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INDUSTRIAL POLICY IN THE ENERGY SECTOR: THE EXAMPLE OF GAS SECTOR IN SERBIA*

Industrijske politike u energetici: primer sektora gasa Srbije

Abstract

Global energy demand is rising with declining fossil resources. In such circumstances, energy security has to be the number one priority of any national or regional policy. It is believed that gas will play a critical role in the transformation of the current energy system toward the sustainable one. Unlike most European countries, energy import dependence of Serbia is not very large and is about 33%. This dependence is especially pronounced in the oil and petroleum products sector (70%) and gas sector (86%). The problem of high dependency on imported gas can be overcome in two ways: by diversifying sources of energy supply and creating of mechanisms which would withstand unexpected supply disruptions (i.e. adequate strategic reserves). The South Stream pipeline is the first measure while new domestic regulation has to ensure the implementation of the second measure. The subject of analysis in our paper will be the South Stream project.

In the Draft of the Reindustrialization Strategy of Serbia, the first place on the list of priority sectors with comparative advantages belongs to the energy sector. Having in mind that fact, the aim of this paper is to highlight the potential contribution of the South Stream, not only to the energy stability of Serbia, but also from a broader perspective, to the growth and development of the national economy, all within a new energy policy.

Key words: *energy sector, natural gas, South Stream pipeline, industrial policy, Energy Sector Development Strategy of the Republic of Serbia*

Sažetak

Globalna tražnja za energijom raste dok se istovremeno rezerve fosilnih izvora energije smanjuju. U takvim uslovima energetska sigurnost mora biti top prioritet svake nacionalne i regionalne politike. Veruje se da će gas imati kritičnu ulogu u transformaciji postojećeg ka održivom energetsom sistemu. Za razliku od većine evropskih zemalja, energetska uvozna zavisnost Srbije nije naročito visoka i iznosi oko 33%. Međutim, uvozna zavisnost je izražena u sektoru nafte i naftnih derivata (70%) i prirodnog gasa (86%). Problem visoke zavisnosti od uvoza gasa može se rešiti na dva načina: diversifikacijom izvora snabdevanja i kreiranjem mehanizama koji treba da amortizuju neočekivane poremećaje u snabdevanju (adekvatne strateške rezerve). Gasovod Južni tok predstavlja primenu prve mere, dok nova regulativa mora da omogućiti implementaciju druge mere. Predmet analize u našem radu biće projekat Južni tok. U nacrtu Strategije reindustrializacije Srbije, na prvom mestu prioriteta sa komparativnim prednostima nalazi se energetika. Polazeći od toga, cilj ovog rada je da ukaže na potencijalni doprinos Južnog toka ne samo energetske stabilnosti Srbije već i generalno rastu i razvoju domaće privrede, a sve to u okvirima nove energetske politike.

Ključne reči: *energetski sektor, prirodni gas, gasovod Južni tok, industrijska politika, Strategija razvoja energetike Republike Srbije*

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Introduction

Human existence, competitiveness of the economy and survival of the society in general are determined by available energy. Different forms of energy have certain advantages and disadvantages, and are often reduced to their physical availability and environmental properties. The EU has committed to reducing greenhouse gas emissions by 80-95% compared to 1990 levels by 2050, which requires a significant change in the existing energy system. It is believed that gas will play a critical role in the transformation of the energy system [8]. This stems from the fact that the substitution of coal and oil gas, using the existing technology (without huge investment), can considerably reduce greenhouse gas emissions in the short and medium terms. The time horizon in the energy sector is different from the usual time horizons in economics, which means that a period of less than 10 years is a short period in the energy sector, given the delayed impact of the measures.

Trends in the global energy market indicate the growing importance of natural gas. Natural gas is extracted from natural underground reserves and is not a chemically uniform product, but it contains a mixture of different gases, predominantly methane (typically over 85 %). In order to make it suitable for use, it must be adequately processed. It is estimated that gas reserves are sufficient for the next 250 years (IEA). In addition to solid fuels, natural gas is only primary energy form which can be used directly, with basic preparation. Other forms of energy such as crude oil, hydropower, nuclear fuel and the like must first be transformed into a suitable form (petroleum products, electrical power, steam, etc.), which requires substantial investment in the construction of huge power plants, so that favoring the use of gas seems reasonable. As for its environmental attributes, this source of energy is superior to other conventional fuels and is the cleanest fossil fuel. Furthermore, gas is considered to be an ideal partner for renewable energy sources and has an extensive usability. Since the use of natural gas is in accordance with the strictest 3E's standards (energy, economy, ecology), it is now apparent why natural gas is

becoming the most prominent source, being labeled as energy source for the 21st century [23].

A well-developed gas market involves integration of the participants, greater diversity of sources (suppliers) and sufficient storage capacity. The global gas market is changing rapidly due to the development of technology that opens up virtually limitless possibilities and greatly relativizes physically limited reserves of natural gas. The proof of this lies in the development of new types of unconventional gas (such as shale gas in North America). Also, liquefied natural gas (LNG) is distributed independently of pipelines, which reduces the dependence on the impact of monopoly pipelines and provides greater flexibility to the users of this energy source.

The world's largest natural gas producers are the United States (with 681 billion cubic meters, or 19.8% of total global production), Russia (19.1%), Qatar (4.7%), Iran and Canada (each with 4.6%). The largest exporter is Russia (about 28% of its production), followed by Qatar, Norway and Canada, while the largest importers are Japan and leading EU countries [9]. The prices of energy sources often differ significantly between countries. When determining gas prices in a country, the following factors are taken into consideration: domestic production, pipeline imports, LNG imports and total consumption (domestic production plus import).

