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## ENERGY STRATEGY OF UKRAINE IN BLACK SEA REGION: BILATERAL AND MULTILATERAL FORMATS

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In the article the author considers the major problems of Ukrainian energy sector and how the cooperation with the Black Sea countries could contribute to its development as well as to the strengthening of energy security of Ukraine and the whole region. Special attention is paid to the different formats of such cooperation including bilateral and multilateral formats.

**Key words:** energy strategy, energy security, transit routes, harmonization of energy legislation, EU 3<sup>rd</sup> energy package, FDI, green energy, BSEC, GUAM.

The unique geographical location of the Black Sea region and its increasing role in the transit of energy resources enhance the geopolitical importance of the region, while increasing its vulnerability in the area of security. In recent decades, the Black Sea region has become increasingly important as a crossroads of the national interests of the leading regional powers (primarily Turkey, Russia and Ukraine), as well as geopolitical and geo-economic interests of such major world players as the United States and the European Union.

The reason for the attention of the external forces to the Black Sea region is, first of all, its transit significance: important transport routes linking Western countries with rich hydrocarbons in Central Asia and Transcaucasia are located here. The projects of new gas pipelines, which are planned to be conducted along the Black Sea, in conjunction with the rich deposits of shale gas and gas hydrates in the region make it possible to predict the growing role of the Black Sea region in the world economy and geopolitics.

The increasing importance of this region requires from Ukraine, which has a serious political and economic interests in this area, the development and implementation of consistent and effective long-term policy of economic cooperation with the countries of this region, especially in energy sector, in bilateral and multilateral formats.

Just to understand what role Ukrainian energy sector could now play in Black Sea region and what could be its strategy for mid-term and long-term perspective it is necessary to give an assessment of the current state of the energy sector in Ukraine.

Today the situation in the energy sector of Ukraine is extremely complicated. The main reason is the tremendously difficult political and economic situation that has developed in the country as a result of the annexation of the Crimea and the military conflict in Donbass region. This conflict led not only to the deaths and suffering of tens of thousands of Ukrainians, but also to significant material losses, the disruption of economic ties, and a sharp aggravation of social problems in the country.

In the energy sector this conflict caused significant decline in coal production, which is still one of the major sources of electricity generation. The production of coal has been decreased during last three years by almost 50%.

Especially difficult situation has happened with anthracite coal which is mostly produced on uncontrolled territories. This coal is used by 50% of Ukrainian thermal power plants.

The consumption of electricity due to serious decline in Ukrainian industry was also shortened approximately by 20%.

Ukraine lost serious amounts of hydrocarbons' production. Only in Crimea in 2016 it was produced more than 1.6 billion cubic meters of gas. In Donbass area the Production Sharing Agreement with Shell on shale gas production was terminated in 2014. This so called Uzivska project with Shell had the potential to provide in few years more than 8 billion cubic meters of gas annually.

The conflict with Russia also raised a very urgent issue of how to ensure an acceptable level of energy security of Ukraine in current circumstances. To resolve this problem the Government of Ukraine made a decision to provide a complete reorientation of Ukraine's energy sector in the purchases of energy supplies, power equipment and technical components.

Now, the direct purchases of gas in the Russian Federation are close to zero. Today, almost all the vol-

ume of imported gas (which is about 11 billion cubic meters) is supplied by European counterparties through reverse schemes.

Within the framework of the agreements with the Westinghouse Company, there is a constant increase in the numbers of its fuel rods used in Ukrainian nuclear reactors, which replace Russian TVELs.

The projects on completion of 3<sup>rd</sup> and 4<sup>th</sup> units of Khmelnytsky NPP and construction of a Plant for the Production of Nuclear Fuel, which were supposed to be implemented with the Russian side, have been stopped.

In addition, recently it was decided to organize total blockade of the goods, which are delivered from uncontrolled territories of the Donbass. As a result of such decision coal purchases from these territories, mostly anthracite, were completely stopped.

Of course, such solutions have their own, rather high price. Reverse gas from Europe costs Ukraine 20-30 dollars per 1,000 cubic meters more than direct supplies from Russia. The fuel from Westinghouse is also more expensive than Russian TVELs.

