EUROPEAN ENERGY SECURITY AS A PUBLIC POLICY ISSUE CASE OF NABUCCO

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ABSTRACT

The price volatility of the main energy commodities, the ever decreasing energy resources and constantly increasing energy demand, emergence of new players in the global energy arena such as China and India have made 'energy security' an important issue of international debates. Europe as the major consumer of natural gas is concerned with securing its energy supply, especially after several cut-offs of Russian gas supply due to the price disputes between Russia and its neighbors Belarus and Ukraine. These concerns have leaded Europe to search for alternatives to the Russian dominance in the European energy market. The construction of Nabucco pipeline is viewed as one of the effective tools to diversify the gas supply and enhance energy security of the European Union.

In the light of these geopolitical debates, this study will develop the public policy framework for European energy security and gas market as such, analyzing the Nabucco project as a public policy attempt to tackle market failure which the gas market is subject to.

TABLE OF CONTENTS

Abstracti
TABLE OF CONTENTS
INTRODUCTION1
CHAPTER 1: WHAT MAKES GAS MARKET FAIL?
1.1.Asymmetric information61.2.Public goods characteristics81.3.Monopoly101.4.Externalities11
CHAPTER 2: INFRASTRUCTURE AS A CRUCIAL COMPONENT OF ENERGY SECURITY IN EUROPE 13
2.1. Characteristics of infrastructure problem 13 2.1.1. Free-riding and collective action problem 14 2.1.2. Political risks of infrastructure provision 15 2.1.3. Economic risks of infrastructure provision 16 2.1. Pipeline infrastructure: case for government intervention or "leave it to the market"?
3.1. Nabucco project: characteristics
3.2.2.2. Public goods characteristics303.2.2.3. Monopoly313.2.2.4. Externalities313.3. Is the game worth a candle?32
CONCLUSION
Reference list

INTRODUCTION

The last several years have brought an extraordinary shift in expectations for the world energy system. First, prices for oil and gas and most energy commodities became more volatile. Second, the supplies of energy resources have run short. Governments in regions such as Europe worry about insecure supplies of natural gas (mainly from Russia). According to the International Energy Agency (IEA), the European energetic demands will increase from 50% to 70% until 2030, and the European Union dependency will reach 70% on imported gas. Third, the new players as China and India are appearing in the global arena creating even more competition in the distribution of scarce energy resources and rivalry between Europe and Asia in the demand for natural gas. All these issues have made energy security an important topic and center of international talks lately. International Energy Agency defines energy security as "the uninterrupted physical availability at a price which is affordable". Europe as the major consumer of natural gas is concerned with securing its energy supply, especially after several cut-offs of Russian gas supply due to the price disputes between Russia and its neighbors Belarus and Ukraine. These concerns have leaded Europe to search for alternatives to the Russian dominance in the European energy market. The construction of Nabucco pipeline is viewed as one of the effective tools to diversify the gas supply and enhance energy security of the European Union.

Majority of discussions and contemporary debates around energy security concept and the construction of Nabucco pipeline are centered in the geopolitical prospective, stating that the main purpose of the project is to reduce European dependency on Russian supplies, based on the assumption that energy policy is used as an instrument of foreign policy (Kalicki and Goldwin, 2005). The aim of this research is to look at the concept of energy security from the different perspective – from the public policy view. No doubt, natural gas is a private good by

its nature. However, its provision and the maintenance of energy security have also become a public policy issue, meaning the supply of energy for everybody at affordable price. So can the construction of Nabucco, which implies billions of euros to be invested, provide that? Hence, the research question of this study is whether there is a case for public intervention into cross-national project Nabucco and whether or not construction of this project can be justified from public policy perspective.

In a usual business environment, one would find the suppliers first and then construct the infrastructure, while the Nabucco project seems to be totally different. For now, it still remains unclear where the necessary volumes of natural gas to fill the Nabucco pipeline, the construction of which is planned for 2011, should come from. Azerbaijan's gas supplies are insufficient; Turkmenistan has contractual agreements with Russia, though it would be much more beneficial for it to sell gas directly to Europe at a higher price; and Iran is not a politically desirable partner. Then can the geopolitical reasoning of the project be considered sufficient? Is the construction of Nabucco reasoned by the market fundamentals as well?

The current research study will draw on the theoretical public policy literature that establishes the reasons for public intervention in the provision of goods, explaining the theory of market failure and monopolies (Weimer and Vining (2005), Goldthau (2010). The importance and relevance of the energy problems, as well as the geopolitical side of the issues will be grounded on existing works of Richard Youngs, David G. Victor, Amy M. Jaffe, Mark H. Hayes and other authors and researchers in the energy policy field. The paper will also refer to the statistical data of IEA and OPEC to provide proof and evidence for the arguments and recommendations made. Analyzing the empirical geopolitical knowledge of international relations and theoretical background in public policy sphere, this research will allow explaining energy security and the construction of the Nabucco pipeline as a public policy issue in the context of market relations, thus, opening the new perspective and facet of the existing energy debates.

The paper can be considered as conceptualizing case-study, based mainly on qualitative methods and second data sources. To demonstrate the extent of the European demand for natural gas, as well as the volume of gas markets, and to prove or deny the European dependency on the Russian gas the use of statistics will be appropriate. The statistical data will also be necessary to evaluate the costs and grounds of the construction of the pipeline. The purpose of the study is to put energy security in the framework of public policy studies on market failure and cases for public intervention and see whether this is the case for Nabucco project, thus feeling the gap in the current literature, which, as noted earlier, focuses mainly on geopolitical perspectives of the project and energy security in general.

The structure of the paper represents the logic of the research which starts with a general analysis of market failure cases putting it into the context of gas market and gradually narrowing down to gas supply infrastructure provision, further looking at Nabucco project as a case study, putting it into the public policy framework. Therefore, the first chapter introduces the concept of market failure and analyzes the Eurasian gas market through the prism of the stated public policy concept. The second chapter focuses mainly on infrastructure provision risks from public policy and economic prospective. The third chapter introduces Nabucco project, as a concrete example of infrastructure provision, into the framework of the discussion presented in the first two chapters and analyzes the project from two different angles – pure business and public considerations. Finally, it draws the conclusion and based on the previous analysis and findings answers the research question, which is whether Nabucco project really makes the case for public intervention and justified from this perspective.

3

CHAPTER 1: WHAT MAKES GAS MARKET FAIL?