After a long time, in 2012, we saw a slowdown in the growth of global natural gas consumption. This is a result of a reduced demand of European countries (due to a decline in economic activity), more significant use of coal in North America, and a global decline in the supply of LNG (after thirty years of constant growth). The situation is completely different in Asia where the demand for gas remains in the "red" zone, with gas being increasingly used for transport as well [10].

Characteristics of the gas sector in Serbia

The energy system of our country comprises oil sector, natural gas sector, coal sector, electrical power sector and district heating systems. Within the energy system of the Republic of Serbia there are the exploitation of domestic primary energy (coal, oil, natural gas, renewable energy),

imports of primary energy (mainly oil and natural gas), production of electrical power and thermal energy, mining and secondary processing of coal, as well as transport and distribution of electricity and energy sources to end users of final energy [16].

Energy resources of the Republic of Serbia include fossil, conventional (coal, oil and natural gas) and unconventional fuels (oil shale), as well as renewable energy sources. As regards the scope and structure of energy reserves and resources, the energy position of Serbia is unfavorable, given that the reserves of high-quality energy sources, such as oil and gas, account for less than 1% of total balance reserves. Almost the entire energy reserves consist of various types of coal, predominantly of poor quality lignite (92%). In 2010, the remaining balance reserves of crude oil in Serbia amounted to about 10.14 million tonnes, while natural gas reserves amounted to about 4.23 billion cubic meters. These reserves are of low exploitation quality since they are found in mature and later stages of exploitation of the existing reservoirs, which means that it is necessary to apply new production technologies [17].

The existing energy reserves will improve through the adoption of a new Law on National Commodity Reserves. According to the draft of this law, Serbia will be required to establish a mandatory oil reserves to cover 90 days of average daily imports or 61 days of average daily consumption before the end of 2022, which will require funds of about EUR 700 million [6].

Unlike most European countries, our country is not largely dependent on energy imports, amounting to about 33%. This dependence is especially pronounced in the oil and petroleum products sector (70%) and gas sector (86%). The problem of high dependency on imported gas could be overcome by the forming adequate reserves and diversifying sources of supply. With the privatization of NIS, and the increasing levels of domestic oil and derivatives production, oil import dependence of Serbia has been decreasing with years. The example of NIS can serve as a guiding principle for the future strategy for development of the gas sector, since NIS today is not only the pivot of energy sector, but also of economic, financial and environmental stability and security of Serbia.

Table 1: Total energy balance of Serbia for 2012

Description	Natural gas	Oil and oil products	Hydro energy	Electricity	Heat	Coal and coal products	Geothermal energy	Wood fuels	Total
	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ
Primary production	19762	51256	35690			304725	261	11480	423174
Import	66297	105817		20811		21635		610	215170
Export		14322		19411		242		1667	35642
Stock changes	-8005	-1853				-2513		437	-11934
Bunkers		121							121
Gross inland consumption	78054	169663	35690	40222	0	324089	261	14194	662173
Transformation input	30603	109611				294720		2049	436983
Transformation output		98138		96786	35203	12167		1974	244268
Exchange and transfers			-35690	35690					0
Consumption in the energy sector	3472	6866		15884	1723				27945
Losses	439	864		20192	2940	829	1	2	25267
Energy available for final consumption	43540	122752		97800	30540	40223	260	10783	345898
Final non-energy consumption	796	9745				1182			11723
Final energy consumption:	42744	113007		97800	30540	39041	260	10783	334175
Industry	28169	23208		23810	10355	14367		2922	102831
Construction		1414		1141		45		146	2746
Transport	165	74328		1771					76264
Households	9047	3947		52261	16917	17472		7342	106986
Agriculture	766	5452		1112		17	156	130	7633
Other users	4597	4658		17705	3268	7140	104	243	37715

Source: [18]

In 2012, total primary production of natural gas in Serbia amounted to 533.5 million cubic meters (equivalent to 19,762 TJ), while the imported amount was three times higher and amounted to 1.79 billion cubic meters. Of the total gas available, around 40% is used for energy production, while the remaining amount is intended for end consumption. The largest end users are industry (760 million cubic meters) and households (244 million cubic meters). About 240,000 households and about 11,000 other customers use natural gas. The Energy Balance of Serbia for 2012 with relevant indicators for each energy source is shown in Table 1.

