IMPROVING ENERGY SECURITY: CURING THE BULGARIAN GAS SECTOR'S INEFFICIENCIES

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Submitted to

Central European University
Department of Public Policy

In partial fulfillment of the requirements for the degree of Master of Arts in Public Policy

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Budapest, Hungary
2010

ABSTRACT

Despite the intensive convergence process in the Bulgarian gas sector and adoption of the main EU directives on gas market liberalisation in the past decade, the Bulgarian gas market is still far from actual liberalization and competitiveness. Why is that? What is the government's role in shaping and regulating the Bulgarian natural gas market? Are the inefficiencies in the Bulgarian gas sector due to market failures or to government failures?

Past studies have focused on challenges of corruption, lack of good governance and heavy government control over the energy sector, and especially the gas market. Heavy monopolisation of the gas market, lack of gas infrastructure and consumer access to gas, limited storage, high import dependence, lack of investment incentives and of appropriate regulations, are some of the major obstacles to the development of a fully competitive gas market. This invites further questions about why exactly inefficiencies in the gas sector persist and endanger the energy security of the country. This study investigates the question of how the Bulgarian gas sector be restructured so as to better ensure energy security for the country through the theoretical lens of market failures and government failures.

The research confirmed the hypothesis that that gas sector inefficiencies are due to government failures which have reinforced inherent market failures from the pre-liberalization period instead of acting to resolve them.

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ACRONYMS/ABBREVIATIONS

EU – European Union

CEE – Central and Eastern Europe

MEET – Ministry of Economy, Energy and Tourism

SEWRC – State Energy and Water Regulatory Commission

MEER - Ministry of Energy and Energy Resources

PPP – Purchasing Power Parity

VIU – Vertically Integrated Undertaking

ITO – Independent Transmission Operator

MS – Member States

GLOSSARY

Taken directly from Article 2, **Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC:**

1) “"natural gas undertaking" means a natural or legal person carrying out at least one of the following functions: production, transmission, distribution, supply, purchase or storage of natural gas, including LNG, which is responsible for the commercial, technical and/or maintenance tasks related to those functions, but shall not include final customers;
2) "upstream pipeline network" means any pipeline or network of pipelines operated and/or constructed as part of an oil or gas production project, or used to convey natural gas from one or more such projects to a processing plant or terminal or final coastal landing terminal;
3) "transmission" means the transport of natural gas through a network, which mainly contains high-pressure pipelines, other than an upstream pipeline network and other than the part of high-pressure pipelines primarily used in the context of local distribution of natural gas, with a view to its delivery to customers, but not including supply;
4) "transmission system operator" means a natural or legal person who carries out the function of transmission and is responsible for operating, ensuring the maintenance of, and, if necessary, developing the transmission system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the transport of gas;
5) "distribution" means the transport of natural gas through local or regional pipeline networks with a view to its delivery to customers, but not including supply;
6) "distribution system operator" means a natural or legal person who carries out the function of distribution and is responsible for operating, ensuring the maintenance of, and, if necessary, developing the distribution system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the distribution of gas;
7) "supply" means the sale, including resale, of natural gas, including LNG, to customers;
8) "supply undertaking" means any natural or legal person who carries out the function of supply;
9) "storage facility" means a facility used for the stocking of natural gas and owned and/or operated by a natural gas undertaking, including the part of LNG facilities used for storage but excluding the portion used for production operations, and excluding facilities reserved exclusively for transmission system operators in carrying out their functions;
10) "storage system operator" means a natural or legal person who carries out the function of storage and is responsible for operating a storage facility;
11) "system" means any transmission networks, distribution networks, LNG facilities and/or storage facilities owned and/or operated by a natural gas undertaking, including linepack and its facilities supplying ancillary services and those of related undertakings necessary for providing access to transmission, distribution and LNG;

12) "linepack" means the storage of gas by compression in gas transmission and distribution systems, but not including facilities reserved for transmission system operators carrying out their functions;
13) "interconnected system" means a number of systems which are linked with each other;
14) "interconnector" means a transmission line which crosses or spans a border between Member States for the sole purpose of connecting the national transmission systems of those Member States;
15) "direct line" means a natural gas pipeline complementary to the interconnected system;
16) "integrated natural gas undertaking" means a vertically or horizontally integrated undertaking;
17) "vertically integrated undertaking" means a natural gas undertaking or a group of natural gas undertakings where the same person or the same persons are entitled, directly or indirectly, to exercise control, and where the undertaking or group of undertakings perform at least one of the functions of transmission, distribution, LNG or storage, and at least one of the functions of production or supply of natural gas;
18) "horizontally integrated undertaking" means an undertaking performing at least one of the functions of production, transmission, distribution, supply or storage of natural gas, and a non-gas activity;
19) "related undertaking" means an affiliated undertaking, within the meaning of Article 41 of Seventh Council Directive 83/349/EEC of 13 June 1983 based on the Article 44(2)(g) of the Treaty on consolidated accounts [13] and/or an associated undertaking, within the meaning of Article 33(1) of that Directive, and/or an undertaking which belong to the same shareholders;
20) "system user" means a natural or legal person supplying to, or being supplied by, the system;
21) "customer" means a wholesale or final customer of natural gas or a natural gas undertaking which purchases natural gas;
22) "household customer" means a customer purchasing natural gas for his own household consumption;
23) (26) "non-household customer" means a customer purchasing natural gas which is not for his own household use;
24) "final customer" means a customer purchasing natural gas for his own use;
25) "eligible customer" means a customer who is free to purchase gas from the supplier of his choice, within the meaning of Article 37;
26) "wholesale customer" means a natural or legal person other than a transmission system operator or distribution system operator who purchases natural gas for the purpose of resale inside or outside the system where he is established;
27) "long-term planning" means the planning of supply and transport capacity of natural gas undertakings on a long-term basis with a view to meeting the demand for natural gas of the system, diversification of sources and securing supplies to customers;
28) "emergent market" means a Member State in which the first commercial supply of its first long-term natural gas supply contract was made not more than 10 years earlier;
29) "security" means both security of supply of natural gas and technical safety;
30) "gas supply contract" means a contract for the supply of natural gas, but does not include a gas derivative;

31) "gas derivative" means a financial instrument specified in points 5, 6 or 7 of Section C of Annex I to Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments [14], where that instrument relates to natural gas;
32) "control" means any rights, contracts or any other means which, either separately or in combination and having regard to the considerations of fact or law involved, confer the possibility of exercising decisive influence on an undertaking, in particular by:
    a. ownership or the right to use all or part of the assets of an undertaking;
    b. rights or contracts which confer decisive influence on the composition, voting or decisions of the organs of an undertaking.""

1. INTRODUCTION

Energy security has been an increasingly important issue for EU countries because of the rising uncertainty about energy prices, resource availability and national security. Given the prominent role that external energy suppliers, such as Russia, play for the EU, and the risks of energy supply shortages, such as gas, it is even more pressing to look at options for strengthening the EU internal energy market and security, and to address national energy dependency problems through new mechanisms.

Small Member States, such as Bulgaria, are overly dependent on one natural gas supplier (Russia) which can have enormous economic implications for the development of a country. Despite the intensive convergence process in the Bulgarian gas sector according to EU directives on gas markets' liberalisation, the Bulgarian gas market is still far from actual liberalization and competitiveness. Lack of gas infrastructure and consumer access to gas, limited storage, high import dependence, lack of investment incentives and of appropriate regulations are some of the major obstacles to the development of a fully competitive gas market. This invites further questions about why exactly inefficiencies in the gas sector persist and endanger the energy security of the country.

Thus, the study seeks to answer the following question: How can the Bulgarian gas sector be restructured so as to better ensure energy security for the country? To answer the main question, the study will investigate the following queries: are the inefficiencies in the Bulgarian gas sector due to market failures or to government failures? What is the government's role in

shaping and regulating the Bulgarian natural gas market? What measures can be taken to compensate for these failures and to enhance the Bulgarian energy security?

The main hypothesis of this paper is that gas sector inefficiencies are due to government failures which have reinforced inherent market failures from the pre-liberalization period instead of acting to resolve them.

The paper aims to analyze and evaluate the actual reasons behind the existing inefficiencies in the Bulgarian gas sector. It evaluates the structure, functioning, and regulation of the Bulgarian gas sector through the lens of theoretical models of market failure and government failure. The paper aims to propose recommendations to address market failures and to increase efficient outcomes in the gas sector through more adequate government policies to enhance energy security. Through answering the research questions, the study aims to contribute to the debate about energy security in Bulgaria in the context of liberalising and integrating energy markets across the European Union and to propose recommendations for changes in the gas sector.

The thesis is structured as follows: The underlying theoretical literature on energy security and the Bulgarian gas market problems within the context of the EU gas markets' liberalisation principles are provided to give relevant background and to substantiate the analysis in chapter two. The third, fourth and fifth chapters provide insight into the methodology employed, the analytical framework for the study as well as findings and analysis. Chapter six concludes and provides recommendations for further restructuring of the gas sector.

