ENERGY SUPPLY SECURITY IN THE EUROPEAN UNION

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Abstrakt

The paper deals the issue of energy supply security in the European Union and its importance. It describes the key facts about European Union energy security, increasing energy production in the European Union, the security of energy supply guaranty in Europe, the new European Energy Security Strategy and the investments and financial support of the infrastructure energy projects for the EU Member States.

Keywords: Energy supply, Energy security, European Union, Energy Strategy, Investments, Financial support

Introduction

At the beginning of the 21st century, the fight against climate change, the vagaries of geopolitics, the terrorist threat and the necessary reinforcement of institutions emerged with acuteness. In the energy sector, uncertainties and weaknesses appeared in a more alarming light, like the continuous rise of energy prices on the world market and the unavoidable strengthening of the European Union's energy dependency, mainly on the Russian Federation and the Persian Gulf.

These factors worked in favour of a clearly defined at last energy policy at the European Union (EU) level. The Lisbon Treaty gave concrete expression in legal terms to the three fundamental pillars of the energy policy: Security of supply, Environment sustainability and Competitiveness. The European Union Energy Targets are "20-20-20 by 2020". It means:

- reduction of the greenhouse gas emissions by 20% compared to 1990
- increase the share of renewable energy sources in energy consumption to 20%
- increase the energy efficiency to 20%

(achieve the -20% energy consumption target) [1, 4].

It also established a flagship value of European construction: solidarity between the Member States.

If we are talking about security of supply, we have to define, what the Energy supply and Energy security exactly means. Energy supply is the delivery of fuels or transformed fuels to point of consumption. It potentially encompasses the extraction, transmission, generation, distribution and storage of fuels. It is also sometimes called Energy flow. [3, 4]

This supply of energy can be disrupted by several factors, including imposition of higher energy prices due to action by OPEC or other cartel, war, political disputes, economic disputes, or physical damage to the energy infrastructure due to terrorism. The security of the energy supply is a major concern of national security and energy law. Energy security is the association between national security and the availability of natural resources for energy consumption. Access to cheap energy has become essential to the functioning of modern economies. However, the uneven distribution of energy supplies among countries has led to significant vulnerabilities. [2]

Key facts about European Union energy security

The EU is highly dependent on energy from abroad. Today EU imports 53% of the energy it consumes. Energy import dependency relates to crude oil (almost 90%), to natural gas (66%), and to a lesser extent to solid fuels - coal (42%) as well as nuclear fuel - uranium (40%).

Energy security of supply concerns every Member State, even if some are more vulnerable than others. This is valid in particular for less integrated and connected regions such as the Baltic and Eastern Europe.

The most pressing energy security of supply issue is the strong dependence from a single external supplier. This is particularly true for gas, but also applies to electricity:

- Six Member States depend from Russia as single external supplier for their entire gas imports and three of them use natural gas for more than a quarter of their total energy needs. In 2013 energy supplies from Russia accounted for 39% of EU natural gas imports or 27% of EU gas consumption; Russia exported 71 % of its gas to Europe with the largest volumes to Germany and Italy.
- For electricity, three Member States (Estonia, Latvia and Lithuania) are

dependent on one external operator for the operation and balancing of their electricity network;

The EU external energy bill represents more than $\notin 1$ billion per day (around $\notin 400$ billion in 2013) and more than a fifth of total EU imports. The EU imports more than $\notin 300$ billion of crude oil and oil products, of which one third from Russia.

EU energy security has also to be seen in the context of growing energy demand worldwide, which is expected to increase by 27% by 2030, with important changes to energy supply and trade flows.

European Energy Security Strategy

In response to the political crisis in Ukraine and the overall importance of a stable and abundant supply of energy for the EU's citizens and economy, the European Commission has released Energy Security European Strategy an (Communication from the commission to the European parliament and the council) on 28 May 2014 in Brussels. This strategy is based on an indepth study of Member States' energy dependence and the main aims are: diversification of external energy sources. energy infrastructure modernization, internal energy market finalization and energy savings.

The European Energy Security Strategy sets out areas where decisions need to be taken or concrete actions implemented in the short, medium and longer term to respond to energy security concerns. It is based on 8 key pillars that together promote closer cooperation beneficial for all Member States while respecting national energy choices, and are underpinned by the principle of solidarity:

- Immediate actions aimed at increasing the EU's capacity to overcome a major disruption during the winter 2014/2015;
- Strengthening emergency/solidarity mechanisms including coordination of risk assessments and contingency plans; and protecting strategic infrastructure;
- Moderating energy demand;
- Building a well-functioning and fully integrated internal market;
- Increasing energy production in the European Union;
- Further developing energy technologies;
- Diversifying external supplies and related infrastructure;
- Improving coordination of national energy policies and speaking with one voice in external energy policy. [www.1]

Short-term measures

In the short-term, the strategy proposes that the Commission launch **energy security stress tests** to simulate a disruption in the gas supply for the coming winter. The aim of these stress tests is to check how our energy system can cope with security of supply risks, and to develop emergency plans and back-up mechanisms which may include:

- Increasing gas stocks.
- Developing emergency infrastructure such as reverse flows.
- Reducing short-term energy demand.
- Switching to alternative fuels.

