

5-22-2011

Liberalization of the European Natural Gas Market and Achieving Energy Security: An Internal Solution to an External Problem

Merin Yu
Dickinson College

Follow this and additional works at: http://scholar.dickinson.edu/student_honors



Part of the [International and Area Studies Commons](#)

Recommended Citation

Yu, Merin, "Liberalization of the European Natural Gas Market and Achieving Energy Security: An Internal Solution to an External Problem" (2011). *Dickinson College Honors Theses*. Paper 178.

This Honors Thesis is brought to you for free and open access by Dickinson Scholar. It has been accepted for inclusion by an authorized administrator. For more information, please contact scholar@dickinson.edu.

DICKINSON COLLEGE

LIBERALIZATION OF THE EUROPEAN NATURAL GAS MARKET
AND ACHIEVING ENERGY SECURITY:
AN INTERNAL SOLUTION TO AN EXTERNAL PROBLEM

A SENIOR CAPSTONE PAPER
SUBMITTED

TO PROFESSOR WOLFF

DEPARTMENT OF INTERNATIONAL STUDIES

BY
MERIN YU

CARLISLE, PA
15 DECEMBER 2010

Précis

On January 1, 2009, the fears of many European policymakers were confirmed. After a payment dispute could not be resolved, Russia shut off natural gas supplies to Ukraine, leading to widespread gas disruptions across Europe. While this episode highlighted Europe's vulnerability in the energy sector, concerns over the security of supply for natural gas had been existed well before 2009. Ever since the discovery of gas in the 1950s, it has played an increasingly important role in Europe's energy consumption. Due to certain irregular technological and economic features of natural gas as an energy resource, the market has always been uncompetitive and characterized by a limited number of suppliers, leading to security of supply concerns. In attempt to change this, the European Commission began an effort to enact liberalization reforms in 1998 with one of three Directives.

These Directives were designed to make the market more competitive and facilitate the entry of new suppliers into the market. The expected results of this are two-fold: lower prices for consumers, as well as increased energy security due to more options in suppliers. A quantitative analysis of EU documents shows that policymakers overwhelmingly believed that liberalization would increase energy security. However, after an examination of the three liberalization Directives using a mix of economic and qualitative data, there is little evidence that the legislation had positive effects on increasing competition and therefore energy security. Prices have increased, market concentration remains high, and customers are not switching suppliers. The second half the paper looks at the projects that the EU and member states proposed with the explicit goal of increasing energy security and looks at whether liberalization aspects are present. Some of the examples include the Nabucco pipeline, and the Nord and South Stream pipelines. In the projects chosen, none of them included any of the main aspects of liberalization.

A final examination of the reason behind such a stark disconnect between what the EU says and actually does reveals that there are certain characteristics of the natural gas market that simply cannot be altered by liberalization. While opening up the market is supposed to facilitate the entry of new suppliers into the market, the characteristic of gas as a natural resource signifies that even if market conditions are favorable, supply cannot be increased purely due a firm's desire. While the goal of creating an internal market for energy appears beneficial in theory, it is clear that certain characteristics of the natural gas market make it impossible in practice.

In the field of International Relations, something extraordinary is occurring: Europe is currently experiencing the longest period of continent-wide peace in its history, stretching from 1945 until the present. While some scholars point to fighting in the Balkans in the 1990s or the recent conflict between Russia and Georgia to argue that peace does not exist in Europe, it appears that there has not been the traditional geopolitical hotspot that affects the entire continent. However, one overlooked hotspot is the issue of achieving energy security, which is an issue that ultimately affects all countries. For Europe, a significant component of energy security is natural gas. Due to technological limits, natural gas is primarily transported through a series of pipelines. In the event of a disruption in supply, there is little short-term flexibility in switching suppliers. As a large portion of Europe's natural gas imports come from unstable and/or unfriendly states, securing the supply of gas has been a top issue for many policymakers. One of the recent strategies to accomplish this has been a push towards liberalizing the natural gas market.

The European Commission is currently spearheading a process to liberalize the natural gas market, an effort that began in 1998 with the first of three liberalization Directives. Two central goals of liberalization are to lower prices for consumers and to increase energy security. If achieved, these two objectives would be the results of a more competitive market that provided more suppliers from which to choose. It appears that from this logic, liberalization is both economically and politically beneficial. However, after examining the liberalization legislation, it appears that liberalization has not been successful. Prices remain high, the number of suppliers is low, and countries are still susceptible to disruptions in the supply of natural gas. When one looks at the efforts of the European Union that are explicitly designed with achieving energy security as the main goal, there are no traces of liberalization principles in these projects. In fact, many of the attempts to increase energy security are contradictory to the tenets of liberalization

outlined in the Directives. When analyzing the failure of market liberalization as a tool to achieve energy security, it becomes clear that it is due to the fact that liberalization is an internal solution to an external problem.

Background

Natural gas was first used after World War II, and its share in Europe's energy consumption has been increasing ever since. The first discovery of natural gas occurred in the 1950s in the Po Valley in Italy, and in 1959, the Groningen field was found in the Netherlands, and it continues to be Europe's largest deposit of natural gas today.¹ According to the International Energy Agency, natural gas comprised 3 percent of Europe's energy consumption in 1965. That percentage rose to 20 percent in 2009², and the IEA predicts that by 2035, approximately 44 percent of Europe's energy consumption will be natural gas.³ Thus, it is clear that natural gas will play an increasingly important role in achieving energy security in Europe. A large part of the concern about securing the supply of natural gas is that production occurs outside the borders of the EU. Russia holds 42 percent of the world's gas reserves, followed by Norway (24%), Algeria (18%), Iran (15%), and Nigeria (3%) and Libya (2%).⁴ The EU imports about 47 percent of all gas it consumes each year, and this percentage is expected to increase.⁵ In addition to the location of natural gas deposits, there are certain irregular technological and economic features of gas as an energy resource.⁶ Combined, these two elements create an inflexible and uncompetitive market that leads to security of supply concerns.

To discuss the gas market, it is necessary to divide it between the physical structure and the structuring of competition, and the first influences the second. The physical structure of the natural gas market has three distinct sections: production, transmission and distribution. The production stage refers to when the gas is extracted from the ground and refined into a usable

product. It is obvious, but necessary, to mention that producers are constrained by the fact that gas is a natural resource; firms simply cannot choose to produce natural gas. In the second stage, gas is transferred, primarily via pipeline, to the customer, and it is then locally distributed in the end-user country as the third step in the process. The vast majority of natural gas – approximately 80 percent – travels through pipelines that are extremely costly to build. For example, according to current steel prices, an average 400-km pipeline would cost between \$480 million to \$770 million.⁷ (As a point of reference, one of the pipelines to increase Europe’s energy construction that is under construction is approximately 3,300 km.⁸) Thus, natural gas differs from other energy sources such as oil, which can be bought, sold, and physically transferred with minimal difficulty. The production and distribution stages are both dependent on the expensive transmission network of pipelines. The physical structure influences the lack of competition in the natural gas market, namely that the market primarily uses long term contracts, is oligopolistic, and characterized by both vertical and horizontal integration.

One of the features that has been consistently present in the natural gas market is long-term contracts. These contracts typically lock the buyer and seller into an agreement for a duration of around 25 years.⁹ The reason behind designing contracts this way is a result of the physical structure of the market. Due to the enormous start-up infrastructure costs, companies building gas pipelines need to ensure that there will be guaranteed demand after the project is completed so that they are able to recoup their initial capital investments. These long-term contracts “tie suppliers and users together in a contractual relationship which is substantially insulated from outside competitive pressures.”¹⁰ The contracts are just one aspect of the limited competition in the gas market.

Another barrier to a competitive market is that the supply side of the gas market is oligopolistic (see Glossary for definition). In the case of Europe, four companies – Gazprom (Russia), Sonatrach (Algeria) and GFU (Norway) and Gasunie (Netherlands) – are responsible for supplying 87.7 percent of natural gas imports.¹¹ Again, it is the physical structure of the market that affects how competitive it is. Since companies cannot simply choose to produce natural gas, once a company establishes itself in a region where there are gas deposits, it enjoys a natural monopoly on that particular field. Clearly, the supply of gas existing in the hands of a few companies is not conducive towards competition.

The other relationship between physical structure and competition is how the transmission stage affects vertical and horizontal integration (see Glossary). In the case of natural gas, there is widespread vertical integration between the production stage and transmission stage. A company is not going to extract natural gas without being assured of the existence of a transmission network to transfer their product to the end consumer. Likewise, companies are not going to enter the transmission stage and invest billions in pipeline infrastructure if there is no guarantee there will be natural gas to transport. Thus, there is an incentive for firms to integrate vertically to assure the success of both stages. Much of the rationale for Standard and Poor upgrading Gazprom's credit rating from negative to stable in 2010 is due to the presence of vertical integration.¹² However, while it may be beneficial to Gazprom, it does not promote competition and the lower prices and increased energy security that follow.