2. LITERATURE REVIEW

2.1. The paradigm of Energy Security and Gas Market Liberalization

Energy security is most often defined as "the reliable and adequate supply of energy at reasonable prices" (Bielecki 2002) which would signify in simple terms uninterrupted supplies of gas for the economy. Reasonable prices are connected to the volatility and risks associated with price fluctuations: to be reasonable, they should be cost-based and dependent on the supply and demand balance of energy markets (ibid.). Thus energy security would also depend on the relationship of adequate supplies to cover demand. Bohi and Toman (1996, 1) define energy security "as the loss of economic welfare that may occur as a result of a change in the price or availability of energy." The IEA (1995, 23) stated that "energy security is simply another way of avoiding market distortions" because "smoothly functioning international energy markets' will deliver "a secure – adequate, affordable and reliable – supply of energy" (IEA 2002, 3). Another definition of energy security states that "energy security always consists of both a physical unavailability component and a price component, (but) the relative importance of these depends on market structure" (IEA, 2007, 32).

These definitions, focusing on the role of markets in ensuring energy security, are based on the idea that through energy markets' liberalization, energy security as a market product is determined by the functioning of markets and thus can be defined in market terms through physical supply and price mechanisms (Chester 2010). Energy security strategies are meant to

mitigate "situations when energy markets do not function properly…(and) should be mostly aimed at 'making markets work' and letting them work when they do" (Noël, 2008). In terms of operationalisation of energy security, short-term (operational) and long-term (adequacy) risks for supply shortages, transit, storage and delivery should be looked at from a market perspective (IEA and Stern, 2002). Energy security supplies can be quantified further through measuring risks and policy effectiveness (Tönjes and de Jong, 2007 in Chester 2010). However, one question that remains is if the market has the role to regulate itself, how can it ensure the security of supplies when they come from a third party that is subject to its own different rules of management? Can deregulation and liberalization ensure the security of supplies?

A broader definition of energy security in the European Commission's Green Paper *Towards a European strategy for the security of energy supply* noted: "energy supply security must be geared to ensuring, for the well-being of its citizens and the proper functioning of the economy, the uninterrupted physical *availability* of energy products on the *market*, at a price which is *affordable* for all consumers (private and industrial), while respecting environmental concerns and looking towards *sustainable* development … Security of supply does not seek to maximise energy self-sufficiency or to minimise dependence, but aims to reduce the risks linked to such dependence" (Green Paper 2000, 1–2). Thus, governments have an important role to play through policy decisions and regulations to guarantee the proper functioning of energy markets in relation to energy security.

The institutionalist model prescribes an important role of the state regarding market functioning as states and politics shape the institutions and processes in which markets can function. The purely market-focused definition of energy security in terms of output and prices has to be expanded to include affordability, sustainability, demand issues and policy making

mechanisms. This is much closer to the definition of energy security which the European Commission and EU member states have adopted in the latest directives. The EC's 2006 Green Paper *A European strategy for sustainable, competitive and secure energy* underscores the importance of the physical security of supply (network infrastructure, strategic stocks, supplies' diversification) in view of the increasing dependence on energy imports (gas) which have to be addressed by policies that reduce demand, diversify supply sources and routes, stimulating enough investment and ensure energy access to supplies. The role of national governments in ensuring energy security should be recognized both from the perspective of increasing dependence on imports and geopolitics, as well as higher reliance on competition in energy markets and adequate regulatory frameworks to sustain these markets (Youngs, 2007 in Chester 2010).

Furthermore, energy security can be characterized as a public good that is not valued adequately by the markets but it can benefit equally everyone in society regardless of whether they pay to have it or not (Bielecki 2002). This inadequacy might result in less efficient/optimal production levels of energy security for society. Supply shocks may be equally bad for an economy by triggering inflation, loss of GDP, or high unemployment (ibid.). With the problem of price volatility of commodities such as oil and gas, the security of supply can be endangered by the negative influence of price fluctuations on consumers as they lose from the fact that they cannot always expect affordable prices.

The concept of security of gas supply as part of the overall energy security thus involves the physical infrastructure' security, economic security and supply continuity. In the long term, security of gas supplies would means the ability of a country like Bulgarai to receive reliable and economic supplies of gas. In the short term security would mean reliability of contracted gas

supplies (Eurogas 2002). Both of these would also imply availability of gas (domestic production, imports, storage space) to meet consumer demand, and the physical network for transportation to connect final consumers with gas supplies.

2.2. Improving Bulgaria's Energy Security

For the Bulgarian gas market, the supply of gas is determined at the international level through one single supplier, Russia. A major disruption of gas supplies in January 2009 had a significant negative impact on the Bulgarian economy because of the high dependence of the country on gas imports. However, the country cannot have an influence on factors related to security of supply beyond the scope of the predetermined quantities and prices for gas supplies through contracts. The way to mitigate future supply shocks would be based on the regulatory and the business environment in the country and whether government policies and market mechanisms can cushion supply shocks adequately. If not, then there is a failure of the government to provide for a public good such as energy security or a failure within the liberalizing markets which are supposed to ensure energy security through creating open and competitive environment for investments.

High energy prices might have negative effects on macroeconomic indicators and the performance of a country's economy due to losses from potential supply shortages (Bielecki 2002). The problem of energy security is complicated further because of the time horizon of gas policies. While short term energy security would mean mostly risks of disruptions along the

supply chain due to technical issues, geopolitical risks or weather conditions, the long term security aspect of energy entails the idea of the adequate timely supply to meet expected growth in demand, which may depend on a number of economic, political decisions affecting investment in production or transport infrastructures (ibid.).

The 2009 gas crisis was a clear sign that the government needs to design better emergency plans for managing gas supply shortages if they occur again. In order to improve the energy security of the country, analysts advice, the government should establish a more transparent and effective energy governance practice with coordination of roles between institutions, allocations of rights and obligations between decision-makers, and reliable long-term forecast on energy (CSD 2009). Looking from a good governance perspective, Bulgaria needs to have a better system of implementation and monitoring indicators as well as mechanisms ensuring better management and clear priorities and strategies for the energy sector (ibid.). The lack of clear mechanisms for decisions regarding large-scale investment projects impedes further the effective functioning of the Bulgarian gas sector (ibid.). Further necessary steps to ensure the success of gas projects infrastructure would require transparency, clear relationships with foreign investors, adequate cost-benefit analysis etc. (ibid.).

Bulgaria's energy markets are still heavily monopolistic, with regulated prices and low competition in the energy sector, especially in the gas market as compared to electricity and oil (Nitzov et al. 2010). Despite government attempts in 2008 to draft new legislation on energy policy in line with the EU objectives on sustainable and competitive development and diversification of energy supplies, the proposed strategy did not pass through Parliament (ibid.). The newly elected government in 2009 has undertaken a major revision of its predecessors' proposed energy initiatives, but the lack of transparency and the high corruption practices in the

sector are still alarming, and as the CSD points out, “decision-making and procedures regarding major projects and policies remain opaque and may be swayed by interests” (ibid. 1).

As the Ministry of Energy and Energy Resources (MEER) noted in 2004, the corruption risk “remained high” in the energy sector because of “insufficient legal regulation at the national and institutional levels; large stakes and significant financial resources, and the processes of privatization” (Pashev et al., 2). Nowadays, the sector continues to be hampered by high corruption risk, which contributes to costly inefficiencies in the gas supply chain. The state-owned gas supply monopoly, Bulgargaz, has no prospects of privatization and there are only partial attempts to introduce more competition within certain operations of the enterprise (ibid., 43). Gas market liberalization and privatization is often seen as a powerful tool to increase competitiveness in the gas sector, reduce politicization and promote energy security. However, for Bulgaria privatization might not be such a good solution to problems in the gas market because it could just lead to the substitution of domestic corruption by foreign corruption practices beyond the Bulgarian jurisdiction, especially in areas of public procurement of gas imports (ibid., 43).

A major obstacle to the development of a competitive Bulgarian gas market is the fact that gas is supplied solely from one country and by only one foreign provider that lies beyond the EU borders and regulatory jurisdiction, Russia, under long-term agreements with predetermined prices. This hampers seriously attempts for full liberalization of the Bulgarian gas market (Nitzov et al. 2010). Excessively high gas prices that Bulgargaz and the system operator Bulgartransgaz have to pay for imports do not allow them to charge good marginal prices to consumers (Nitzov et al. 2010). They have been pressed simultaneously by the State Energy and Water Regulatory Commission (SEWRC) to not increase consumer prices as much as markets

push for, which has affected negatively the so needed investments in infrastructure and services (ibid.).The lack of sufficient gas infrastructure and the unstable institutional set up the in the country made foreign private investment more difficult (Kunneke and Arentsen 2003).The diversification of gas supply routes, energy sources and geographical locations is possibly the only feasible way to stimulate further and more successful market liberalization (Nitzov er al. 2010).

The regulatory environment in Bulgaria has significant role to play in the gas market. The SEWRC's price regulations seem to have a negative impact on the development of a competitive gas industry as there seem to be very weak incentives for distribution companies to invest in services and to supply households and commercial users. A biased and unfriendly regulatory environment combined with gas prices based on imports and pegged to the oil price point out to a potential government failure in the gas sector because of inadequate regulations that hamper investments.

The functioning of the SEWRC needs further investigation because of the inherent conflicting objectives that this body as such has in the gas sector as well as the high potential of political pressures on the regulator to follow certain directions. On the one hand, the SEWRC is supposed to ensure proper conditions for the development of a competitive gas market through breaking monopolies' market power, barriers to entry for new actors and ensuring transparency and predictability in the sector. The contradictions as such seem to be between the idea of the development of competition in the gas market based on the principle of free and open access which might mean potentially higher prices for consumers in the future. This could result in the possible exclusion of certain groups of society because of excessively high energy prices.