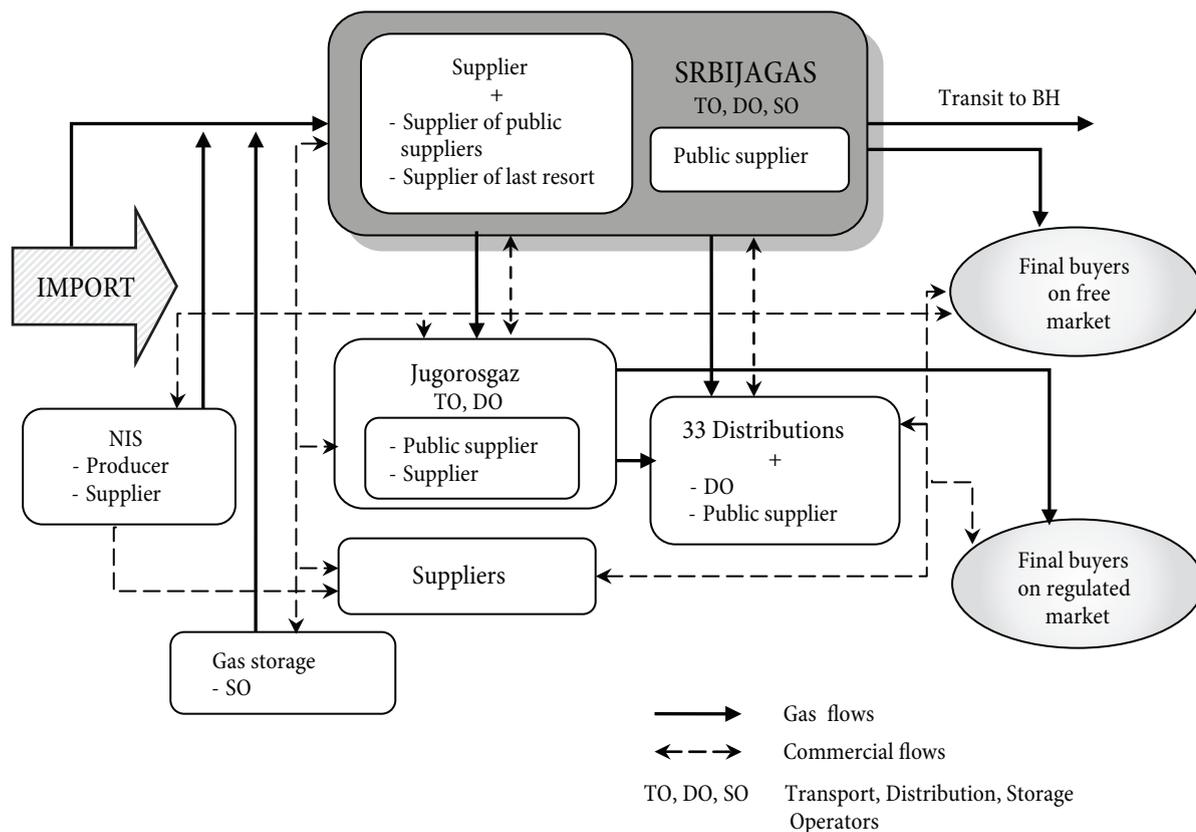
Our standards set high requirements to be met by gaseous fuels for residential use. There are four groups of gaseous fuels. According to the classification of gaseous fuels, the second group includes natural gases from natural reservoirs, rich in methane. Serbia uses the natural gas from the second group from Russia (Siberia) and the Banat region. Natural gas is imported through Hungary (border crossing at Horgos), while the construction of

the connection from Bulgaria is underway [23]. With the construction of South Stream, the above sources will become only alternative energy sources, which will significantly improve the gas market situation.

The natural gas sector of Serbia operates as a bilateral market, or a market in which natural gas is bought and sold directly between market participants. The gas market participants are: manufacturers, suppliers, public suppliers, end users, operators of transportation systems, distribution system operators, and operator of storage facilities (see Figure 1) [7]. As obvious from the chart below, the largest and most significant participants in the domestic gas market are Srbijagas (100% owned by the Republic of Serbia), Jugorosgaz (75% of Gazprom, 25% the Republic of Serbia), underground gas storage “Banatski Dvor” (51% Gazprom, 49% the Republic of Serbia), and NIS (56.15% Gazprom, the Republic of Serbia 29.87%, 13.98% minority shareholders).

One of the key energy goals of Serbia is equal development of the energy sector. With the arrival of

Figure 1: The natural gas market in Serbia



Source: [7]

Gazprom, i.e. the privatization of NIS, the oil sector has recorded significant growth. In such circumstances, the Serbian gas sector lags significantly and still is a weaker part of the energy sector.

Industrial policy in the energy sector

The global financial and economic crisis has brought losses, unemployment, and poverty in every sense of the word. In addition to myriads of negative consequences, the crisis has at least one bright side. If nothing else, it represents the ultimate “wake-up call” because it became apparent even to the greatest market fundamentalists that the current path is the wrong path. The current model of economic growth and development has not ensured growth and development for a long time. Smith’s concept of the invisible hand of the market, like any other concept, has proved to be short-lived and to little avail. It provided the answer and solution to the problems of the previous model of economic growth, but its utility value is obviously limited. As is the case with medicines: their use, in addition to the desired effects, may also lead to accompanying contraindications and side-effects. The global financial and economic crises are probably contraindications of the use of the existing system of economic development, since the outcomes are contrary to the desired ones. Also, it is a common fact that, over time, the body becomes immune and resistant to the medicine, in which case the therapy is usually changed. This analogy should also be applied to the chronically unhealthy economy.

Market imperfections, further enhanced by the global economic crisis, will not disappear by themselves. Routine establishment of market equilibrium is simply not possible in conditions of the perfect market where all the players are in the state of perfect information. Since this is not the case, i.e. the solution, the question is what next? Which way to go? It is certain that there is the need for state aid or intervention, but the question is in what form and to what extent. There is no perfect model of state-market partnership, so it is necessary to design a model that would be consistent with the level of economic development, culture and traditions of each individual country [14, p. 77].

Some of the effective tools are industrial policies [3], [4], [5]. In modern economic theory, industrial policy means the application of a series of measures and practical policies implemented by public institutions in order to create a favorable business environment and encourage the creation of new enterprises [13]. A theoretical basis for a new model of industrial policy in developed market economies was found in the theory of endogenous development as the dominant modern theoretical option for defining development, particularly of industrial policy. Industrial policies first aim at instigating, and then monitoring structural change and restructuring of companies in order to enable them to cope with all the changes and challenges of the business environment. These changes and challenges are a result of technological progress and the cumulative effects of political events, global integration, and global recession [14, p. 79].