Furthermore, the structure realities of the gas market also favor horizontal integration. As input and infrastructure costs for building the transmission networks are extremely high, they are “both difficult and uneconomical to duplicate.”¹³ If there are two firms operating two different transmission routes, and one of the companies wants to start transporting gas over the

other firm's route, a merger is a more likely option than laying down identical pipeline. The physical structure of the gas market, specifically the need to link the production and transmission stages, influences the integration of firms, both vertically and horizontally. This lack of competition -- as seen in long-term take or pay contracts, oligopolistic nature of the market, and the tendency for firms to integrate -- explains a great deal of Europe's desire to enact liberalization reforms. Making the problem of an uncompetitive market severe is that of the few number of gas suppliers, most of the supplying firms are owned by politically unstable and unfriendly states.

Methodology

To study the relationship between liberalization and energy security of the natural gas market in Europe, I first studied what European policymakers aimed to achieve by liberalizing the market. To do this, I created a simple coding scheme to analyze official documents of the European Union, either in the form of actual legislation, press releases, or information from the www.europa.eu website. I looked at content that mentioned both liberalization reform and energy security. My coding scheme had three categories: if liberalization was mentioned as a method to achieve energy security; if the two goals were mentioned as separate goals but not in competition with one another; lastly, if the two goals were described as being competing with one another and mutually exclusive. The detailed results can be found in the Appendix. Next, I analyzed the liberalization legislation, and measured the effectiveness it had in increasing energy security. My criteria for effectiveness is a mix of raw economic data (primarily from the International Energy Agency and Energy Information Administration), and more subjective factors such as the amount of power a regulatory authority holds and uses. I then focused on the projects designed with the explicit purpose of increasing energy security. These are subdivided

into two categories: projects of the European Union, and projects led by individual member states. I evaluated whether liberalization principles were present in these energy security projects. Finding that they were not, I discuss what the possible reasons to explain the disconnect between rhetoric and practice.

Liberalization Process: Legislation

The liberalization process of the natural gas market is a result of the three Directives handed down by the European Commission in 1998 (98/30/EC), 2003 (2003/55/EC), and most recently in 2009 (2009/79/EC). The Directives aimed to create an internal market for natural gas, which would theoretically lower prices and increase energy security through introducing more competition. In all of the Directives, there are several components that comprise the bulk of the liberalization process, and they are: third party access, minimum percentages of market opening, unbundling, contracts, and a regulatory authority. The EU emphasized these because they were seen as the primary barriers to a competitive market.

The first portion of the liberalization process requires states to grant third parties to the gas transmission system and the gas storage system. Third-party access (TPA) is when a firm that does not own the actual pipeline or storage facility must have access to operate it, assuming certain conditions are met by both the owner and operator of the system. The rationale behind TPA is that a firm that both owns and operates a transmission system can strategically shut off the supply of gas to a country, often for political reasons. However, if a company operates the transmission system and does not own it, nor the production system, its revenue only comes from buying the gas from the producer and selling it at a profit to the customer. Thus, they would have little if any incentive to restrict supply. In 1998, TPA focused solely on the transmission network,

i.e., the pipelines. The Directive outlined two different types of third-party access Member States could choose from: negotiated TPA or regulated TPA (see Glossary).

Both forms of TPA have their benefits and drawbacks. Negotiated TPA allows companies to be more flexible in deciding on terms of access through the negotiation process, but it is difficult to ensure that the negotiation process is non-discriminatory. For example, a company not wanting to grant access to its transmission network in order to retain control over it could simply set unacceptable prices or stipulations that would discourage a third party from entering the transmission business. Regulatory TPA eliminates the discrimination problem, as any company willing to pay the tariffs in order to use the system would be able to, but it requires an extensive regulatory authority to assess what fair and accurate tariff levels are, which can vastly differ from country to country, and even within different parts of a country.

The 2003 Directive extended third-party access to gas storage facilities in addition to the transmission systems. Since natural gas can be stored, storage facilities play an important role; firms that are not a part of the production process can buy gas, store it, and then eventually sell it to customers at a later date, bringing another actor into the transaction between producing country and consuming country. The Directive holds that “storage facilities are an essential means of security of supply.”¹⁴ Changing the operation procedure of both the gas transmission and storage system has been a consistent theme throughout the liberalization process.

The second aspect, minimum percentage opening of the natural gas market, is related to third party access. The idea of minimum opening levels signifies that a certain percentage of the market must grant TPA (either negotiated or regulated) to eligible customers (see Glossary). Throughout the liberalization process, the levels of required opening have increased. The 1998 Directive required 20 percent opening immediately, 28 percent by 2003, and 33 percent by

2010.¹⁵ These levels were increased in the 2003 Directive, which stipulated that by July 2004, 100 percent of eligible non-household customers must have access to TPA, and by July 2007, all eligible customers must have access to TPA.¹⁶ Greater levels of market opening were designed to make the natural gas market more competitive.

The third aspect of the Directives is the concept of unbundling, and each Directive has addressed it. There has been a progression of the different type of unbundling required, starting from account unbundling in 1998, to legal unbundling in 2003, and finally, to ownership unbundling in the most recent Directive. At its core, unbundling is separating vertically integrated companies, forcing firms either to be only involved in either production or transmission or distribution. As ownership unbundling is currently what is in effect, it will be the type outlined. The 2009 Directive required Member States to either perform ownership unbundling, or as an alternative, setting up either an Independent System Operator (ISO) or Independent Transmission Operator (ITO). Ownership unbundling requires that someone with a majority ownership share in one natural gas company cannot have a majority ownership in another. He or she also cannot be simultaneously a voting member of a managing board, nor have the power to appoint members to both boards. The other option, creating an ISO or ITO, would entail “The setting up of a system operator or a transmission operator that is independent from supply and production interests,”¹⁷ but it would still allow a vertically integrated company to retain its assets in both transmission and production/distribution sectors. To ensure that the ISO or ITO is operating independently, the Directive calls for “cooling off” periods, in which “no management or other relevant activity giving access to the same information as could have been obtained in a managerial position.”¹⁸ This is a practice more commonly known as putting

up “Chinese walls,” in order to avoid conflict of interest problems. Emphasizing unbundling is supposed to facilitate the entry of more actors in the market, thus making it more competitive.

As previously discussed, the long-term contracts that characterize much of the natural gas market were problematic because they prohibited competition. Since much of the demand is locked up in contracts for years, it is difficult for new suppliers to move in and out of the market. The EU Directives attempted to lessen this problem, by encouraging shorter and interruptible contracts, starting in 2003. The Directive acknowledges the existence and importance of long term contracts, but goes on to say that “Member States shall ensure that the eligible customer is effectively able to switch to a new supplier.”¹⁹ Furthermore, it states that if a natural gas undertaking encounters serious financial difficulties due to the long term take or pay contracts, it can apply for an exemption.²⁰ The 2009 Directive went further and told Member States explicitly that they “should encourage the development of interruptible supply contracts.”²¹ It is clear that the EU believed that shorter contracts would encourage more competition on the supply side.

The last major area of focus in liberalization reform is the creation of a regulatory authority. The 1998 Directive called for the establishment of an “designated competent authority” that would be responsible for performing tasks such as determining whether the TPA was non-discriminatory and ensuring that the tariffs are set at a fair level. However, the specifications of what exactly comprises a competent authority were unclear, and in 2003, the regulation authorities in Member States were required to perform a minimum set of competencies, such as setting tariffs and publishing the rates before they go into effect.²² In 2009, in order to ensure unbundling operates effectively, the Directive declares that “regulatory authorities should be empowered to refuse certification to transmission system operators that do not comply with the

unbundling rules.”²³ In each Directive, the power of regulatory authorities has increased with the goal to make the market more competitive.

While the three liberalization Directives encompass more than third party access, minimum percentage of market opening, unbundling, contracts and regulatory authorities, they are what is at the heart of liberalization. These tenets of liberalization are designed in mind to address and counteract what leads to an uncompetitive natural gas market – contracts, oligopolies, and vertical and horizontal integration.

Liberalization Process: Results

As it is clear from the rhetoric and language in statements by officials and legislation, a large part of the push behind liberalizing Europe’s natural gas markets is the idea that successful liberalization means opening up gas markets, which will encourage more suppliers to enter the market, thus providing greater energy security and choice for the customers. In order to determine whether liberalization (and the theorized increase in energy security), a number of economic factors can be analyzed. For instance, if liberalization worked, that would mean more competition and thus lower prices, according to basic microeconomic theory. Along with prices, other economic indicators of success include market concentration levels, percentage of customers switching gas providers, the length of contracts, and effect of ownership unbundling on prices. In addition to raw economic data, evaluations of unbundling and the independence of network operators contribute to determining whether liberalization has been successful in increasing energy security.

While lowering prices for natural gas was a central goal of the liberalization effort, at this point, prices have not decreased; rather, prices have increased steadily. Appendix B shows a graph of a handful of European countries’ annual gas prices gathered from annual IEA statistics

from 2002 to 2009. It is important to emphasize that natural gas prices are often indexed to oil prices, thus “The changes in the oil price have a direct impact on gas wholesale prices.”²⁴ One can reasonably conclude that the sharp drop in 2009 in both gas and oil prices was largely the result of the global recession that led a downturn in economic activity and thus less demand for energy. In a report on the progress of the internal market for gas, the European Commission acknowledges the increase in prices, which “suggests perhaps an insufficient level of market integration.”²⁵ Increasing rather than decreasing prices suggest that liberalization has not been effective and signal that increased competition is not taking place. However, more factors than prices need to be analyzed to determine whether liberalization has been successful.