Regulations should be there to ensure a level playing field for all participants in the market. According to the EU third legislative package on gas market liberalization directive:

> the independence of regulatory authorities is a key principle of good governance and a fundamental condition for market confidence. Existing legislation calls for regulatory authorities to be wholly independent of the interests of the gas and electricity industry...it is proposed that regulatory authorities have legal personality, budgetary autonomy, appropriate human and financial resources and independent management (SEC(2007) 1179).

The practices of the Bulgarian gas industry regulator suggest a potential government failure in the sector that needs to be investigated further in the light of the challenges of rising energy costs, eliminating state subsidies, and improving service quality in the process of liberalization.

Thus a framework that looks at both the role of markets and governments in ensuring energy security with a focus on the gas market and its specifics would be most appropriate to provide a comprehensive overview of the major market mechanisms and institutions in the Bulgarian gas market as well as to point out problems and possible solutions for more efficient outcomes in the gas sector.

The paper aims to bring light to the nature of the gas market transformation and the different factors that lead to inefficiencies in the Bulgarian gas market. Market failures are important contributors to the gas sector's problems and to the energy security of the country. While lots of studies focus on the role of governance and corruption in the gas sector as main factors that impede its development, not as many are looking at the interaction between a liberalizing gas market and a changing regulatory environment. When the regulatory and political environment impedes the development of a competitive gas market due to excessive regulation, lack of transparency, corruption, then government failures certainly would be a major factor behind inefficient outcomes in the gas sector.

The findings of this study aim to bring more light into the essential reasons for the inefficiencies in the Bulgarian gas market which have important implications for the country's energy security. They could be of significance to other countries in the region which might face similar problems due to governance problems and communist legacies of energy dependence and ownership.

3. METHODOLOGY

The study follows a qualitative research design following the case study method, i.e. single-unit design with temporal variation, which is intended to be "an intense study of a single unit with the purpose of understanding a larger class of similar units" (Gerring 2004). Case studies provide for more depth in the study, case comparability and an insight into causal mechanisms (ibid.). The primary value of single-unit analysis allows for a tight focus and in-depth analysis of a given case by explaining the specific features of a given event (why, how etc.) beyond the simple occurrence of events which can be explained through cross-unit studies (ibid.). A critique of the single-unit case study is that it is poorly bounded and forgoes generality to gain in terms of depth of understanding and more knowledge about a limited area as opposed to the cross-unit studies whose design tests inferences explicitly. The problem of generalizations which cannot be based on a single-unit investigation is not a threat to the analysis since the objective of the research is to explore in depth the various reasons behind Bulgarian gas market inefficiencies and descriptive inferences can be drawn as opposed to providing just a broader and more representative and comparable overview which falls short in specificity and depth.

Data for the research was collected through secondary sources. Research was conducted through the review of relevant literature on energy security and gas markets, governmental and industry reports, legal documents as well as national and European statistical data on energy indicators. The focus of the study is on the Bulgarian gas sector and its inefficiencies. As a CEE country, Bulgaria shares numerous commonalities with the other CEE countries as former communist states in terms of structural legacies in the energy sector (state-owned monopolies, high import dependence, high energy intensity, governance problems, etc.).

The findings of this single-unit case study aim to bring more light into essential factors that should be addressed in the Bulgarian gas sector in order to enhance national energy security, but they can further be relevant to other CEE countries which face similar problems. The study could have important implications both for Bulgarian and EU policy makers as it aims to expose the reasons behind failures in the Bulgarian gas sector, but the Bulgarian gas market example can be further used as a comparison to other CEE cases of gas market liberalization to draw inference and further insights as to why the process of gas market liberalization and integration has been going so slowly and ineffectively at the EU level.

4. ANALYTICAL FRAMEWORK: MARKET FAILURES VS. GOVERNMENT FAILURES

As discussed in the introduction, this study aims to answer the questions of whether the inefficiencies in the Bulgarian gas sector are mainly due to market failures or to government failures, what measures can be taken to compensate for these failures and how can the gas sector be restructured so as to enhance the country's energy security.

For the first question, "market failures" implies markets failing to perform efficiently because of inherent violations of the goal of Pareto optimality" (Munger 2000, 241). Market failures happen when "unregulated private markets fail to meet consumers' requirements with maximum efficiency" (Helm et al. 1989, 2). Under the competitive economy's theory, under certain conditions, "the self-motivated behaviors of economic actors lead to patterns of consumption and production that are efficient in the special sense that it would not be possible to change the patterns in such a way as to make some person better off without making some other person worse off (the Pareto efficiency principle)" (Weimer and Vining 2005, 54).

Conventional economic theories classify markets as being Pareto efficient under conditions of perfect competition, no public goods and no externalities (Arrow and Debreu in Stiglitz 2008, 2). However, under conditions of imperfect information, public goods, incomplete markets, such as the gas markets, for example, this means that by themselves markets cannot result in truly efficient outcomes (Stiglitz 2008, 2). Traditionally several types of market failure are identified: **economies of scale, information problems and externalities of consumption or production** (Munger 2000, 241). One of the criteria for judging market failures suggested by Weimer and Vining (2005) and which will be used in this study is **efficiency**. Market failures

hamper the efficient allocation of resources and provide a rationale for government intervention through the provision of public goods, regulations of industrial sectors by governmental agencies etc. (Weimer and Vining 2005, 54).

In the natural gas industry, market failures are particularly prominent for several reasons. As a network industry, it is characterized by the existence of networks (pipelines) which ensure the functioning of the industry to achieve its purpose of supplying consumers, and as such can take advantage of **economies of scale** to reduce transaction costs (CPB 2004). As a resource industry, the gas industry is also subject to the limited availability of resources in terms of places of origin and transmission distances (Mulder and Zwart 2006). The transportation of gas over long distances creates interdependence between gas producers, traders and consumers which in brings potential political or technical risks for the various sides involved (ibid.).

The gas industry relies heavily on the economies of scale concept because of "the high level of fixed costs independent of the number of consumers connected, and low marginal costs of extending the networks" (ibid.) Natural monopolies can exist in the gas sector both at the local level and at the national level in the form of national gas grids, high pressure or low pressure distribution networks, or various pressure transmission systems (Helm 1989, 7). Because of cost efficiency, when such networks are already existent, it is useless to provide new parallel infrastructure by other producers just for the sake of competition. The potential problem behind such a system is that monopolies can exploit their market power through overpricing due to the lack of competition and there are few incentives to reduce costs (ibid.). Cases of natural monopolies can be tackled through regulations on prices, output, and rates of return (ibid.). While natural monopolies can reduce transaction costs because of the existence of networks, artificial monopolies, where dominant market actors can create barriers to impede competitors to

enter the market, exist in the gas industry in the form of barriers to entry. There barriers to entry can be addressed through competition policy regulations, meaning that governments have to intervene in the gas markets to tackle inefficiencies problems (ibid.).

This brings further the question of governments' role in shaping gas markets as well as the potential for government failures. This study adopted the broader definition that Besley provides with "government failure" meaning **"the problems that arise when one actor in the economy (the state) monopolizes the legitimate use of force"** (2006, 45). There are three notions of government failure according to this definition.

One of them sees government failure as pareto inefficiency when government policies do not result in an outcome making society better off or inside its pareto frontier (Besley 2006, 48). The efficiency criterion is derived from a standard welfare economic approach which predicts that according to social welfare maximization, an inefficient policy choice is a failure (Besley 2006, 47).

The second view considers political processes that generate an 'undesirable' distributional outcome (Besley 2006, 48). The criterion of efficiency for government failure has its limitations here since the policy context is not static and problems of distribution and equity may arise. A better criterion for government failure, Besley suggests (2006), is to compare whether it is possible to have the same policy outcome with lower rents. An outcome with excessive rents relative to the established social benchmark would indicate a government failure. This goes in line with what Munger calls a type 2 failure that results from inadequately created policies when "governments create, or fail to remove, impediments to market processes" like taxes, subsidies, regulations that distort prices or information (2000, 242). Traditional market

failures (monopolies, information asymmetries) cause distributional income problems (Munger 2006, 259). When the allocation of resources by markets is in conflict with the level of wealth distribution that is accepted as just by society, then government redistribution policies may try to fix the problem and this may result in either better or worse outcomes than the status quo (ibid.). For the purpose of this study, Munger's definition of equity as "distribution according to need" will be used as a second criterion to identify possible government failures (2006).

According to the third notion, government failure is present when a "particular intervention Pareto dominates what would happen in the absence of government" in a negative way, meaning that policy outcomes and political choices should result in a better outcome compared to what could happen if government were not involved (Besley 2006, 48). Since policy choices happen within a dynamic context that depends on historical background, there are further opportunities for government failure because of commitments to previous policies, re-election concerns in policy-making and path dependences (Besley 2006, 78).

What is also important to take into consideration is that the gas market is affected by timing (Mulder and Zwart 2006) in terms of accommodating infrastructure and pricing policies, flexibility of gas supplies, spare capacity and storage as well as infrastructure investments in the long run (ibid.). This requires government participation in gas markets.

