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Dudin, Mihail Nikolaevich; Frolova, vgenia vgenevna; Sidorenko, Valentina Nikolaevna et al.

## Article

# Energy policy of the European Union : challenges and possible development paths

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## Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics  
Düsternbrooker Weg 120  
24105 Kiel (Germany)  
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)  
<https://www.zbw.eu/econis-archiv/>

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## **Energy Policy of the European Union: Challenges and Possible Development Paths**

**Mihail Nikolaevich Dudin<sup>1\*</sup>, Evgenia Evgenevna Frolova<sup>2</sup>, Valentina Nikolaevna Sidorenko<sup>3</sup>, Ekaterina Alexandrovna Pogrebinskaya<sup>4</sup>, Irina Vladimirovna Nikishina<sup>5</sup>**

<sup>1</sup>Russian Presidential Academy of National Economy and Public Administration) 82, Vernadsky Prosp., Moscow 119571, Russian Federation, <sup>2</sup>Peoples' Friendship University of Russia (RUDN University) 6, Miklukho-Maklaya Street, Moscow 117198, Russian Federation, <sup>3</sup>Moscow City Teacher Training University 2<sup>nd</sup> Sel'skokhozyaystvenny Proezd, d. 4, Moscow 129226, Russian Federation, <sup>4</sup>I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University) 2-4 Bolshaya Pirogovskaya Street, Moscow 119991, Russian Federation, <sup>5</sup>Moscow Institute of Economics, Politics and Law Klimentovskiy Pereulok, House 1/18 Building 1, Moscow 115184, Russian Federation. \*Email: [dudinmn@mail.ru](mailto:dudinmn@mail.ru)

### **ABSTRACT**

Energy policy is an important part of economic, environmental, and overall public policy of each country. For a long time, energy policy is being one of the most significant issues of each state and depends on many factors, including the availability of fossil energy sources and the geographic location of the country, access to natural resources, as well as political relations between energy exporters and importers. The article aims at analyzing the views of foreign authors on the assessment of the energy policy in the European countries in the context of further diversification and security of fuel supply, energy market liberalization, and renewable energy development. The article discusses the current state of energy policy of the European Union (EU) member countries. The main tenet of this policy is the requirement to resolve the problems existing in the energy sector to ensure energy security. The EU countries import more than half of all energy consumed, and reducing this dependence provides for the completion of the gas market liberalization, the deployment of low-carbon technologies, renewable energy development, as well as enhancement of energy efficiency and energy saving. The authors analyze the energy policies of France and Germany, which are leaders in European energy policy. Besides, the article presents historical analysis of changes in the EU energy policy vector, as well as the main provisions of the new energy strategy to resolve European energy security problem. The article is prepared based on the analysis of works of foreign and Russian authors including politicians, officials, and researchers, as well as analysts and experts in the energy industry.

**Keywords:** European Union, Energy Policy, Energy Security, Fuel Sources, Energy Efficiency, Energy Conservation, Energy Intensity

**JEL Classifications:** Q40, Q43, Q49

### **1. INTRODUCTION**

The energy policy of a particular country is dependent on fuel imports and, in turn, on the country's integration into the energy system, involvement in joint European energy policy, which ensures protection against the impact of energy crises. Despite the significant commitment of the European Union (EU) member countries to ensure their energy security, the current state of their energy policy requires careful study of the existing problems in the European energy sector and their further solution.

Currently, the EU countries import more than half of all energy consumed. At that, the imports of crude oil amounts to more than 90%, while natural gas - 66%. In regard to natural gas supplies, many countries heavily depend on a single supplier, including Russia (Energy Security Strategy, n. d.). Russia is a key source of oil and gas supplies for Europe. Thus, in 2013 Russia supplied 29% of total oil imports (22% of consumption) and 39% of gas imports in the EU (27% of consumption) (Kieman, n. d.). The main oil and gas suppliers to Europe include also Middle East and North Africa. Such dependence on imported energy sources makes the EU vulnerable to supply

disruptions due to political or commercial conflicts as well as failure of infrastructure.