One of the main public policy issues that the gas market is entitled to provide, or at least create environment for its provision, is energy security. However, due to geographical remoteness of necessary "vital" fuels deposits from the place of manufacturing and allocation for the time being, and thus, making it more complicated to provide, energy security concept attracted a huge attention (Smart 1981, 257). Energy, being a key factor of production and even, key component of national security is no longer produced where it is consumed (Stevens 2003). This fact means all possible risks of cross-border trade and price uncertainty, unstable supply, and insufficient transport infrastructure that may threaten country's energy security. Moreover, energy security is no longer the issue of just national policy making, but the global public policy challenge, as cross-border relations and responsibilities are at play (Goldthau 2010, 2).

Hence, energy security possesses public policy characteristics, be that the intention of the government of consuming nation to secure its energy supply, or the government actions of producing nation aiming at securing demand (Goldthau 2010, 2). Price uncertainty, infrastructure problems or unstable supply are the risks that may threaten energy security. Furthermore, these risks can be regarded as classical gas market failure and thus, serve as justification for public intervention.

The theoretical literature, however, doesn't pay too much attention to that. Global energy affairs are rather mostly part of geopolitical debates, than are viewed from the public policy angle (Crandall (2006); Victor, Jaffe and Hayes (2006); Helm (2007); Bahgat (2002); Smith (2006). All the literature available on global policy making and public goods in particular lacks the application of public policy concepts to the case of fuel markets and energy security. The classical studies on public goods focus mostly on development, health

and education issues (Kaul, Grunberg and Stern (1999); Kaul, Conceicao, Goulven and Mendoza (2003); Stone (2008), and only a few bring energy to analysis. For example, Ian Smart mentions the connection between energy and public good theory, highlighting public good characteristics of energy, comparing its vital necessity for the society with food for a human being. He comes to the conclusion, that because of mal-distribution and public goods characteristics, energy security as a basic necessity cannot be "safely left entirely to the conventional interplay of commercial forces and separate national interests" (Smart 1981, 271). Nevertheless, he fails to develop the idea and clearly state what he suggests that should be done in such a case. Bohi, Toman and Walls (1995) and Goldthau (2010) are basically the only attempt to conceptualize energy security from public policy perspective.

Such negligence to this issue from the scholars is surprising, since energy security provision makes a perfect public policy case due to the potential market failure of energy market.

This study will focus mostly on gas market due to the fact that, first, gas together with oil comprise more than half of global energy demand (European Energy Forum), which is forecasted to increase; second, high EU dependence on gas imports, which is expected to balloon to 75% by 2030 (Pogany 2009); third, gas trading is probably the most politicized issue in energy market; forth, gas trade usually involves cross-border trading, what makes it the global public policy issue, and last but not least, transportation peculiarities of gas market – provision depends on a single type of transportation – pipelines. Though, there are certain innovations like LNG gas, but still they are on the stage of development and cannot be regarded as a real competitor to the conventional gas supply for the time being (Pricing Mechanisms for Natural Gas).

No doubt that gas itself is a commodity and possesses all private goods characteristics, and is subject to market interaction and commercial provision. However, as any other market, gas market may fail in providing commodity at the quantity or price it is demanded. There are four classical cases of market failure: incomplete information (asymmetric information); and public goods characteristics; imperfect competition (monopoly); existence of externalities (Weimer and Vining 2005, 104). The following chapter will briefly discuss these four incidents of market failure and apply them to the case of natural gas.

1.1. Asymmetric information

One of the reasons why market may fail in providing the good is imperfect information. The counterparties (the seller and the buyer) may, for instance, have different information about the characteristics of goods or externalities that can appear as a result of the transaction (Weimer and Vining 2005, 104). Applying this case to energy market, there can be several possible reasons for asymmetric information between market participants. This may include insufficient or purposely hidden data on supply or demand characteristics, uncertainty and instability in regulation on the market, or simply the market price no longer being the market signal due to the specific market arrangements (Goldthau 2010, 12).

The supply side may have different reasons not to disclose the real number and the real information to the contractors or third parties – they may be willing to purposefully increase or decrease the actual numbers or alter the data in order to get a stronger influence on the market. For example, while counting the total amount of gas reserves, since in case of Russia, the government and Gazprom can be considered the same, the actual numbers may have been altered regardless of the purpose. Thus, the demand side would not have a clear cut answer if the supply side will be able to maintain the supply amount for the next, say, 50 years (Helmer 2008). This undermines the reliability of the information provided by the supply side, Gazprom in this case, that creates the problem of asymmetric information.

Another challenge is regulatory uncertainty. Regulatory uncertainty is quite relevant for Eurasian gas market today: it mainly comes from the attempts of the European Commission to liberalize gas markets within the EU, making them more transparent and 'common' - the term the EU is highly obsessed with in recent years (Bressand 2010, 21). In spite of the fact that Brussels intends to 'demonopolize' the market and to take the control over transport infrastructure, the member states still managed to preserve oligopolistic structures and loud bids, making the Commission attempts "stuck in a hybrid of deregulation and protectionism"(Goldthau 2010, 15). The Brussels intention to abolish bilateral long-term agreements scheme and destination clauses (Jong and Linde 2008, 6), may disincentivize the key producer companies like Gazprom from investing into upstream projects what would certainly affect the quantity supplied. Moreover, Brussels itself seems to be lost in its policies towards common energy market creation. Imposing special regulations on Russian supplier, such as Gazprom clause, undermines the aforementioned common and equal treatment advocated by the Commission itself (European Parliament Focus 2009). Even if long-term agreements still prevail, the current regulatory uncertainty will remain and all the same affect the planning security and production plans of suppliers. Hence, regulatory mist on the demand side may cause the market failure when the commodity, in this case gas, is not provided in the quantity demanded.

However, unstable regulation and insufficient information provision may appear on the supply side as well. Recent changing decisions on the gas supplies of the potential suppliers for Nabucco pipeline such as Turkmenistan or Azerbaijan may influence the investment decisions and the fate of the project as a whole (Eurasian Transition Group 2009; HIS Global Insight 2010). It has to be emphasized that the absolute majority of the current gas suppliers to Europe, largest of them being Gazprom, are government companies, the same is true about

possible suppliers for Nabucco, which makes the supply side extremely politicized and unstable.

