

## NEW EUROPEAN PIPELINE PROJECT EASTRING

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This paper focuses on the idea of a new European gas pipeline project called Eastring promoted by company Eustream. Eustream is the Slovak gas transmission system operator and has been one of the key players in European gas transmission from Russia to Europe in the last decades. Previous Russian-Ukrainian crisis resulted in reviewing gas flow directions from Russia to Europe in order to enhance the security of gas supplies to Europe. Russia plans to stop gas transmission to Europe via Ukraine in 2019. Alternative pipelines are planned to be built from Russia to Turkey and Germany. TurkStream pipeline and the Trans-Anatolian pipeline will bring gas to the Turkish-Bulgarian and Turkish-Greek borders in the Balkans. The main goal of the Eastring pipeline project is to connect Western Europe with the Balkans. This project has also other purposes such as supplying Europe with gas from alternative, non-Russian gas sources e.g. Caspian gas sources.

**Key words:** eastring, eustream, pipeline, gas, security, diversification.

**Novi europski projekt plinovoda Eastring.** Rad se fokusira na ideju novog europskog projekta plinovoda pod nazivom Eastring kojeg promiče tvrtka Eustream. Eustream je slovački operator transportnog sustava plina i jedan je od ključnih igrača u europskom prijenosu plina iz Rusije u Europu zadnjih desetljeća. Prethodna rusko-ukrajinska kriza rezultirala je preispitivanjem smjera dostave plina iz Rusije u Europu kako bi se povećala sigurnost opskrbe plinom Europi. Rusija planira zaustaviti prijenos plina u Europu preko Ukrajine 2019. godine. Alternativni plinovodi planiraju se graditi iz Rusije u Tursku i Njemačku. TurkStream plinovod i Trans-Anatolijski plinovod dovest će plin na tursko-bugarsku i tursko-grčku granicu. Glavni cilj Eastring plinovoda je povezivanje zapadne Europe s Balkanom. Ovaj projekt ima i druge svrhe kao što je opskrba Europe plinom iz alternativnih, ne ruskih izvora plina, npr. Kaspijskih izvora plina.

**Ključne riječi:** eastring, eustream, cjevovod, plin, sigurnost, raznolikost.

## INTRODUCTION

Pipelines are a very interesting piece of energy infrastructure. Once built, the pipelines are invisible for almost their entire life. Only facilities such as compressor stations and metering stations are seen above ground. Pipelines lay almost unnoticed underground for decades, transporting energy resources that allow us to live a modern and comfortable life. Sometimes, however, suddenly they find themselves in the spotlight, fill the headlines and become highly topical political issues. Pipelines can

get to the limelight when a new major project is planned and implemented, or also when geopolitical events threaten the reliability of existing infrastructures. Both of these scenarios are currently taking place in Ukraine, the Black and the Baltic Sea, and also directly concern Slovakia's and Eustream's long-term interests.

Gas exports have been a major driver of Russia's economic growth over the last decades. Since 1990, Russia through state owned Gazprom gradually diversified export

routes for its Western customers by constructing several new pipelines, one of which was the Blue stream pipeline to Turkey in 2003. Another major pipeline system was the Nord Stream pipeline to Germany in 2011 (Line 1) and 2012 (Line 2). Despite these efforts, nearly half of Russian gas destined for Western Europe is still transported via Ukraine, despite of the current political and economic instability

and international disputes with Russia. On this contrary, Gazprom proposes additional new pipeline projects based on ensuring the flow of gas to its Western customers in Europe. If Nord Stream 2 is built, 70 % of all Russian gas imports to Europe would go via Germany. It would also make Ukraine's gas transmission system obsolete in a hammer blow to its economy at a time when it is trying to align with the West. [1]