The import dependence of the EU countries in the energy sources differs in fuel amount and types. Today, there are several countries that are fully dependent on imports (Lithuania, Cyprus, and Malta). In other countries (Italy, Portugal, Spain, and Ireland) the import ranges from 80% to 90% of energy sources. There is also a group of countries, whose dependence on imports is rather limited (Poland, Romania, and the Czech Republic). The most independent in terms of energy supply is France, which produces 75% of energy at nuclear power plants, as well as Great Britain, which has its own oil and gas fields located in the North Sea that provide about 70% of domestic demand in energy, while the remaining 30% come in the form of gas imports from Norway or Qatar liquefied natural gas (LNG) (Dyduch, 2015). Note that European oil exporters can supply from multiple sources, whereas gas markets depend only on one supplier. Expanding options for natural gas supply in the EU is the basic EU energy policy, which provides for easing of dependence on Russian gas. At that, today the share of gas imports to the EU from Russia is lower compared to 1990, when it was 75% of the total supply. Thus, in 2013, this figure fell down to 39% mainly due to the emergence of suppliers such as Qatar and Norway (Riis-Johansen, n. d.).

## 2. RESEARCH METHODOLOGY

The research method used was based on retrospective analysis of the views and opinions of the European expert community (politicians, officials, and researchers, as well as analysts and experts in the energy industry) involved in the issues related to energy policy in the European countries, as well as consideration of the probability of their supply with domestic energy sources, dependence on imported oil and gas supplies, the prospects for the energy infrastructure development, the ways to complete creating a single EU energy market, and analysis of EU regulatory documents.

## 3. RESEARCH OUTCOMES

According to experts, the peculiarity of the EU energy policy is a discrepancy between the EU member countries in terms of creating common energy market and its liberalization. Thus, wide privatization of the energy sector was carried out in the UK in 1970. This policy continued throughout the 1990 s and was completed in 1999 with the creation of the wholesale internal energy market and its liberalization. The energy sector in the UK was one of the 1<sup>st</sup> economy sectors in the world, who came out from the state monopoly. Six major energy companies are currently operating in the domestic electricity market, while 7 companies are operating in the gas market, 5 of which are also major producers (Communication from Commission to European Parliament and Council European Energy Security Strategy, COM/2014/0330 final, n. d). Energy sector in France, as before, remains largely under state control. Germany takes a somewhat ambiguous position on the creation of a common energy market. On the one hand, German authorities defend European integration,

while on the other hand, Germany protects its companies against the reforms implemented in most other countries.

In fact, each European country has its priorities in economic policy. For this reason, Annika Hedberg, senior political analyst at the European policy center, noted that the energy security of the EU member countries suffers from the lack of political cohesion of these countries, as well as existence of many national mini-markets (Hedberg, 2015).

Consider energy policy, primarily with regard to France and Germany, which are considered the two leaders in Europe's energy policy. In the late 1950 s, both France and West Germany moved away from coal as the primary energy source towards imported oil. From 1960 to 1973, the share of coal in meeting public energy needs decreased in West Germany from 77% to 31%, while in France - from 55% to 17%. After the oil crisis in 1973-1974, countries went their separate way in the implementation of energy policy. Thus, France has pursued a coherent national policy based on an ambitious nuclear program as a single alternative to oil, while Germany has implemented a decentralized economy adapted to high oil prices (Jebsen, n. d.). Today, France is the European leader in the nuclear energy production, while Germany plans to completely abandon from nuclear fuel until 2020 and is gradually moving away from fossil fuels towards renewable energy sources and energy efficiency (Bitoune, 2015).

The main path of energy policy in France is the development of nuclear energy. France is one of the few countries, where operate all the nuclear fuel cycle facilities including conversion, enrichment, fabrication, and reprocessing of nuclear materials; though France critically lacks other energy resources. Gas production provides <1% of the national production of primary energy; while oil provides about 1.8% of the total consumption. The demand for fossil fuels is provided only through imports. To reduce energy dependence, France began to invest in renewable energy (Meritet, 2010). Today France operates 58 commercial nuclear reactors that produce 80% (previously 75%) of the internal energy (Nuclear Energy in France, n. d.).