The specific arrangement of European gas market – basically single supplier and fragmentized consumer – creates another risk for potential market failure – the price not being the market signal. Such a characteristic of continental European gas market implies that very small number of suppliers and buyers have to take investment risks in order to maintain their planning security (Pricing Mechanisms for Natural Gas). That's why the long-term contracts are the most suitable way to ensure the prices and contractual conditions. However, the pricing mechanisms for Natural Gas). Hence, coupling gas prices with oil prices secure better from price volatility but at the same time it deprives the trading parties from getting information on consumer or supplier preferences from the price behavior as a market signal. Thus, possessing no information, the parties cannot make efficient investment decisions corresponding to market needs and consumer preferences.

Hence, the highly politicized and strongly controlled from the supply side and attempted to liberalize from the demand side gas market creates strong likelihood of asymmetric information and thus, room for potential market failure in providing gas at affordable price in the quantities demanded.

1.2. Public goods characteristics

Scholarly literature defines "pure" public goods as goods that are non-rival and nonexcludable in consumption (Weimer and Vining 2005, 81; Samuleson (1954); Olson (1971).

The tricky issues about public goods lie in the fact that their provision creates a free rider problem, "because it is usually impossible to get persons to reveal their true demand (marginal benefits) schedules for the good. Even though all would potentially benefit if all persons agreed to contribute to the financing of the good so that their average contributions just equaled their marginal benefits, self-interest in terms of personal costs and benefits discourages from honest participation" (Weimer and Vining 2005, 84).

As a result, public goods can hardly be provided by the market, or at least not at competitive quantities or prices. And even though gas itself is a commodity that has the characteristics of private goods – rival and excludable – yet, the gas market as a whole has certain public goods attributes, which may lead to a market failure. This may refer to infrastructure provision and collective action problems.

Since gas in itself is a private good, its production and extraction may be given to private hands, however, when it comes to allocation/distribution/providing the gas for the whole market or region, the distribution of gas gets the characteristics of pure public good – as it is directly related to national security. As a simple example, one may try to imagine what may happen in case gas supply would be cut for a long time, say, in Hungary – the whole economy will be on the verge of collapse (gas is used for consumer usage including heating, producing electricity, industries, etc) – as it happened already in 2009 (Nesterov 2009). Hence, the uninterrupted, stable, and reasonably priced gas supply is what comprises energy security and the goal of government policy. And such a supply is a result of, *inter alia*, reliable developed infrastructure (pipelines).

Collective action problems ensue from public goods characteristic of some gas market arrangements like pipeline or gas storage provision. An individual consumer in Hungary would need to invest in infrastructure that will allow diversifying sources and increasing its individual energy security. Evidently, not only this single consumer will benefit from these investments, as he cannot exclude others members of the society to use enhanced energy security, sometimes without even contributing to it. Hence, there is an inherent collective action and free-rider problem that indicates the public good character of energy infrastructure, such a necessary component of energy security.

1.3. Monopoly

Markets also may fail because of imperfect competition, arising from concentration of market power. Monopolies or cartels on the supply side lead to an output below the quantity at which the marginal social benefit is equal to the marginal social cost of the last unit produced (Mankiw 2003, 320) (e.g. Gazprom). Vice-versa, monopsonies or cartels on the demand side may be able to dictate the terms and conditions of trade to the suppliers (Goldthau 2010, 4), e.g. the trade agreements between Turkmenistan and Russia on supply of Turkmen gas (Eurasian Transition Group 2009).

Gas market, as it was already mentioned above, is regional in nature; there is no global market comparable to that of oil. The market transactions are based on the long-term bilateral contracts. The supply side of European gas market is concentrated among few suppliers, Gazprom being the most dominant and influential. By contrast, the demand side is fragmentized (Goldthau 2010, 5). Such a specific gas market feature may serve as the source of supply distortions, as the gas supply to Europe depends on one major producer and one single form of infrastructure, mostly controlled by same producer.

The literature of energy policy concentrates on Russia being the single largest supplier and thus having the almost a monopolistic position in the European gas market, however, what is overlooked is the oligopolistic characteristic of the supply infrastructure – all pipelines that deliver gas to Europe are owned by Russia, Ukraine and Belarus. This effectively means that controlling the pipeline increases the bargaining power of the supplier. Existence of a single pipeline for delivering the gas to the European market may be essential characteristics of monopoly to some extent: no pipeline – no gas, one pipeline – one way to have the gas.

Later in the thesis the monopolistic characteristics of certain pipeline projects are discussed and the case of Nabucco is analyzed as a potential attempt to weaken the pipeline monopoly in the region and solve gas market failure.

1.4. Externalities

The theory on market failure suggests that externalities may refer to "any valued impact (positive or negative) resulting from any action (whether related to production or consumption) that affects someone who did not fully consent to it through participation in voluntary exchange" (Weimer and Vining 2005, 91). Basically, this means spillover costs on third parties, not directly involved into transaction. On the energy market externalities directly refer to transportation infrastructure problems (Bohi 1995, 10).

Externalities on the gas market may arise basically from the peculiarities and characteristic of market arrangements discussed above, one of the main being the pipeline-bound nature of the gas markets. Externalities may occur because of the cross-border trade, when the big volumes of gas traded have to cross several countries before they reach the contractual partner. In case of Europe, since more than 80% of gas imported from Russia goes through the Ukraine (Bovair and Chow 2009), and the rest through Belarus (Goldthau 2010 8), any conflict that may arise between Russia and transit countries may result in extreme negative externalities for those down the distribution chain of the pipeline, by affecting the welfare of the parties, not influencing the price itself (Markandya and Hunt 2004). The most recent example of externalities of this kind in the gas market is the gas dispute of January 2009 between Russia and Ukraine, as a result of which south and eastern European countries

– Albania, Bulgaria, Romania, Serbia, Greece, Slovakia, and Bosnia-Herzegovina – were totally cut off gas supply for the whole two weeks. The economy of these countries totally stalled, all public institutions were closed, and the industry was forced to shut down due to absence of gas supply (Kovacevic 2009, 2). It is obvious from the example above that the European gas market can be exposed to certain externalities that might prove to be dangerous by undermining the energy security in Europe.

In sum, theoretically gas market failure in providing energy security may occur in four potential cases discussed above: asymmetric information, due to politicized and oil price-peg nature of gas market arrangements; public goods characteristics, mainly related to the freeriding and collective action problem of gas infrastructure and storage provision; monopoly, due to the oligopolistic supply side and monopolistic pipeline infrastructure; and externalities caused by cross-border trade and transit necessity of gas traded. Hence, the pipeline bound nature of the European gas market seems to be the center issue for potential market failure to occur, as cases of public goods, monopoly and externalities follow from infrastructure problem, what allows to assume that infrastructure provision is an important factor and indicator for energy security. The next chapter discusses infrastructure provision problem as a public policy issue in more detail and investigates the necessity and justifications of government involvement into infrastructure provision due to the fact that market fails to do it.