**Figure 1.** Existing Slovak transmission system in 2017 [2]

**Slika 1.** Postojeći slovački transportni sustav u 2017. godini [2]

Eustream is the gas transmission system operator (TSO) in Slovakia. It is currently in the position of a gas crossroad in Central Europe. In 2016 it transported 60.6 billion cubic meters (bcm) of gas through its high pressure pipeline system (Pic 1). Thanks to the continual modernization and upgrade of its gas infrastructure, Eustream contributes to ensuring safe and reliable gas supplies to Central and Western Europe. Eustream officially introduced the inception

of the Eastring pipeline project at the Central European Energy Conference on the 25<sup>th</sup> November 2014 in Bratislava. Eustream, which is 100 % shareholder of Eastring B.V. company (one of the Project promoters), works in close cooperation with other three project partners of the Eastring project: FGSZ Zrt. (TSO in Hungary), SNTGN Transgaz SA (TSO in Romania) and Bulgartransgaz AED (TSO in Bulgaria). [2]

## THE EASTRING PROJECT

The Eastring pipeline project represents a vision to connect the Slovak transmission system from the existing connecting point in Veľké Kapušany, where Eustream owns and operates the largest compressor station in European Union (EU), with a new interconnecting point at an external border of the EU on the territory of Bulgaria, e.g. Turkey or Black Sea coast. In early December 2014 came official news that Gazprom is stopping the South Stream pipeline project with an annual capacity of 63 bcm. Instead, Gazprom proposed a new pipeline project called TurkStream with an annual capacity of 31, 5 billion cubic meters. The Eastring project was initially intended as a full-fledged alternative, bringing compared to South Stream project several advantages. Most of them are incomparably lower capital costs, because of the maximum use of existing infrastructure. The Eastring project is also fully compatible with the so-called 3<sup>rd</sup> Energy package and other legislative standards of the (EU). The South Stream

project was many times criticized by representatives of the European Commission (EC) for non-compliance with these standards. [3]

Since Eastring is planned as a bi-directional pipeline, South-Eastern European countries can gain access to the Western European gas hubs and Central and Western European countries will reach the resources of the Caspian region, or the Black Sea and the Mediterranean Sea as well as from the Middle East. Balkan countries can also gain alternative gas supplies routes. Eastring has a potential to connect Central and Western European countries with the planned gas hubs in Bulgaria or Turkey. This will create a major European bi-directional conjunction bringing a great transit potential and will be improving gas market situation in each of the respective countries. Possible sources of natural gas for Eastring can be from Azerbaijan, Turkmenistan, Iraq, Iran, Cyprus, Romania as well as Russia. [4]

## ROUTING

The Eastring project's routing will be chosen to respect mainly environmental and social sensitive areas wherever possible with an effort of maximal utilization of existing infrastructure. Eastring pipeline will connect together the Slovak transmission network with the Hungarian-Romanian-Bulgarian transmission networks. One of the analyzed route option starts in the interconnection point Veľké Kapušany, where either using an existing infrastructure on the territory of Hungary, respectively using a short newly built pipeline crossing Hungary, continuing to Transylvania, where are significant deposits and underground storage facilities of natural gas and heading to the Romanian capital city Bucharest. Romania has the third

largest natural gas reserves within the European Union (EU) and new reserves are still being discovered. [5]

Overall number of analyzed routing options/corridors in the internal pre-feasibility study of the project Eastring performed by Eustream and discussed with partners from Bulgaria, Romania and Hungary is five. At least two routing variants, starting from Slovakia and passing Hungary, Romania and Bulgaria, will be defined and analyzed by the Feasibility Study with main focus on length of the pipeline and not least on environmental and social impacts of the project. The Feasibility Study, which is currently being developed

will act as a base for further engineering works. [6]

The Eastring pipeline length will depend on the final decision on the routing of the pipeline. The main target of the Feasibility Study is to design a bi-directional pipeline interconnector between Slovakia and South-Eastern Europe with consideration of the following options of routing (Fig. 2):

- **OPTION 1:** Construction of a new pipeline from Slovakia (Compressor station (CS) Veľké Kapušany) to an external border of the EU on the territory of Bulgaria, e.g. Turkey or Black Sea coast via the territory of Hungary (via node Csengersima and CS Beregdaróc), Romania and Bulgaria (via node Giurgiu – Ruse);
- **OPTION 2:** Construction of a new pipeline from Slovakia (CS Veľké Kapušany and/or CS