Germany depends heavily on imported energy. Natural gas is imported into the country solely through cross-border gas pipeline. Germany is the largest importer of gas from Russia in Western Europe. It produces just about 15% of natural gas, while Russian import is about 40% of all gas consumed. There are 47 gas storage facilities in the country, which must provide access to natural gas for all companies and at a fair market price. There is also no infrastructure of LNG. In the country there are several legal instruments for emergency response with regard to natural gas. In case of emergency, the supply, sale, purchase, use of gas by volume and time may be limited, or special permission may be set for use of gas in specific order only in the case of the vital energy needs. Besides, policies are implemented towards further reduction of natural gas consumption through the development of bio fuels (up to 2020 its share should reach 10% of the total fuel consumption) as well as alternative fuels, implementation of progressive taxation, and efficiency standards for buildings and transport (Oil and Gas Security, 2012). Even today, renewable

energy sources reduce Germany's dependence on energy imports making it less vulnerable to unpredictable fluctuations in the prices on fossil fuels and the political risks (Morris and Pehnt, 2012). Ambitious goals of Germany's energy policies consist in achievement of 55% share of renewable energy in electricity generation by 2035 (in 2014, renewable energy sources [RES] accounted for 28%) (Schmid, 2014).

#### 4. DISCUSSION

European gas market development and functioning is influenced by many diverse factors such as economic, technological, political, environmental aspects, which are interrelated and greatly influenced by each other. First of all, these are factors caused by the global economy, the development and implementation opportunities for new gas production and transportation technologies. Not less important are the political factors, in particular, the EU policy to diversify gas supply sources and the production of unconventional gases, as well as Russia's policy to diversify markets and gas transportation routes. Essential are domestic-related policy decisions on the establishment of a full-fledged gas market. Among the environmental factors, first and foremost, we should highlight the changing in environmental requirements, and implementation of scenarios of European energy sector decarbonization.

In general, the EU energy policy is focused on reducing the consumption of fossil fuels and increasing renewable energy production. Such goals were set for the first time in 1997 in the White Paper of the European Commission, which covered the period up to 2012. In 2010, the objectives were revised and reflected in the new EU economic development strategy for the next 10 years, which was called "20-20-20" and was aimed at improving energy efficiency and decarbonization of the European energy sector. The document indicated the following main objectives: Increasing by 2020 the share of RES in total energy consumption up to 20% (binding target), reducing greenhouse gas emissions by 20% relative to 1990 levels, enhancing energy efficiency by 20%, and increasing the use of bio fuels in transport to at least 10% (binding target) (D'Oultremont et al., 2015).

In 2011, the European Commission adopted an even more radical scenario for the EU energy development entitled "Energy Roadmap 2050", which was considering 5 possible decarbonization scenarios based on various events, namely, significant improvements in energy efficiency and conservation, increasing the share of renewable energy in the power balance, and diversification of energy supply sources. At that, in the EU member countries in 2020 the share of natural gas in total consumption of energy was planned to be at the level of about 25% that almost corresponds to its share in 2000. Nevertheless, according to some experts, the target reduction of emissions by 80% can be achieved at lower cost and with less risk, if by 2050 the European economy will use the natural gas more intensively. Thus, the "Energy Roadmap 2050" has led to increased uncertainty regarding demand for gas in the EU (D'Oultremont et al., 2015).

Another set of documents, which also has a significant impact on the functioning of the natural gas market in Europe, is Directive

of the European Parliament and of the Council 2009/73/EC of 13.07.2009 "Common Rules for the Internal Market in Natural Gas" (Third Gas Directive), which radically changes the structure of European wholesale gas market. Today this document is the final document governing long-term change in the EU gas sector. However, it is not a document with direct effect, since its provisions should be included in the national legislation of the EU member countries. As envisioned by the European Commission, the reform of the EU wholesale trade sector in the first place should be aimed at reducing the monopoly position of major companies such as ENI, Ruhrgas, Gas de France, and others in the domestic markets and the EU market in general. At the same time, the "Third Gas Directive" requires the separation of vertically integrated companies, i.e. the separation of activities on gas production, transportation, and distribution, which applies to the EU gas companies and other companies operating in the EU market. Also, the directive provides for a ban on investment of companies from countries that are not EU member states if they do not meet the requirements on the separation of functions for the extraction and transportation of energy sources, or if the emergence of these companies in the EU market could threaten the energy security of the EU member countries. Therefore, this document has an impact on the potential distribution of pipeline gas flows between alternative transit routes.