CHAPTER 2: INFRASTRUCTURE AS A CRUCIAL COMPONENT OF ENERGY SECURITY IN EUROPE

The four cases for potential market failure in the gas market were discussed in the previous chapter. The theoretical analysis led to the conclusion that most for the cases for market failure arise due to the pipeline-bound characteristic of the European gas market. Pipeline infrastructure is a key element of disagreement and uncertainty in transit issues and consumer-supplier relations, and is a centered problem for potential free-riding and collective action compromise. Hence, reliable and safe pipeline routes are the main components of energy security, what makes them the subject to national (as it directly affects individual country's security) and global (as it involves several players) public policy. And if the market fails to provide reliable infrastructure it is the task of the government to secure it. What are the main problems and risks related to the energy infrastructure provision and whether these risks make the case for government intervention is being discussed in the second chapter.

2.1. Characteristics of infrastructure problem

As pipeline infrastructure possesses public goods characteristics it is inclined to freeriding and collective action problems. The high upfront investment costs and cross-border nature of the modern pipeline makes them being a subject to political and economic risks. This section exactly focuses on the main problems and risks that may occur when providing infrastructure for secure and uninterrupted energy supply – both pipelines and gas storages.

2.1.1. Free-riding and collective action problem

As it was already briefly mentioned before free-riding may mean benefiting from some action while not willing to, or actually not contributing to the provision of it (Weimer and Vining 2005, 84).

In infrastructure provision in the gas market the range of veto players may vary greatly, beginning from national governments to private companies or international organizations. Though, no matter who takes the responsibility of building pipeline or storage capacity, the benefits of these project will be not excludable or rival in consumption. Here where the collective action problem and free-riding come to the stage.

A vivid example of this tricky situation was given by A. Goldthau (2010, 12), when discussing the public policy perspective of energy security, where the collective action problem arises in

the case of a gas interconnector between Vel'ky Krtis in Slovakia and Vecses in Hungary. Since most of the pipeline would need to be build in Hungary, the Hungarian partner would have to bear most of the costs of connecting both of the markets. Hence, a collective action problem occurred, as a consequence of which the interconnector may only materialize with third parties money. In fact the European Commission has included the interconnector in a recent call (Goldthau 2010, 12).

Another example of the same author concerning the collective action touches upon the storage gas capacities in Europe. He argues that although all the EU member countries would benefit from the storage gas capacities planned to be built, the burden of building these capacities would ultimately fall onto the wealthier Western European countries (Goldthau 2010, Stern 2007).

Basically, all transnational pipeline projects represent the collective action problem and free-ride temptation. Yet, another example is the constructed Central Asian pipeline that brings the gas from Turkmenistan to China. Notably, most of the costs are covered by the

Chinese contractual partner, though it is undoubted that Turkmenistan will benefit from the project and get a free-ride abstaining from investing into it at the same time (The China Post 2007).

Taking into consideration this spread, when the parties are tempted to abstain from fair participation, the market mechanism is unable to allocate resources and provide goods efficiently and output will not be optimal because of free-rider problems (Asian Development Bank Report 2008). The private companies will not provide goods, if they cannot maximize their profit, though to enhance energy security by providing gas supply infrastructure the government involvement will be necessary.

2.1.2. Political risks of infrastructure provision.

Political risk in infrastructure provision may occur due to the cross-national nature of pipelines. The mere fact that the pipelines pass through one or more countries strongly diminish consumers' or sometimes even suppliers' influence on the security of supply. The recent gas disputes of transit countries - Ukraine and Belarus - with Russia prove this argument (Stern 2006; Stern et al. 2009; Nesterov 2009). Europe has limited ways to control the flow of gas from Russia through transit countries, yet both sides are dependent on this pipeline route, making the supply agreement hanging in the air in terms of its security.

Yet, not all political risks are that obvious. For instance, all the attempts to build a gas pipeline connecting Iran and India we blocked by the continuous conflicts between India and Pakistan (Stevens 2003). A similar situation may occur in the current European project Nabucco intended to enhance European energy security and diversify gas supplies: Iran and Iraq are considered as possible suppliers of natural gas for Nabucco pipeline; however, a strong pressure from the pivotal player in this project - the USA - questions the reality of these supplies. Thus, another justification for government intervention/involvement in the area of gas supply is the fact that the market itself can neither foresee nor eliminate the political risks connected with the transactions; however, at least in theory such risks could be only eliminated on the political level with government involvements.

2.1.3. Economic risks of infrastructure provision.

Economic risks of infrastructure provision in gas market arise due to the very nature of market arrangements of the current gas markets, such as oligopolistic supply market and fragmentized non-influential demand market, and the special characteristics of pipelines as such.

The specific of the pipeline construction is that it involves high capital investment and may cover only limited distances (Pricing Mechanisms for Natural Gas). Once it is built, the pipeline is not flexible to change the route and basically the long-term business relationship established between parties connected by the pipeline secure energy supplies. The abolition of the long-term bilateral agreements offered by Brussels may question the planning security of the government and business parties involved.

In order for a pipeline to be economically efficient, it has to be exploited in its full capacity; otherwise it risks being loss-making. Construction of a gas pipeline involves huge upfront investments and high fixed costs and very low variable costs; that is why it is important to use the pipeline for its full capacity, so the costs could be quickly refinanced. Below-capacity use spreads fixed costs around lower throughput and this seriously affects pipeline profitability.

Due to peculiarities of the gas market, the parties of the gas supply contract may be simply unable to come to a mutually beneficial agreement, "ranging from failure to agree on the terms of transit and on profit and rent sharing to issues regarding the obsolescing bargain" (Stevens 2003).

Hence, the existence of the collective action problems and potential free-riding, as well as political and economic risks, may justify the government's role in providing infrastructure project.

2.1. Pipeline infrastructure: case for government intervention or "leave it to the market"?

From the previous chapters it became clear that gas market failure in providing energy security, at least in theory, requires government intervention to fix it. Government provision of the pipeline infrastructure may serve as one of the tools of such intervention. The following section analyses the possible justifications and reasoning of this intervention – why not just to leave it to the market.

