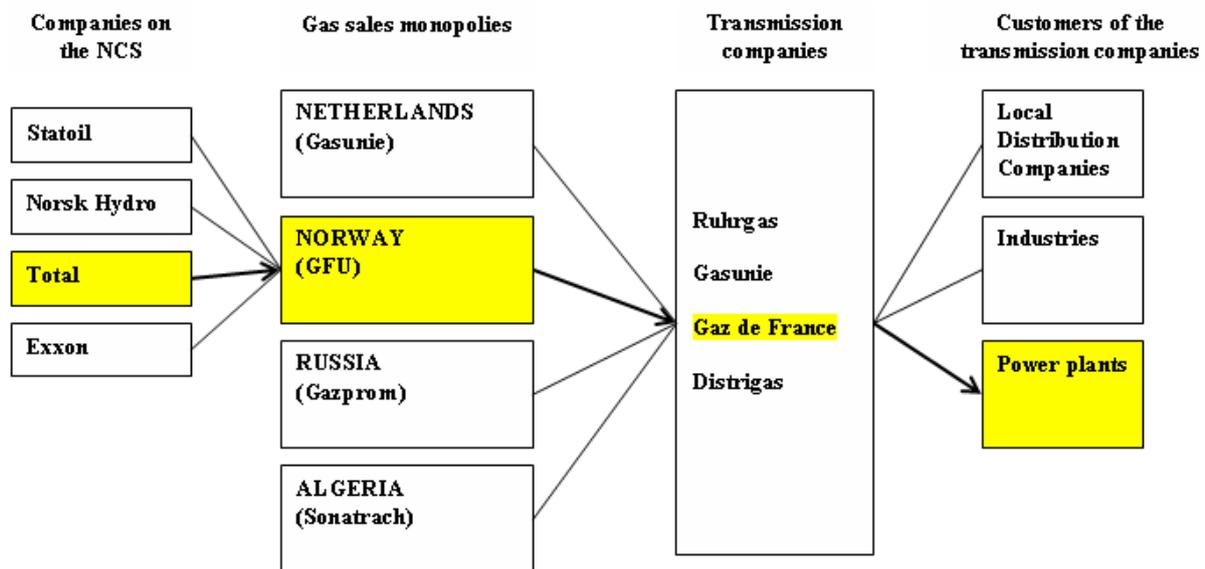


Figure 10: European gas market structure with GFU and no TPA

With TPA and the abolishment of GFU, Total now has the opportunity to sell its gas from the NCS directly to the French power plant, even if it does not own the pipeline going from the NCS to the French border or the pipeline from the French border to the power plant.

Under a TPA regime, Total can book capacity with the owner of pipelines, at tariffs that are either regulated or negotiated. The figure below summarizes the difference.

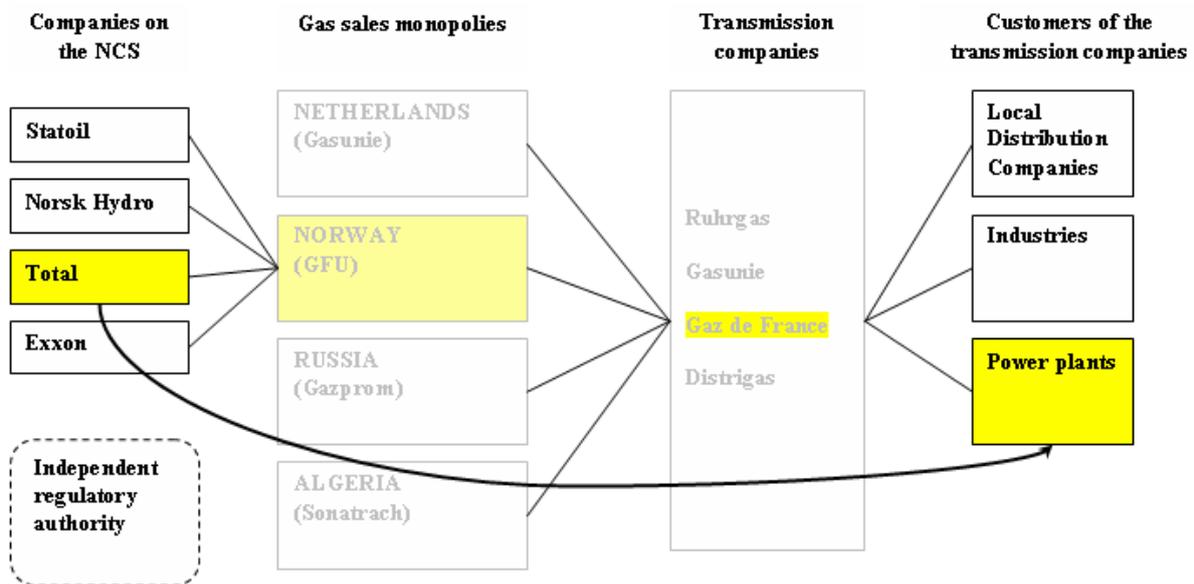


Figure 11: European gas market structure with TPA and no GFU

In this market, Total can decide to sell its gas to transmission companies as before, or supplement its sales by selling to the customers of transmission companies. Transmission companies and its customers can on the other hand choose their supplier of choice. As opposed to the monopolistic gas market structure which up until now has been characterized as gas-to-oil competition as gas prices have competed with competing fuels; this situation is called gas-to-gas competition.

4.3.2 Unbundling and market opening

To create TPA and consequently a non-discriminatory and transparent access to infrastructure for all participants in the gas market, unbundling of the vertically integrated companies was put forward as a requirement. With Germany as the exception in continental Europe (competing gas infrastructure exists between E.ON Ruhrgas and Wingas), incumbent companies had natural monopolies over the gas infrastructure. Unbundling means that companies owning gas infrastructure have to be separated from other companies or affiliates that trade gas. The operator of the gas infrastructure is to act on a neutral basis and to make any given spare capacity available for third parties. GFU was seen as an obstacle in the process of making the European gas market more competitive, and was targeted by the EU as a market imperfection.

4.3.3 Arguments in favor of liberalization

The most general argument for liberalizing any market is as follows: “vigorous competition is the best way to produce dynamic and innovative industries that can meet consumer needs in an efficient manner and compete in expanding global markets” (Sunnevåg, 1999). This school of thought is likely to have had an impact on the EU in their liberalization efforts to battle high energy prices. In 2004, concerns were voiced from the European Central Bank that the high energy prices would lead to higher inflation.¹⁰ Although energy prices are not as important to the European economy as before due to less heavy industry and more energy efficient households, they are still important for companies’ competitiveness. The experiences in the UK and the US, which both have opened up their gas markets for competition, show that end user prices declined due to increased gas-to-gas competition in the market (Stern, 1998). Experiences also show that both countries have seen increased supplies with resulting lower gas prices. Reduced pipeline tariffs in a TPA regime could also lower gas prices. However, both UK and US markets are different than the current European gas market and have been characterized by many buyers and sellers with a well built infrastructure (cf. 2.4.2). Spot markets for short term trading have emerged, giving companies and gas users more flexibility in their optimisation efforts. A liberalization of the gas market was thus put forward by the EU as an argument to give the European economy a much needed relief from high energy prices.

It was also argued that with TPA, Europe would be able to diversify its supply portfolio by giving pipeline access throughout Europe to new supply countries such as North Africa and the Middle East. The problem for these emerging gas exporting countries has been lack of infrastructure and lack of access to pipelines to transport the gas from Europe’s outskirts to the market (Sagen, 2001). With TPA, Egyptian gas producers could then theoretically transport gas through pipelines (whenever capacity is available) to for instance Germany.