It is possible for prices to rise despite the entry of new firms into the market. Thus, by looking at firm’s market share using the Herfindahl-Hirschman Index, one can determine whether competition has increased.²⁶ Appendix C shows the concentration of sixteen different European countries, and the majority of them still face significant market domination by one or two companies. A report by the EC states that “In 10 Member States, the three largest wholesalers have a market share of 90% or more. The share of the three biggest companies decreased in only five Member States” and companies increased their market share in two states.²⁷ Furthermore, horizontal integration is increasing in some places. The recent merger between Gaz du France and Suez, “creates Europe's largest buyer and seller of natural gas, as well as its biggest natural gas distributor,” which runs “directly counter to the centerpiece of proposals by the European Commission to break up control of the production, transportation and distribution of energy.”²⁸ The HHI data, along with the increased prices, support the conclusion that competition has not significantly increased.

In addition to market concentration levels, the percentage of customers that have switched suppliers is another important economic indicator of competition. For example, if there were only two firms competing, that might not seem like a particularly competitive market. However, if 70 or 80 percent of customers switched suppliers, it would be a sign of increased competition. After looking at the data, it appears that “in most liberalized markets, the switching rate remains relatively low.”²⁹ A detailed graph of switching rates in 2009 can be found in the Appendix. Another indicator of competition that is evaluated quantitatively is contract length. To date, there has only been one extensive study on the length of contracts after the liberalization efforts were put into place. It compiles data starting in 1980 through 2003. The overall trend has been a significant decline in the average contract length, from of a peak around 25 years in 1988 to 10-12 years in 2003.³⁰ Furthermore, “the share of gas supplies through long-term contracts was reduced from about 100% to below 50%.”³¹ The authors of the study hypothesize that the decrease in contract length has been a result of market liberalization. In this area, the EU has been effective in achieving one of their goals: removing the long term contracts as the primary way to contract gas. However, contract length alone does not necessarily signal competition.

Finally, it is possible to quantify one of the types of unbundling – ownership. In a study that controls for many of the other variables that control price, the authors find that “ownership unbundling seems to have no significant impact on the level of end-user prices for households.”³² Using two different models, the decline in prices for countries using ownership unbundling were either 0.2 % or 0.08%.³³ It should be noted that several of the countries only had implemented ownership unbundling recently, and it is certainly possible that larger declines

are possible in the future. However, at this point, it does not appear that ownership unbundling has had an effect on prices or competition. The increased prices of natural gas, relatively unchanged market concentration and low switching rates are strong economic indicators that competition, and thus energy security, has not increased.

In addition to quantitative data, there are other ways of assessing whether the liberalization efforts have increased competition and energy security, such as determining whether alternative types of unbundling and regulatory authorities have been effective. As detailed in the 2009 Directive, countries can also choose to unbundle using Independent System or Transmission Operators. While there is no empirical way of determining if the ISOs and ITOs are in fact operating independently and putting up “Chinese Walls,” the European Commission notes that Member States continue to make extensive use of derogations from unbundling at distribution level.³⁴ The evaluation of regulatory authorities is also more subjective, and this task is made more difficult by the fact that the regulatory authority created by the 2009 Directive, the Agency for the Cooperation of Energy Regulators (ACER), will not go into effect until March 2011. The general consensus is that regulatory authorities are not as effective or independent as they could be.³⁵ The effectiveness of some aspects of the 2009 Directive cannot be fully determined due to the fact that many of its policies have not been implemented yet. However, for the areas that can be measured, the data show that liberalization has not been effective at increasing competition and energy security.

Measures to increase energy security

On January 1st, 2009, the Russian state-owned company Gazprom cut off natural gas supplies to Ukraine, due to disputes over the amount of debt that the Ukrainian gas company

Naftogaz owed Gazprom. Initially, Russia continued to use Ukrainian pipelines to transport gas, intending that the remaining gas would continue to be delivered to the rest of Europe.³⁶ However, it soon became clear that Ukraine, through which 80 percent of all Russian gas travels, was siphoning off some of the gas intended for other countries for its own domestic consumption, leading to supply levels in other European nations to drop. Italy and Austria reported only receiving ten percent of gas they were supposed to, and Serbia, Bulgaria, Slovakia, Germany, Poland, Croatia, the Czech Republic, Hungary, Macedonia, and Greece, Turkey also faced shortages in gas.³⁷ While energy security had been a concern of the European Union for some time, the January 2009 crisis highlighted the vulnerability of EU member states. As a result, several projects designed for the explicit purpose of enhancing energy security were accelerated or re-emphasized, and new projects and partnerships were created as well. These projects can be divided on the basis of whether they are EU sponsored, or implemented by individual countries or a small group of countries. The EU-backed projects include the Nabucco pipeline, Energy2020, and the EU-Ukraine Joint Declaration. Projects pursued by individual countries include the Nord Stream and South Stream. Following the rhetoric in EU legislation and other documents and statements, one should see elements of liberalization in the measures to increase energy security. However, a close analysis of these projects finds no inclusion of the principle tenets of liberalization.

The first stages of discussion about the Nabucco pipeline started in 2002, with the intent to distribute gas from the Caspian Sea region to Europe. The EU viewed Nabucco as a way to eliminate dependence on Russian gas transported through Ukraine or other countries with tense relations with Russia. It is a 3,300 km pipeline that projects to deliver 31 billion cubic meters of natural gas per year, through Turkey, Bulgaria, Romania, Hungary and Austria. Companies that

are involved include: Otas (Turkey), Transgaz (Romania), Bulgargaz (Bulgaria), MOL (Hungary), and OMV (Austria), and Germany's RWE. The main suppliers of gas will be Turkmenistan, who recently announced that it plans to provide 40 billion cubic meters of gas per year, which actually exceeds the planned capacity of Nabucco.³⁸ Azerbaijan and Iraq are also expected to contribute around 10 bcm/year, depending on how long it takes for their natural gas to come online and connect to Nabucco. The pipeline is clearly designed to lessen dependence on Russia and increase energy security. However, the lack of liberalization principles in the financing and operation of Nabucco prove how liberalization is in fact only regarded as a tool to achieve energy security, and not actually used as one.

The financing of Nabucco is a very telling aspect of how the concept of liberalization does not actually figure into attempts to achieve energy security. While liberalization by nature focuses on markets that already exist and thus the Directives do not explicitly provide guidelines for the creation of new projects, the main concepts behind liberalization are non-discrimination and eliminating preferential treatment. In the document produced by the European Commission that outlined ten strategically important energy projects, the EC writes on the question of financing, "As a general rule therefore, financing the construction of these projects should be the responsibility of the network operators, who will after all receive the proceeds from their operation. Operators are expected to invest their own funds or raise capital from the markets to realise these projects."³⁹ At the beginning, it appeared that the European Union would follow a model of non-discrimination and not contribute any financing towards the construction of the pipeline, when on January 27, 2009, immediately after the Russia-Ukraine dispute, EU Energy Commissioner Andris Piebalgs ruled out the possibility of funding the flagship project, stating that "it [financing] doesn't make sense, it's not anymore the consortium's project."⁴⁰ However,

this position was not the final position of the EU. One day later, the European Commission pledged to give 250 million euros to the European Investment Bank (EIB) to “help it secure financing for the Nabucco pipeline,⁴¹ and in September 2010, the EIB agreed to finance 2 billion euros in loans for the project. Further evidence that project enjoys the EU’s full support is through the preferential terms agreed upon concerning the actual operation of the pipeline, many of which violate liberalization principles set forth in the 1998, 2003 and 2009 Directives.

Two of the central aspects of liberalization – unbundling and third party access – are in serious jeopardy in the Nabucco project. One EU official describes Nabucco as a test case for big infrastructure projects under the EU’s new system of “regulatory unbundling.”⁴² Under the rules in the 2009 Directive, the “new law requires them to at least run their supply, transport, and sales businesses separately.”⁴³ For the companies involved in Nabucco, it is the transport sections of the companies that will build and operate the pipeline, but the upstream production part of the companies will also use Nabucco under preferential terms. The “Nabucco consortium members will get the right to use or directly sell 50 percent of Nabucco’s maximum capacity, while the rights to use the other 50 percent will be auctioned off in an open tender.”⁴⁴ There is supposed to be full access to any interested third party under the liberalization effort, but this is clearly not the case. As one author writes, “The Europeans cannot have it both ways. Either they insist that Nabucco is a private endeavor and a risky one at that, or they get serious about the political nature of the ‘southern corridor.’”⁴⁵ Based on the financing commitments and derogations from liberalization components, it appears as though the Europeans chose the political nature of energy security over adhering to liberalization reform.