Cross-border pipelines have several relevant dimensions: first of all it is the use of the pipelines, second, cross-border trade and transit. All these dimensions include several potential conflicts:

- Gas supply through a pipeline involves a number of veto-players that may have and usually have different interests and priorities.
- As it is cross-border trade and due to the characteristics of gas market discussed above, the regulatory uncertainty and non-transparency prevails.
- Collective action problem and free-riding, when it comes to the profit, rent sharing and responsibilities (Stevens 2003).
 - Monopolistic nature of the pipelines discussed previously.
- Large upfront investments and high fixed costs, that bring the necessity of the full-capacity exploitation of the pipeline constructed.

Usually most of the pipelines have some dimension of government intervention, as basically to use the land for a pipeline requires state approval, and as we learnt from the previous chapters pipeline infrastructure is often a subject to market failure which also require "helpful government hand". Also, gas pipelines are often seen as a projects of national strategic importance as they are one of the components of energy security and hence, national security. Thus, their construction and operation is often maintained by state-owned companies.

Yet, private actors are also often involved as contractual partners for the pipeline construction. Here the main area of concern is the divisions of roles and responsibilities between the state and the private investor regarding the risk and rent sharing (Stevens 2003). The interests of public and private players involved may be fundamentally different. The private investor will never operate if he cannot cover its risks and costs, and the government, by contrast, is more concerned with the issues of energy security and country's well-being and public order and stability, rather than with pure business interests. However, there should be a clear distinction between commercial and political role of the government, the lack of the separation can "make the government vulnerable in its commercial role to noncommercial considerations" (Stevens 2003). This may lead to economic inefficiency and distortions.

Hence, when market failure occurs, government may intervene to fix it, by promoting competition or internalizing externalities or providing public goods characterized pipelines. But is such intervention only justified when it produces the outcome better than leaving it to the market?

Economically – yes, though from the point of view of politics and also public policy, government may intervene even if economically it is not very efficient. For example let's take Romania or Bulgaria who suffered a lot from the recent gas supplies cut offs. Building new pipeline or storage capacities may be extremely expensive, but still the government may go for it because energy security and public stability is at stake. It cannot leave it to the market, because the market simply would not be willing to invest in loss-making projects. Another example may be the decrease of the US oil domestic production and increase of the amount of crude oil imports [Churchill 2000], which may be economically unreasonable, as domestic production is cheaper, but from public policy perspective it is absolutely justifiable as it is enhancing its energy security and oil supplies, maintaining internal reserves.

In sum, due to the collective action problem and political risks of the pipeline construction the government involvement and guarantee might be necessary. However, from economic point of view, government intervention is not all the time justified even when the market failure occurs, when public intervention produces worse result than the failing market. By contrast from the public policy perspective the market failure often requires public intervention and can be justified even if it is economically unreasonable, but only in case such intervention reaches its stated goal – in this case enhancing energy security. The next chapter discuses a particular case of public intervention in the international pipeline construction project Nabucco as an attempt to tackle market failure in providing energy security and draws a conclusion on the finding made in the previous chapters and reasonability of the project from public policy perspective.

CHAPTER 3: NABUCCO PIPELINE: GOVERNMENT ATTEMPT TO TACKLE MARKET FAILURE?

Nabucco pipeline is known as a European attempt to link the Caspian and possibly Iraqi and Iranian gas supplies with Central and Western European consumers. In most of the cases the project is discussed in geopolitical terms and criticized for its high cost and inconsistence. The aim of this chapter is to put the costly project into the framework of public policy and analyze whether the construction of this pipeline and spending billions of taxpayers' money can be justified. As noted earlier, the government intervention may be justified in case Nabucco is targeting the market failure the gas market is subject to. However, while the link between public goods and infrastructure investment, in this case the construction of the pipeline, is obvious in theory, in practice it would be more difficult to make the case for public intervention.

3.1. Nabucco project: characteristics

Route

The Nabucco project represents a new pipeline aimed at bringing the Caspian, Middle East and Egypt gas via Turkey, Bulgaria, Romania, Hungary and Austria (see Figure 1) to the Central and Western European gas markets (Nabucco Gas Pipeline). The new pipeline will be approximately 3,300 km long, starting at the Turkish/Georgian and Turkish/Iranian border and running to Baumgarten, the major natural gas hub in Austria. What is worth mentioning is more than half of the route – approximately 2,000 km of the planned pipeline will run on the territory of Turkey, 412 km over Bulgaria, 460 km in Romania, 390 km in Hungary and 46 km in Austria (Nabucco Gas Pipeline).

Figure 1. The route of the Nabucco pipeline.



Source: Nabucco Gas Pipeline http://www.nabucco-pipeline.com/portal/page/portal/en/pipeline/overview

Capacity

Official capacity of the planned Nabucco pipeline is 31bcm/y (Nabucco Gas Pipeline). It implies that in the most favorable scenario it will bring 31 billion cubic meters of Caspian, Central Asian, Middle Eastern and North African (see the section about suppliers) annually to the gas hub in Austria via Bulgaria, Romania, Hungary and Turkey.

The current level of EU gas needs is 502 bcm/y, and according to the European Commission's forecast, this figure will increase by 61% from its current level and will amount to 815 bcm/y by 2030 (Daly 2010).

Hence, making simple mathematical calculations, Nabucco pipeline might satisfy only 6% of current European gas needs in 2010, and only 3.8% of the estimated needs in 2030.

Shareholders and veto players

The six shareholders of the Nabucco project are:

•OMV (Austria)

•MOL (Hungary)

- •Bulgargaz Holding (Bulgaria)
- •Transgaz (Romania)
- •Botas (Turkey)
- •RWE (Germany)

Each shareholder has an equal share in the project – 16.57% (Nabucco Gas Pipeline), and thus, equal distribution of costs and benefits. Interestingly, that there is strong government presence in the construction of the pipeline through the government's share in all the shareholding companies of Nabucco gas Pipeline International GmbH (see Table 1). Moreover, in all cases the state share is the biggest and most influential one. Hence, the governments of participating countries are important veto players and possessors of blocking powers of the project decisions.

Nabucco Shareholder	State share (including municipalities)
OMV (Austria)	31.6%
MOL (Hungary)	"Golden Share"
Bulgargaz (Bulgaria)	100%
Transgaz (Romania)	75%
Botas (Turkey)	100%
RWE (Germany)	16%

Table 1. The state share in the companies-participants of the Nabucco project.