These stress tests should serve as the basis for strengthening existing European emergency and solidarity mechanisms. The EU should also engage with its international partners to develop new solidarity mechanisms for natural gas and the use of gas storage facilities.

Medium to long-term challenges

In addition to the proposed short term measures, the strategy addresses medium and longterm security of supply challenges. It proposes actions in five key areas:

- Increasing energy efficiency and reaching the proposed 2030 energy and climate goals. Priorities in this area should focus on buildings and industry which use 40 % and 25 % of total EU energy, respectively. It is also important to help consumers lower their energy consumption, for example with clear billing information and smart energy meters.
- Increasing energy production in the EU and diversifying supplier countries and routes. This includes further deployment of renewables, sustainable production of fossil fuels, and safe nuclear where the option is chosen. It also entails negotiating effectively with current major energy partners such as Russia, Norway, or Saudi Arabia, as well as new partners such as countries in the Caspian Basin region.
- Completing the internal energy market and building missing infrastructure links to quickly respond to supply disruptions and re-direct energy across the EU to where it is needed.
- Speaking with one voice in external energy policy, including having Member States inform the Commission early-on with regards to planned agreements with third countries which may affect the EU's security of supply.
- Strengthening emergency and solidarity mechanisms and protecting critical infrastructure. This includes more

coordination between Member States to use existing storage facilities, develop reverse flows, conduct risk assessments and put in place security of supply plans at regional and EU level. [www.2]

Increasing energy production in the European Union

For the Increasing energy production in the European Union, EU Member States should:

- Continue the deployment of renewable energy sources in order to achieve the 2020 target in the context of a market-based approach;
- Initiate the Europeanization of renewable energy support systems through improved coordination of national support schemes;
- Accelerate fuel switch in the heating sector to renewable heating technologies;
- Ensure stable national regulatory frameworks for renewables and address administrative barriers;
- Facilitate access to finance for renewable projects on all levels (large and small scale) through a concerted initiative by the European Investment Bank and national investment banks. The development of renewable energies is a major issue in this respect. It heralds the establishment of security of supplies and is dependent upon the development of attractive high-technology industry and the production of solar panels and wind turbines in particular, as well as the design of ever more highperformance geothermal energy and tidal power plants. Renewable energy resources and significant opportunities for energy efficiency exist over wide geographical areas, in contrast to other energy sources, which are concentrated in a limited number of countries. Rapid deployment of renewable energy and energy efficiency, and technological diversification of energy sources, would result in significant energy security and economic benefits.

The deployment of renewable technologies usually increases the diversity of electricity sources and, through local generation, contributes to the flexibility of the system and its resistance to central shocks. For those countries where growing dependence on imported gas is a significant energy security issue, renewable technologies can provide alternative sources of electric power as well as displacing electricity demand through direct heat production. [www.1]

The security of energy supply guaranty in Europe

The EU energy policy has to securely supply energy to all 500 million European citizens. To complete the internal energy market, the EU has to enhance security of supply, to enable the integration of renewable energy sources, to upgrade and modernize electricity grids and to ensure the interconnection and interoperability between Member States' (MS) energy infrastructure as well as the integration between trans-European energy networks with the energy infrastructure of the neighbouring countries. [www. 5]

The third energy package established the framework to develop the Pan-European energy infrastructure. The 10 year investments plan should not only provide flexibility to the internal energy market and increase the security of supply, but will identify the needs for further investments in order to remove the energy islands. A total of €750m will be made available for first priority projects mainly in the gas and electricity sectors under the Connecting Europe Facility (CEF). These projects will address security of supply issues and help bring an end to the energy isolation of some member states. They will also contribute to the completion of the EU-wide internal energy market and to the integration of renewables to the energy grid. The EU funding aims to accelerate investment in missing cross-border links by leveraging the necessary private and public funding.

European Commissioner for Energy, Günther Oettinger, said: "This is a crucial step. Such a huge amount of EU financial support will make a solid difference. The current Ukraine crisis underlines the importance of upgrading energy infrastructure and building missing interconnections between member states in order to enhance the energy security in the EU. In general, member states can only help each other with energy supplies if they are well connected. Moreover, improving the energy infrastructure is a prerequisite for completing the internal energy market for the benefit of consumers and businesses in the EU."