As a result of the termination of coal purchases from uncontrolled territories, Ukraine experienced a total deficit of anthracite coal. Today 5 out of 6 thermal power plants that work on anthracite coal are stopped. And it is extremely difficult to replace this coal from other sources in required volumes because of its relative scarcity in the world, insufficient level of development of the corresponding port infrastructure in Ukraine.

Of course, it is also the issue of price. Even after the establishment in 2017 of the price formula for coal, used at thermal power plants (so called "Rotterdam +"), it did not exceed 1700 UAH per ton or slightly more than 60 US dollars (before 2017 the price of coal was 1100 UAH per ton or about 40 US dollars). Now the price of such coal at the last tender, which was held by the state-owned power generation company Centrengo, amounted to more than \$ 95 per ton.

The ongoing military conflict accelerated the efforts of Russia to organize the transit of Russian gas to Europe using the pipelines which bypass the territory of Ukraine. Today, a number of decisions have been made that open the way for Gazprom to start the construction of such gas pipelines - the Nord Stream-2 and Turkish Stream. As a result, gas transit via the Ukrainian gas transit system could be reduced to minimum level and will not be economically viable.

Another very serious problem in Ukrainian energy sector is that almost all thermal generation plants are

over 40 years old. And today the level of depreciation of the most of thermal units' equipment is close to 90%. In nuclear generation by 2020 the regulatory deadlines for the operation of almost all nuclear power units are going to be completed and they require the prolongation of their service life. Therefore the industry requires a sizable investments not only in modernization of existing facilities but also in construction new generation capacities.

But despite all these difficult problems Ukraine's energy sector it still remains one of the largest energy sectors in this part of the world. Very diversified energy mix which includes 4 nuclear power stations with 15 nuclear power units, 14 thermal generation plants with total installed capacity of more than 25 thousand MW, rising renewable energy capacities, extensive high voltage grid which effectively supports United Energy System (UES) of Ukraine together with second largest in Europe (after Russia) gas pipelines network makes Ukraine a very important player in Eastern Europe and Black Sea region.

To resolve existing problems in the energy sector Ukraine needs to accelerate radical reforms in order to ensure the country's energy security, attract investment in the extraction of energy resources, modernize existing and build new energy facilities, develop green energy.

Considering that in 2011 Ukraine became a Contracting Party of the Treaty Establishing of the Energy Community the major directions of reforms in the energy sector are carried out in accordance with the obligations undertaken by Ukraine to implement the Third Energy Market Package of the EU.

This Package was adopted by EU in 2009 to accelerate investments in energy infrastructure to enhance cross border trade and access to diversified sources of energy. It consists of two Directives and three Regulations ([1], [2], [3], [4], [5]):

Directive 2009/72/EC concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC;

Directive 2009/73/EC concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC;

Regulation (EC) No 714/2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003;

Regulation (EC) No 715/2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005;

Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 es-

tablishing an Agency for the Cooperation of Energy Regulators.

The major goal in adoption of these documents is to correct existing market transposition in the electricity and gas legislation in all EU Member States, mainly to offset the problem of the market concentration on the energy market in the EU where a small number of companies control a large part of the market. The EU 3<sup>rd</sup> Energy Market Package provides three options to weaken the market power of the biggest energy firms: ownership unbundling, independent system operator (ISO) and independent transmission operators (ITO).

Ownership unbundling is intended to separate generation from transmission (in electrical sector - from electrical generating facilities through electricity network to a distribution system operator or to the consumer). Such approach could ensure that the European energy market will not suffer from vertical integration. There are some controversial issues concerning this approach, including the questions of the ownership of transmission networks, principles of regulation of such markets, possible compensations to the energy firms, effectiveness of the whole scheme, etc ([6], [7], [8]).

If the transmission networks will remain under the ownership of energy groups, the operation and control of their activities should be provided by an independent system operator, which could also participate in investments into the networks using its own funds ([9]). Such a scheme is a specific form of ownership unbundling, which helps to eliminate conflict of interest in transmission operation.

The other option in the case when energy companies retain ownership of their transmission networks is to establish on the base of their transmission subsidiaries legally independent joint stock companies operating under their own brand name as an independent transmission operators, with strictly autonomous management and under stringent regulatory control.