If the gas market is taken as a chain of three submarkets: network (transmission and distribution), the wholesale market, and the retail market (Mulder and Zwart 2006), then the infrastructure itself can be a natural monopoly while the gas flowing through it is part of the supply (ibid.). Infrastructure needs to be regulated due to its strategic significance and security

implications while other components of the gas supply chain can be open to competition, such as supply and services (Hrivnak and Krizanova 2006). The pre-liberalisation idea of network industries or "public utility" industries considers gas infrastructure as natural monopolies with state-owned companies ensuring network services and regulating them through state ownership (Hrivnak and Krizanova 2006). Non-cooperative components of the gas industry (high-pressure transmission of gas, local distribution) were usually integrated vertically with other potentially competitive activities (i.e. gas production, storage, retailing etc.) (Hrivnak and Krizanova 2006).

In theory, network industries, such as the gas industry, can function more efficiently if competition is introduced in areas of competitive components and if non-competitive components are left to the provision of a natural monopoly enterprise (Hrivnak and Krizanova 2006). Removing legal barriers to entry is one way of introducing competition in the parts of network industries within competitive components. This can happen successfully only within the framework of adequate regulations that ensure further new entrants' market access to inputs or services that otherwise were exquisitely under the auspices of incumbent monopolies in the industry (Hrivnak and Krizanova 2006), and monopolies, according to economic theory present a case of market failure.

Because of these characteristics of the gas industry, market failures present a clear case for government interventions that aim to improve social welfare by addressing market imperfections through adequate regulations. However, in practice it is not guaranteed that such interventions will result in a more socially equitable allocation of resources. This is where government intervention becomes a failure. Government policies can both impede or foster market competitiveness through regulations. Government or regulatory failures, on the other

hand, occur when government intervention in markets aims to address a perceived market failure but results in lower instead of higher efficiency (Helm et al. 1989, 2). Government failures are difficult to define, and therefore to discover and address, and unlike market failures, they are difficult to resolve due to the wide variety of possibly wrong decisions during the policy cycle (Besley 2006).

"Markets fail if governments remove, or fail to create, the "infrastructure" of market processes" defining property rights and an appropriate legal system (Munger 2000, 242). These failures appear as a result of the inadequate institutional framework in which markets operate. As Munger (ibid.) points out, "unless the institutional environment is properly constructed, the organizations that give markets their dynamic power may do more harm than good." "Regulations can thus play an important role in addressing market failures"(Stiglitz 2008, 3).

In practice, successful regulations can reduce transaction costs when other market mechanisms might not be so efficient to do so (Stiglitz 2008, 4). Regulations can alleviate the consequences of externalities, maintain market competition, prevent monopolies from abusing their market power (regulating utilities in the gas industry) and protect consumers (ibid.). Government regulations can also serve as mechanisms to absorb or reduce risks on the markets by imposing certain restrictions or standards through certification (ibid.). Regulations can further serve the important task of equity and welfare distribution as markets fail to achieve efficient outcomes. As proponents of regulation argue, the appropriately deliberated regulations help markets become more efficient and more equitable (Stiglitz 2008, 1). The important question to keep in mind is whether with regulation the results achieved have been adequate and whether they were achieved at lower price than otherwise (ibid.).

In the context of gas markets, government regulation is important for several reasons. First, as gas transportation pipelines are often natural monopolies (especially in local distribution), the prices for transportation services have to be adequately regulated to ensure that the monopoly service provider will not exploit his position and gain excessive profits (Genoud et al. 2004, 23). Regulation is important to ensure the security of supply both in the short term and in the long term (ibid.). In the short term, there are risks of supply disruptions because of the failure of gas markets to balance well the changes in supply and demand (ibid.). In the long run, there are risks of not having enough investments to ensure the future security of supply deliveries (ibid.). A third risk factor that governments or regulators need to manage is the diversity of supply sources if a sudden major supply shock from one supplier or energy source occurs (ibid.) Market concentration risks should also be managed by adequate regulations as a dominant company could try to impede its competitors in the gas wholesale or retail (ibid.). Regulations are also needed in order to ensure adequate protection of household consumers, especially the poor ones (ibid.).

In the liberalized gas markets, regulation is essential for several reasons: because of the introduction of competition in the market, because of the existence of natural monopolies in the gas industry that remain due to network industries' benefits and require regulation (third party access), and because of the delivery of public services (Genoud et al. 2004, 17). Since regulation design and implementation is the responsibility of governments in order to ensure the functioning of liberalized gas markets, what matters is both the institutions (regulators, governmental authorities) and the instruments in the hands of these institutions (unbundling, third-party access, prices etc.) (ibid.). Using Genoud et al.'s aspects of regulatory design (regulator's legal status, autonomy, power and competences, instruments, and resources), the

study explores further whether the institutional set up and functioning of the gas sector regulator point to government failure in Bulgaria.

The regulatory authority is not immune to policy failures because of the various underlying objectives of regulations and due to information asymmetry problems (Helm 1989, 8). The problem with regulatory policies is that their success depends highly upon the availability of information to both the regulated entity and to the regulatory body (ibid.). This poses the "principal-agent" problem which when applied to the regulation of utilities means that the principal (the regulatory body or government agency) and its agent that has to accomplish given aims (the utility) have differing objectives or incentives as well as asymmetrical information (ibid). The regulator does not possess the full information about the firm or industry it has to regulate and thus its regulatory actions are limited only as a response to the observable and expected processes within an industry (Stiglitz 2008, 7). The design of inadequate regulations in a given industry in order to address market failures results in an unsuccessful policy intervention also known as government failure.

To summarize briefly, the study follows Besley's and Weimer's definitions and criteria for government failure and market failure respectively which put together offer an extensive framework for analyzing the interaction of governments and gas markets and the effects on society in terms of efficiency and equity as applied to the case of the Bulgarian gas market.

One limitation of Belsey's model is that it does not explain in detail how government failures can be addressed more efficiently. Government failure is avoidable, but more transparency, competitiveness, and better incentives with outputs that "can be reasonably well-defined and attributed to particular individuals" (Stiglitz 2008, 15) could lessen the chances for government failure. An analysis of the potential opportunities for government failure in the

Bulgarian gas sector would give some indications about the significant weaknesses within the decision-making processes and the institutional setup and markets that would need to be addressed in order to ensure the country's energy security. The framework of market and government failure is suitable for analyzing gas markets due to the nature of the gas industry as a network industry with natural monopolies, the necessity for strategic government decisions for storage, imports, security of supplies, pricing regulations which can both impede or foster gas market liberalization, and the underlying social objectives that governments might have. The framework allows for a comprehensive analysis of the relevant actors, structures and processes in the gas market to provide insights into the origins of the inefficiencies in the Bulgarian gas sector.

CHAPTER 5. FINDINGS AND ANALYSIS

5.1 The Bulgarian Gas Market: Overview of Sector Developments within the Context of the EU Liberalization Principles

The Bulgarian domestic consumption market is very small compared to other big gas consuming countries, amounting to about 2.5-3.5bcm/year (Eurostat). The biggest gas consumers are industrial and power generation sectors. The miniscule domestic gas reserves mean that Bulgaria relies for more than 92% of its gas on imports on Russia (Eurostat). Supplies to the country come through a pipeline from the communist regime through Ukraine and Romania.

The Bulgarian energy sector is still primarily state-owned despite liberalization attempts (EIU 2009). Major activities of the energy sector include the production of electricity, and transit of oil and gas to neighbors and Western Europe. The Bulgarian economy is very energy intensive despite the small size of the consumer market and has a much higher rate of energy consumption per capita, compared to EU average levels (Eurostat). The industrial sector, mainly chemical and power industries, have accounted for the higher energy consumption rates in the country. Natural gas consumption is about 14% of primary energy consumption, coal has the highest share (around 33%), oil (25%) and nuclear (16%) in 2006 (Eurostat). The share of natural gas in primary energy consumption is expected to reach 30% by 2030, compared with the current 14% (DG Energy). State-owned enterprises own much of the coal and gas sectors which are important for the electricity generation and transmission in the country. Only partial privatization took

place in the oil refining, district heating companies and thermal generators with the gas sector continually under state control.

The importance of natural gas for Bulgaria has grown over the years and continues to increase. The way the natural gas market is structured and regulated so that it satisfied energy demand and ensures energy security will become more and more important in the future but the inefficiencies in its functioning persist longer, the country could face serious energy security obstacles.

5.1.1 Gas Market Liberalization

Bulgaria has needed to import gas since the 1970s when the increased consumption and the limited abundance of domestic natural gas resources led to the construction of a natural gas pipeline in the 1970s (BEH 2010). The gas sector was under the direct supervision of the national company Neft I Gas (Oil and Gas), which became Gazosnabdyavane (Gas Supply) in 1975. With the fall of communism, the originally state-owned gas company Gazosnabdiyavane, was converted to Bulgargaz EAD and with a Decision of the Council of Ministers it was restructured in 1993 as a joint-stock company (BEH 2010).

The actual transition from state ownership to market economy principles in the gas sector started with the adoption of the EU directives on common rules for the internal market of natural gas and electricity (Council Directive 2003/55/EC, later Directive 2009/73/EC). The Directive's regulations required restructuring of the natural gas monopolist Bulgargaz EAD into Bulgargaz Holding EAD, consisting of several single owner companies – Bulgartransgaz EAD, Bulgargaz EAD, etc. – in 2007 with capital 100% owned by Bulgargaz Holding EAD. In 2008, Bulgargaz

Holding EAD became incorporated into the Bulgarian Energy Holding EAD (BEH) which was created with the decision of the Minister of Economy and Energy through the unification of 8 energy companies, among which the gas giants Bulgartransgaz EAD, Bulgargaz EAD and Bulgartel EAD (Bulgartransgaz 2010a). This ownership model was approved by the Council of Ministers with the aim to ensure cost efficiency, better quality of services, and incentives for further investments (Bulgartransgaz 2010a). Currently, BEH is one of the biggest energy companies in the region with assets worth EUR 4.3 billion, revenue of EUR 1.8 billion, and about 21 000 staff members (Semerdjiev 2009).