Source: the data for the Table 1 is taken from official companies' websites (see Reference list).

The answer to the question why exactly these governments and these companies decided to build the Nabucco pipeline is obvious. From the Chart 1 below, it is evident that Bulgaria (gas provided by Bulgargaz), Slovakia and Hungary (gas provided by MOL), Czech Republic and Austria (energy is provided by OMV), Turkey (Botas) and Germany (RWE) are European countries that to a great extent depend on imported Russian gas, ranging from 50% (like Germany) to 100% level of dependence (e.g. Slovakia).



Chart 1. European Dependence on Russian Natural Gas

Country's Natural Gas Consumption coming from Russian Sources: 2007
Europe & Eurasia Energy Consumption coming from Natural Gas

Source: Swartz Paul. Center for Geoeconomic Studies. http://blogs.cfr.org/geographics/

After the recent gas crisis and disruption in supply in 2006 and 2009 (Stern 2006; Stern et al. 2009; Nesterov 2009) due to the conflicts between Russia and transit Ukraine, most of the countries mentioned above experienced the lack of supply gas, and these countries seemed to have got their lesson. In order to enhance energy security and prevent future gas supply distortions the decision to diversify energy sources and routes was taken.

However, one should not overlook the interests and possible influence of the other veto players. For instance, the United States, one of the driving forces of the Nabucco project, undoubtedly have interest in the construction of the Nabucco, primarily due to the fact that Iran and Iraq are viewed as possible suppliers, while the United States has political, economic and other interests in these countries.

The other veto player is Russia. It is obvious that Nabucco is a threat to its profit making gas supplies to Europe, which might also be used as a political instrument, thus, it would by all means oppose construction of such a rival pipeline, for example by building alternative pipelines like Nord Stream and South Stream (Loskot-Strachota 2008), and try to cut the possible suppliers for Nabucco. Certain steps are already being taken by Russia, such as a supply agreement with Azerbaijan, which is considered as the main source of gas supply for Nabucco (IHS Global Insight 2010), and on 24 April, 2010, Austrian Chancellor Werner Faymann and Russian Prime Minister Vladimir Putin have signed an agreement to build the Austrian part of the South Stream (AsiaNews 2010).

Cost

The planned Nabucco project is considered to be quite expensive in the energy world. At the moment, estimated costs, which include also financial costs of the construction and completion of the new pipeline system, amount to around 7.9 billion Euros (11.4 billion US dollars) (Nabucco Gas Pipeline). All six shareholders of the project stated above have equal amount of shares – 16.67% each. This implies the equal share of costs as well as grounds and weight for decision-making and benefits of the project (Nabucco Gas Pipeline).

However, only 2 billion Euros of the estimated 7.9 billion will be covered by the energy companies involved in the Nabucco project (Pogany 2009). The quoted official EU support amounts to 3.2 billion Euros, out of which the EU Commission is ready to give 200 million Euros (Pogany 2009) and the European Investment Bank earmarked its financial support for the project to the amount of roughly 2 million Euros (Pogany 2009). The European Bank for Reconstruction and Development (EBRD) also expressed its readiness to support the construction of the cross-border pipeline (1 billion Euros) (Pogany 2009). Still 2.7 billion Euros remain unfunded. This sum is expected to be raised in international markets or financed from international financial organizations.

Suppliers and possible supply alternatives

As it was already mentioned before the Nabucco pipeline is aimed to bring the Caspian, Middle East and North African gas to European consumers. In theory and on paper there is no shortage of possible and potential suppliers. Natural gas meant for Nabucco pipeline "could enter Turkey from Iraq and Iran directly; or from Caspian and Central Asian fields through Georgia, and from North Africa via Syria" (Pogany 2009).

Iran and Iraq in fact could compose a good and sufficient supply team for Europe, however, there are no written agreements on the supply at the moment, and in light of politically unstable situation in these countries and one of the pivot players such as the US being against, it is even questionable if such agreements can appear.

Practically, the only certain agreement on gas supplies to feed Nabucco pipeline Europe has with Azerbaijan (Yavuz Ercan 2010), which has indicated explicit support for the project (Pogany 2009). However, the recent gas trade agreements with Russia also raise some doubts on the reliability of this supply source (HIS Global Insight 2010). Other possible theoretical gas sources are Central Asian countries – Turkmenistan, Kazakhstan and Uzbekistan also are under question as their gas reserves are long-term contracted to Russia.

Egyptian gas could be connected to Nabucco through the extension of the Arab Gas Pipeline (Pogany 2009), which is still under construction. However, Egyptian gas would represent only one-tenth of the pipeline full capacity. Qatar is also considered as one of the possible suppliers for the planned project, however, at the moment there is no any connecting pipeline to Turkey (Pogany 2009).

In fact, Russia could also be a potential supplier for the Nabucco pipeline, yet, this possibility is controversial, as in practice Nabucco is constructed mainly to avoid Russia and diversify current European gas sources, which is ironically mainly Russia.

In sum, though, in theory the geographical potential supply map for Nabucco is quite broad and promising, de facto, it is incredibly hard to find a viable alternative to Azerbaijan and Central Asia if they turn to Russia, and to Iran and Iraq – if the US takes a strong position.

3.2. Viewpoints and justifications

The first section of this chapter provided the project characteristics, on the basis of which the following sections will conceptualize the project into the public policy framework. As it was concluded in the second chapter the economic and public policy justification are not mutually dependent and when business cannot reason the viability of the project, the government may do. Hence, it is reasonable for analysis to look at Nabucco from both these viewpoints in order to see whether the practice create a room for public intervention, as the theory perfectly does.

3.2.1. Business consideration (cost-benefit analysis)

The main question the businesses aimed at cost optimization might ask: is 7.9 billion Euros (11.4 billion US dollars) the real price of the project, if not, is it still worth to spend it for other considerations from business viewpoint?

There is certain doubt in the expert literature regarding the real costs of constructing the Nabucco. It is fascinating to see the timeline of the agreements related to Nabucco, as well as gradual cost increase as the time went by. Originally, it was OMV and Botas that started to design the project as early as in 2002, and only after several years the parties of the pipeline construction project did realize the essential character of intergovernmental treaties that would lay the political and legal basis for the pipeline construction. As a result, only after 7 years, in 2009, were such agreements actually signed (EuroActiv 2009). However, even with these

agreements signed, still there is no assurance that the project will eventually become a reality – any party to the agreement can start renegotiating the terms of the agreements, or any other disruption may appear as well (EuroActiv 2009).