In Ukraine the implementation of the 3<sup>rd</sup> Energy Market Package aimed at harmonization of Ukrainian energy legislation with European energy aquis is realized through adoption and implementation of the laws on the gas market and the electricity market were. These laws and related regulations are aimed at formation of competitive energy markets, the establishment of market prices for energy products, and the attraction of domestic and foreign investment in this critical sector of the economy.

In particular, within the framework of the Law on the Gas Market it was initiated the unbundling of the state monopoly NAK Naftogaz of Ukraine into sepa-

rate, legally independent companies for the production of hydrocarbons, the transit of gas to the territory of Ukraine and the sale of gas to consumers, as well as the division of oblgases (private regional gas companies, holding a monopoly position in the regional gas markets) into separate legal entities responsible for gas transportation and its realization to the consumers.

In electricity sector the implementation of the Law on Electricity Market envisaged the transition from the existing "pool" model to the market model for direct contracts and a balancing market, which creates new opportunities for attracting investments in so needed modernization of outdated equipment and construction of the new electric generation capacities.

The reforms in the electricity and gas sectors already facilitated several positive developments. Recently the Agreement on Joining of the United Energy System of Ukraine to the ENTSO-E was approved by the Regional Group Continental Europe of the ENTSO-E. The signing of this Agreement will be a turning point of the integration of the UES to its European counterpart. This will enhance the sustainability of the UES, provide the opportunity to strengthen the competition on Ukrainian market, facilitate the increase the export of the electricity from Ukraine to EU.

At the same time several ambiguous decisions were made in the reform process, especially in the sphere of tariff policy, when gas prices were raised instantaneously almost 6 times, the tariffs for electricity more than 3 times in the year and half period, for heat and other types of communal services more than 2 times.

It seems that in such an unprecedentedly sharp increase in tariffs there are no winners except the top management of Naftogaz Ukrainy, whose revenues in 2016 increased more than 13 times and amounted to an average of almost UAH 9 million annually or about 330 thousand US dollars.

In fact, the profitability of Naftogaz is ensured by direct transfers from the budget of huge amounts of subsidies (their total volume was about 50 billion UAH). At the same time, the level of public utilities payments of a rapidly declining population sharply decreased, despite the fact that more than half of the country's households have already issued subsidies (this, by the way, is a record indicator, and not only for European countries). As a result, for example, even in Kiev, far from the poorest city of Ukraine, the level of utility payments in December 2016 fell to 58% (previously it was at least 90%). Of course, this is the way to nowhere.

Analyzing the potential of cooperation in the energy sector with countries of Black Sea region it should be mentioned several areas.

First of all, within the framework of further diversification of energy supplies Ukraine is interested in supplies of the hydrocarbons produced in this area. In this regard there is certain potential for supplies of natural gas from Georgia, if the reports of the discovery in the South Kakheti region of gas deposits with the capacity of more than 5 trillion cubic meters will be confirmed. In 2015 the American company Frontera Resources already prepared a contract with Naftogaz on the supply of Georgian gas to Ukraine, expressing readiness to build a terminal for receiving liquefied natural gas in Ukraine.

In regard to the issue of security of energy supplies, the formation of the coordinated political position of the countries of this region became of crucial importance. It is especially true in the case of the development by Gazprom of the new pipeline project in Black Sea area - Turkish Stream. This project not only significantly reduces the volume of gas transit by the territory of Ukraine, but also is a direct competitor of the TANAP project for the transportation of gas from Azerbaijan through the territories of Georgia and Turkey to Europe. And the recent start of its implementation calls into question the feasibility of building a gas pipeline that is extremely important for the economies of these countries.

Another important area of cooperation may be the participation of Ukrainian design, construction and engineering companies in the implementation of energy projects in the countries of the Black Sea region. Ukraine has a vast experience in the implementation of such projects, many of them with the participation of international financial organizations like the World Bank, EBRD and EIB. This includes the construction of high-voltage networks and substations (750, 330, 220 kV), the construction of large hydrotechnical facilities such as the Dniester Hydro Pump Storage Station (the 4th largest in the world with total capacity of 2268 MW), the modernization of the hydro power stations' cascade on the Dnieper river, the construction of gas pipelines and compressor stations with gas and electric drives. The experience and high qualification of Ukrainian designers, engineers and constructors can be very much in demand in these countries.