The EU's dependency on gas imported from third countries is above 60%. The Black Sea Region (BSR) is of geostrategic importance, in particular for energy security and the diversification of EU energy sources and of energy supply routes, given its proximity to the Caspian Sea, the Middle East and Central Asia. Therefore, we stress the European added value and the importance of the Southern Gas Corridor as a means of enhancing the EU's security of supply. Projects such as the Nabucco pipeline, a key priority project for the EU, along with smaller projects, such as the Trans-Adriatic Pipeline (TAP), the Pan-European Oil Pipeline (PEOP), the Turkey-Greece-Italy (ITGI) or Azerbaijan-Georgia-Romania the (AGRI). Interconnectors should be sped up and supported. Furthermore, new gas pipelines should be built between Bulgaria and Romania, between Greece and Bulgaria, Germany and Austria, Hungary and North-Eastern South-Eastern Slovakia, and

Germany (OPAL). In addition, reverse flow capacity is needed to be built between Greece, Turkey and Bulgaria, between Hungary and Romania, Hungary and Bosnia and Herzegovina, Germany, Czech Republic, Slovakia and Hungary, Adriatic Sea and Austria, Italy and Austria, Italy and Slovenia, Austria and Slovenia. In addition to this, the Eastern Baltic Sea region requires urgent action to ensure security of supply through connection to the rest of the EU.

The North South corridor in Western Europe should remove the bottlenecks in the internal market and should in particular improve the interconnection between France and Spain.

The interconnections between Member States' national gas infrastructures should not only include projects which are pure "reverse flow projects", but also ones which contribute to the improvement of European security of supply.

Related to the security of oil supply, EU should improve the connection between the Western European pipeline network and the Eastern infrastructure. Therefore, a new pipeline between Austria and Slovakia, the upgrade of Adrian pipeline and of Odessa-Brody pipeline, including its extension to Poland, are also considered as EU priorities.

The EU should urgently develop a Pan-European Smart Grid, able to use the electricity produced locally or regionally from renewable sources and integrated within the required infrastructure for the use of electric or hybridvehicles. This requires better inter-connections between the national electricity grids of the Member States, especially the interconnections between France and Spain, the Baltic Energy Market Interconnection Plan and between Poland and Lithuania.

A special importance should be attached to the development of the cross-border sections of the European energy infrastructure, which should be better supported by European funds. [www.3]

Conclusion

In order to reduce EU's dependency on energy products imported from third countries which are traditional partners, the EU should be more focused and should invest more in energy efficiency measures. The improvement of energy efficiency of the building sector as well as of the transport sector will reduce primary energy consumption and CO_2 emissions. Therefore, the upgrade of urban district heating and cooling networks as well as the introduction of smart metering should be part of EU priorities and should be properly reflected and supported by the current and future financial perspectives.

Under the CEF, a total of €5.85bn has allocated to trans-European energy been infrastructure for the period of 2014-2020. The grant money will be available to finance studies and construction works. While oil infrastructure projects are excluded from any form of financial assistance, grants for studies are available to all other projects of common interest. In general, the amount of EU support cannot exceed 50% of the eligible costs. In exceptional cases, when a project will contribute significantly to the security of supply or boost energy solidarity between member states, the EU support can amount to 75% of the costs. The application deadline for proposals is 19 August 2014. [www.4]

References

- [1] Andrejovský, P., Demjanová, L., Gajdoš, J., Naščáková, J., Ručinský, R.: Booklet Renewable Energy Sources - Output of the project ENER-SUPPLY "ENergy Efficiency and Renewables – SUPporting Policies in Local level for EnergY". http://enersupply.euke.sk/?page_id=16,
- [2] Gajdoš, J., Naščáková, J., Andrejovský, P., Ručinský R.: ENER SUPPLY - Reasons for participation in the international project SEE/A/037/2.4/x – ENER SUPPLY "Energy efficiency and renewables – supporting policies in local level for energy." In: Reviewed proceedings. Košice 2010, ISBN 978-80-225-3207-5,
- [3] Rybár, R., Kudelas, D.: Energy sources classification and interpretation terms in the context. In: Acta Montanistica Slovaca, Vol. 12 (2007), Iss. 2, 269-273 Source at: http://actamont.tuke.sk/pdf/2007/s2/6rybar.pdf
- [4] Vlahinić N.: Regional Electricity Market and Free Trade Area in Southeast Europe: Position of Croatia. Lecture, Summer School 2014, EFRI, Rijeka

Websites:

www.1:

http://ec.europa.eu/energy/doc/20140528_ener gy_security_communication.pdf

www.2:

http://ec.europa.eu/energy/security_of_supply _en.htm

www.3:

http://ec.europa.eu/energy/publications/doc/20 110601_the_european_files_en.pdf

www.4:

http://www.paneuropeannetworks.com/energy /e750m-for-energy-infrastructure-projects/

www.5:

http://www.ener-supply.eu/en/index.php