When it comes to Serbia, for many years now, the macroeconomic trends clearly indicate that the current model of economic growth and development is unsustainable. In this context, the pressure and expectations of a new model of economic development are enormous since it must first stop the collapse of the local economy, and then redirect its path. The predominant position of domestic experts regarding the future model of economic development is the concept of (re)industrialization. It is a new concept of economic policy, which aims to strengthen the competitiveness of domestic industry through supporting its growth and development.

The National Council for Economic Recovery has prepared a Draft of the Reindustrialization Strategy of Serbia containing proposals of measures to overcome the crisis in Serbia, i.e. the anti-crisis program with the possible path of sustainable economic development. The anti-crisis program,¹ in accordance with the above new economic policies, advocates involvement of the state in the economic environment in order to enable the process of recovery of the local economy and create the foundations for its growth and development. Reindustrialization is perceived as the means of recovery and it simultaneously involves three things: 1) the expansion of financially healthy

¹ The anti-crisis program involves three processes: fiscal consolidation, closing the output gap and industrial development.

companies in tradable sectors, 2) the revitalization of public enterprises and companies undergoing restructuring, and 3) development of new businesses based on modern technology platforms. The focus should be on real economy instead of financial services, investment instead of consumption, saving instead of borrowing and activating domestic sources of growth in production instead of imports [5].

The post-crisis model of economic growth and development of Serbia 2011-2020 also advocates reindustrialization which should be based on the pyramidal structure of industrial policy. The base of the pyramid should be structural changes and infrastructure investment, linear (non-discriminatory) industrial policy is at intermediate level, while the top of the pyramid consists of selective instruments of industrial policy [24].

Industrial policy is defined solely for the priority sectors of the economy which leverage the overall economic development. The priority sectors are the sectors with comparative advantages and competitive advantages. In the Draft of the Reindustrialization Strategy of Serbia, the first place on the list of priority sectors with comparative advantages belongs to the energy sector. Emphasizing energy sector is expected, since the energy issue ranks among the top priorities of national and regional policies. Many countries have long since understood the importance of energy sector and are active not only as a regulator but also as a strategist, partner, and investor. A famous Robinson's words on energy are, "It is too important to be left to the market!" [22].

The new legislation of the Republic of Serbia which regulates the energy sector is fully compliant with the European Union regulations, the regulations of the countries in our region and internationally accepted principles of creating non-discriminatory conditions for transmission, transport and trade related to electric power and natural gas in the entire region [2], [12], [17].

Serbian Energy Policy and Energy Development Plan are based on the Energy Law, which clearly defines the main objectives, such as improving energy security, energy efficiency, competitiveness of energy market, utilization of renewable energy sources and environmental protection. Energy policy is elaborated and implemented by the means of the Energy Development Strategy of the Republic of

Serbia, the Strategy Implementation Program, and the Energy Balance of the Republic of Serbia. Subsequently, national action plans are developed within the framework of Strategy and Program which identify the development objectives and measures of their implementation more closely.

The Energy Strategy of the Republic of Serbia is the guiding principle that defines long-term objectives and directions of energy development. It is made for a period of at least 15 years. The Program outlines the conditions, manner, pace and measures for the implementation of the Strategy. The program is adopted by the Government for a period of up to six years upon the proposal of the Ministry in charge of energy, which, if necessary, proposes its alignment with the real needs at least every other year. The Energy Balance shall define: annual energy and/or energy sources needs expressed on a monthly level to be provided for the reliable, safe and quality supply of final customer, while recognizing the need for rational consumption of energy and energy sources; sources for the provision of required energy and/or energy sources; required level of reserves and reserve capacities of energy facilities for the safe supply of customers with energy and energy sources [11], [12].

The current Energy Sector Development Strategy of the Republic of Serbia by 2015 differentiated its objectives into three groups: basic – the energy objectives; specific – technological and environmental objectives, and overall – development and strategic objectives. In order to meet the objectives set, they defined five priority programs [15], [16]. Over time, the current strategy has become less topical since the assumptions on which it is based are largely inadequate and unrealistic. In the meantime, the Draft of the Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with projections by 2030 was developed, which proposes the path of market restructuring and technological modernization of the energy sector of the Republic of Serbia.

The implementation of the Energy Law and the new Energy Sector Development Strategy of the Republic of Serbia should result in adequate energy, economic, environmental and social policies, which, along with relevant legislation and the rule of law, would lead to a

sustainable energy system, a more efficient economy and greater social well-being, with a sustainable balance of natural resources and lower levels of pollution [17]. The basic principles according to which the energy policy by 2030 should be developed are ensuring energy security, energy market development and overall transition to sustainable energy (see Table 2).

Unlike the electricity market, the oil market has been liberalized since 1 January 2011. It created the preconditions for the opening of the oil products market in Serbia because it eliminated import barriers and stopped the state price regulation of oil derivatives. The Energy Law of 2011 created the conditions for the introduction of competition in the natural gas sector in Serbia in order to increase the efficiency of the sector through market mechanisms in the production and supply of natural gas. On the other hand, the activities of transport and distribution of natural gas, as natural monopolies, have remained in the domain of state regulation. All end users of natural gas have the right to freely choose their suppliers on the market, with the exception of households, which will have this right as of 1st January 2015. Liberalization, i.e. the process of opening

the natural gas market, is prescribed by the Law and will be carried out through several stages, thus narrowing the circle of customers who have the right to purchase natural gas from the Public Supplier at regulated prices. Customers who are not eligible for public supply may purchase gas from a licensed gas supplier on the open market [6].