4.3.4 Arguments against liberalization

Many arguments have been put forward against liberalization of the gas market. Transmission companies have enjoyed monopoly status and have advocated for the monopolistic structure with stability and security of supply. Long-term contractual

¹⁰ Das Rauschen des Geldes. Der Spiegel 25/2004

agreements between European buyers of gas and supply countries have ensured a continuous, stable flow of gas for 30 years to European customers. For consumers, the liberalization could prove to give more volatile prices. The gas price developments in the UK after the liberalization have been more volatile, due to a gas market influenced by seasonal fluctuations in demand. In the cold winter of 2005/2006, gas prices in the UK rose to exceptionally high levels, due to a combination of supply shortfall and lack of storage availability (Stern, 2007). The volatility in the UK during the winter of 2005/2006 can be seen in the figure below.¹¹ For some consumers of gas, reliable prices through long-term contracts may be preferable to volatile prices.

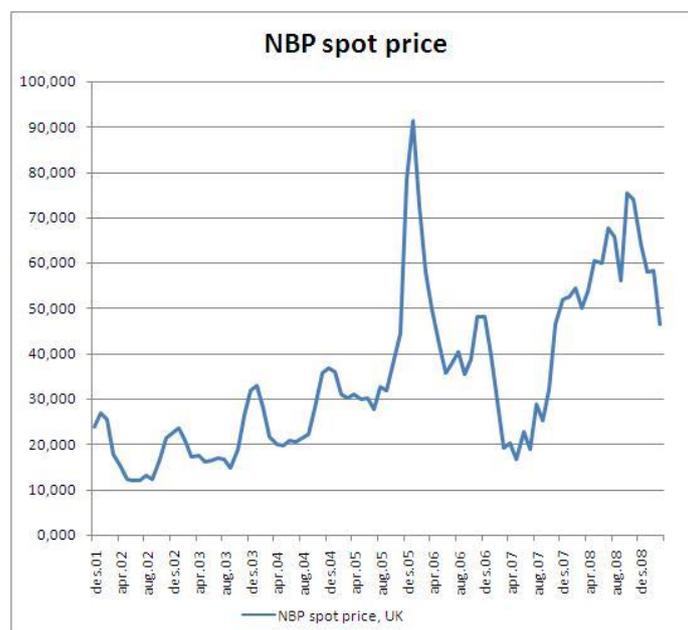


Figure 12: NBP spot prices, 2001-2008. Industry sources

Some research suggests that the monopolistic structure is as good as competition. The starting point for liberalizing the European gas market has been imperfect competition on both the sellers' and buyers' sides. The buyers' side has been characterized by natural import and transmission monopolies, and the sellers' side has been concentrated in national gas sales monopolies. Henderson and Quandt (1980) describe this market structure as a 'bilateral monopoly'. In a bilateral monopoly, the two parties cooperate and achieve a Nash solution, or one of the parties dominates the other party. If we assume that the two parties cooperate and maximize their joint profit, Henderson and Quandt argue that the resulting allocation is

¹¹ <http://www.ofgem.gov.uk/Markets/WhlMkts/CustandIndustry/energybuyers/Documents1/14066-GazDeFrance.pdf>

as good as it would have been with perfect competition on both sides. The distribution of the joint profit depends on the parties' bargaining positions.

4.3.5 Regulatory challenges

When the EU wants to liberalize the gas market, it wants to reduce gas prices to create competitiveness for the European economy and to provide households with lower gas prices (Heyerdahl, 2003). Because the gas market is a natural monopoly in areas such as transmission, the gains from increased competition have to be larger than the losses of less efficient operations. Significant economies of scale exist in pipelines and sunk investments, and possible economies of scope exist in having vertically integrated companies. The challenge is to avoid the inefficient bundling and exploitation of economies of scale of scope, and maintain the efficient parts. According to Austvik (2003), to have a functioning gas market, the crucial element will be the cost of, and access to, transportation. The problem of access in a TPA regime arises because some of the major suppliers of gas to Europe and their pipelines (most notably Russia and Algeria) are not affected by EU's jurisdiction. Furthermore, it is not likely that the gas sales monopolies of Russia and Algeria, Gazprom and Sonatrach, will discontinue their roles in the near future. Thus, the Gas Directive and its implications only affect parts of the European gas supplies, i.e. domestic gas reserves within the EU and Norway.

Another problem is that much of the gas sold from countries affected by the Directive is already sold through long-term contracts. When these contracts take up all the capacity in the pipelines, introduction of TPA (which implies capacity available) is difficult.

4.4 Economic rent

To get to the core of what the EU perceived as the problem in the gas sector, the theory of economic rent has to be discussed. In the European gas market, gas is sold and resold numerous times. As we have seen, the gas price that the end user pays consists of various components, all of which are going to different parts of the gas value chain. Economic rent is defined as profit earned beyond normal profit, and normal profit is defined as the minimum profit needed to run a business (Austvik, 2003). Due to the fact that gas together with other fossil fuels is a non-renewable resource, economic rent will exist even in a liberalized gas market. Although the gas reserves have continuously been upgraded as new discoveries have

been made, gas reserves are limited. Because of this scarcity, an economic rent beyond marginal production costs has existed for gas producers. The Emirates Center for Strategic Studies and Research (2001) explains that the economic rent in the gas market can either go to the gas producers, transmission companies or end users. With taxes, the economic rent can even go to the countries' treasuries.

It has long been a perception that due to the European gas market structure, gas producers and transmission companies have earned the economic rent in the gas value chain. The EU believes that this has led to higher than necessary gas prices for European end users. To look at how liberalization of the gas market with the resulting abolishment of GFU would affect the price structure, it may be useful to look at how a liberalized market would work in theory. The figure below by Austvik (2003) shows the different price components of the end-user gas price paid in Europe.

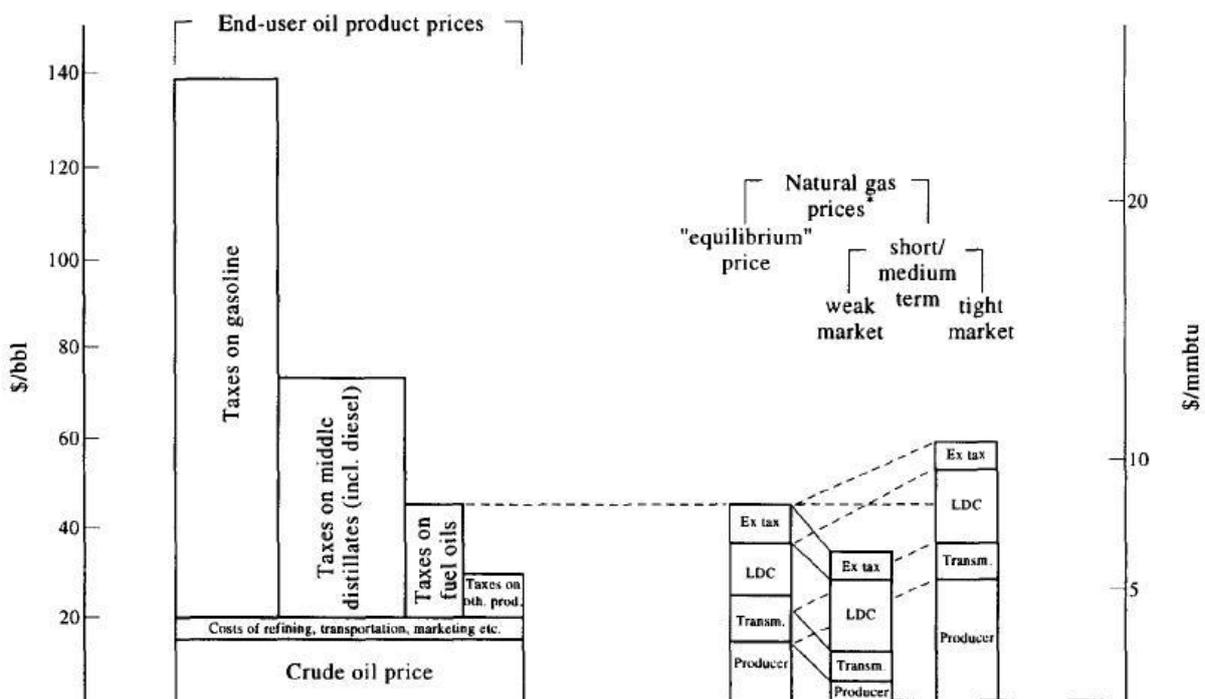


Figure 13: Price volatility in a liberalized market (Austvik, 2003)

In a liberalized gas market, transmission companies lose their monopoly role as wholesalers of gas, and are reduced to transporters of gas. The non-discriminatory third-party access to pipelines ensures regulated tariffs that reflect the investment and operating cost of the infrastructure to all parties, leaving little room for margin to the transmission companies. With hypothetically more producers selling gas (at least from the NCS), and more customers

able to bypass the transmission companies for their gas demand, end user prices will be more determined by gas-to-gas competition as opposed to gas-to-oil competition. The emergence of a short-term market as opposed to the long-term contracts that have dominated the European market will create more price fluctuations in accordance with demand and supply.