Bulgaria has adopted the EU gas directives and the Third Liberalization package necessitating gradual full gas market opening for different eligible customers. The Energy Act of 2003 sets provisions for the access to gas transmission and gas distribution networks according to EU legislation. However, as the gas sector is still in the process of transformation, many of these provisions have been only adopted but not implemented.

From July 1, 2007 the Bulgarian gas market is by legislation officially 100% open for the different types of eligible customers according to EU regulations, i.e. “all consumers have the right to select their supplier of natural gas” (SEWRC 2009, 27). However, the Bulgarian gas sector is lagging behind in the development of gas distribution infrastructure and in the extent of gasification of households as compared to EU members. Gas distribution currently reaches only 35-40 municipalities (15% of all municipalities in Bulgaria) while for the EU this % is 80% (CSD 2010). Gas distribution and household gasification rates in Bulgaria are lagging behind the EU ones considerably (MEET 2009). Only 49% of municipalities have received licenses or are in the process of acquiring licenses for gas distribution and in the most part of them the process of gasification just started recently or still has not started, resulting in less than 1% of households

having actual access to gas (MEET 2009). These municipalities do not have access to gas supplies and they are at an economic disadvantage. After 1990, many private and joint stock companies appeared on the gas market in Bulgaria, trying to get distribution rights across municipalities (Gas Center Database) but gas distribution goes mostly to industrial customers and the district heating with very low rates of residential gas distribution (ibid.).

Even after the adoption of EU directive on the liberalization of gas markets, the Bulgarian gas market has shown no actual progress. Despite the fact that the SEWRC has issued a number of licenses for private distribution companies all of these companies represent regulated regional monopolies (Nitzov et al. 2010). Bulgargaz has a dominant position on the market of distribution for large customers as it is the only company that has been granted a license as a public gas supplier. Overgas Inc., the biggest private energy distribution company in Bulgaria, holds about 60% of all licenses that were issued for natural gas distribution in the country and distributes through its subsidiaries 70% of the total gas volume (Kalaydzhiev 2008).

The State Energy Regulatory Commission (SERC) was established in 1999 as an independent regulatory body and after February 2005, it became the State Energy and Water Regulatory Commission (SEWRC) (ERRA). The SEWRC has the responsibility to determine tariffs and monitor the services' quality of companies functioning in the gas, electric, district heating and water supply and sewage sectors (ibid.). The SEWRC is the sole actor that can award licenses to companies in the gas, electric and district heating fields and can allow for the construction of gas transit pipelines (SEWRC 2009).

5.2 Market Failures in the Bulgarian Gas Sector

Major problems in the sector that point to market failures are the extremely high dependence on natural gas imports and their concentration through a single supply pipeline, the very high concentration of market power in the sector through national monopolies, the complete control of the transit natural gas pipeline network by one single customer (monopsony), Bulgartransgaz EAD, which at the same time has high presence in the domestic gas distribution market, and the high control of the domestic market distribution by very few major companies (Nitzov et al. 2010). These conditions of the Bulgarian gas market point to a possibly substantial risk for Bulgarian energy security. What factors contribute to inefficient outcomes in the gas market? Is it the case of a classical market failure or is it the regulatory environment that causes inefficiencies in the gas sector?

This section analyses the Bulgarian gas market through the lens of market failures and government failures, discussing economies of scale (monopolies), market power, and geopolitical factors. The existence of market failures would require government involvement to address these problems. The issues of security of supplies, and economic impacts of energy security are closely related to market failures and would require special attention. The chapter explores further government failures in light of the outlined definitions and criteria within the analytical framework.

When there is an economic actor with a big size and high impact on the market prices, there is imperfect competition as this impact could be used to increase private profits at the expense of society leading to prices that are higher than the ones the market dooms competitive

to pay (Mulder and Zwart 2006). Market power can be expressed through prices but also through other means like restrictive clauses and barriers to free trade, intentionally keeping competitors away from entering the market etc. (ibid.) Natural gas markets are also subject to political influence because governments of major suppliers such as Russia among others have big market shares and because of the uneven distribution of supplies of natural gas through different regions. Market power can be exerted as a result of geopolitical circumstances, economies of scale and monopolies, trade restrictions among others (Mulder and Zwart 2006).

5.2.1 Geopolitical factors, Market Power and Inefficiencies

The liberalization of gas markets aims to ensure more competition, access of third parties, and lower prices but the supply of gas still depends on external players outside the borders of the EU. Bulgaria is almost entirely dependent on the supply of natural gas from Russia (92%) at present unless new infrastructure is built to diversify supply sources. Regardless of market competition at the internal level, there is only one supplier currently who has monopoly over all resources that come to the territory of Bulgaria under pre-negotiated contracts about quantities and prices, Russia. The Bulgarian government has an important role to play in the negotiation of these contracts to ensure the supply of energy and the necessity to respond to expected growth in demand of natural gas and of import dependence of the country. There is also only one buyer of the imported gas on the border (Bulgartransgaz) with a monopoly over the national transmission system.

Gas supplies to Bulgaria come through a single route, from a single source and a single supplier. Import gas is still subject to pegs to the oil prices through a special formula which means that oil price fluctuations can affect in various ways (either positively or negatively depending on the direction of variations) the Bulgarian economy and gas consumers. There is currently no effective negotiating method for more adequate terms of gas trade with the only gas supplier of the country, Russia, who lies beyond the border of Bulgarian and European legislation and has special trade agreements on using the transit pipelines' capacity for gas transiting through Bulgaria. The Russian gas sector is highly politicized with strong government involvement in the industry, which always hides risks for price manipulation.

During the communist time, gas imports to members of the COMECON were made according to negotiated barter deals at favorable prices that were set as compensations for help in building pipelines or for transit services (ECT 2007). In the 1990s these types of contracts were mostly harmonized with the Western European long-term contracts' notion, separating the gas supply arrangements from transit arrangements' contracts (ibid.). Since 2005 Gazprom has been trying to reset the pricing scheme for its Eastern European markets with the aim to be able to get equal financial returns from all of its clients (ibid.). The new pricing method is determined by the price of gas in the main EU market at the end of a given pipeline as a reference point and then a deduction based on the different transportation costs, unlike previous agreements which took into account the individual replacement value of gas in the different countries along the infrastructure (ibid.).

Bulgaria however remains the only EU member that still has a barter contract with Gazprom on gas supplies with transit through Bulgarian infrastructure being paid in kind with more gas (ibid.). The existing agreement will be renegotiated after it expires in 2010 (ibid.). The original

contract for gas supplies date back to 1998 when Bulgaria agreed to pay internationally adjusted prices for its gas supplies,1.7bcm/year, according to a flexible formula with gas price pegged to the price of oil and other energy goods on a quarterly basis (ibid.). The latest renegotiation of prices in 2006 was 257$/1000m3 (ibid.). Regarding the transit fees, Russia has a second contract with Bulgaria, in which it pays $1.67/1000m3/100km but in kind, by gas at the fixed rate of $83/1000m3, which was higher than the average European price at this time (ibid.). Previously, Bulgargaz obtained a price reduction for the gas it buys in exchange for allowing Gazprom to use the Bulgarian transit network (ibid.). These reductions will be changed into a fixed transmission fee over time. Unfortunately, there are currently no effective negotiating methods for more adequate terms of gas trade with the sole gas supplier of the country which presents risks to the Bulgarian energy security because of price uncertainties, transit conflicts.

The problem with dependence on imports is that it hides high risk of supply disruptions since supplies rely on long pipelines that cross sometimes numerous territories. As the gas crisis in 2009 demonstrated, disruptions of supplies can lead to high social and economic costs for small countries such as Bulgaria. Such vulnerability of the sector because of supply shocks can lead to potential abuse of market power by the suppliers resulting in higher prices for imports of gas based on the types of contracts that are signed.

Due to the lack of alternative gas supplies, there is currently no chance of developing any gas-to-gas competition conditions in the country, since all the gas supplies come from only one importer and are based on long-term negotiated contracts with prices based on competing fuels. The potential diversification of sources of gas supplies would contribute to alternatives on the market and to conditions that would drive gas prices down due to competition in the market. If

spot markets or alternative supplies of gas develop, then there would be opportunities for consumers to choose their supplier.

Geopolitical factors matter to the extent that effective competition cannot develop given the existence of one supplier controlling the production of gas and inserting its market power over the Bulgarian gas supply. While this situation points to a market failure in terms of strong market power presence of a single supplier, the question of gas infrastructure requires government involvement and cannot be just left to the market to ensure energy security Government intervention is needed in this case to ensure the necessary political and possibly economic support for encouraging infrastructure that would ensure security of supplies.