In the field of gas, a new strategy sets out two objectives: ensuring safe supply of natural gas to the domestic market, and establishing national and regional natural gas markets. Therefore, the priority actions of the energy policy are the construction of the South Stream pipeline, the establishment of at least two regional interconnections by 2020 and the completion of gasification in Serbia. The subject of analysis in our paper is the South Stream project.

South Stream pipeline – the importance and potential impact on the Republic of Serbia

South Stream will have strong impact on the development of the energy sector and gas industry of the Republic of Serbia in the near future (end of 2015). The Republic of Serbia, which is on its route, also participates in the

Table 2: Key priorities of the energy sector policy of Serbia by 2030

1. Energy security	<ul style="list-style-type: none"> • Reliable, safe, efficient and quality supply of energy and energy products • Setting up conditions for reliable and safe operation and sustainable development of energy systems and energy sector in general
2. Energy market	<ul style="list-style-type: none"> • Competitiveness on electricity market based on non-discrimination, publicity and transparency • Protection of energy and energy products customers • Development of the electricity and natural gas market and their connection with the unique energy market of EU • More intense connection of energy system of the Republic of Serbia with energy systems of other countries, especially neighboring countries
3. Sustainable energy	<ul style="list-style-type: none"> • Provision of conditions for energy efficiency improvement in energy activities and energy consumption • Creating economic and financial conditions for increase of share of energy from renewable energy sources, as well as for combined production of electric and heat energy • Creating institutional, financial and technical assumptions for using new energy sources • Promotion of condition and environmental protection system in all fields of energy activities • Establishing more favorable legal, institutional and logistical conditions for more dynamic investment into energy sector

Source: [17, p. 31]

realization of this project. The project aims to stabilize the energy security of the European continent. The issue of stabilization of gas supply arose in 2006 when the relations between Russia and Ukraine, as a transit country, deteriorated due to the issue of the gas price.

Stabilization of gas supplies from Russia to Europe is achieved by diversifying gas flows. The first stage of diversification was finished with the construction of the Nord Stream gas pipeline. The second stage of diversification has been realizing through the construction of the South Stream. A separate company South Stream Transport AG was founded for this purpose as well. It is also based in Zug, Switzerland. The founders are: Russian OAO Gazprom (50% equity), Italian ENI (20%), French EDF (15%) and German Wintershall (15%). This company is responsible for covering the marine section of the South Stream pipeline, a distance of 925 km. The land section of the pipeline is about 1,450 km long and passes through the following countries (see Figure 2):

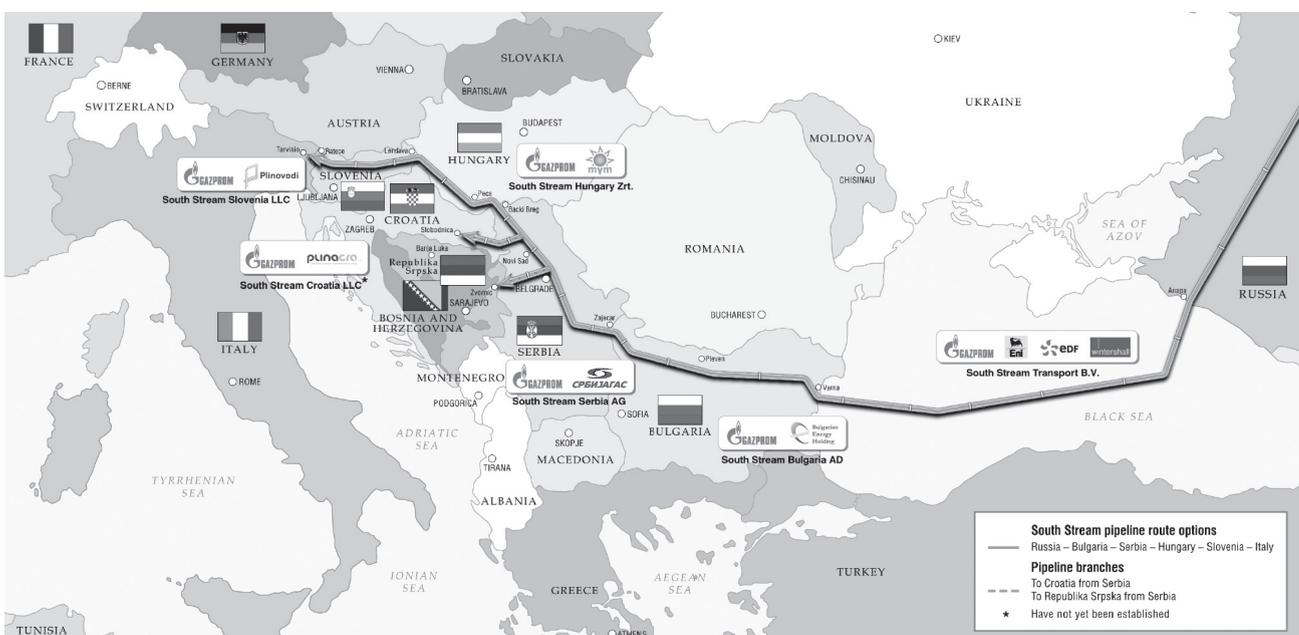
- Bulgaria (section length 536 km; operations are managed by the company South Stream Bulgaria AD, which was created by pooling the capital of the Russian Gazprom and Bulgarian EAD with 50:50 equity stakes);

- Serbia (section length 422.4 km; operations are managed by the company South Stream Serbia AG, which was created by pooling the capital of the Russian Gazprom and Serbian Srbijagas with 51:49 equity stakes);
- Hungary (section length 229 km; operations are managed by the company South Stream Hungary Zrt created by pooling the capital of the Russian Gazprom and the Hungarian MVM with 50:50 equity stakes);
- Slovenia (section length 266 km; operations are managed by the company South Stream Slovenia LLC, which was formed by pooling the capital of the Russian Gazprom and Slovenia's gas pipelines with 50:50 equity stakes), and
- Italy (section length 11 km).