Hence, in a tight market with gas supply shortages, gas prices will rise. With transmission and local distribution companies' (LDCs) margins static due to contractual agreements, the producer price will increase as much as the end-user price, leaving the producer with the entire price increase. If on the other hand the end-user price sinks in a market with abundant supplies, the producer price sinks equivalently, leaving the producer with the entire price decrease. Price determination in a liberalized market can thus give larger variations not only in end-user prices, but also producer prices. The scale of these price fluctuations depend on the scope of the liberalization, how tight or weak the market is opposed to 'a normal situation', and how the producers, transmission companies and customers behave in such a market.

Because gas producers in a liberalized market can market their gas directly to large industrial gas customers, local distribution companies and power plants, the important role of transmission companies are likely to decline. Contracts between transmission companies and end users will, in a fully liberalized market, get replaced by contracts between gas producers and end users.

4.5 The end of GFU/FU

4.5.1 Increasing pressure from the EU

Due to the EEA agreement, Norway is also affected by the Gas Directive of 1998 and EU law regarding the single market. From an EU viewpoint, the few dominant suppliers to the European market such as GFU were part of a structural problem. EU regards monopolies as both inefficient and a burden on the operation of an integrated single gas market (Heyerdahl, 2003). With the Gas Directive and the introduction of third-party access and unbundling of vertically integrated gas companies, European buyers of gas would be more fragmented. This would enhance the bargaining position of GFU, an outcome that EU wanted to counter. As the surveillance agency of the EEA, ESA had already looked into GFU in 1996 when one

of the members of GFU, namely Saga, was barred from selling gas directly to the German company Wingas by the two other members, Statoil and Norsk Hydro. Additionally, excluding companies from GFU because they were non-Norwegian companies was also considered a serious violation of the EEA agreement (Heyerdahl, 2003).

This was however expected from the members companies of GFU. In 1999, the three members of GFU narrowed down to two when Saga Petroleum was acquired by the two other members, Statoil and Norsk Hydro. Statoil, realizing that GFU would be more difficult to justify in a liberalized gas market, suggested the termination of GFU. Statoil expressed views that the company would “seek to capitalize on the increased flexibility in the new market environment” (ECON, 2006). Norsk Hydro, the junior company of the two, opposed this, as it thought its marketing power would diminish with such a solution. The MPE was also in favour of continuing with GFU, applying a wait-and-see strategy in relation to the EU Commission’s decision of GFU on the competitiveness on the European gas market, according to Sunnevåg (1999).

4.5.2 Abolishment of GFU

The Norwegian Ministry of Petroleum and Energy (MPE) accepted to discontinue the coordinated gas sales monopoly GFU on 29 May 2001 after pressure from Brussels and companies on the NCS. With parliamentary approval it was officially abandoned 31 December 2001. The Minister for Petroleum and Energy, Olav Akselsen, claimed that “Now that the infrastructure is in place and the shelf has entered a more mature phase, it is not a very dramatic step to give up the co-ordinated gas sales arrangement”¹². Shortly after the Norwegian government’s willingness to give up the gas sales monopoly, the EU issued a letter to its member states, warning them to limit access to gas from the NCS. Opening access to pipelines to gas from NCS would allow reaching customers in the EU without having to go through the transmission system operators, i.e. midstream players, such as Ruhrgas and Gaz de France.

Although GFU was abolished early June 2001, the EU started legal proceedings against the former members of the GFU shortly after, claiming that Statoil and Norsk Hydro through

¹² GFU goes in dustbin. Upstream 29.05.01

their gas sales monopoly had violated EU competition rules.¹³ The companies received however full backing from the Norwegian authorities claiming that they had only followed regulation. The threatened fines of up to 10 percent of the companies' gross turnover did not materialize, and the parties reached a compromise when Statoil and Norsk Hydro promised to sell a considerable amount of gas to new independent sellers between 2001 and 2005.¹⁴ The settled amount accounted however only for six percent of the total gas export volumes in this period. The newspaper Dagens Næringsliv declared the compromise as a success for both Norwegian gas exporters Statoil and Norsk Hydro.¹⁵

4.5.3 Reactions

The Norwegian Petroleum Directorate (NPD) expressed concerns already in 1997 that the Gas Directive could pose serious threats to the Norwegian gas industry.¹⁶ The Gas Directive, then and now, puts the emphasis on the considerations of Europe's gas buyers' needs and not those of the suppliers. GFU's role in negotiating stable long-term gas contracts with European buyers were by many perceived as premise for further development on the NCS. In a newspaper article in 1997, Rolf Erik Rolfsen of Total Norway responded to the EU's early liberalization efforts and even threatened that, "in the worst case, there will be no new contracts".¹⁷

The next Minister of Petroleum and Energy at the time, Einar Steensnes, admitted that that abolishing GFU was in line with the strategies of the oil and gas companies (ECON, 2006). He further explained that the decision was justified by increased maturity on the NCS, less rigid market structure in Europe and the changing business environment.¹⁸ However, the perception at the time of the abolishment of GFU depicted Norway as the loser and the EU as the winner of the GFU battle (Heyerdahl, 2003). The CEO of E.ON Ruhrgas of Germany, one of the main importers of Norwegian gas in Europe, welcomed the abolishment of GFU:

¹³ Norwegians in court fight over gas sales. Upstream 21.06.01

¹⁴ EU settles \$133bn gas row. Upstream 17.07.02

¹⁵ Seier for Statoil og Hydro. Dagens Næringsliv 13.07.02

¹⁶ Norwegian gas flame flickers. Upstream 11.10.97

¹⁷ Norwegian gas flame flickers. Upstream 11.10.97

¹⁸ www.regjeringen.no/en/langsiktig_norsk_petroleumsvirksomhet.html?id=265913

We look forward to increased competition between the Norwegian players and hope it will lead to lower prices.”¹⁹

Before the abolishment of GFU, the Norwegian Minister of Petroleum and Energy said that a price decline in gas of 10 percent will affect Norway by yearly 10 billion NOK.²⁰ Worries of lower investments and activity on the NCS were also expressed. Additionally, worries were made that without GFU companies would use transfer pricing to evade the high tax rate on the NCS, e.g. selling gas with a substantial discount to a foreign affiliate. These lower prices would result in lower taxes for the Norwegian State. However, the economic consequences of discontinuing GFU and adapting the Gas Directive were unclear in the beginning. The consultancy Wood Mackenzie did not have the answer in a 2001 report to whether the abolishment of the gas sales monopoly would detain development on NCS or not.²¹ Whereas the pessimistic analyses presented to the Norwegian government predicted an annual loss of 10 billion NOK, optimistic analyses focused on the increased gas demand from Europe which would neutralize any negative effects of abolishing GFU.²²

In short, two effects were expected;

- Lower gas export price (negative effect), and/or
- Better downstream opportunities for NCS producers and consequently a more competitive business environment (positive effect)

4.5.4 Other changes in the Norwegian petroleum sector

At the time of the abolishment of GFU, the Norwegian petroleum sector underwent major changes. The Norwegian parliament approved to implement the EU Gas Directive from 2002 with non-discriminatory third-party access in the gas infrastructure. The fully state-owned Gassco was established as the independent operator of the gas infrastructure, and replaced the pipelines operators Statoil and Norsk Hydro. The ownership of the pipelines was

¹⁹ Brussels beats retreat on gas. Upstream 25.10.01

²⁰ Gassdirektivet dyrt for Norge. Aftenposten. 14.02.01

²¹ Åpnere gassmarkeder kan stanse utbygging. Aftenposten 24.01.02

²² Jaglands EU-jobb. Aftenposten 07.12.00

gathered into one company, Gasled. Gassco also replaced the infrastructure coordination of the Supply Committee FU which was abolished together with GFU.