Veľké Zlievce) to an external border of the EU on the territory of Bulgaria, e.g. Turkey or Black Sea coast via the territory of Hungary (via node Csanádpalota), Romania and Bulgaria (via node Giurgiu – Ruse);

- **OPTION 3:** Construction of a new pipeline from Slovakia (CS Veľké Kapušany and/or CS Veľké Zlievce) to an external border of the EU on the territory of Bulgaria, e.g. with Turkey or Black Sea coast. (OPTION 3 is yet to be proposed in the Feasibility Study as a competing alternative to OPTION 1 and OPTION 2 with a partly or completely new and unique pipeline corridor.)

For each option it is necessary to consider also utilization of existing corridors.



**Figure 2.** Routing options of the Eastring pipeline project applicable for Options 1 & 2 [7]

**Slika 2.** Opcije usmjeravanja plinovoda projekta Eastring primjenjive za Opcije 1 i 2 [7]

Every 20 to 40 km (in compliance with national rules and standards) will be located a block valve station with a valve that can effectively close the pipeline into sections in case of maintenance or malfunction. New compressor stations will consist of gas filters, compressor drives, compressors units and gas coolers. Data transmission will be performed via an optical

cable laid next to the pipeline. At each state border will be located one metering station with gas filters and metering runs measuring gas volumes (measuring function is necessary in reverse direction as well). All equipment will be operated remotely from one dispatch center for the whole pipeline or locally on site.

## CAPACITY

The Eastring pipeline is planned to have a diameter of DN1400 (inner diameter approximately 1,379 mm) and a maximum operating pressure of 98 barg. The project is planned to be realized in 3 stages:

- **Stage I:**
  - Bi-directional gas flow from Slovakia to Hungary/Romania/Bulgaria of 10 bcm of natural gas per year;
  - Utilization of compression work of compressor station Veľké Kapušany in Slovakia with installed power of 285 MW and new compressor station at the beginning of the system in Bulgaria or Romania according to realized routing option.
- **Stage II:**
  - Bi-directional gas flow from Slovakia to Hungary/Romania/Bulgaria of 20 bcm of natural gas per year;
  - Utilization of compression work of compressor station Veľké Kapušany in Slovakia with installed power of 285 MW and their adjustment and 1 new compressor stations at the beginning of the system in Romania or Bulgaria according to realized routing option.
- **Stage III:**
  - Technical solution with maximum technical capacity up to 40 bcm of natural gas per year with additional compressor station technologies.

## THE EASTRING FEASIBILITY STUDY

Eustram launched a public tender for the elaboration of the Feasibility Study (Study) for Eastring project in early 2017. Feasibility study for the Eastring Project is assumed to provide the ultimate definition, information on general, technical, economic, financial, environmental, regulatory and

other issues necessary to implement the Eastring Project (Project). The Study shall consist of following main parts: [7]

- Business part of the Study shall be composed of SCOPE OF THE PROJECT, MARKET FEASIBILITY and LEGAL AND REGU-

LATORY FRAMEWORK. It should deliver clear recommendations regarding the prospects of the Project in relation to the identified business case, based on the findings and conclusions of the analyses.

- Technical and Environmental part of the Study shall be composed of TECHNICAL FEASIBILITY, ENVIRONMENTAL ISSUES, TIME SCHEDULE and COST IDENTIFICATION.
- Financial part of the Study shall be composed of TARIFF ANALYSIS and FINANCIAL ANALYSIS.
- Part of further analyses of the Study shall be composed of ORGANIZATION – GOVERNANCE, RISKS ANALYSIS part, Cost Benefit Analysis and Socio-economic analysis.
- The Conclusions of the Study have to provide the ultimate definition, information on general, technical, economic, financial, environmental and other issues necessary to make decision on the best routing

options, technical solution, project feasibility and implementation of the Project.

All works shall be done according to adequate EU-endorsed guide lines, which will enable Eustream to utilize the results as direct inputs to CEF Funding and CBCA applications.