5.2.2 Economies of Scale and Market Power

The Bulgarian gas industry is dominated by Bulgargaz EAD, a filial of the state-owned company BEH EAD. It is heavily involved in the import of gas, public supply, transmission and distribution networks, storage and transit of natural gas in the country. Bulgargaz EAD is currently the sole public supplier of gas in Bulgaria and the sole company that imports natural gas (SEWRC 2009). Bulgargaz manages the gas imports through long-term "take or pay" contracts (currently set to expire in 2010 and 2012) with Gazprom subsidiary companies (Overgas Inc., Gazpromexport, and Wintershall) (Novinite 2010). The current gas supply contracts are in the process of renegotiation as the Bulgarian government wants to buy gas directly from Gazprom through its subsidiary Gazpromexport without the other intermediaries that sell Russian gas (ibid.). The biggest private distribution company on the Bulgarian gas market, Overgas, is 50% owned by Gazprom.

Gas storage, gas quality conversion, gas import infrastructures can be subject to economies of scale and thus monopolies. The Bulgarian gas market is still heavily monopolized with gas storage, and transmission and distribution infrastructures managed by the same company (Bulgargaz) which currently results in practical barriers to the expansion of the gas distribution network by having into its network the biggest part of industrial consumers and possibly reducing incentives for new investors. The large investments required to gasify certain regions along with regulatory uncertainties regarding the development of high pressure branches are further obstacles for the development of an effective gas market. The monopolistic control of Bulgargaz has not resulted in significant new investments in transmission infrastructure and is equivalent to practical abuse of monopolistic position and market failure.

Overgas Inc., the largest private energy distribution company in Bulgaria holds 60% of all issued licenses for gas distribution and as a shareholder in 32 other companies, distributes through its subsidiaries 73% of the total gas volume in Bulgaria (Kalaydzhiev 2006). Practically Overgas Inc. has controlling interest in 26 gas supply companies which hold 6 licenses for natural gas distribution and on the territory of 42 municipalities in 2006 (ibid.).

Bulgartransgaz EAD is part of the state-owned Bulgarian Energy Holding EAD (BEH EAD), registered as a separate company to manage the transmission, transit and the storage of natural gas, and to maintain and operate the underground gas storage and the gas transmission network (Bulgartransgaz 2010c). Bulgartransgaz EAD is the sole owner and operator of the national gas transmission network. It operates the branches with high pressure for transmitting natural gas to end users and to other gas distribution companies. Bulgartransgaz owns the gas transit transmission network (945km) and maintains and operates the underground gas storage near

Chiren for which it has received licenses form the SEWRC, thus enjoying great monopolistic powers.

The transmission system under the ownership of Bulgartransgaz EAD links gas distribution companies and consumers through a transmission network under Bulgartransgaz's ownership (high pressure) and gas distribution networks that are managed and operated by gas distribution companies. Bulgartransgaz EAD owns the largest amount of infrastructure in Bulgaria with gas transmission networks for consumers, compressor, pressure-reduction stations, and gas measuring stations in the different regions of the country (Bulgartransgaz c). The total length of the major gas pipelines owned and operated by Bulgartransgaz EAD is 2 645 km (ibid.), which places Bulgartransgaz as a monopoly on Bulgarian gas market.

Vertically integrated undertakings can have economic incentives to discriminate against competitors when it comes to network access investment, and ownership unbundling which might endanger the prospects of investing enough in new infrastructure and services and thus endanger energy security (Directive 2009/73/EC). The separation of the supply and generation processes from the transmission operations is thus a vital requirement for a liberalized and competitive gas market to function. EU countries can choose their own model for unbundling to achieve network operation independence (ibid.). Bulgaria, along with seven other EU members, has adopted the so-called "third way approach," which allows creating an Independent Transmission Operator (ITO), Bulgartransgaz EAD, which can remain as part of the VIU Bulgarian Energy Holding EAD but requires adequate regulation to ensure that the ITO is independent in its functioning from the VIU (Tsekova and Rangelova 2010). The major reason behind this model's adoption was that the full ownership unbundling might have possible negative social costs as Bulgaria depends on one sole gas supplier.

Provisions have been made to unbundle the Bulgarian gas TSO Bulgartransgaz from the national gas distribution company Bulgargaz. Bulgartransgaz EAD's activities are divided legally, financially and functionally from all other initiatives in the VIU Bulgargaz Holding EAD (SEWRC Report 2009). The management of the operator is not allowed to take part in the managing and decision-making activities of the other subsidiaries of the VIU; has to make independent decisions about their activities and is not allowed to use discriminating treatment in its activities (SEWRC Report 2009). Transportation and distribution functions which are monopolistic by nature should not be under the control of market entities that compete in the gas sector because the controlling entity could hamper network access or overcharge competitors through tariffs for the use of the network, resulting in unfair profits for the controlling entity and losses for competitors (Keyaerts 2009). To be realized, the processes of unbundling to separate gas transmission system from the storage system operation would require further changes to the current Energy Act regarding price regulations on natural gas and gas trading (Tsekova and Rangelova 2010).

The danger with keeping the TSO unbundled within a vertically integrated company as is the case of the Bulgarian market presents possible problems regarding the market power of VIU. TSOs could treat preferentially their own supply businesses and associates through dominating the transport capacity in pipelines and thus to create barriers to market entry (Keyaerts 2009). Non-discriminatory open access to transit capacity and storage is crucial for the development of competitive markets and avoiding conflicts of interest as a result of vertically integrated undertakings (Keyaerts 2009). Ownership unbundling of the TSO however is still not a reality in Bulgaria.

Gas distribution is done on a regional and local basis, mainly through private companies Overgas AD (market share of 65.8%), Chernomorska tehnologichna kompania (Black Sea Technological Company) (market share 13.6%) and Citygas Bulgaria (7.9%) (MEET 2009, 7). Overgas has dominance in the gas distribution market distorting real chances for market competition at the present. The unbundling of gas distribution network operators has resulted in 32 DSOs but since they all serve less than 100 000 customers, an exemption from the EU directive on unbundling is valid for Bulgaria for economic purposes (SEC(2010)251 final).

The SEWRC regulates the trade prices for the only public provider Bulgargaz EAD which had a market share of 96,98% of total consumption in 2008 (ibid.). The other natural gas trader with 3.02% is Dexia Bulgaria (ibid.). There is no information available on the annual switching rate for customers for the whole retail market, large or medium sized industries or small industries and households which prevents any estimate about the extent to which customers have the opportunity to freely switch between suppliers and to negotiate tariffs.

In the retail market, 32 gas transmission companies provide services to 5 gas regions and to 58 municipalities beyond the 5 principal regions, accounting for 12.87% of the national gas consumption (SEWRC 2009). Thus 87% of the gas consumption is provided by one transmission company (Bulgartransgaz EAD). The number of retail companies with market share bigger or equal to 5% is 4, meaning a relatively high concentration of the gas sales within very few companies (EGREG Annual Report 2009, 29). Between 2007 and 2008, the number of companies with market share over 5% in the whole retails market decreased from 5 to 4 and the market share of the three largest companies in the retail market decreased by almost 20% from 32,7% to 12,87%, which is a positive sign of decreasing the concentration within the retail market (SEC(2010)251 final).

The gas storage aspect is often seen as one that is subject to government strategic decisions. In Bulgaria the only existent gas storage facility is owned and operated by Bulgartransgaz EAD. A potential field for the development of a second storage site near Galata field has been in the process of development but the SEWRC has not awarded yet a license for it. The Chiren storage capacity is 1.1 bcm in total, part of which is reserved for buffering natural gas (to serve in cases of shortages) and active gas for balancing activities and storage is about 0.5bcm (Kema 2009). The storage size practically covers only one third of the approximate volume of gas consumption in the country which n 2008 was was 3 341 million m3 (3.341 bcm) (SEWRC 2009). Although steps have been taken to increase the capacity of the Chiren storage y, currently the storage is reserved for the only two gas traders Bulgargaz EAD and Dexia (SEWRC 2009). The independence of the storage system operator is crucial to ensure third-party access to storage facilities which serve to provide access to the system for further supplying of more customers (Directive 2009/73/EC). This means that currently one company is involved both in the transmission and distribution networks, storage and transit of natural gas in the country, and this may pose problems of independent decision-making and possible discriminatory access of third parties to storage facilities.

Long-term contracts can ensure security of supply and commitment of participating parties over certain supply quantities and prices and more predictability for the market with possibly less fluctuations and risks. On the other hand, long-term contracts lock the network for further capacity or supplies of resources and impede competition down the road. Given the fact that there is currently only supply route to Bulgaria from only one supplier (Russia), long-term contracts are the only possible way to ensure supplies but if they are singed under unfavorable

conditions, market power can be abused and can result in market foreclosure within the EU gas markets (Art. 2.3.2)(COM(2006) 841 final).

The Bulgarian gas market shows clear signs of market failure in its functioning with strong monopolization in the transit, transmission and supply segments, concentration of supplies through one sole pipeline, the concentrated power of a few distribution companies. These all signify the need for a more suitable regulatory approach to enhance the development of a competitive gas market. In some of the areas of the sector that would be more difficult because of the source of gas supplies and the current contract arrangements. However, more can be done to limit the powers of monopolies and to stimulate a level playing field for investments in the gas sector in order to foster a more competitive gas market. Appropriate government regulations are crucial in the process of liberalization of the gas sector since they can stimulate or impede competition equally well depending on the incentives mechanisms and rules that are put forward. In the process of transformation market failures seem to be to a large extent a legacy of the previously largely state owned energy sector and they still have not been addressed efficiently enough by the government and the regulatory authorities. It is up to the government to design appropriate policies that fix market failures, preserve social welfare and create a level playing field for the gas industry.