Statoil was partially privatized and listed on the stock exchange to enhance Statoil's competitiveness in both Norway and abroad. The State's Direct Financial Interest on the NCS (SDFI) was partially sold to other licensees. The remaining assets came under the management of Petoro, a fully state-owned company. Petoro manages the SDFI assets and controls that Statoil markets the SDFI gas in accordance with the 'sales instruction' given by the Norwegian government.

In 2006, Statoil and the oil and gas division of Norsk Hydro announced that they would merge into one company. With no objections from the EU competition authorities, the merged company StatoilHydro started operations in 2007. Together, the merged company markets roughly 70-80 percent of the gas sold from the NCS (ECON, 2006).

5. EFFECTS OF THE ABOLISHMENT OF THE GFU

To analyze whether the forced abolishment of GFU has been a blessing or a curse for Norway, it is of importance to look at the subsequent degree of Gas Directive implementation in EU countries. Norway was promised when it abolished the GFU that gas producers on NCS would face a diverse buyer side with the opportunity to sell directly to large end customers. Secondly, the impact of the abolishment of GFU to gas producers' long-term contracts and flexibility is analysed. The key aim with the Gas Directive was to shift the economic rent from producers and transmission companies to end customers. The price increase since 2001 may reveal a different outcome. Lastly, the market structure on the NCS has changed. Since this thesis is focused around Norway's outcome of the abolishment, the following stakeholders will receive most attention: (i) gas producers on the NCS and (ii) the Norwegian government.

5.1 Implementation of the Gas Directive

Norway's compliance with EU competition law through the EEA agreement made Norway abolish GFU. Norway's compliance with EU legislation on the single market through the EEA made Norway also implement the Gas Directive and introduce non-discriminatory third-party access (TPA) on the pipeline infrastructure on the NCS. Both components are part of the EU's aim towards a more competitive gas market with resulting lower end user prices.

With the Gas Directive, the rigid structure of the European gas market that had prevailed started to change into a more open market with room for gas-to-gas competition. The gas sales monopolies of GFU and Gasunie of Netherlands were abolished, the buyers' consortiums, e.g. the German Consortium, were discontinued, and third-party access was introduced to accommodate gas-to-gas competition. The question is whether the degree of implementation has been high enough to create competition in the market.

5.1.1 A new Gas Directive

In 2000, even before the first Gas Directive had been implemented, more ambitious and global aims to make a single market for gas were signalled by the European Council (IEA, 2008). Although the implementation of the first Gas Directive had caused some gas markets

to open more than the required minimum originally set out, the rate and scope of implementation had been unequal amongst EU member countries. Uneven efforts within regulations, market opening, third-party access and unbundling made competition in the European gas market not as competitive as planned. Shortly after, the first Gas Directive was revised with the second Gas Directive (2003/55/EC), which intended a total market opening for 2005. Third-party access became a basic rule, and the vertical disintegration of transmission system operators and independent regulations overseeing the market were reinforced.

5.1.2 Slow implementation rate

In the same year as the second Gas Directive was introduced, the reality was that the liberalization efforts directed towards the energy market were not giving the anticipated results. In numerous benchmarking reports published by the European Commission²³, lack of industry unbundling, regulated end-user prices, lack of intra-national gas infrastructure, uniform sources of gas supplies, low rate of customer switching and declining investments were all issues identified to hamper the creation of a competitive and functioning single EU energy market. The mixture of compulsory and non-binding measures proved to be insufficient to reach the aims of the Gas Directive. The transmission companies continued to signal their strong preference for the prolongation of the pre-liberalization market. Third party access has been put in place in France, but this has proven to be more difficult in Germany. Whereas France already had a strong regulator in place, Germany first established a regulatory body for the gas market in 2005.

Due to its geographical location in the middle of the EU, Germany's liberalization of the gas market is crucial for the further development of the single European gas market. Until now, the liberalization efforts in Germany have been below the average of the EU. This is amongst other things embedded in the low customer switching. The Gas Directive was to give end customers the possibility to choose their own gas supplier, but according to the IEA Energy Review of Germany 2007, the rate of customer switching is still low. This can derive from the fact that losing customers can be very expensive for gas importers. In the long-term contracts with producers of gas, importers have agreed to market an assured volume of gas,

²³ http://ec.europa.eu/energy/gas/benchmarking/doc/4/com_2004_0863_en.pdf,
http://ec.europa.eu/energy/electricity/report_2005/doc/2005_report_en.pdf

i.e. if they do not sell it they still have to pay for it. The threat of new entrants taking their existing customer base has forced the transmission companies to lower their margins and offer their customers a lower price. The customers have thus been more able to negotiate better prices with their suppliers than prior to the implementation of the Gas Directives (IEA, 2007). Although legal unbundling of transmission and sales have been mandatory in Germany for some years, industry sources claim that the capacity in the infrastructure is already fully booked by the incumbent operator, making it difficult for new entrants. The market has been to some extent saturated due to the long-term contracts.

5.1.3 Outlook

The benchmarking report on the European gas market published in 2007 addresses the issues that have stalled the creation of the single market for gas in the EU. Measures proposed in the report were to treat energy and environment together, as well as gas and electricity, ownership unbundling between transport and sales, and a regulatory body to oversee cross-border issues. These measures are to be included in a third Directive. The problem is however that most of the gas supplied to the EU comes from countries not affected by the Gas Directives, e.g. Russia and Algeria. The Russian government has expressed that it is not a supporter of liberalization of the gas market and that the gas sales monopoly through Gazprom will not change²⁴. The same arguments have been affirmed by the Algerian authorities. Thus, approximately 50 percent of gas supplied to the European market will in the future also be dominated by gas sales monopolies (Sagen, 2001).

The emergence of significant spot markets for gas in continental Europe has also been slow with lack of infrastructure investments and lack of liquidity (Stern, 2007).

5.2 The effects of abandoning GFU

The arguments used to justify a gas sales monopoly such as GFU were mainly concerned with optimal resource management and maximization of Norwegian petroleum wealth. This could be interpreted as achieving a sustainable high gas price that would not have been achieved without coordination of gas sales through a monopoly such as GFU. Now that the

²⁴ Russia toughens stance on energy prices. Financial Times 16.10.03

GFU has disappeared and the Norwegian petroleum sector has undergone major structural changes (cf. chapter 4), it is interesting to see whether the two arguments justifying GFU have been compromised with individual gas sales to Europe. The expected effects from abolishing GFU were as previously mentioned:

- a lower gas export price, and/or
- better downstream opportunities for NCS producers

5.2.1 Price

Critics of the decision to abolish GFU and implement the Gas Directive were worried that lower gas prices for end customers would materialize in lower producer prices for gas companies on the NCS. With all producers on the NCS having the opportunity to freely sell their gas and utilizing the entire production system, critics were also worried that Norwegian gas would oversupply the European gas market. With the discovery of the Troll field in addition to other major gas fields, Norway had more gas than Europe needed, i.e. the European market was the constraint of selling more gas.

In today's market, the ability to provide enough gas and not the market itself is the new threshold. Since 2001, gas production has increased. Large gas fields such as Troll have increased production and new fields such as Ormen Lange have come on stream²⁵. Norwegian gas exports have also increased since 2001, with increased demand for Norwegian gas in UK and on the European continent. Additionally, a potential oversupply has been prevented by delayed field and infrastructure developments in Europe (IEA, 2008). According to the IEA (2008), the demand for gas is likely to continue to grow in the years to come and adds that there is no longer any doubt that the market will be able to consume the gas produced the NCS. Thus, the expected oversupply effect with decreasing prices of abolishing GFU has not materialized. Contrary to a 'weak market', the European gas market since 2001 could be characterized as 'tight'.