Another measure to increase energy security, the Energy2020 declaration, identifies existing vulnerabilities in European energy security and ways to overcome them. The first

sentence of the document reads, “The price of failure is too high.”⁴⁶ It is the nature of any liberalized or open market that there will inevitably be some failure – the concept of competition implies that the most efficient companies will remain, while less efficient ones fail. In order to increase energy security, Energy2020 outlines five main areas of concentration, two of which relate to natural gas: “building a truly pan-European integrated energy market” and “strengthening the external dimension of the EU energy market.”⁴⁷ In the section about an integrated market, the document calls for increased investment in infrastructure. The contradictions in philosophy appear in back to back sentences: “While investment decisions lie mainly with market players (energy companies, system operators and consumers), it cannot be assumed that all the necessary investments will be delivered by the market alone. The Commission will adopt a new strategy on energy development to encourage adequate investments in electricity, gas, oil and other energy sectors.” It is hardly surprising that there are barriers to fair competition when the EU consistently inserts itself in the market. Furthermore, in the section about strengthening the external dimension of the energy market, Energy2020 does not follow the non-discriminatory principles found in the Directives. One of the specific actions is “Establishing privileged partnerships with key partners,” and outlines that “reinforced energy partnerships will be established by the EU with key suppliers and transit countries.”⁴⁸ Once again, concerns over energy security trump efforts to liberalization the gas market.

The final example of a European Union led effort to increase energy security is the strategic partnership between the EU and Ukraine, which came into effect in March 2009. The founding document of the partnership “recognized that that the institutional and legislative adaptation of Ukraine to the EU’s energy market acquis will require political, technical, and legislative support.”⁴⁹ The document calls Ukraine an “indispensable pillar” of European energy

security and “a strategic partner.” The document ostensibly encourages Ukraine to subscribe to several liberalization practices in Directive 2003/55/EC. However, it would come as a surprise if the Ukraine did not request, and be granted, exemptions for areas such as third party access and unbundling (such as the Nabucco pipeline receives), considering Ukraine’s role a vital player in Europe’s quest to achieve energy security. The preferential relationship between the EU and Ukraine along with other EU sponsored projects such as the Nabucco pipeline and Energy2020 document displays how the European Union ultimately prioritizes energy security above liberalization.

The bulk of this paper focuses on policies carried out by the EU, and that is because it is the EU that frames liberalization as a method to achieve energy security. Thus, is it primarily EU energy security efforts that should be discussed and evaluated for the presence (or absence) of aspects of liberalization. However, it would be remiss not to address other, non-EU sponsored measures to increase energy security. Indeed, the fact that there are several major projects sponsored by individual countries or blocs of countries shows that the EU’s attempt at increasing energy security vis-à-vis liberalization has been ineffective. The most noteworthy projects are the South and Nord Stream pipelines, both of which transport Russian gas to Europe. Similar to Nabucco, the two routes eliminate the need to transport gas through Ukraine or other states that have conflict-ridden relationships with Russia.

The first of these is the Nord Stream pipeline running from Vyborg, Russia to the German city Greifswald underneath the Black Sea for a distance of 1,222 kilometers. It is projected to supply 27.5 billion cubic meters of natural gas from 2011, and by 2012, it could provide Europe with 55 billion cubic meters annually.⁵⁰ While there is much debate over whether increasing dependency on Russia is ultimately positive or negative for energy security, it is

designated as one of the EU's TEN-E Priority Projects, and according to EU Energy Commissioner Andris Piebalgs it enjoys the "full support" of the EU.⁵¹ A spokesman from the Germany company Eon Ruhrgas, which has a 25% stake in the Nord Stream pipeline, said on the issue of third party access that "We are currently in a very intense discussion with the regulator, and would like to receive an exemption,"⁵² and the project was later granted a derogation on TPA. The Nord Stream pipeline is also exempt from the unbundling requirement.⁵³ Another project designed to increase European energy security is a pipeline that is largely regarded as a reactionary response to Nabucco: the South Stream pipeline, a partnership between Gazprom and the Italian company Eni, to bring Russian gas to Europe. It will cross the Black Sea from Russia to Bulgaria and is expected to bring 63 billion cubic meters of gas to Europe.⁵⁴ Like Nord Stream and Nabucco, the South Stream has requested an exemption from granting third-party access to the transmission system. Bulgaria's energy minister requested that "that 50-70% of the South Stream pipe be accessible only to the joint venture shareholders, while the rest be liberalized,"⁵⁵ and he expects the derogation to be approved. There was also no plan for an ISO, "thus apparently contravening the EU legislation's unbundling requirements."⁵⁶ The EU continues to support projects that do not adhere to two of primary components of liberalization, third-party access and unbundling.

Discussion and Implications for the Future

Despite the overwhelming amount of rhetoric portraying liberalization as a method to increase energy security, it is clear that this has not happened. The three Directives in 1998, 2003, and 2009 have not been successful in liberalizing the natural gas market, as evidenced by increasing prices, high market concentration, low rates of customers switching suppliers and analyses that argue unbundling and regulatory are not effective. Efforts to explicitly increase

energy security include three major proposed pipelines that are exempt from third-party access and unbundling. Furthermore, documents and partnerships like Energy2020 and the EU-Ukraine Joint Partnership are discriminatory. All the major projects designed to increase energy security are contradictory to liberalization principles. This begs the question, why such an extreme disconnect between rhetoric and practice?

To answer this question, it is useful to consider the theoretical situations in which liberalization would be effective in increasing competition. A market that would benefit from liberalization would be one in which more production firms would enter if the market weren't as fragmented and regulated. That is, a market in which there are firms that are capable of producing the product, but choose not to because of high entry or operating costs. A relevant example is the US natural gas market, which was liberalized in the 1980s using many of the same principles that the EU does, such as third-party access and unbundling. The liberalization process is widely considered successful as it is "much more open to competition and choice."⁵⁷ There are over 6,300 firms that produce natural gas in the US,⁵⁸ which is a far cry from the limited number of suppliers available to Europe. The number of producing wells almost doubled from 262,483 in the 1980s to 478,562 in 2008.⁵⁹ Thus, it is clear that the U.S. had the capacity to boost natural gas production, but fragmentation of the market and regulated prices discouraged many firms from entering and operating. Europe, however, simply does not have the production capacity. Its natural gas production has reached a peak and is declining.⁶⁰ It is not as if there are companies in the EU that are simply deciding not to produce natural gas because the tariffs are too high, or the prices are excessively regulated. The market could be fully liberalized, but this would still not facilitate significant additional entries of suppliers into the market. At this point,

nothing will change the fact that production takes place outside the EU and thus, liberalization is not an effective method to increase the number of energy suppliers.

Furthermore, the way that the natural gas market is physically structured as this point inherently makes it uncompetitive and inflexible. As long as pipelines continue to be the main method of transportation, the expensive infrastructure entry costs will prohibit full competition from taking place. There is simply no way to avoid granting exemptions from third-party access and unbundling – companies will not sink billions of dollars into projects without a guaranteed return on their investment. The only way to do this is to allow them to own and operate the pipeline. The Nabucco, Nord Stream, and South Stream pipelines are classic examples of this. As it stands now, it is not likely that liberalization will significantly increase competition and therefore energy security. However, this is not to say energy security will never be achieved. There are several situations that could lead to alleviations of security of supply concerns.

It goes without saying that it is difficult to predict what the future looks like. Prior to January 2009, many analysts would not have forecast that Russia would act so severely against Ukraine. Nevertheless, there are a few variables that could significantly alter the European natural gas landscape. Liquefied Natural Gas involves temporarily compressing natural gas into a liquid form in order to transport it via tankers, similar to oil. Improvements in this technology could eliminate the need to transport gas primarily through pipelines, which would reduce structural barriers to competition and contribute to increased energy security. Hydrofracking is also another possible technology that would allow more countries and firms to become natural gas suppliers. Finally, Europe has signaled more than any other country that it is serious about increasing the share of renewable energy sources in its energy consumption. With enough advances in wind, solar and hydro power, natural gas could potentially play a smaller role in

Europe's energy consumption. However, barring the discovery of new natural gas fields in Europe, one thing that will not reduce concerns over natural gas is market liberalization, as it is ultimately an internal solution to an external problem.

NOTES

-
1. Joe Barnes, et al., 2006 *Natural Gas and Geopolitics*, London: Cambridge University Press, 7.
 2. International Energy Agency, 2010 *Key World Energy Statistics*, Paris, 31.
 3. Ibid.
 4. Thomas Cottier, Sofya Matteotti-Berkutova, Olga Nartova, "Third Country Relations in EU Unbundling of Natural Gas Markets: The 'Gazprom Clause' of Directive 2009/73 EC and WTO Law," available from <http://www.nccr-trade.org/publication/third-country-relations-in-eu-unbundling-of-natural-gas-markets-the-gazprom-clause-of-directi/>, accessed 10 December 2010.
 5. Energy Information Administration, *World Energy Outlook 2010*, available from http://www.eia.doe.gov/oiaf/ieo/nat_gas.html, accessed 20 November 2010.
 6. Richard Ericson, "Eurasian Natural Gas Pipelines: The Political Economy of Network Interdependence," *Eurasian Geography and Economics*, 50, no.1 (2009): 28-57.
 7. Vivek Chandra, *Gas Pipelines*, available from <http://www.natgas.info/html/gaspipelines.html>, 10 December 2010.
 8. East European Gas Analysis, 29 October 2009, "South Stream Gas Pipeline Project," available at <http://www.eegas.com/southstream1.htm>, accessed 10 December 2010.
 9. Ericson, "Eurasian Natural Gas Pipelines," 29.
 10. Ibid.
 11. Rudolf Egging, Examining Market Power in the European Natural Gas Market, *Energy Policy*, 34, no. 17 (2009): 2762-2778.
 12. Standard and Poor, "Outlook On Russian Gas Giant Gazprom Revised To Stable From Negative On Healthy Performance," 18 August 2010, available from <http://www.gazprom.com/f/posts/37/136769/sp-en-18-08-2010.pdf>, 10 December 2010.
 13. Ericson, "Eurasian Natural Gas Pipelines," 9.