5.3 Government Failures in the Gas Sector

"Public policy encourages, discourages, prohibits, or prescribes private actions" (Weimer and Vining 2005, 54). Regulatory policies the government adopts are crucial in setting a direction for economic actors. As the Bulgarian gas market is liberalizing, it is even more

important to devise the appropriate regulations to manage the transition and to ensure that network industries are regulated adequately without being overregulated or underregulated. The scope and level of regulatory frameworks, the design of regulations and regulatory institutions and the role of public ownership in the intended competitive gas sectors should all be taken into consideration.

5.3.1. Government Failure as Pareto Inefficiency

Besley's first notion of government failure relates to the pareto efficiency concept and the cases where government policies result in an outcome making society worse off (Besley 48). The conventional welfare economic model equates good government with good policy in terms of efficiency and distribution (Besley 2006, 23). This section discusses the government intervention in the gas sector based on the criteria of efficiency. Market failures result in inefficient outcomes and have to be addressed by government actions. However, if the government policies fail to produce an outcome where society is better off than the status quo, then there is evidence of government failure according to the efficiency criterion.

The existence of monopolies in the Bulgarian gas market means there are still inefficiencies that prevent the establishment of a competitive and well-functioning gas market to enhance the energy security of the country. Competitive markets and 'independent' regulation are considered the "most effective way of delivering secure and reliable energy supplies" (DBERR 2007, 8). Monopolization of the gas market endangers energy security since it prevents the development of adequate infrastructure, investments and industry incentives to ensure that in the long run services and supplies will correspond to the expected increases in gas demand.

Although legally the gas market opened to competition 100% since 2007, this is not the case in reality due to slow implementation of policy and regulations. State-owned monopolies still dominate in the import of gas, public supply, transmission and distribution, storage and transit of natural gas. Although the activities of the gas transmission network operator, Bulgartransgaz EAD, are legally, functionally and financially separated from the other functions in BEH, the transmission network operator remains still a part of the VIU with monopoly over the transmission and storage operation. Further lack of enforcement of unbundling activities from the regulator means that the transmission system will continue to be monopolized regardless of regulatory provisions and that market failures and inefficiencies will persist because of government failure.

Despite the issuance of a number of licenses by the SEWRC to private distribution companies to develop gas networks, no further market liberalization has realized as these companies are practically regulated regional or local monopolies. In order to establish a level playing field in retail markets, there should be better monitoring of distribution system operators so that they do not abuse their market power as part of their vertically integrated status, especially regarding households and small non-household consumers. In Bulgaria Bulgargaz as a national distribution company still has monopoly over the distribution of gas along with Overgaz as the other dominant distribution company. Monopolies seem to be ineffective in investing and developing the gas distribution networks and household gasification with such small percentage of gasification. This can be due to a lack of proper incentives for the development of gas infrastructure because of the dominance of very few distribution companies which means more should be done by the Regulatory Agency to stimulate investments. Furthermore, the areas subject to licensing cover only half of the territory of the country, the regions that are closest to

the transmission network, which means that 4.5 million people are out of gasification plans. The government's plan for gasification and ensuring customer access to gas resources might fail if these numbers are not revised upward.

High market concentration is seen as a serious obstacle to competitive gas markets which results in higher prices and market foreclosure, especially in the wholesale and retail markets. Because of market power, it would be difficult for new entrants regardless of how well implementation of legislation happens. The very high concentration of market power in the gas sector despite introducing formal competition through unbundling and third-party access means that the regulatory environment has not been strong enough to induce faster and deeper changes in the gas market. Things remain close to the levels of pre-liberalization in terms of market power of actors and this perpetuates inefficiencies in the gas market.

5.3.2 Government Failure as Undesirable Distribution Policies

The second view on government failure focuses on the role of policy makers where **"the political process produces an 'undesirable' distributional outcome"** where an outcome of excessive rents relative to a generally acceptable social benchmark would point to a government failure. The major underlying question is how to ensure the same policy outcome at lower rents.

In Bulgaria, gas prices are regulated for both household consumers and industries. Evidence of regulatory intervention shows that the regulator's role in the Bulgarian gas market possibly has a negative impact on the development of a competitive gas industry as it impedes business investment plans of distribution companies and their incentives to supply households because of unprofitable price regulations. Compared to all other EU countries, Bulgarian

households pay the highest gas prices in PPP which is due to price regulations and energy subsidies, although in relative terms they remain 36% below EU averages (EC 2010). Industrial consumer prices also rose but remained below EU averages with 45% and lower than households' prices in absolute terms (EC 2010). Prices of gas have continued to rise in the past few years due to trends of equating with general market prices and because of oil price fluctuations. The current political and regulatory environment fails to impede monopoly power and inequitable distribution since there is only one external gas supplier.

On the one hand, due to the nature of gas import contracts and the fact that gas price is tied to oil prices, Bulgarian gas import prices are essential in the formation of the price of gas provided by the public supplier, Bulgargaz EAD. Higher import prices of oil over time would mean higher gas prices and may lead to general increase in price levels and aggravate existing inflationary pressures or increase inflation (Arnold and Hunt 2009, 2). Government failure could then partially contribute to the macroeconomic impact of gas prices increases (Bohi & Toman, 1996) because of inefficient adjustments in gas prices when oil prices soar as a result of regulations, and price rigidities may cause economic problems (Arnold and Hunt 2009, 2).

Final consumers are charged some of the lowest energy prices among EU countries in terms of real value, but in terms of PPP, gas prices are most expensive compared to other EU countries (Eurostat). The national regulatory agency (SEWRC) regulates the prices customers pay. It is estimated that households in Bulgaria spend approximately 14% of their monthly income on bills of water and electricity, classifying consumers as "energy poor" with about 360, 000 households being dependent on state support for meeting their energy demand and payments (Nitzov et al. 2010). The government still lacks an effective policy to manage the problem of low

prices for companies and low incomes for households, and this presents further constraints over companies' investment in the gas sector (ibid.).

Recently, the SEWRC pressed Bulgargaz and Bulgartransgaz to cushion the increasing gas prices so that consumers do not suffer by price shocks but this happened arguably at the expense of infrastructure and service development investments (Nitzov et al. 2010) and left negative signals to investors about the regulatory environment in Bulgaria, especially regarding distribution companies' plans to increase services to households because of the current tag of gas prices to fluctuating oil prices. The SEWRC asked several big power suppliers in the country to reduce their spending in order to make the price increases expected in July minimal so as to not affect consumers gravely at this moment. However, utilities said that the security of suppliers could be endangered if prices did not rise to an adequate level to sponsor necessary investments in grids and plants (Mudeva 2010). No sufficient investments in the gas sector infrastructure endanger the energy security of the country in the long run as a result of government failure.

The inefficient government regulations in the gas sector seem to create conditions that impose excessive costs at the expense of consumers, which further create opportunities for corruption practices in the sector.

5.3.3 Government Failure as Inappropriate Government Intervention

When policy outcomes and political decisions result in a worse situation after government interventions, there is government failure. As the EU gas markets are increasingly being liberalized according to the European Commission's directives and there is more competition introduced into the previously largely state-controlled monopoly sector, there is still

the question of how to design appropriate regulations for network industries as compared to the regulation of traditional competitive markets. Even though the theoretical perspective on competition says that liberalization would increase competition in various sectors, the institutional point of view questions the nature of regulation in network industries as compared to traditional competitive markets due to the differences in the supply chain of the gas industry (Genoud 2004, 15). Issues such as how third party access in the gas market should be regulated and whether the traditional competition regulation is adequate to ensure proper functioning of the gas markets still persist (Genoud 2004, 15). Regulations are needed to create a level playing field for all participants in the gas market and to stimulate the entry of new actors and the development of competition.

The regulatory framework that defines path reform within the Bulgarian energy sector is composed of two main documents: the National Energy Strategy and the Energy and Energy Efficiency Act. The regulatory authorities in the gas sector are the Ministry of Economy, Energy and Transport and the SWERC which has the responsibility over the development and implementation of tariffs, prices for electricity, gas and heating and for approving the company proposals in the energy sector. Reforms in the energy legislation in 2004 brought the regulatory framework closer to the EU one and separated the areas of responsibilities for the different actors.

According to Directive 2009/73/EC concerning common rules for the internal market in natural gas, any measures that MS take to ensure social benefits, gas supplies to vulnerable customers, should not hamper the opening of gas markets (Art. 4.2) Member States Governments in the liberalized gas markets security of supplies and giving responsibilities to the appropriate

bodies and through appropriate instruments (Eurogas 2002). Thus, the EU Third legislation package adopted in 2009 established the institution of "national regulatory authorities" or "regulators" in charge of regulating the EU liberalized gas energy sectors and ensuring competitive development.

The National Regulators have the competency to oversee the development of competition in the gas sector and non-discrimination practices (Eurogas 2002). However, their role of ensuring efficient gas markets might contradict the government's role of designing policies for security of supply and of distributing responsibilities to various market actors.