When looking at the price developments of gas sold from the NCS, it is difficult to determine whether any discrepancies in the gas export price can be explained by the

²⁵ http://www.shell.no/home/content/nor/products_services/solutions_for_businesses/ep/ormenlange/no/facts/

abolishment of GFU. Firstly, the linkage between oil and gas prices still seems to prevail. As seen from the figure below of German border gas prices during the last ten years, the Troll price is still highly correlated with international oil prices. The unprecedented rise of the oil price has also made the price of gas rise to new heights.

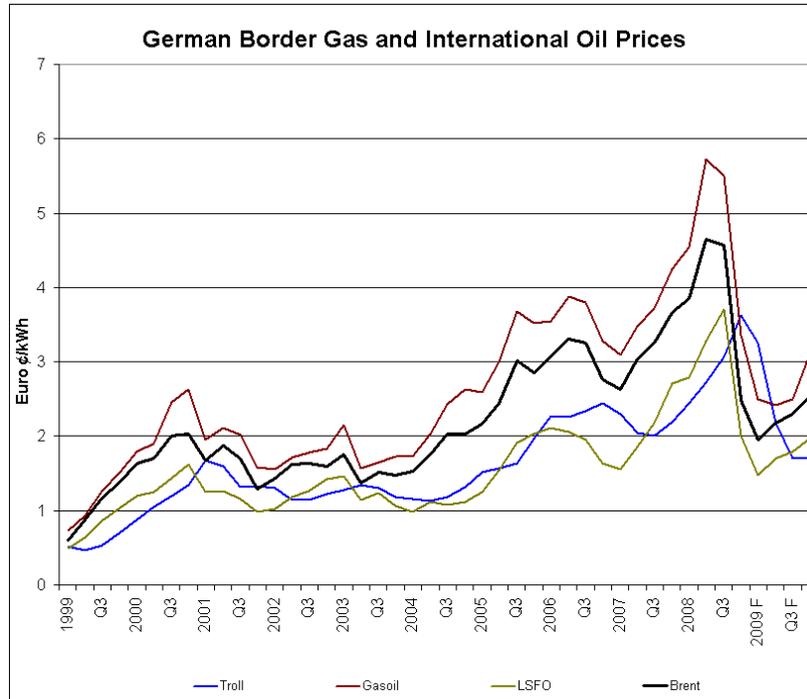


Figure 14: German border gas and international oil prices, 1999-2009.
Industry sources

The gas export price to Germany has therefore not decreased, but this is as mentioned mostly due to the existing oil price linkage. Industry sources have emphasized that the oil price linkage still prevails with the exception of gas sales contracts to the UK where the price is linked to the spot market. As discussed in the section of price formation, in a liberalized gas market the producer gains the price increase to his advantage in a tight market (see figure 15). Assuming that gas taxes and margins to transmission companies and local distribution companies are unaffected throughout the price increase, producers on the NCS should have gained the increased flexibility that the abolishment of GFU gave. In the years of GFU, the government decided all contracts, thereby putting a ceiling on the amount of gas sold to Europe. Without GFU, producers have been more flexible in terms of volume and may have sold more gas than what they would have with a gas sales monopoly. Also, companies on the NCS have been more flexible in entering new contracts and renegotiating existing contracts.

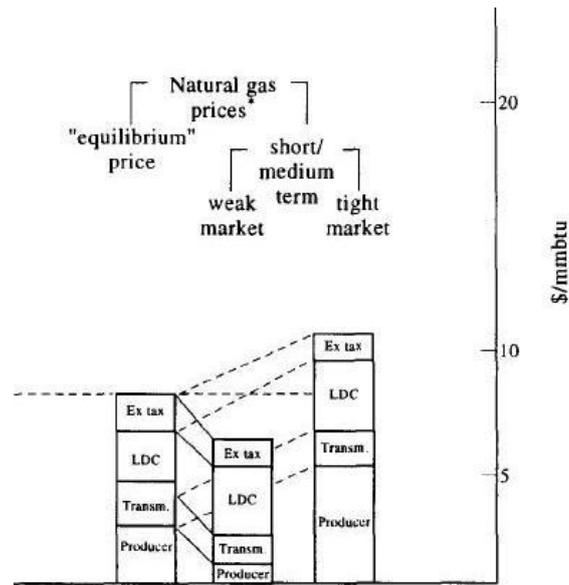


Figure 15: Price volatility in a liberalized market (Austvik, 2003)

The unprecedented oil price increase has indeed affected the price of gas sold from NCS. The question is whether the price of gas sold from NCS would have been even higher with GFU. To look at this, it is of interest to look at border gas prices from the NCS in relation to other border gas prices. A clear divergence in border gas price to Norway's disadvantage could for instance be a sign that Norwegian producers on the NCS have relatively lost bargaining position to the advantage of buyers.

Before the gas market was liberalized and GFU was abolished, Asche et al. (2000) analyzed the price integration of gas from three suppliers to France. The aim of the study was to find the level of market integration and if there were arbitrage opportunities in the market. At the time of the study, Gaz de France still had a monopoly on French gas imports and exports. The conclusion of the study was that the import prices of gas in France had a high degree of correlation. This meant that imports from the Netherlands and Norway had no relative price premium compared to Russia although both of the former countries are geographically closer to France than the latter.

In a similar paper, Asche et al. (2000) looked into the German market for gas to see whether prices from different supply countries were correlated. They conclude that import prices from the Netherlands, Norway and Russia are correlated, suggesting that the German market was well integrated. However, the prices were different although they correlated, i.e. Norwegian and Dutch imports achieved somewhat higher prices than Russia. The paper suggests that Norwegian producers have obtained higher prices due to (i) geographical

distance from Russia to Europe, (ii) willingness from European importers to pay for security of supply, and (iii) the bargaining positions of the Netherlands and Norway compared to Russia.

Both Germany and France are countries that rely on gas supplies from NCS to meet their energy demand. Gas sold from NCS to these countries is mostly through long-term contractual agreements. The prices and clauses of these contracts are confidential, but estimates of border gas prices are available in the industry. The figure below shows historical French border prices for gas. Because the Troll field was and is the main supply field for gas sold to France, the Norwegian border gas price estimated is the Troll price. In addition to Norway, France receives LNG gas from Algeria, and some gas from Germany. In 1999, the price curves seem quite correlated. The recent developments in price show that the Troll price and the German border average price are still highly correlated. Exports from the Netherlands (Gasunie) seem to have obtained a higher gas price.

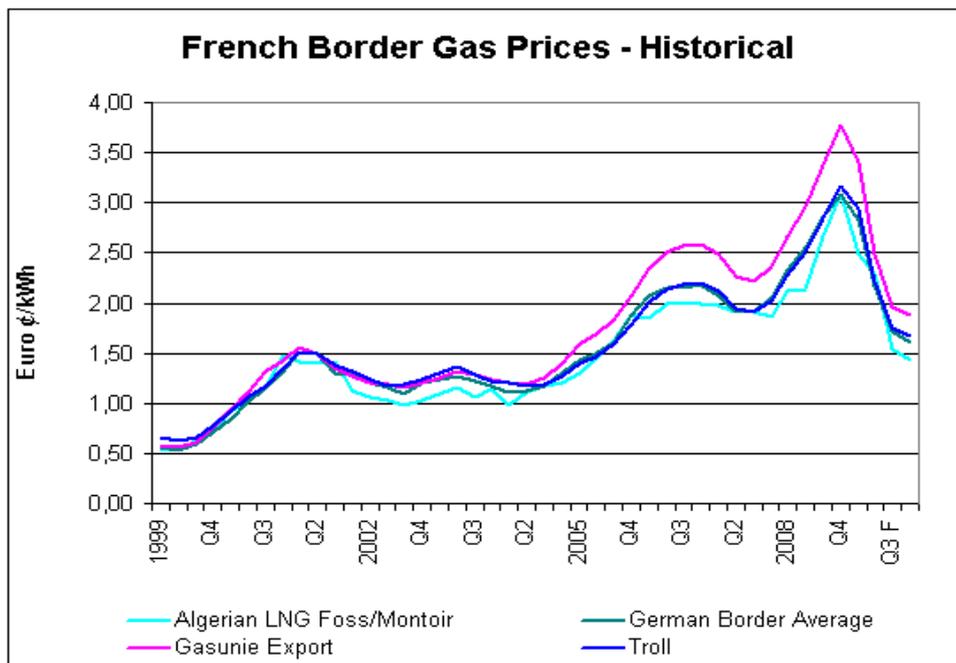


Figure 16: French border gas prices, 1999-2009. Industry sources

Looking at the German market in figure 17, it is clear that the Troll price initially is highly correlated with the Russian border price. Additionally, the Troll price seems to have been roughly equal to the average border price estimated in Germany. After 2001, and especially around 2005, this trend changes as the Troll price is higher than both the average German

border price and the Russian price. As in France, gas border price from the Netherlands is in general higher than the Norwegian price.