-
14. European Union, *Directive 2003/55/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC*, 26 June 2003, available from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:176:0057:0078:EN:PDF>, accessed 10 December 2010.
 15. European Union, *Directive 98/30/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas*, 21 June 1998, available from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:204:0001:0012:EN:PDF>, accessed 10 December 2010.
 16. European Union, *2003/55/EC*.
 17. European Union, *Directive 2009/73/ EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC*, 14 August 2009, available from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0094:0136:EN:PDF>, accessed 10 December 2010.
 18. Ibid.
 19. European Union, *2003/55/EC*.
 20. Ibid.
 21. European Union, *2009/73/EC*.
 22. European Union, *2003/55/EC*.
 23. European Union, *2009/73/EC*.
 24. European Union, *Report on progress in creating the internal gas and electricity market*, 14 August 2009, available from http://ec.europa.eu/energy/gas_electricity/doc/2010/com_2010_0084_f_en.pdf, accessed 10 December 2010.
 25. Ibid.
 26. U.S Department of Justice, *THE HERFINDAHL-HIRSCHMAN INDEX*, available from <http://www.justice.gov/atr/public/testimony/hhi.htm>, accessed 10 December 2010.
 27. European Union, *Report on progress in creating the internal gas and electricity market*.

-
28. New York Times, “GDF-Suez merger deals a blow to EU ambition to open energy sector,” 3 September 2007, available <http://www.nytimes.com/2007/09/03/business/worldbusiness/03iht-energy.4.7366942.html>, accessed 10 December 2010.
29. European Union, May 2010, *EU Energy Markets in Gas and Electricity, State of Play of Implementation and Transmission*, available at http://www.europarl.europa.eu/meetdocs/2009_2014/documents/itre/dv/a_itre_st_2009_14_eu_energy_markets/_a_itre_st_2009_14_eu_energy_markets_en.pdf, accessed 10 December 2010.
30. Anne Neuman and Christian von Hirschhausen, 2004, “Less Long-Term Gas to Europe? A Quantitative Analysis of European Long-Term Gas Supply Contracts,” *Zeitschrift für Energiewirtschaft*, Vol. 28, No.3: 175-182.
31. Ibid.
32. Christian Growitsch and Marcus Stronzik, 18 November 2008, *Ownership Unbundling of Gas Transmission Networks – Theoretical Background and Empirical Evidence*, available at <http://crni.epfl.ch/papers/growitsch.pdf>, accessed 10 December 2010.
33. Ibid
34. European Union, *Report on progress in creating the internal gas and electricity market*.
35. European Union, 2007, *Commission Staff Working Document Impact Assessment*, available at http://ec.europa.eu/energy/gas_electricity/interpretative_notes/doc/2007_09_19_impact_assessment.pdf, accessed 10 December 2010.
36. Rianovosti, 1 January 2009, “Russia fully cuts gas to Ukraine, ups supplies to Europe,” available at <http://en.rian.ru/world/20090101/119302144.html>, accessed 10 December 2010.
37. BBC News, 6 January 2009, “European gas supplies disrupted,” available at <http://news.bbc.co.uk/2/hi/europe/7812860.stm>, accessed 10 December 2010.
38. Novinite News, 25 November 2010, “Nabucco Spokesman: Turkmenistan Natural Gas Promise 'Remarkable,’” available at http://www.novinite.com/view_news.php?id=122557, accessed 10 December 2010.
39. European Union, 2004, *Trans-European Energy Networks: Ten-E Priority Projects*, available at http://ec.europa.eu/ten/energy/studies/doc/2004_brochure/ten_e_priority_projects_2004_en.pdf, accessed 10 December 2010.
40. Reuters, 27 January 2009, “EU not considering giving Nabucco capital,” available at <http://www.reuters.com/article/idUSBSB00161920090127>, accessed 10 December 2010.

-
41. Radio Free Europe, 28 January 2009, “Despite Nabucco Funding Plan, EU's Intentions Remain Muddled,” available at http://www.rferl.org/content/Despite_Nabucco_Funding_Plan_EUs_Intentions_Remain_Muddled_/1376046.html?page=1&s=1&x=1#relatedInfoContainer, accessed 10 December 2010.
42. Katinka Barysch, 2010, “Should the Nabucco project be shelved?” *Transatlantic Academy Paper Series*, available at http://www.gmfus.org/galleries/ct_publication_attachments/TA_NabuccoPipeline_Barysch.pdf;jsessionid=aFCTsIL978t7ecHyEL, accessed 10 December 2010.
43. Ibid.
44. Ibid.
45. Ibid.
46. European Union, 10 November 2010, *Energy 2020: A strategy for competitive, sustainable and secure energy*, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0639:FIN:EN:PDF>, accessed 10 December 2010.
47. Ibid.
48. Ibid.
49. European Union, *Joint EU-Ukraine International Investment Conference of the Modernisation of Ukraine's Transit System*, available at http://www.eeas.europa.eu/energy/events/eu_ukraine_2009/joint_declaration_en.pdf, accessed 10 December 2010.
50. Itar-Tass, 6 December 2010, *Germany, Poland Resolve Disagreements Over Nord Stream*, available at <http://toolkit.dialog.com/intranet/cgi/present?STYLE=739318018&PRESENT=DB=985,AN=309201181,FM=9,SEARCH=MD.GenericSearch>, accessed 10 December 2010.
51. Nord Stream, 20 July 2009, “Increased Investment Into Gas Infrastructure Is Welcome,” available at <https://e-facts.nord-stream.com/app/article/index.cfm?fuseaction=OpenArticle&aoid=796&lang=EN>, accessed 10 December 2010.
52. Gas Connections, 01 November 2007, “Nord Stream challenges TPA rule,” available at http://www.accessmylibrary.com/coms2/summary_0286-33360303_ITM, accessed 10 December 2010.

-
53. ICIS Heren, 31 August 2010, "WINGAS to unbundle pipelines but Nord Stream, NEL exempt," available at <http://www.icis.com/heren/articles/2010/08/31/9389503/wingas-to-unbundle-pipelines-but-nord-stream-nel-exempt.html>, accessed 10 December 2010.
54. Downstream Today, 15 May 2009, "Gazprom Agrees To Boost Pipeline Capacity," available at http://downstreamtoday.com/news/article.aspx?a_id=16386&AspxAutoDetectCookieSupport=1, accessed 10 December 2010.
55. World News, 16 November 2010, "Bulgaria Confirms It Will Request Derogation on South Stream from EC," available at <http://bulgaria.world-countries.net/archives/58490>, accessed 10 December 2010.
56. The Jamestown Foundation, 18 November 2010, "European Commission Urges Corrections to Bulgarian-Russian South Stream Agreement," available at http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=37185, accessed 10 December 2010.
57. NaturalGas.org, *Industry and Market Structure*, available at <http://www.naturalgas.org/business/industry.asp#overview>, accessed 10 December 2010.
58. Ibid.
59. Energy Information Administration, 29 November 2010, *U.S. Natural Gas Number of Gas and Gas Condensate Wells*, available at http://www.eia.gov/dnav/ng/hist/na1170_nus_8a.htm, accessed 10 December 2010.
60. EIA, *World Energy Outlook 2010*.

APPENDIX A:

Coding Scheme

Scope

Documents that were analyzed included any official document produced by the European Union. Legislation, press releases, statements by EU officials, and content found on www.europa.eu were included.

Size

Twenty documents were analyzed

Key Phrases

Liberalization key phrases: “Liberalization”; “Third energy legislation package”;
“Internal market”

Energy Security key phrases: “Energy security” or “Security of supply”

Categories

1. *Beneficial*: If liberalization and energy security were both mentioned as goals, and liberalization was characterized as a way to increase energy security.
2. *Neutral*: If liberalization and energy security were mentioned as separate and non-competing goals.
3. *Detrimental*: If liberalization and energy security were mentioned as competing goals.