In order to evaluate how adequate the regulatory framework is set up and is functioning, it is important to take into consideration the level of regulatory intervention in the gas sector (competition policy and gas policy) and the economic and political regulatory interventions in terms of concentration of power and scale of intervention. Political pressure can be exerted on the regulatory bodies resulting in very high regulatory pressures over the sector and politicization of the process. The following aspects of regulatory bodies' set up can point to issues of inappropriate regulation design and therefore of government failure in setting up mechanisms for oversight of the gas sector (Genoud et al. 2004, 14): legal status, budget resources, human and financial resources independence, and management.

The legal status of regulatory bodies is important to consider in order to analyze the level of independence of regulators from political and administrative pressures and to avoid the "capture" power of different interests (Genoud et al. 2004, 14). According to the Bulgarian Energy Act, the SEWRC is created legally as an "independent specialized state body" to regulate the gas sector (Energy Act, Art. 2)

National regulatory authorities should have actual powers to issue binding decisions regarding gas companies and to impose “effective, proportionate and dissuasive penalties on natural gas undertakings which fail to comply with their obligations” as well as “the power to decide on appropriate measures ensuring customer benefits through the promotion of effective competition necessary for the proper functioning of the internal market in natural gas” (Directive 2009/73/EC, Art. 33). Regulators should be able to fix and approve tariffs on the basis of proposals from TSOs or DSOs. This should ensure more transparency and non-discrimination. The SEWRC also has limited control over issuing tariff secondary legislation (Kema 2009, 70) which means there is a potential threat to transparent tariff set up and possibilities for discrimination in access to networks. The SEWRC would need to gain further powers regarding the separation of transmission and distribution, investments and market power abuses. Currently, the Energy Act does not grant such extensive powers to the Commission and would thus need to be amended adequately.

In order to ensure further the rights of consumers, the SEWRC should be given further powers to enforce 'effective, proportionate and dissuasive penalties' against gas companies that do not comply with their obligations or with the commission’s decisions (Tsekova and Rangelova, 2010). Currently, the Commission’s decisions are not legally binding.

Regulators are supposed to have enough expertise and authority to address adequately the market needs of a given industry (Stiglitz 2008, 14). However, concerns about accountability, transparency and democratic decision-making arise which gives space for inadequate regulatory practices and the possible concentration of resources in very few hands. The Supreme Administrative Court or the Court of Appeal has the right to discuss the Commission’s decisions to resolve disputes between the regulator and the industry, and can act as a mechanism ensuring

accountability and transparency of operation of the regulator. The SEWRC however seems to not be insured against industrial pressures from the sector it regulates which is partially a consequence of the limited number of energy experts in Bulgaria and of the huge financial stakes in the industry (Pashev et al. 2006, 43).

The SEWRC is financed through revenues raised from the fees collected by the Commission, a percentage of fines and penalties, donations from persons not subject to licensing under the Energy Act or persons related to them plus state budget (Kema 2008, 46). However, in practice there are still some problems in the regulator's setup in Bulgaria involve financial pressures over its functioning since its budget is approved by the government and there have been delays in receiving its budget (Kema 2008, 69). The regulator cannot allocate the resources it is given by its own discretion. The National Assembly must approve the budget and the Council of Ministers specifies it further (Kema 2008, 46). This means that the SEWRC, despite its set up as an independent agency, can actually be financially dependent and influenced in its decisions from political factors.

The SEWRC is "elected and removed from office by a decision of the Council of Ministers and appointed by an order of the Prime Minister" (Energy Act, Art. 11). The chairman is held accountable by the Council of Ministers and has to submit an annual report on the activities of SEWRC. Further formal provisions prohibit regulators from having any stake in the energy sector they regulate or from holding execute leading political positions. The regulators can solve disputes between industry and consumers.

As the SEWRC states in its report (2009), it is guided by the principle of "balancing between the interests of energy enterprises and consumers and creates a competitive environment

and equal treatment for access to the service of gas supply." It enhanced its monitoring and control powers over licensed companies which should ensure better distribution network investments and access to services in the future. One danger to the successful work of the regulator comes from the so called "principal-agent" problem which when applied to regulation of utilities means that the principal (the regulatory body) and its agent that has to accomplish given goals (the utility) have differing objectives or incentives as well as asymmetrical information (Helm 1989, 8). Inadequate regulations can be designed as a result of inherent problems of information availability within the sector and as such will be a government failure. As the Bulgarian Energy Act gives the Commission the right to conduct public discussions with relevant stakeholders when deciding on administrative acts (Article 14.1) with stakeholders including state bodies, branch organizations, energy companies, customer organizations, which ensures the existence of further expertise and interests influencing decisions of the Commission, this increases the availability of information to the decision-makers and should foster more adequate regulations at least in relative terms.

Regulation of network industries such as the gas industry has two dimensions: economic and sociopolitical (Genoud et al. 2004,19). Economic regulation refers to the creation of market competition and efficiency, as well as market imperfections, efficient allocation of resources and pricing mechanisms. The second function of regulation is connected to public service provisions, including the different governmental decisions in the name of public interest (consumers' access, energy efficiency, quality and adequate prices). The SEWRC has to combine contradictory roles in its job to ensure proper conditions for competition development through breaking market power and barriers to entry, open access which might mean higher consumer prices and on the

other hand to follow the socio-political rationale behind the prices and public service obligations. The level of successful provision of these two objectives will give indications as to how successful the regulation is and whether there is any government failure in this area.

CHAPTER 6.CONCLUSIONS AND RECOMMENDATIONS

6.1. Summary of Findings

The study sought to answer the question of how the Bulgarian gas sector could be restructured so as to better ensure the country's energy security. The main questions that were investigated sought to provide a further insight into the government's role in shaping the gas market in Bulgaria and to elaborate on the reasons behind the gas sector's inefficiencies. The paper evaluated the structure, functioning, and regulation of the Bulgarian gas sector through the lens of market failures and government failures with the aim to propose recommendations to address these failures and improve the country's energy security.

The findings of the study supported the hypothesis that the Bulgarian gas sector's inefficiencies are mostly a result of government failures as regulatory policies have not succeeded yet to address inherent market failures form the pre-liberalisation period and to foster a more competitive gas market. Major market failures were observed in the gas sector's functioning with heavy monopolisation of transit, transmission and supply components, market concentration of few big distribution companies, and the import of gas through one sole gas supplier. More can be done to privatize some of the monopolies in the sector or to ensure at least a more efficient and equitable regulation framework that would foster further investments and ensure energy security. Even though the government has adopted all legislative acts on gas market liberalisation, the gas sector suffers from implementation deficit. Adequate government regulations are crucial in the process of liberalization of the gas sector since they can stimulate or impede competition based on the incentives mechanisms they formulate.

The evidence from the Bulgarian gas market shows that the SEWRC has not been so successful in enhancing market competition. Although competition may have risen in certain parts of the gas supply chain, in general the level of gas market concentration continues to be very high. The Bulgarian gas market is still heavily monopolized and the liberalization in the sector moves too slowly despite the adoption of the necessary legislation. Monopolies can still potentially use their market power in the gas sector and they continue to exist much in a similar way as before. The SEWRC has provisions for ensuring access to gas for all consumers without exclusion in compliance with the public service obligations criterion. However, evidence from slow gasification in the country demonstrates that there are further obstacles to the successful provision of gas services, based on inadequate price regulations imposed by the Commission which fail to stimulate investments in the gas sector and at the same time fail to correspond to the purchasing power of the population in Bulgaria. Government interventions are impeding the development of competitive gas markets. Government policy does not stimulate currently the development of real market mechanisms to foster competition in the gas sector and to improve its efficiency.

6.2. Recommendations

In light of the findings of the research, the following recommendations are proposed:

1. Gas-to-gas competition conditions should be created through the construction of gas pipeline connectors with neighboring countries. In this way the current problem of max capacity taken because of long-term contracts for Russian gas can be mitigated. The

creation of more transport capacity will create competition to Russian imports and will allow various players to compete for available capacity, thus possibly driving prices down and stimulating further investments. The government has planned several interconnectors with financial support from the EU and should pursue their construction.

2. The SEWRC should receive more power to issue binding decisions so that the recommendations it makes can be taken more seriously into consideration and followed. Its independence should also be strengthened by giving it more competence over its decisions about its projects so that it can be allowed to defend the end consumers' interests.
3. The Bulgarian government should adopt a more flexible negotiating policy towards Russia when renegotiating the new gas supply contracts this year. The government should stand firm to defend the national interests connected to both the gas supply prices and the gas transit fees through Bulgaria which currently are not in favour of Bulgaria.
4. Large energy monopolies (Bulgargaz, Bulgartransgaz) should be broken up or at least partially restructured in practice to allow space for real competition to enter the market and for market mechanisms to actually bring more benefits to consumers and contribute to energy security in the long term. Currently BEH is the largest vertically integrated company in the energy sector. Debates about privatization should go beyond words and turn into reality since the current vertically integration imposes more costs on society than benefits because of the lack of competition in the sector.

6.3. Limitations and Suggestions for Future Research

The limitations of this study were due to scarcity of data, time and space. The strong post-communist lobby groups as well as the energy monopolies interests are the most powerful groups that currently impact energy policy-making and shape the gas market developments in favour of further dependence on Russia. Due to the limited access to information and the lack of transparency about projects, procedures of decision-making about big energy investments, it is not possible currently to make an independent thorough analysis on the real conditions in the gas market. Further research can be conducted on the role of lobby groups in the policy-making process since they are a leading factor behind the curtains in shaping the Bulgarian energy policy.

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