According to the project, the pipeline in the Republic of Serbia has two branches: towards Croatia (52.8 km section, whose operations will be managed by a company with 50:50 equity stakes of Russian Gazprom and Croatian Plinacro), and towards the Republic of Srpska (105.8 km long).

South Stream is a project that will be used to transport 63 billion cubic meters of gas from Russia to Europe. The pipeline has four lines, with a capacity of 15.75 billion cubic meters each. First deliveries are scheduled for late

Figure 2: South Stream pipeline route¹



1 <http://www.south-stream.info/en/maps/>

2015, and the exploitation of the full capacity is expected in the period 2018-2019. The idea of the size of the pipeline in terms of its capacity is materialized through the fact that the world's total gas reserves are estimated at 193 trillion cubic meters, of which Gazprom owns about 35 trillion (more than 1/6).

An alternative to Russian gas is liquefied gas, which can be transported by outside pipelines (in Croatia, preparations are being made for the storage of this gas transported from Qatar to a terminal on the island of Krk). Another alternative was the construction of the gas pipeline Nabucco from Central Asia or the Middle East. The main source of gas would have been in Azerbaijan (about 16 billion cubic meters), and the remaining sources would have come from Turkmenistan and Iraq. The capacity of the Nabucco would have been 30 billion cubic meters and its length would have been about 4,000 km. However, assuming that the capacity utilization would probably be about 50%, such a project would not be financially viable, and it was abandoned.

The value of the whole South Stream investments is about EUR 16 billion. Of this amount, investment in the construction of the gas pipeline under the sea is about EUR 10 billion, while the construction of the land section will require investment of about EUR 6 billion. However, despite the high level of capital investment, the expected effect is significant. The transit countries can expect total annual revenues from the joint investment of about EUR 1 billion, with annual costs of EUR 0.3 billion. For a 25-year forecast horizon, total revenues are estimated at EUR 25 billion and total operating costs at EUR 7.5 billion.

Technically speaking, this is a very complex undertaking. Construction of the entire South Stream includes welding as many as 304,000 pipes. Furthermore, the project is facing challenges such as laying pipes on the seabed, sand waves, obstacles in the form of deep valleys, possible erosion, underwater currents, earthquakes, etc. However, the project is technically feasible and commercially reasonable in view of the growing demand for this energy source in Europe, and it is cost-effective for all the countries and companies involved in its implementation.

South Stream is one of the three priority activities in the field of natural gas that are listed in the Draft of

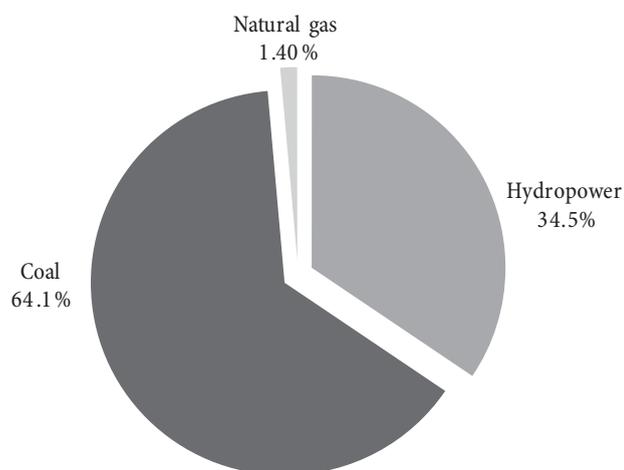
the Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with projections by 2030. The other two priorities are: the establishment of at least two interconnections by 2020 and the completion of the gasification in Serbia. From this gas pipeline, as planned, 3.9 billion cubic meters of gas will be used in domestic consumption. How large this amount of energy is for Serbia can be grasped from the fact that in late 2010, the balance reserves of natural gas in the country were only 4.23 billion cubic meters of gas.

The pipeline enters Serbia near Zajecar and goes past Belgrade and continues to the Hungarian border (near Sombor). Technical capacity includes the installation of pipes (about 400,000 tonnes of steel pipes), the use of the existing gas storage in Banatski Dvor and the construction of two compressor stations (near Backi Breg and near Paracin). The capacity of the pipeline in Serbia is projected at 40.5 billion cubic meters per year. It is expected that about 5,000 workers will be hired for the construction of the pipeline, and indirectly, approximately 100,000 workers employed in construction companies, equipment manufacturers and service companies.

The realization of the project requires high-quality machinery and qualified staff. The machinery consists mainly of trucks, excavators, bulldozers, pipe layers. It is estimated that there are enough trucks to perform these operations, but the situations with other machinery is uncertain in terms of its availability. This raises a new question of purchasing the missing machines and adequate models of financing this purchase given the short-term exploitation period of these resources (if it is known that South Stream will be launched by end 2015). The pipeline project through our country will mainly hire qualified welders. However, this is an advanced welding method, and in that respect, it is necessary to provide high-quality workforce that will be able to perform these tasks responsibly.

The construction of a gas pipeline in Serbia has an additional impact on the energy sector. Namely, this pipeline will provide gas supply to the gas power plants. Currently, natural gas accounts for 1.4% of electricity generation. The share of energy sources in the production of electricity in 2010 is shown in Figure 3.