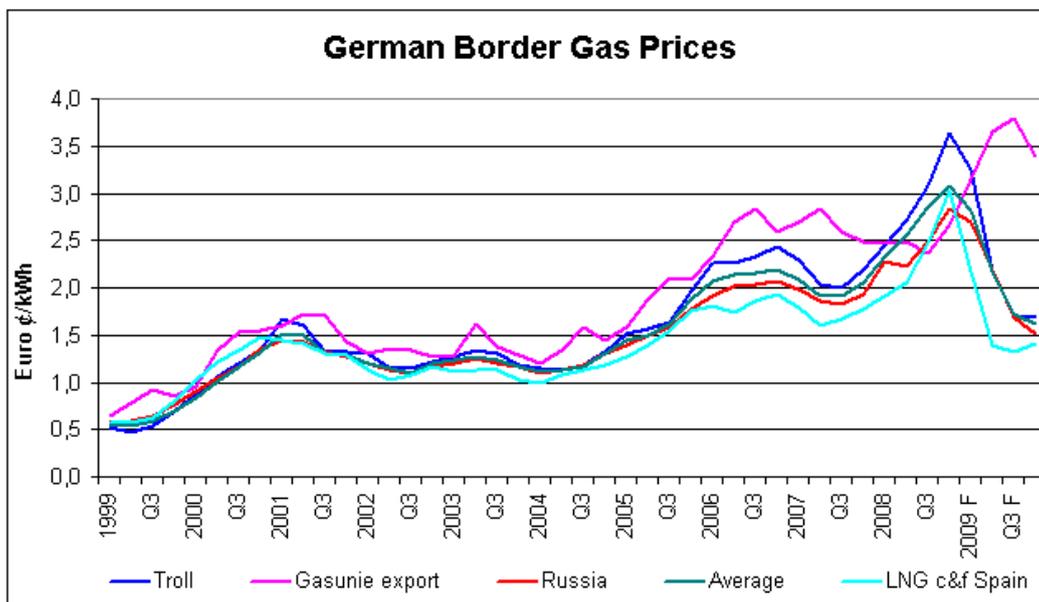


Figure 17: German border gas price, 1999-2009. Industry sources

Looking at these two graphs, it seems that there is no clear indication that Norwegian gas sold from the NCS has experienced relatively lower prices than competing gas supply countries after the abolishment of GFU when compared to the situation prior to the abolishment. In a questionnaire amongst important personalities in the Norwegian gas industry made by ECON (2006), 95 percent of the respondents could not identify any significant price change in either direction after the abolishment of GFU. If there has been any price change to the disadvantage for gas producers on the NCS, it has most likely been offset by the possibility to market larger volumes to a market with growing demand for gas.

5.2.2 Long term contracts

After the GFU was abolished, the contracts with European buyers were split up into company-based contracts. This created a range of contracts between producers and buyers of gas. Whereas Germany and Norway previously had one contract between the German Consortium and GFU, the new situation required every producer selling gas from the NCS to sign a contract with a European buyer. For instance, with five Norwegian producers and five German importers, 25 new contracts had to be signed. The large European transmission companies would face a large variety of companies wanting to sell their gas to Europe, and not only one counterpart such as the GFU. On the other hand, companies on the NCS would

also face a larger variety of companies on the buyers' side, and even bypass the transmission companies when selling gas to end users.

One of the main worries with the abolishment of GFU was the future of long-term contracts with European gas buyers. These long-term agreements had ensured that the risk of large investments on the NCS was shared between producer and buyer. Experiences from the US and UK markets who have both liberalized their gas markets show that long-term contracts do not disappear, even in a liberalized market. Firstly, the Troll contracts signed in 1986 are still valid until 2028. Secondly, although new contracts being signed do not have the same lifespan as the Troll contracts, they could still be considered long-term with a lifespan of 10 years. Shortly after the abolishment of GFU, the Norwegian subsidiary of Italian Eni, signed an agreement with German gas importer VNG to supply 2.5 bcm of gas from the NCS over a 15-year period.²⁶ Similarly, Statoil reached an agreement with UK gas company Centrica to supply 5 bcm of gas over a 10-year period.²⁷ According to industry sources, this trend has continued. Long-term contracts are still the backbone of the gas sales to European customers. This is also backed by the Norwegian authorities; prior to the G8 summit in 2006, the Norwegian Minister of Foreign Affairs clearly expressed Norway's views on the importance of long-term contracts for investments and stable supplies to Europe.²⁸

5.2.3 Flexibility

After the gas sales monopoly of GFU was abolished, field-specific contracts were abandoned and replaced with company-based contracts. All companies had now the responsibility for their own licenses and could market the gas according to their needs. The international oil and gas companies (IOCs) such as ConocoPhillips, ExxonMobil, Statoil and Shell could now include their Norwegian assets in their international portfolios and thereby enhance their flexibility in terms of production, delivery and trading. ECON (2006) claims in its analysis that these supply optimisations that became available after the abandonment of GFU led to "higher utilisation of the Norwegian production system and possibly to higher value".

²⁶ Gas Taker for Norsk Agip. Upstream (20.09.02)

²⁷ Statoil sets new gas supply trend. Upstream (13.01.02)

²⁸ Norge ypper til gasstrid. Aftenposten 23.02.06

The UK market is the most liquid and liberalized market for gas in Europe. The abolishment of GFU made gas producers on the NCS more flexible in their agreements with UK counterparties. For instance, if Statoil is to deliver 1 bcm of gas to a company in the UK, the origins of that gas is irrelevant as long as it is delivered. Statoil can decide to supply the gas from own fields, or even other producers' fields. If the UK spot market price is lower than the price entailed in Statoil's UK contracts, it can decide to provide the company in the UK with gas bought on the spot market. Contrary, if Statoil or any other company has excess supplies of gas and the spot market price is higher than the contract price, they can sell gas to the spot market. With GFU, this flexibility had not been possible.

This newly gained flexibility has been well received by the gas industry in Norway. In 2006, ECON (2006) sent out a questionnaire to key persons within the gas industry to measure the industry opinion of the abolishment of GFU. The respondents claimed that "large Norwegian and international producers" have gained the most of the abolishment GFU. In the same questionnaire, "small producers with no gas marketing" were dubbed 'stakeholders who have benefited the least of the abolishment of GFU'. Large companies have due to the abolishment more flexibility in their gas sales and can now combine their gas assets on the NCS into their international portfolios and gain optimization advantages. Small producers that previously sold all their gas through GFU did not have any expertise within the area of sales and marketing of gas because it was not necessary. Without GFU, these companies were forced to acquire expertise within the area. In the same study, it is also noteworthy to see that the respondents point out the end users as the losers of the abolishment of GFU, and the transmission companies as the winners (with no further explanation). Ironically, this was not the intention of the EU when it introduced the Gas Directive and indirectly forced the abolishment of the gas sales monopoly GFU.