Regarding the costs, the gradual increase in the cost and delays in expected completion date is incredible (see Table 2).

	Year	Cost	Expected completion date
1	2002	4.5\$ bln	2009
2	April 2006	5.5\$ bln	2010-11
3	April 2007	6.2\$ bln	2010-2011
4	May 2008	7.9\$ bln	2013
5	January 2009	11.4\$ bln	2014

Table 2. The Timeline of the Cost Increase of the Nabucco project

Source: Gerson Lehrman Group 2010.

As a counter example to the Nabucco project, one could provide the construction of the Central Asia – China pipeline. Central Asia–China pipeline, which delivers Turkmen gas to China, similarly transits through several countries, crossing Uzbekistan and Kazakhstan on its way. Though it is a bit less in length - 1,833 kilometers, as opposed to Nabucco's 3300 km; what is important to stress in this comparison is the difference between them in transposition to reality. Although the Turkmenistan – China pipeline is projected to be connected to the Chinese east-to-west pipeline, it is out of scope of the discussion, since this particular pipeline is Chinese internal one, and does not have the same implications and difficulties.

The first general agreement concerning construction of the Central Asia–China pipeline and delivery of Turkmen gas was signed by Chinese President Hu Jintao and Turkmen President Saparmurat Niyazov in April, 2006, between Chinese and Turkmen governments (China National Petroleum Corporation (CNPC) Press 2008). It is very interesting to see the rapidity of construction of the pipeline, see the timeline below:

Step	Date
Turkmen section started	30 August 2007
Uzbekistan section started	30 June 2008
Kazakh section started	July 9 2008
Inauguration ceremony	December 14, 2009
Pipeline operation started	On December 31, 2009

Table 3. The timeline of the Central Asia – China Pipeline.

Source: China National Petroleum Corporation Press.

Hence, it took China and Turkmenistan only 3.5 years, and 2.2 billion US dollars to build and start operating a 1.833 km long pipeline, while Nabucco, after 8 years of projecting, is still on paper, while the cost has arisen 2.5 times.

Apart from rapidity of acting, the issue of financing is still not totally solved. Strangely, the 2.7 billion of 7.9 billion Euros is still hanging in the air. Also the participants are reluctant to invest their own funds, though it is unquestionable that these companies are not in crisis and do have certain funds and profits. What brings even more suspicion is that all 6 shareholders undertake to cover only 2 billion of the total 7.9 billion costs (Pogany 2009).

Yet another feature of the Nabucco project that undermines the business justification is that the Nabucco has no throughput guarantee. There is a bunch of potential and possible suppliers to maintain the full capacity operation of the pipeline, though none of them (except Azerbaijan) has an official agreement with the buyer. Hence, based on a basic cost-benefit analysis the private investors would most probably be reluctant to finance the project not because the political instability of the regions, but simply for a practical reason: the construction of the pipeline is not backed up by the through put agreements (EuroActiv 2010). There was already an example of the blind construction of the pipeline without agreements with certain pipelines in history.

The 419-mile, \$500 million Odessa-Brody oil pipeline, completed in 2001, provides a cautionary tale to building pipelines without throughput guarantees. The Ukrainian government rashly built the self-financed line without foreign investment, stretching from its Black Sea port to the Polish border to provide Central Europe with oil despite not having firm commitments from a single oil producing nation for export throughputs. After the pipeline remained unused for three years, a reluctant Kiev was forced in 2004 to agree to transport Russian oil southwards in the opposite direction, for export from Odessa rather than northwards to Central European markets as originally envisaged (Daly 2010).

As it was already stated in the previous section the Nabucco pipeline used in its full capacity will satisfy only 6% of the current European gas demand. However, at the moment, there is only a secure commitment of Azerbaijan to feed Nabucco with 8 bcm/y of natural gas, what is equal only to one-tenth of the current amount of Turkish and South Eastern European import. Moreover 8 bcm/y of natural gas provided by Nabucco out of 502 bcm/y of current consumption will comprise only 1.6% of the European annual demand, which is ridiculously small for such an expensive project (Fernandez 2010).

Hence, all of the above pure economic considerations of the Nabucco pipeline construction allow concluding that economically this project is not justifiable. The private players would not provide loss-making good, creating a market failure; hence, that is the role of the government to fix it. The next section analyzes if the government provision of the Nabucco at taxpayer's money really fixes market failure.

3.2.2. Does Nabucco solve the market failure problem?

In the first chapter the four incidents of market failure that are currently occurring in the gas market were analyzed. Even if Nabucco is not economically justifiable it is still could be justified if it helps to fix the market failure on the gas market. - The second chapter of current

thesis concludes that if the government intervention reaches the policy goal – in our case enhancing energy security and thus, national security - such intervention is justified from the public policy angle. In this case market fails to provide energy security due to the reasons discussed in the first chapter and in the section above, then, the public intervention through Nabucco project is supposed to fix it. The following sections will attempt to see if it really the case.

3.2.2.1. Asymmetric information

The planned Nabucco project does not affect the current regulatory uncertainty on the gas market in Europe related to the liberalization and at the same time protectionism initiatives of the EU governing bodies. Quite the opposite, it seems to actually worsen the problem of asymmetric information by not only creating uncertainty of the amount and terms of actual supply, what definitely affects investment decisions and stalls the project itself, but also by uncertainty of actual demand (e.g. Austria signed the agreement with Russia on the construction of South Stream)(AsiaNews 2010) what questions the provision of supply – practically right now the whole project seems to be in a vicious circle in terms of information.

3.2.2.2. Public goods characteristics

In terms of public goods characteristics of the gas supply and Nabucco as a pipeline infrastructure, the government involvement practically does not change anything from what was discussed in the first chapter. The collective action problem of who should finance it, and private parties' reluctance to actually fund the project, hoping to free-ride on the government involvement, still exists. The EU's attempt to escape Russia though "diversifying its suppliers" with the help of expensive pipeline can be viewed as nothing more than another free-ride at the expense of the most dependent on Russian gas countries and its citizens.

3.2.2.3. Monopoly

The construction of the Nabucco pipeline will weaken the monopolistic characteristics of the current pipeline system of the European gas supply, for the moment basically controlled by the main supplier – Russia as mentioned before. Nabucco will weaken monopoly infrastructure and also monopoly supply and also give Europe some bargaining power in gas affairs. All it would be true if Nabucco would operate at least with half of its capacity, which is questionable for the moment.