Figure 3: The share of energy sources in the production of electricity in 2010



The Draft of the Energy Sector Development Strategy, in line with the objectives of increasing energy security and achieving sustainable situation in the energy sector, recommends the construction of a thermal power plant – a heating plant that uses natural gas with the capacity of about 450 MW by 2020. The Draft also envisages the possibility of building gas power plants in major industrial centers, primarily in Novi Sad, Belgrade, Nis, Kragujevac, Pancevo, Loznica and elsewhere. These power plants would produce electrical energy in an amount corresponding to the domestic and export needs, but also thermal energy for heating users in industry and in households. This idea is justified bearing in mind a similar situation with the Nord Stream in Germany, where the high profitability of this investment (with the degree of utilization of energy of 80 %) allowed the production of electricity from gas. Without the South Stream, the construction of gas power plants would only be possible in Novi Sad and Subotica, based on the current flow of gas from Hungary. South Stream increases the possibility of building these plants. In fact, for a power plant with the capacity of about 200 MW, it is necessary to provide 400 to 500 million cubic meters of gas per year, which is only possible with the new pipeline. Power plants are an integral part of the EPS (Electric Power Industry of Serbia), which means that the implementation of this venture implies the cooperation of Srbijagas and EPS.

The value of the investments in Serbia is estimated at EUR 1.9 billion. Initially, the value was estimated at

EUR 1.7 billion, but this estimation was subsequently adjusted to reflect rising steel prices in the world market. Also, the start of investment requires expropriation of land where the line will pass through, some 10,000 lots with a total area of 8,000 hectares and a value of around EUR 24 million.

This investment is financed in phases. The amount of EUR 500 million will be secured by the start of the construction, of which EUR 150 million (EUR 75 million invested by each the Republic of Serbia and Gazprom) were already secured in 2013. The remaining EUR 350 million will be secured in the first quarter of 2014, where Gazprom will provide EUR 175 million in investment and Serbia the same amount in the form a loan received from Gazprom at an annual interest rate of 4.25%. The security for this loan is the future revenues of the South Stream. Repayment of the loan is quite certain given the forecast that each party will have guaranteed 8 % revenue from investment.

The financing model of this investment is project financing, i.e. funding in phases will be provided by banks, mainly Russian. With this model of financing, the repayment of project financing is based on the cash flow analysis of the project itself.

In terms of the effects side of the said investment, there should be noted, first of all, that Gazprom will lease one hundred percent of the capacity of the South Stream for the next 25 years, on the ship-or-pay contract basis. This means that Gazprom will pay for the lease of this capacity regardless of whether blue gas is running through the pipeline or not. On the basis of this lease, it is expected that, by 2040, when the lease contract expires, Serbia will earn around EUR 5 billion. Annual amount of transit fees is EUR 200 million.

Financial impact on the budget is also visible. First of all, the transit fees are collected by the South Stream company Novi Sad. On this basis, all taxes flow into the budget of the Republic of Serbia. Opportunity benefits are reflected in the fact that there will be no penalties for purchased and unused (also Russian) gas from Hungary (at a price that is much higher than that paid by other countries). In addition, Serbia is guaranteed 8 % profit per annum from gas transportation.

The impacts on the economic environment are significant and obvious. First of all, the construction of the pipeline will make Serbia an important energy transit country. Also, from a broader perspective, it increases the attractiveness of the country in the process of attracting foreign direct investment. Apart from stable legal and macroeconomic environment, foreign investors are also interested in the stability of energy supply. With that respect, investors are primarily focused on their availability and price trends. South Stream provides the opportunity to extend the existing gas network and provide consumers in the household sector and the industry with more affordable access to gas.

The environmental impact is favorable compared to other energy sources (excluding renewable energy sources). First and foremost, natural gas is renowned for emitting 70% less carbon monoxide. The South Stream project is implemented according to the highest international environmental standards, and impeccable environmental footprint of its “brotherly” project (Nord Stream) confirms this assumption.

All in all, the South Stream is becoming a focal element not only of the gas industry of the Republic of Serbia, but also of the entire energy system with significant implications for employment and budgetary inflows.

Useful experience and data about the Nord Stream pipeline

About half of the total Russian exports to the EU go through Italy and Germany, while France is the third biggest European importer. Gas trade between Russia and the EU became vulnerable after Soviet Union dissolution, due to turmoil and conflicts between Russia and key transit countries – Ukraine and Belarus.² Around 80% of gas exports to Europe transit through Ukrainian pipelines. In order to prevent such problems in the future, Gazprom has implemented the strategy of diversifying its exports alternatives to Europe. Implementation of this strategy began in the 1990s with Yamal-Europe pipeline and more

recently has continued with the Nord Stream and South Stream projects [1].

The Nord Stream connects the gas reservoirs in Western Siberia with Europe, and gas is distributed through the Baltic Sea, from the Russian town of Vyborg to the German town of Lubmin, a distance of 1,224 km. Each pipeline is made up of over 100,000 concrete weight coated pipe segments, each with an average length of about 12.2 m and a constant inner diameter of 1,153 mm. This stream has two legs and the annual capacity of each is 27.5 billion cubic meters. This pipeline can supply more than 26 million households per year with its total capacity of 55 billion cubic meters.³ Nord Stream’s twin-pipeline system came on stream on schedule (completed in 30 months) and on budget, the first line in November 2011 and the second in October 2012 [19], [20].