5.2.4 Internal sales

The liberalization efforts of the EU and the abolishment of GFU created new opportunities for companies on the NCS to market their own gas. Internal sales between the upstream and downstream affiliates of a company create synergies with more possibilities for supply and market optimisations. International companies could then evade the large importers of gas in Europe and sell the gas internally to another affiliate. Total of France could for instance after the abolishment of GFU sell gas to its own affiliate in France, evading the previously monopsonist importer of Gaz de France.

This move was followed by other companies on the NCS. In a press release shortly after the decision to abandon GFU, Statoil announced that it would market its own gas through its UK subsidiary.²⁹ Downstream companies have gone in the opposite direction and established upstream affiliates on the NCS. For instance, both transmission companies E.ON Ruhrgas and Gaz de France Suez have established an upstream presence in Norway, a move explained by the desire to secure own supplies in their supply portfolios.³⁰ ECON (2006) measured the degree of internal sales before and after the abolishment of GFU in their Norwegian Continental Shelf Quarterly of 2006. In the figure below, it is clear that internal sale of gas within companies have increased in the years after the abolishment of GFU. Internal sales as a percentage of total sales increased from 9 percent in 2002 to 18 percent in 2004.

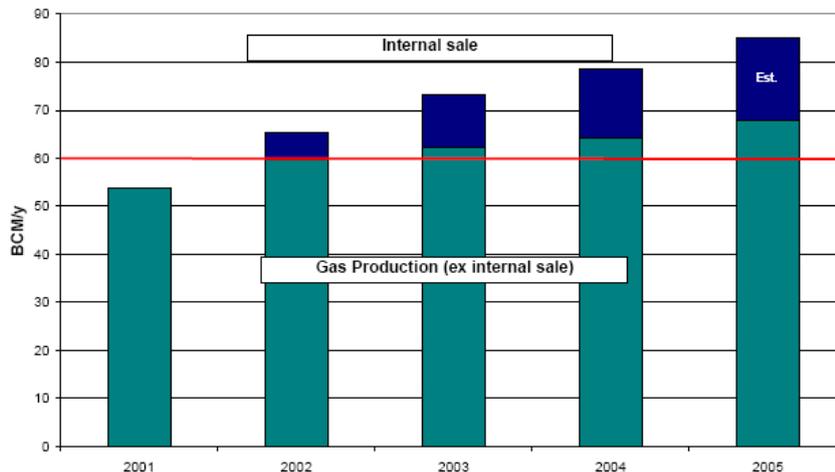


Figure 18: Internal gas sales from NCS (ECON, 2006)

One of the Norwegian State's main revenue sources from the petroleum sector is the tax on the gas export price. Thus, the Norwegian authorities were concerned about the increasing trend of internal sales, as they thought that a lower gas sales price would result in lower tax revenues for the state. When GFU was abolished, companies could sell gas from their producing fields on the NCS to downstream affiliates in other countries. Because the tax rate for companies operating on the NCS is higher than the tax rate the same companies experience in their downstream operations, there were worries in the government that

²⁹ <http://www.statoilhydro.com/no/NewsAndMedia/News/2001/Pages/SellingOwnGasToTheUK.aspx>

³⁰ www.gazdefrance.no, www.eon-ruhrgas.no

revenues from gas extraction on the NCS would be transferred to the downstream affiliates through low transfer pricing in internal sales.³¹

To counteract this, the Norwegian authorities introduced a system that enables them to adjust the gas sales price a company reports in its tax assessment if the transaction has occurred between two affiliates of the same company, i.e. internal sale.³² This practice has been named the “arm’s length principle”. Companies operating on the NCS can ask the office in charge, i.e. the Oil Taxation Office, to “render a binding advance tax ruling as to what price shall form the basis for the tax assessment of internal sales”. Thus, companies selling gas from NCS cannot evade Norwegian tax law by pricing their internal sales lower than prevailing market prices.

5.2.5 Market structure and regulatory control

The gas infrastructure in Norway, i.e. pipelines and terminals, were in 2001 gathered in one company, Gasled. To operate the infrastructure, a wholly state-owned company Gassco was established to ensure non-discriminatory access and equal tariffs to all users of the system, in line with the EU Gas Directive. This and the abolishment of GFU meant that companies with licenses on the NCS could sell their gas to anywhere in Europe without having to go through a gas sales monopoly and without having to use pipelines under a discriminatory owner. Gassco also assumed responsibility of the infrastructure coordination from the Supply Committee FU, a well-functioning system according to industry sources.

In 2000, the Norwegian companies opened up the possibility for smaller companies to become licensees and operators on the NCS. With the tax reform of 2005, giving companies 78 percent deduction of exploration expenses (with no production expenses needed), numerous more companies established themselves on the NCS. Today, around 70 companies are active exploring and producing for oil and gas on the NCS, according to a report by SINTEF (2008). Although the upstream diversity on the NCS has increased, StatoilHydro is still the dominating company on the NCS.

³¹ Skatte- og avgiftsopplegget 2006, Ot.prp. nr. 1, www.regjeringen.no

³² http://www.regjeringen.no/nb/dep/fin/tema/skatter_og_avgifter/bedrifts-og-grunnrentebeskatning/beskatning-av-petroleumsvirksomhet.html?id=41731800

Austvik (2009) argues that the Norwegian government has “become more limited in her freedom to choose natural gas policy than other exporters of natural gas”. He further adds that “Norway had to eventually follow EU rules, but in spite of her legal “defeat” she maintained much of the entrepreneurial initiative on her gas model through regulative innovation; increased direct state participation; the way she reorganized natural gas activities; ownership dominance; and, a state controlled infrastructure”.

With the new organization of the petroleum resource management, the Norwegian authorities managed to retain the main elements from the GFU era. The Storting has decided to increase the government’s share of StatoilHydro from 62,5 percent to 67 percent. StatoilHydro’s gas assets together with the SDFI still account for roughly 70 percent of the gas sales on the NCS (ECON, 2006). Through Petoro, the Norwegian government is overseeing that StatoilHydro is marketing the gas from the SDFI assets in an optimal socio-economically manner. Through Gassco, the Norwegian government controls the gas infrastructure, and kept the former function of the supply committee (FU) with regard to infrastructure development. Additionally, through the licensing policy of the Ministry of Petroleum and Energy, the government controls the field development on the NCS. Thus, the resource management is still very much under the control of the government.

6. CONCLUSION

GFU was established to secure an optimal resource development on the Norwegian Continental Shelf (NCS), and to maximize the value of Norwegian gas. The establishment of GFU was also a reaction to a market structure in Europe that consisted of oligopolies on the sellers' side and oligopsonies on the buyers' side. However, there were numerous arguments to abolish GFU in 2001. For instance, GFU was established for a European gas market structure that prevailed in the 1980's and the 1990's, and GFU's structure was thus out-of-date when it was abolished in 2001. Even the chairman of GFU saw no future in the way of organizing gas sales from NCS through a monopoly. The Norwegian market had matured with most of the gas infrastructure put in place, and mainly small gas fields as the next development projects on the NCS. The EU had launched the Gas Directive with the aim of liberalizing the gas market, the buyer side was getting more fragmented, and non-discriminatory third-party access to the gas infrastructure was being introduced. The arguments used to justify GFU were thus not that apparent anymore.

When the Norwegian government decided to abolish GFU in 2001 after pressure from the EU, the effects were however unknown. Critics claimed for instance that Norway could lose substantial revenues from the gas sector from a resulting lower gas export price. Eight years after the abolishment of GFU, it seems that Norway has experienced benefits from the abolishment of the gas sales monopoly. The gas export price has risen to unprecedented heights due to the oil price linkage that still dominates the gas price. The gas export price for Norwegian gas has not changed relatively to other gas exporting countries, indicating that abandoning GFU has not caused a relatively lower gas export prices for Norway. The fear of an oversupply of Norwegian gas to the European gas market with resulting lower prices has also not materialized. The European market for gas has grown considerably since the inception of GFU in the 1980's, and has since 2001 been characterized as 'tight'.