Very important in today's geopolitical situation is the continuation of active cooperation in the multilateral formats, in particular, within the framework of Black Sea organizations - Organization of the Black



Sea Economic Cooperation (BSEC) and Organization for democracy and economic development – GUAM ([10], [13]). This is especially true in the energy sector, given the strategic importance of this region in the context of ensuring energy security in Europe and other countries.

The decisions of the Member States of BSEC ([11], [12]) have been focused on Energy Efficiency, Green Energy, Oil and Gas Transportation, Creation of a Data Bank on Energy Programs and other important issues. It will help to join their forces with support from international financial institutions (IFI) and multinational companies in implementation such an ambitious projects as development of the interconnection of electric power systems encompassing all the member states, creation an integrated Black Sea energy market, which is aimed at harmonizing the energy legislation of the BSEC member countries. Active participation in this project will help expand opportunities to attract investments in the energy sector of our countries from the EU and IFI, increase the energy security of the region, and increase the use of renewable energy sources.

The experience of Ukraine proves the effectiveness of participation in the Treaty Establishing of the Energy Community. Among the countries of this region Georgia recently received observer status. The proposed by the High Level Reflection Group of the Energy Community more flexibility in the time and scope of the adaptation of the energy acquis ([14]) could speed up the process of adaptation to European

energy legislation other countries of the region. This, of course, will help accelerate the processes of creating energy markets the whole area, and, thereby, increase the opportunities for our cooperation.

The other large area of cooperation in the Black Sea region is the development of the green energy. This direction becomes a priority global trend in the energy sector. Ukraine in this sense is no exception. So far, the share of renewable energy sources does not exceed 1% in the total energy balance, and their installed capacity is 1.1 GW (while in the Crimea there are almost 500 MW of such facilities built in 2010-2013, including such large ones as SES Perovo with a total capacity of 106 MW). However, starting from last year in Ukraine, the construction of such facilities was dramatically accelerated - in 2016 120 MW was commissioned or 4 times more than in 2015, and in the 1<sup>st</sup> quarter of 2017 – 66 MW (more than half of the previous year). The development of this type of energy will continue at an accelerated pace and by the beginning of the 2020s Ukraine will achieve a share of 10% of total energy production from green energy facilities. This direction should be one of the priorities in our cooperation.

Considering the importance of energy sector for the Black Sea area and that with the most countries of this region Ukraine has a long history of friendship and good-neighborly relations, there are all needed opportunities for the successful development of cooperation in the energy sector that will contribute to the prosperity of the countries of this region.

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**Макуха В. Енергетична стратегія України в Чорноморському регіоні: двосторонні і багатосторонні формати**

У статті розглядаються основні проблеми українського енергетичного сектора і як співпраця з країнами Чорноморського регіону могло б внести свій вклад у його розвиток, а також у зміцнення енергетичної безпеки України і всього регіону. Особлива увага приділяється різним форматам такого співробітництва, включаючи двосторонні та багатосторонні.

**Ключові слова:** енергетична стратегія, енергетична безпека, транзитні шляхи, гармонізація енергетичного законодавства, третій енергетичний пакет ЄС, ПІІ, екологічно чиста енергія, ОЧЕС, ГУАМ.

**Макуха В. Энергетическая стратегия Украины в Черноморском регионе: двусторонние и многосторонние форматы**

В статье рассматриваются основные проблемы энергетического сектора Украины и как сотрудничество со странами черноморского региона могло бы способствовать его развитию, а также укреплению энергетической безопасности Украины и всего региона. Особое внимание уделяется различным форматам такого сотрудничества, в том числе двусторонним и многосторонним.

**Ключевые слова:** энергетическая стратегия, энергетическая безопасность, транзитные маршруты, гармонизация энергетического законодательства, энергетический пакет ЕС, ПИИ, зеленая энергия, ОЧЭС, ГУАМ.

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