The following companies are involved in the construction of the Nord Stream: Russian OAO Gazprom (51% equity stake), German Wintershall Holding GmbH (a subsidiary of BASF) (15.5%), German E.ON (15.5%), Dutch NV Nederlandse Gasunie (9%) and French GDF SUEZ (9%). The aforementioned companies have set up an international consortium Nord Stream AG based in Zug, Switzerland. The construction of a gas pipeline cost EUR 7.4 billion, out of which the investors have funded 30%, and the rest was financed from credits.

The policy literature about the Nord Stream usually presents the project as uneconomic and perceives it more as a part of Russia’s foreign policy than Gazprom’s business strategy. Political or not, the Nord Stream is a win-win project because both sides (Russia and the EU) profit from this arrangement. For the purpose of this study, we are mainly focused on the economic aspect of the project because experiences from the Nord Stream may be useful in analyzing the potential role and importance of the South Stream.

There have been plenty of researches and analyses about the Nord Stream’s potential effects and they provide different and often completely opposite conclusions. Financial viability of the Nord Stream project for sure depends significantly on the future development of gas

² There have been major gas transit disruptions through Belarus in 2004 and 2010 and through Ukraine in 2006 and 2009, affecting millions of people in South-Eastern Europe and Western Balkans.

³ 55 bcm is equivalent to the amount of energy transported by 600-700 LNG tankers or produced by 148,000 wind turbines.

demand in Europe and development of LNG market (as competitor). According to the research [1, p. 18] the average NPV of the Nord Stream system is USD 4 billion in the low demand case, USD 6.9 billion in the base case and USD 20 billion in the high demand case. There are three factors contributing to the positive economic value of the Nord Stream: lower transportation cost in comparison to existing options, the lowering of Ukraine's transfer fee and the insurance against transit disruption risks through Ukraine.

The total investment in Nord Stream was EUR 7.4 billion, providing a stimulus for many sectors of the European and Russian economy such as steel, construction, engineering, logistics etc. This investment created businesses and employment for twelve countries. Furthermore, 15.1 million man-hours, with around 2,500 workers per pipeline, were necessary to finish the construction of the Nord Stream pipeline. Some useful data about this investment are presented in Table 3.

The Nord Stream pipeline uses state-of-the-art technology to meet the highest international safety standards during construction and operation. Concerning environmental monitoring, EUR 40 million was invested and 22 companies were involved with more than 1,000 experts. Monitoring activities include surveys of the physical, chemical, biological and socio-economic environment.

The above-mentioned information concerning the Nord Stream pipeline results can help us better understand the importance and role of the South Stream project in Serbia. Having in mind the Nord Stream experience, we can expect that significant funds will be invested in the lacking domestic infrastructure. It will be an extraordinary opportunity for competitive local companies to take part

in the implementation of this project. There is no doubt that construction, engineering and logistic companies will benefit the most. Also, our experts in biology, ecology, chemistry and the like will get a chance to be involved in monitoring activities, especially during the construction and first three years of pipeline exploitation.

Conclusion

In its value, economic and environmental characteristics, gas is a superior source of energy, i.e. energy source for the 21st century. Major producers of gas include the world's leading powers, the United States and the Russian Federation, the latter also being its largest exporter; and the largest importers are also world's powers Japan and leading European Union countries. Uneven availability at global level and prominent import dependence of Europe's leading countries are the reasons why the analysis and formulation of the gas sector development strategies encompass, among other things, the geopolitical dimension.

Import dependence of Serbia's gas sector is extremely high. Moreover, it is higher than the import dependence on other energy sources and amounts to 86%. About 40% of imported gas is used for energy production and the rest is intended for end users (industry and households).

The construction of the South Stream through our country and the projected 3.9 billion cubic meters of gas for our purposes are the facts that assure us that the Serbia's decision to accept the invitation of Gazprom to participate in this large international project is justified. The decision on participating in the project is in line with the current Energy Development Strategy and the Draft of the Energy Sector Development Strategy for the period

Table 3: Useful financial data about the Nord Stream pipeline

Description	Amount (euro)
Total investment	7.4 billion
Cost of pipes and pipeline material	3 billion
Cost of pipe-laying contracts	2 billion
Cost to European taxpayers	0
Saving of transportation costs due to the sophisticated "green logistic concept"	60 million
Investment in developing the necessary harbor infrastructure in the region	100 million
Further investment in environmental monitoring along the route	40 million

Source: [21]

by 2025 with projections by 2030. The strategic priorities to be pursued in the implementation of this strategy are: energy security, development of the energy market and achieving a state of sustainability in the energy sector. In the field of natural gas, strategic priorities are implemented through: construction of South Stream, establishing at least two interconnections by 2020 and completion of gasification of the country.

The construction of the South Stream has multiple impacts. These are:

1. Direct hiring of about 5,000 workers for its construction and indirect engagement of 100,000 workers employed in related industries;
2. Employing machines (including those which have been idle for years due to the economic downturn and reduced national market);
3. Creating opportunities to build gas power plants – power plants in a number of industrial centers in the country;
4. Collecting annual transit fees in the amount of EUR 200 million, which amounts to about EUR 5 billion by 2040;
5. Increasing energy security (by reducing dependence on imported Russian gas via Hungary at relatively high prices and other unattractive purchase terms);
6. Increasing the attractiveness of the country as an investor destination;
7. Avoiding endangering the ecological system of the country;
8. Due to a privileged model of financing – short-term neutral (or least negative) impact on the State budget at the time of its construction and extremely positive long term impact at the time of project exploitation.

The experience based on the example of the Nord Stream, as a predecessor of South Stream, also indisputably confirms the economic, energy and environmental feasibility of the project, which should serve as a tailwind for domestic economy and trigger growth and development.

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