Documents and Categorization

Beneficial:

1. Title: “EU nears energy liberalisation finishing line”
Source: <http://www.euractiv.com/en/energy/eu-nears-energy-liberalisation-finishing-line/article-181541>
2. Title : “DIRECTIVE 2009/73/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL”
Source:<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0094:0136:EN:PDF>
3. Title : “COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT: Report on progress in creating the internal gas and electricity market {SEC(2009) 287}”
Source:<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0115:FIN:EN:PDF>

4. Title: “COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT: Report on progress in creating the internal gas and electricity market SEC(2010)251
Source: http://ec.europa.eu/energy/gas_electricity/doc/2010/com_2010_0084_f_en.pdf
5. Title : “Energy: Commission takes Poland to court to ensure compliance with European legislation”
Source:<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/1216&format=HTML&aged=0&language=EN&guiLanguage=en>
6. Title: “Green Paper Towards a European Strategy for the Security of Energy Supply”
Source: http://ec.europa.eu/energy/green-paper-energy_supply/doc/green_paper_energy_supply_en.pdf
7. Title: “Trans-European Energy Networks: Ten-E Priority Projects”
Source:http://ec.europa.eu/ten/energy/studies/doc/2004_brochure/ten_e_priority_projects_2004_en.pdf
8. Title: “The Commission adopts new rules to prevent and deal with gas supply crises”
Source:<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/1153&language=en>
9. Title: “Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC”
Source:http://eurlex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=32003L0055&model=guichett
10. Title: “Energy 2020: A strategy for competitive, sustainable and secure energy {SEC(2010) 1346}”
Source:<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0639:FIN:EN:PDF>
11. Title: “Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas
Source:<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31998L0030:EN:HTML>
12. Title: “Joint EU-Ukraine International Investment Conference on the Modernisation of Ukraine’s Gas Transit System”
Source:http://www.eeas.europa.eu/energy/events/eu_ukraine_2009/joint_declaration_en.pdf
13. Title: “Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community”
Source: <http://eur-lex.europa.eu/JOHtml.do?uri=OJ:C:2007:306:SOM:EN:HTML>

14. Title : “Energy infrastructure priorities for 2020 and beyond - A Blueprint for an integrated European energy network”
Source:<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2010:1396:FIN:EN:PDF>
15. Title: “BRUSSELS EUROPEAN COUNCIL 8/9 MARCH 2007 PRESIDENCY CONCLUSIONS”
Source: <http://register.consilium.europa.eu/pdf/en/07/st07/st07224-re01.en07.pdf>
16. Title: “Energising Europe: A Real Market with a Secure Supply”
Source:<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1361&format=HTML&aged=0&language=EN&guiLanguage=en>
17. Title: “More competitive energy markets: building on the findings of the sector inquiry to shape the right policy solutions”
Source:<http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/07/547&format=HTML&aged=0&language=EN&guiLanguage=en>
18. Title: “Energy: European Commission proposes to strengthen regional cooperation”
Source:<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/1672&format=HTML&aged=0&language=EN&guiLanguage=en>
19. Title: “New EU Rules on the Security of Gas Supply for Citizens”
Source:<http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/641&format=HTML&aged=0&language=EN&guiLanguage=en>

Neutral:

1. Title: “Energy Charter Treaty”
Source:http://europa.eu/legislation_summaries/energy/external_dimension_enlargement/127028_en.htm2.

Detrimental:

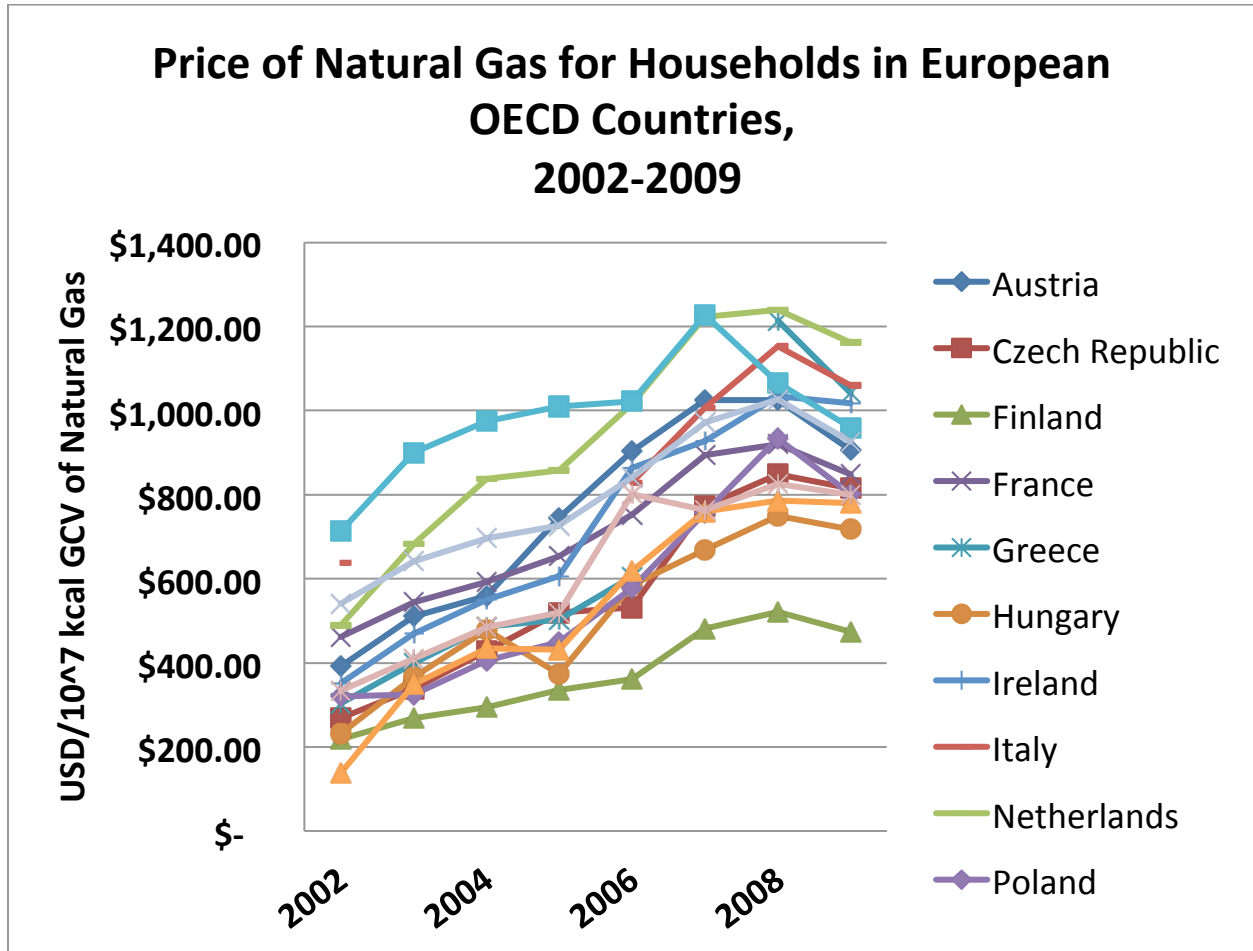
No documents found

Results

Ninety-five percent (19/20) of documents outlined a beneficial relationship between liberalization and energy security, while five percent (1/20) of documents portrayed the relationship at neutral. There were no documents that characterized the relationship as detrimental

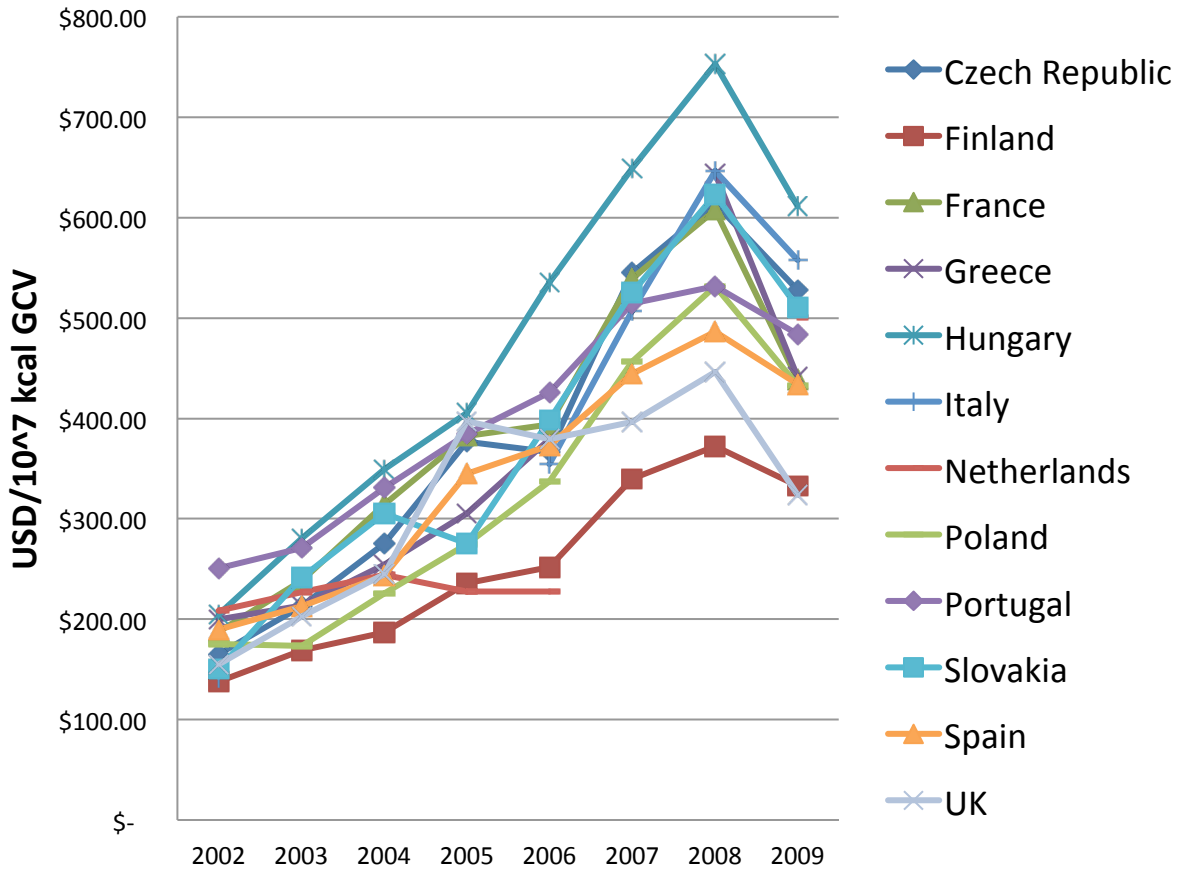
APPENDIX B:

European Natural Gas Prices for Households and Industry, 2002-2009



Source: Annual data compiled from IEA Key World Energy Statistics, 2003-2010

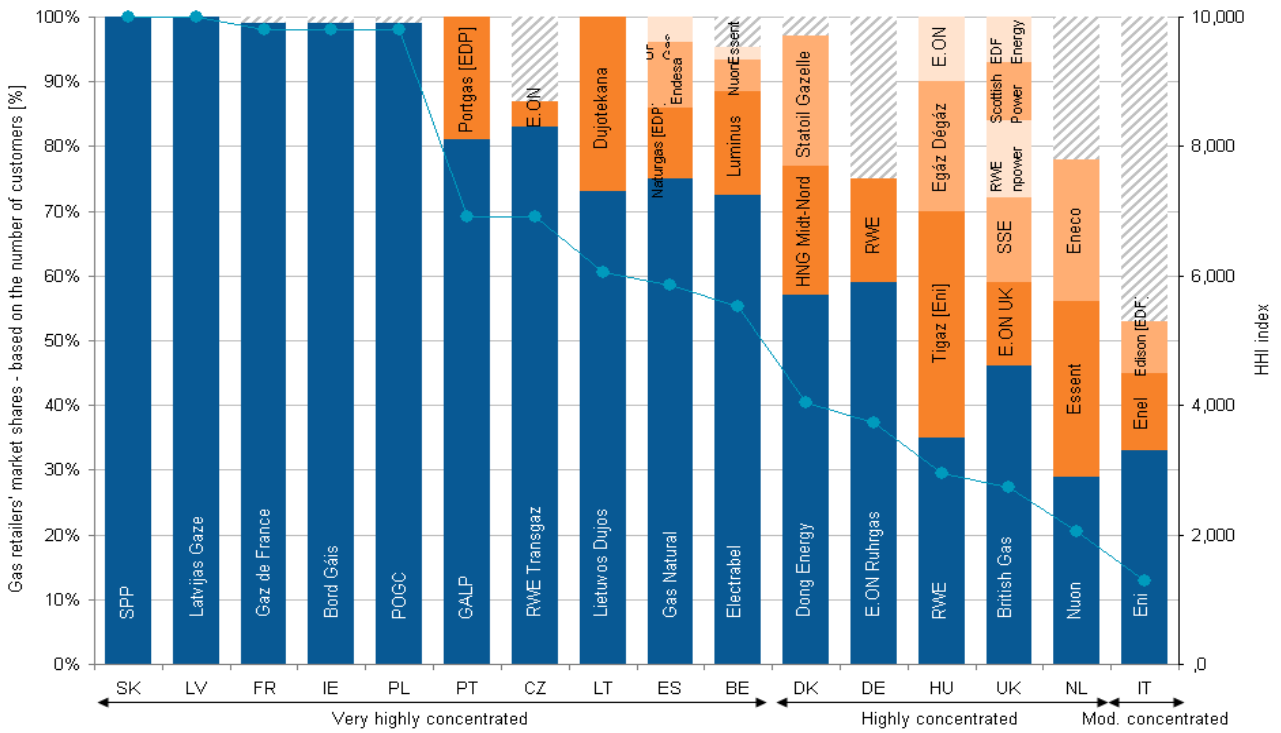
Price of Natural Gas for Industry in European OECD Countries, 2002-2009



Source: Annual data compiled from IEA Key World Energy Statistics, 2003-2010

APPENDIX C:

Herfindahl-Hirschman Index of the European Natural Gas Market



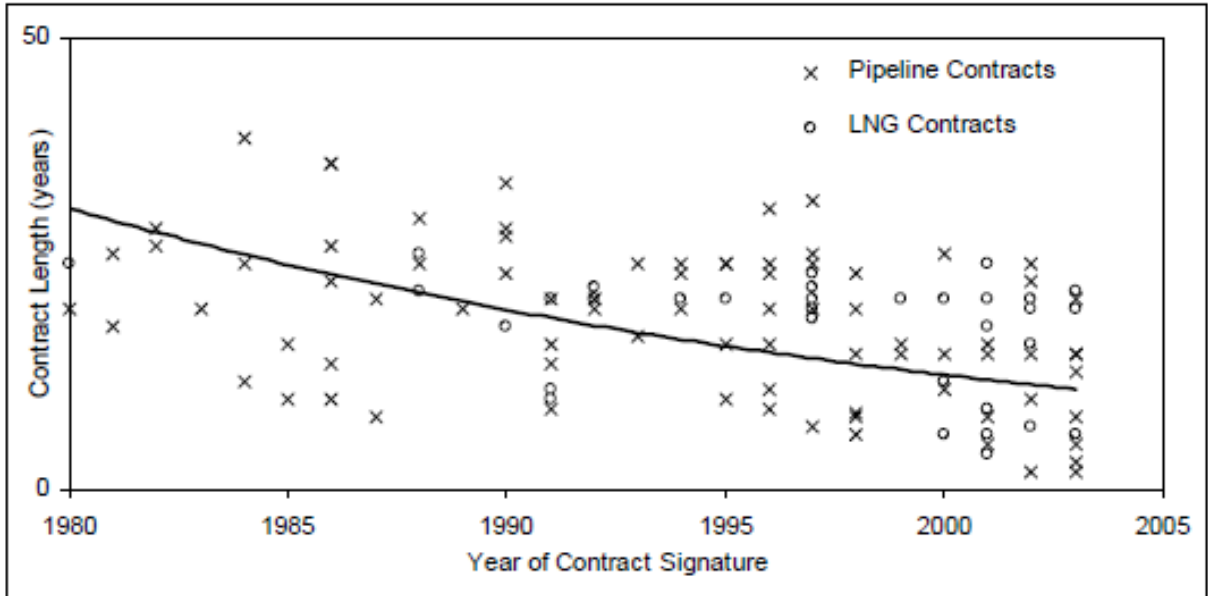
Source: “EU Energy Markets in Gas and Electricity – State of Play in Implementation and Transposition,”

http://www.europarl.europa.eu/meetdocs/2009_2014/documents/itre/dv/a_itre_st_2009_14_eu_energymarkets_a_itre_st_2009_14_eu_energy_markets_en.pdf

APPENDIX D:

Graph of Natural Gas Contract Lengths in Europe, 1980-2003

Figure 2: Distribution of Contracts struck in OECD Europe since 1980



Source: "Less Long-Term Gas to Europe? A Quantitative Analysis of European Long-Term Gas Supply Contracts,"
Zeitschrift für Energiewirtschaft, Vol. 28, No.3, 175-182 (2004).

APPENDIX E:

Proposed Routes of the Nabucco, Nord Stream and South Stream Pipelines



Source: <http://news.bbc.co.uk/2/hi/8186946.stm>

GLOSSARY

Eligible Customer: Customers that use a certain amount of natural gas per year. The level is set on a country-by-country basis.

Horizontal Integration: A merger between firms that produce and sell the same products, i.e., between competing firms. (Source: <http://stats.oecd.org/glossary/detail.asp?ID=3232>).

Negotiated Third-Party Access: Interested companies in entering the gas transportation business must negotiate on a case-by-case basis with the gas merchant companies that already own it.

Oligopoly: A market characterized by a small number of firms who realize they are interdependent in their pricing and output policies. The number of firms is small enough to give each firm some market power. (Source: OECD, <http://stats.oecd.org/glossary/detail.asp?ID=3270>).

Regulated Third-Party Access: Companies interested in entering the gas transportation business can operate the transmission network if they agree to pay a published set of tariffs for using the system.

Vertical Integration: The ownership or control by a firm of different stages of the production process. (Source: OECD, <http://stats.oecd.org/glossary/detail.asp?ID=3327>).