3.2.2.4. Externalities

On the one hand, the planned Nabucco pipeline bypasses the transit countries Belarus and Ukraine, which were the reasons of gas supply distortions in the previous years and the source of the main externality discussed in the first chapter. But on the other hand, the whole situation reminds trading bad for worse, as the current discussed projects also involve transit countries – even more, they are practically the part of the construction, maintenance and benefiting from the pipeline. By contrast, the security of the gas transfer through the offered route will not be completely guaranteed. Even, while Turkey can be considered a reliable partner as it is the beneficiary of the project, the natural transit of the Nabucco through its territory will give the Turkish government a considerable bargaining power, especially when it comes to the desperate desire of Turks to integrate in the EU – and this, in turn, is not accepted by some EU members (e.g. France) (Fernandez 2010).

Hence, it is obvious that public intervention and insistence on constructing the pipeline will not really tackle the existing market failure. The new pipeline will still leave the market failing, and thus, fail to enhance the energy security, what we assumed was the main goal of public intervention.

3.3. Is the game worth a candle?

As outlined in the introduction, the research question that this thesis is aimed to answer is whether there is a case for public intervention into Nabucco and whether or not such intervention can be justified. This section will conclude the analysis provided above and give a clear answer to these questions.

Answering the first question, as proven in the first chapter of the current thesis, market failure indeed exists in the sphere of gas supply to Europe, even more, all four factors leading to market failure do exist in gas supply to Europe. Furthermore, it was established that the private players would not be willing to provide the necessary infrastructure for providing secure energy supply (chapter 3). Consequently, as it was clear throughout the whole thesis, at least in theory, the governments do have a case for intervention. However, the second question needs some more analysis. Even if there is a case for government intervention due to market failure, this does not mean that such intervention is absolutely justified as such.

There is common argument that Nabucco is too expensive, and most probably the private players themselves would not be willing to invest – the project yet lacks 2.7 billion Euros of funding. Since it is the taxpayers' moneys that will be spent would the project get direct government support, it is worth analyzing the actual cost and whether these spending might be justified.

Furthermore, the Nabucco does not even solve the problem of market failure (chapter 3), even if it does; it creates a room for the new ones. First of all, the market failure in having the transit countries will still be there – trading bad for possibly worse – instead of Ukraine and Belarus, the possibly problematic transit country is Turkey, a non-EU member, clearly having its interests and conflicts with some of EU countries. Infrastructure having the public

goods characteristics – practically the costs of Nabucco will be socialized from the pockets of the taxpayers, but basically not satisfying its main goal – enhancing energy security.

Thus, while it is questionable whether construction of Nabucco project is justified at all, an attempt to provide a justification from public policy angle will be made.

On the one hand, Nabucco, aimed at enhancing energy security, hence, national security in participating countries, seems to have failed its mission from the start. With its maximum of 31bcm/y, it will provide 5-6% of the actual gas demand in Europe, combined with all the difficulties connected with construction and operation of Nabucco described above (chapter 3, section 1), it does not seem that the Nabucco will fulfill its mission.

In addition, unlike the aforementioned Central Asia – China pipeline, Nord Stream or South Stream, Nabucco has too many parties involved - 6 companies, 6 governments, other forces, like Russia and the United states, having certain influence and interests (see chapter 3.1 on shareholders and veto players). This chess board seems to have been one of the reasons that Nabucco for the last 8 years is still on paper.

On the other hand, the percentage that a pipeline provides may not matter at all, if one dares to challenge the Russian dominance and actually achieves to have a pipeline right beside Russian one, taking the gas from usual Russian suppliers, like Central Asia and Azerbaijan, introducing Iran with its 16% of world natural gas reserves, it might other players to dare maybe even more risky projects, since they have witnessed that opposing the Russia's dominance is possible in practice. But this is not the purpose of this research to discuss all "if's, which can be countless, as well as delusive.

Furthermore, the governments might take a position that the 5% less of import dependency on Russia is a motivation enough to dare spend the taxpayers' billions. Certain governments may prefer to try to have some alternative source like Nabucco regardless of the costs and difficulties involved. Thus, from the analysis provided in the thesis, I would draw two final conclusions: first, the existence of market failure and unwillingness of private players to take the social role indeed creates a case for government intervention; second, such intervention in the form of providing pipeline infrastructure, in this case construction of the Nabucco pipeline, can hardly be justified, as the goal of this particular intervention is not fulfilled. The Nabucco project doesn't enhance European energy security and thus, doesn't solve the European gas market failure.

CONCLUSION

The purpose of the study was to conceptualize energy security – the uninterrupted gas supply at affordable price – and gas market as such in the framework of public policy, thus looking at these issues from an angle different rather than geopolitical one. The research intended to demonstrate that European gas market is inclined to market failure, as well as any other market, thus, creating the room and necessity for government intervention. The infrastructure provision, and Nabucco pipeline construction in particular, was viewed as a form of government intervention to tackle the existent market failure.

The analysis and public policy theoretical framing showed that the gas market indeed is subject to market failure in providing energy security that occurs in four cases: asymmetric information due to the regulatory uncertainty on the European gas market and its politicization; public goods characteristics represented by free-riding and collective action problem in infrastructure provision; monopoly reflected in monopolistic feature of the pipelines as well as supply side; and externalities connected with the pipeline bound nature of the gas market. That allowed concluding that gas infrastructure is one of the main sources of market failure, causing the necessity of government intervention.

Market fails to provide infrastructure due to collective action problem and political risks that it is not able to mitigate. This makes a perfect case and justification for public intervention if such intervention reaches its stated goal. The Nabucco project, as a case study, was put into the public policy framework and in this light analyzed as a form of government intervention to tackle gas market failure.

The collective action problem in the form of several veto players – six companies and six governments – and pivotal players like the US and Russia involved, as well as political risks and externalities make the project a perfect case for public intervention. However, such intervention in the form of construction of multi-billion pipeline, which in the best scenario would provide only 6% of the current European energy demand, can hardly be justified. The main finding of the research is that public intervention through Nabucco Gas Pipeline doesn't solve the market failure – as asymmetric information, externalities of transit countries and collective action problem would still remain. Hence, the study questions the viability and necessity of the project as a solution for market failure. The government intervention is needed, as the market failure exists and needs government "helpful hand", however the Nabucco pipeline cannot be considered as effective and reasonable "helpful hand". What would be more appropriate government solution to the gas market failure is already a matter of another research study.

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