Primary methodology basis: [7]

- ENTSOG – Energy System Wide Cost-Benefit Analysis Methodology, February 2015;
- ACER – European Gas Target Model Review and Update, January 2015;
- European Commission – Guide to Cost Benefit Analysis of Investment Projects, Economic Appraisal Tool for Cohesion Policy 2014 – 2020, December 2014;
- European Parliament – Regulation no 347/2013 on guidelines for trans-European energy infrastructure, April 2013.

The Agreement on the elaboration of the Study for Eastring project has been signed on the 24<sup>th</sup> August 2017 with EUROIL Ipari és Kereskedelmi Kft from Hungary and the delivery of the final version of Study is scheduled in June 2018.

## THE ENVIRONMENTAL PART OF THE STUDY

The Environmental Assessment Report (EAR) of the Study has to identify the relevant environmental constraints, exclusionary environmental conditions regarding the pipeline route, suggest alternatives in such cases, and provide the general information on environmental issues necessary to make a decision on the best

routing options and implementation of the Project.

The EAR will contain a presentation of the:

- General analysis of the protected areas of national and international significance in the scope of route of the project;

- Identified areas with cultural heritage interest;
- The environmental aspects of compliance with national and regional area utilization plans;
- Deforestation extensity;
- Other constraints, which can have considerable effect.

The Environmental Chapter of the FS study will include the:

- Project description;

- Identification of possible project impacts and impact areas on the natural environment;
- Simplified analyses of the impact on sensitive areas;
- Identification the significance of the impact;
- Risk assessment.

The result of the EAR is the list of potential environmental conflicts of the proposed project, as well as the identified key issues to be addressed in the course of the EIA stage.

## CONCLUSION

The EU recognizes the importance of ensuring security and diversity of natural gas supplies to the EU and in particular to the countries of Central and South-Eastern Europe. Eustream managed to include the Eastring project in the Ten Year Network Development Plan (TYNDP) in the nearest possible term and in the same time to obtain a status of Project of Common Interest (PCI) in 2016. Obtained PCI status means the highest political support of the EU for the project implementation. Inclusion of the project to the PCI list made it eligible for EU funding and thus reduces the burden on funds from other sources of financing. Representatives of Slovakia and Eustream signed a Memorandum of Understanding on project Eastring in 2016 with Bulgaria and in 2017 with Hungary.

The European Commission has awarded the support for the Eastring project by funding the feasibility study under the Connecting Europe Facility (CEF) mechanism up to 50 % of the eligible costs. EU's Innovation and Networks Executive Agency (INEA) and Eustream signed Agreement allowing Slovak TSO to receive EU grant for the feasibility study needed for the planned Eastring pipeline project. Feasibility study will be funded with the sum

up to one million EUR, or 50 % of the eligible costs. Grant Agreement entered into force on 12<sup>th</sup> May 2017. The date of the possible commercial launch of the Eastring pipeline is expected to be in 3 to 5 years since the final investment decision (FID) taken.

South-Eastern Europe is one of the most vulnerable parts of Europe in relation to security of supply. In case of a natural gas transmission disruption from Russia, this part of Europe would suffer the most and companies involved in the Eastring project are aware of it. Building the Eastring pipeline would not only increase security of supply for Romania and Bulgaria, but whole Europe would gain access to new natural gas sources from the Caspian region, the Middle East, etc. Consequently markets would be able to benefit from diversification of routes and sources resulting in increased liquidity of the markets.

In summary, the Eastring pipeline project's main goals are to:

- Security of supply function from the perspective of Balkan countries, Romania and Moldova;
- Not only provide an alternative gas route but also alternative gas sources, increase cross border

interconnectivity and liquidity, offer attractive transmission fees customers;

- Not be linked to any particular gas supplier and open to all immediate gas sources;
- Be compliant with the EU law and its spirit and represent an important step towards a single EU gas market;

- Facilitate future access to new gas sources routed to the EU entry points (gas source diversification) without limitation to one supplier only;
- Represent the most economic and time efficient solution by utilizing the robust existing pipeline infrastructure.

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