Without GFU, gas producers on the NCS have gained more flexibility in their gas sales agreements with European buyers. They can now renegotiate their agreements with the buyer side, and sell gas directly to end customers in Europe, bypassing the transmission companies. Additionally, companies on the NCS with gas production in other countries as well can now integrate their gas assets on the NCS into their international portfolios, and thus benefit from increased flexibility. The fear that the government would lose important

revenues from the petroleum sector with the increased use of transfer pricing between upstream and downstream affiliates has been prevented with the “arm’s length principle”.

The Norwegian government has next to the abolishment of GFU implemented major changes in the state’s participation in the petroleum sector. Although the government no longer controls the gas sales directly as it did through GFU, it has control over the gas infrastructure and through its ownership in StatoilHydro and SDFI control over 70 percent of the gas sales from the NCS. Also, companies operating on the NCS still have to get approval from the Ministry of Petroleum and Energy and the Norwegian Petroleum Directorate in their activities. The Norwegian system for socio-optimal resource management of the gas reserves on the NCS has thus not been compromised.

The combination of increased flexibility in gas sales and a ‘tight’ European gas market has been beneficial for Norwegian gas sales. Thus, it can be said that the EU’s pressure to abolish GFU has been a ‘blessing’ for Norway. It has to be noted however that the market conditions have been overly favourable for Norway since the abolishment of GFU. If the European gas market would experience an oversupply of gas, a coordinated gas sales monopoly such as the GFU could perhaps be of advantage to Norway as a gas exporting country. The future will decide whether abolishing GFU will be beneficial for Norway in the long term. As for now, the growth estimates of the European gas market and the supply shortages reported by the International Energy Agency seem to verify the notion that Norway is and has been better off without a gas sales monopoly.

References

Andersen, Svein S. (2003): Spiller EU-medlemskap noen rolle for Norge som energinasjon? (Horisont nr. 3/2003)

Asche, Frank et al. (2000): Market Integration for Natural Gas in Europe (SNF report no. 45/00)

Aune, Finn Roar et al. (2002): Friere energimarkeder i Europa. SSB Økonomiske Analyser 5/2002

Austvik, Ole Gunnar (2003): Norwegian Natural Gas – Liberalization of the European Gas Market. Europaprogrammet, Oslo.

Austvik, Ole Gunnar (2009): The Norwegian State as a Natural Gas Entrepreneur – The Impact of the EEA Agreement and EU Gas Market Liberalization. University of Oslo

Bakkeland, Geir and Sørensen, Kristian (2002): Prospects for the Further Development of the Spot/Short-term LNG Shipping Market in the Atlantic Basin towards 2010, with Focus on the US LNG Market

Bjerkholt et al. (1985): Olje og gass i norsk økonomi. Universitetsforlaget

Bjørndalen, Jørgen and Nese, Gjermund (2005): Økt bruk av gass innenlands: Norge som del av et europeisk gassmarked (SNF arbeidsnotat nr. 26/05)

BP Statistical Review of World Energy June 2008, www.bp.com

Dalland, Ove Kenneth (2003): The European Gas Market – A New Era? NHH

E.ON Ruhrgas AG (2007): Erdgas aus Norwegen - 30 Jahre Versorgungssicherheit aus der norwegischen Nordsee, www.eon-ruhrgas.com

ECON Analysis (2006): Five Years On – The End of GFU/FU and the Future of EU Market.

ECON Analysis (2006): New Kids on the Block – A Survey of the Newcomers

Eldevik, Frøydis (1999): Liberalisering av gassmarkedet i Europa. ARENA Report 4/99

The Emirates Center for Strategic Studies and Research (2001): The Future of Natural Gas in the World Energy Market. British Academic Press

Golombek, Rolf and Gjelsvik, Eystein (1998): Increased Competition on the Supply Side of the Western European Natural Gas Market (The Energy Journal, 1998, 19, 3)

Hannesson, Rögnvaldur (1998): Petroleum Economics – Issues and Strategies of Oil and Natural Gas Production. Quorum Books

Henderson and Quandt (1980): Microeconomic Theory – A Mathematical Approach, 3rd Edition. McGraw Hill

Heyerdahl, Torbjørn S. (2003): A New Gas World – Administration of Gas Trade in the North Sea. NHH

IEA (1998): Natural Gas Price Formation, www.iea.org

IEA (2000): Regulatory Reform – European Gas, www.iea.org

IEA (2005): Energy Policies of IEA Countries – Norway 2005 Review, www.iea.org

IEA (2006): Natural Gas Market Review 2006, www.iea.org

IEA (2007): Natural Gas Market Review 2007, www.iea.org

IEA (2008): Development of Competitive Gas Trading in Continental Europe, www.iea.org

IEA (2008): Natural Gas Information 2008, www.iea.org

IEA (2008): Natural Gas Market Review 2008, www.iea.org

Kjärstad, Jan and Johnsson, F. (2007): Prospects of the European Gas Market (Energy Policy, 2007, 35, p. 869-888)

Mathiesen, Lars (2001): On modelling the market for natural gas (SNF Working paper no. 66/01)

Müller-Graff, Peter-Christian and Selvig, Erling (2008): Regulation Strategies in the European Economic Area. Berliner Wissenschafts-verlag

Norwegian Petroleum Directorate (2008): Facts 2008, www.npd.no

OECD/IEA (1994): Natural Gas Transportation. Organisation for Economic Cooperation and Development/International Energy Agency

Palm, Thomas Fredrik (2007): The future of LNG in Europe and the potential impact on the market power of the gas suppliers. NHH

Pindyck, Robert and Rubinfeld, Daniel (2008): Microeconomics, 7th edition. Prentice Hall

Pirani et al (2009): The Russo-Ukrainian gas dispute of January 2009: a comprehensive assessment, Oxford Institute for Energy Studies

Radetzki, Marian (1999): European natural gas: market forces will bring about competition in any case (Energy Policy 27, 1999, p. 17-24)

Sagen, Eirik Lund (2001): Mot et liberalisert europeisk gassmarked (SSB Økonomiske analyser 6/2001)

Stern, Jonathan P. (1998): Competition and Liberalization in European Gas Markets – A Diversity of Models. The Royal Institute of International Affairs

Stern, Jonathan P. (2007): Is There A Rationale for the Continuing Link to Oil Product Prices in Continental European Long-Term Gas Contracts? Oxford Institute for Energy Studies

Sunnevåg, Kjell J. (1999): How sustainable is the framework for Norwegian gas sales? (Energy Policy 28, 2000, p. 311-320)

Tvede, Ivar (2006): Olje- og Energidepartementets rolle i gasseskporten til EU. Universitetet i Oslo

Westby, Ola and Forseth, Ulla (2008): Kartlegging av aktørbildet på norsk sokkel – tilbakemelding til selskapene. SINTEF report ordered by the Petroleum Safety Authority Norway

Appendix 1 – List of interviewees

A/S Norske Shell	J. Tegle
A/S Norske Shell	T. Tiedemand
A/S Norske Shell	N. Viste
Lillehammer University College	O. Austvik
Norwegian Ministry of Petroleum and Energy	E. Johnsen
The Norwegian Petroleum Directorate	T. Bertelsen

Appendix 2 – List of abbreviations

Bcm: billion cubic meters

EEA: European Economic Area

EFTA: European Free Trade Association

ESA: EFTA Surveillance Agency

EU: European Union

FU: Forsyningsutvalget – Supply Committee

GDP: Gross Domestic Product

GFU: Gassforhandlingsutvalget – Gas Negotiating Committee

IEA: International Energy Agency

IOC: International Oil and Gas Company

LDC: Local Distribution Company

LNG: Liquefied Natural Gas

MPE: Ministry of Petroleum and Energy

NBP: National Balancing Point

NCS: Norwegian Continental Shelf

NPD: Norwegian Petroleum Directorate

SDFI: State's Direct Financial Interest

SO: Statement of Objections

TOP: Take-or-pay

TPA: Third-Party Access

TPES: Total Primary Energy Supply