REFERENCES

- Aune, Finn, and Rolf Golombek, Sverre Kittelsen, and Knut Rosendahl. 2008. *Liberalizing European Energy Markets: An Economic Analysis*. Cheltenham: Edward Elgar Publishing Limited.
- Barnes, Joe, and Mark Hayes, Amy Jaffe, and David Victor. 2006. *Natural Gas and Geopolitics*. London: Cambridge University Press.
- Katinka Barysch. 2010. "Should the Nabucco project be shelved?" *Transatlantic Academy Paper Series*. Available at http://www.gmfus.org/galleries/ct_publication_attachments/TA_NabuccoPipeline_Barysch.pdf;jsessionid=aFCTsIL978t7ecHyEL. (Accessed 10 December 2010).
- BBC News. 6 January 2009. "European gas supplies disrupted." Available at <http://news.bbc.co.uk/2/hi/europe/7812860.stm>. (Accessed 10 December 2010).
- Bilgin, Mert. 2009. Geopolitics of European natural gas demand: Supplies from Russia, Caspian and the Middle East. *Energy Policy* 37, no. 11 (11) : 4482-4492.
- Chandra, Vivek. *Gas Pipelines*. Available from <http://www.natgas.info/html/gaspipelines.html>. (Accessed 10 December 2010).
- Costantini, Valeria, Francesco Gracceva, Anil Markandya, and Giorgio Vicini. 2007. Security of energy supply: Comparing scenarios from a European perspective. *Energy Policy* 35, no. 1 (1) : 210-226.
- Cottier, Thomas and Sofya Matteotti-Berkutova, and Olga Nartova. May 2010. "Third Country Relations in EU Unbundling of Natural Gas Markets: The 'Gazprom Clause' of Directive 2009/73 EC and WTO Law Working Paper No 2010/06, May 2010." Available at <http://www.nccr-trade.org/publication/third-country-relations-in-eu-unbundling-of-natural-gas-markets-the-gazprom-clause-of-directi/>. (Accessed 10 December 2010).
- Downstream Today. 15 May 2009. "Gazprom Agrees To Boost Pipeline Capacity." Available at http://downstreamtoday.com/news/article.aspx?a_id=16386&AspxAutoDetectCookieSupport=1. (Accessed 10 December 2010).
- East European Gas Analysis. 29 October 2009. "South Stream Gas Pipeline Project." Available at <http://www.eegas.com/southstream1.htm>. Accessed 10 December 2010.
- Egging, Rudolf G., Steven A. Gabriel. 2006. Examining market power in the European natural gas market. *Energy Policy* 34, no. 17 (11) : 2762-2778.
- Ericson, Richard. 2009. Eurasian Natural Gas Pipelines: The Political Economy of Network Interdependence. *Eurasian Geography and Economics* 50, no. 1: 28-57.

- Energy Information Agency. *World Energy Outlook 2010*. Available from http://www.eia.doe.gov/oiaf/ieo/nat_gas.html. (accessed 10 December 2010).
- 29 November 2010. *U.S. Natural Gas Number of Gas and Gas Condensate Wells*. Available at http://www.eia.gov/dnav/ng/hist/na1170_nus_8a.htm. (Accessed 10 December 2010).
- Estrada, Javier, Helge Bergesen, Arild Moe, and Anne Sydnes. 1988. *Natural Gas in Europe*. London: Pinter Publishers Limited.
- European Union. 2003. *Directive 2003/55/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC*. 15 June 2003. Available from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:176:0057:0078:EN:PDF>. (Accessed 10 December 2010).
- 1998. *Directive 98/30/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas*. 21 June 1998. Available from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:204:0001:0012:EN:PDF>. (Accessed 10 December 2010).
- 2004. *Trans-European Energy Networks: Ten-E Priority Projects*. Available at http://ec.europa.eu/ten/energy/studies/doc/2004_brochure/ten_e_priority_projects_2004_en.pdf. (Accessed 10 December 2010).
- 2007. *Commission Staff Working Document Impact Assessment*. Available at http://ec.europa.eu/energy/gas_electricity/interpretative_notes/doc/2007_09_19_impact_assessment.pdf. (Accessed 10 December 2010).
- 2009. *Directive 2009/73/ of the European Parliament and of the Council concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC*. 14 August 2009, available from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0094:0136:EN:PDF>. (Accessed 10 December 2010).
- 2009. *Report on progress in creating the internal gas and electricity market*, 14 August 2009, available from http://ec.europa.eu/energy/gas_electricity/doc/2010/com_2010_0084_f_en.pdf, accessed 10 December 2010.
- 2009. *Joint EU-Ukraine International Investment Conference of the Modernisation of Ukraine's Transit System*. Available at http://www.eeas.europa.eu/energy/events/eu_ukraine_2009/joint_declaration_en.pdf. Accessed 10 December 2010.

- May 2010. *EU Energy Markets in Gas and Electricity, State of Play of Implementation and Transmission*. Available at http://www.europarl.europa.eu/meetdocs/2009_2014/documents/itre/dv/a_itre_st_2009_14_eu_energy_markets/_a_itre_st_2009_14_eu_energy_markets_en.pdf. Accessed 10 December 2010.
- 10 November 2010. *Energy 2020: A strategy for competitive, sustainable and secure energy*. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0639:FIN:EN:PDF>. (Accessed 10 December 2010).
- Gas Connections. 01 November 2007. "Nord Stream challenges TPA rule." Available at http://www.accessmylibrary.com/coms2/summary_0286-33360303_ITM. (Accessed 10 December 2010).
- Growitsch, Christian and Marcus Stronzik. 18 November 2008. *Ownership Unbundling of Gas Transmission Networks – Theoretical Background and Empirical Evidence*. Available at <http://crni.epfl.ch/papers/growitsch.pdf>. (Accessed 10 December 2010).
- Holz, Franziska, Christian von Hirschhausen, and Claudia Kemfert. 2008. A strategic model of European gas supply (GASMOD). *Energy Economics* 30, no. 3 (5) : 766-788.
- ICIS Heren. 31 August 2010. "WINGAS to unbundle pipelines but Nord Stream, NEL exempt." Available at <http://www.icis.com/heren/articles/2010/08/31/9389503/wingas-to-unbundle-pipelines-but-nord-stream-nel-exempt.html>. (Accessed 10 December 2010).
- International Energy Agency. 2010. *2010 Key World Energy Statistics*. Paris. Available from http://www.iea.org/textbase/nppdf/free/2010/key_stats_2010.pdf. (Accessed 10 December 2010).
- 2000. *Regulatory Reform: European Gas*. Paris: OECD/IEA.
- Itar-Tass. 6 December 2010. *Germany, Poland Resolve Disagreements Over Nord Stream*. Available at <http://toolkit.dialog.com/intranet/cgi/present?STYLE=739318018&PRESENT=DB=985,AN=309201181,FM=9,SEARCH=MD.GenericSearch>. (Accessed 10 December 2010).
- NaturalGas.org. *Industry and Market Structure*. Available at <http://www.naturalgas.org/business/industry.asp#overview>. (Accessed 10 December 2010).
- Neumann, Anne, and Christian von Hirschhausen. 2004. Less Long-Term Gas to Europe? A Quantitative Analysis of European Long-Term Gas Supply Contracts. *Zeitschrift für Energiewirtschaft*. Vol. 28, No.3.
- New York Times. 3 June 2007. "GDF-Suez merger deals a blow to EU ambition to open energy sector." 3 September 2007, available

- <http://www.nytimes.com/2007/09/03/business/worldbusiness/03iht-energy.4.7366942.html>. (Accessed 10 December 2010).
- Nord Stream. 20 July 2009. "Increased Investment Into Gas Infrastructure Is Welcome." Available at <https://e-facts.nord-stream.com/app/article/index.cfm?fuseaction=OpenArticle&aoid=796&lang=EN>. (Accessed 10 December 2010).
- Nowak, Bartłomiej. 2006. Electricity and Gas Market Liberalization in the EU as a Part of the Internal Energy Market Strategy--Chosen Aspects: The Lesson for Poland. *Journal of Interdisciplinary Economics* 17, no. 4: 465-480.
- Novinite News. 25 November 2010. "Nabucco Spokesman: Turkmenistan Natural Gas Promise 'Remarkable.'" Available at http://www.novinite.com/view_news.php?id=122557. (Accessed 10 December 2010).
- Percebois, Jacques. 2008. The supply of natural gas in the European Union? *OPEC Energy Review* 32, no.1: 33-53.
- Radio Free Europe. 28 January 2009. "Despite Nabucco Funding Plan, EU's Intentions Remain Muddled." Available at http://www.rferl.org/content/Despite_Nabucco_Funding_Plan_EUs_Intentions_Remain_Muddled_/1376046.html?page=1&s=1&x=1#relatedInfoContainer. (Accessed 10 December 2010).
- Reuters. 27 January 2009. "EU not considering giving Nabucco capital Piebalgs." Available at <http://www.reuters.com/article/idUSBSB00161920090127>. (Accessed 10 December 2010).
- RIA Novosti. 1 January 2009. "Russia fully cuts gas to Ukraine, ups supplies to Europe." Available at <http://en.rian.ru/world/20090101/119302144.html>. Accessed 10 December 2010.
- Slaba, Monika. 2009. Liberalisation of Natural Gas Market--EU Vision vs. Reality. *Energy Studies Review* 16, no. 1: 80-95.
- Standard and Poor. Outlook On Russian Gas Giant Gazprom Revised To Stable From Negative On Healthy Performance. *Global Credit Ratings Portal Direct*. 18 August 2010. Available from <http://www.gazprom.com/f/posts/37/136769/sp-en-18-08-2010.pdf>. (Accessed 10 December 2010).
- The Jamestown Foundation. 18 November 2010. "European Commission Urges Corrections to Bulgarian-Russian South Stream Agreement." Available at http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=37185. (Accessed 10 December 2010).
- United States Department of Justice. *THE HERFINDAHL-HIRSCHMAN INDEX*. Available at <http://www.justice.gov/atr/public/testimony/hhi.htm>. (Accessed 10 December 2010).

Weisser, Hellmuth. 2007. The security of gas supply—a critical issue for Europe? *Energy Policy* 35, no. 1: 1-5.

World News. 16 November 2010. “Bulgaria Confirms It Will Request Derogation on South Stream from EC.” Available at <http://bulgaria.world-countries.net/archives/58490>. (Accessed 10 December 2010).