The summit of the EU member states represented by their heads and governments was held on May 22, 2013. This summit is considered to be one of the most notable milestones in the development of the EU energy policy. Representatives of the energy industry (E.ON and RWE (Germany), GdF Suez (France), ENI (Italy), Ibedrola and Gas Natural Fenosa (Spain)) appealed to the leaders of the EU member states with a proposal to make radical changes in the EU energy policy. This proposal aimed at ensuring the competitiveness of the European economy through re-industrialization. In the context of the fall in the share of industry in total gross domestic product (GDP) of the EU and a general weakening of the European economy, the environmental aspects recede into the background. More attention is paid to the growth of energy costs and weakening competitiveness, which pushed activities to prevent climate change to second place.

During 2013-2014, issues were raised about the future of the EU energy strategy, as well as the targets next after those that have been identified to be achieved in 2007. Public statements a few months before the EU energy summit gave a clear indication of the decisions that must have been taken at the meeting. Thus, on March 27, 2014, Angela Merkel, after meeting in Berlin with Prime Minister of Canada Stephen Harper, said that the reduction of dependence on Russian supplies is extremely essential. Moreover, she announced the consideration of the whole EU energy policy under a new perspective (Konflikt Mit Russland: Merkel stellt Komplette Energiepolitik in Frage, 2014).

A new EU energy security strategy was published on May 28, 2014. The major focus of the strategy was given to gas supply, which amounts to 42% in imports and 27% in the energy consumption structure. The European Commission hopes to increase gas supplies based on alternative sources, as well as the



development of interconnectors. i.e., pipelines, which cross or span a border between the EU member states for the purpose of connecting their national pipeline systems.

The list of short-term measures, which should help the EU to overcome potential disruptions in gas supply, is reduced to the accumulation of stocks in storages and developing plans to reduce consumption at the national level. It is proposed also creating a strategic reserve by transferring part of the underground vaults to the control of the EU or the International Energy Agency (IEA).

The document also proposed to establish the European Energy Union. It is about combining energy and climate policy in European countries. It was proposed to establish at the first stage a coordinating mechanism, under which the EU member states would have the opportunity to discuss energy policy in general as well as the individual steps (for example, the conclusion of large-scale contracts with Gazprom). According to this document, in preparation for the signing of agreements with third parties, the EU member states should inform the European Commission about the details of the transactions and tune in to its recommendations. There was a proposal to create a unified energy policy management of all 28 EU member states to combine isolated peripheral energy markets in Europe with the main EU market. In this case consumers will benefit from lower prices. The EU member states should conduct joint negotiations about purchase of gas from monopolistic suppliers such as Russia (Buchan and Keay, 2015).

Thus, the specific provisions of the EU energy strategy include the following:

1. In the short term: Adopting measures to mitigate the possible disruptions of gas supplies in winter. First and foremost, measures will be taken with regard to those countries that are most dependent on supplies (Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Finland, and Slovakia).
2. In the longer term: Increasing supplies from Norway and Algeria as well as establishing the “gas relations” with Greece, Cyprus, and Israel. Although these steps are important, they will not be able to fully meet the requirements of the EU.
3. Also in the long term it is planned to construct LNG terminals to import gas from Qatar or the United States.
4. Constructing the southern gas corridor to transport gas from the Caspian Sea that became also a strategic initiative. Günther Oettinger defined the idea of the southern gas corridor as a key and vital initiative (European Energy Strategy, 2014).
5. Reforming the European energy infrastructure has become another strategic initiative along with creating additional capacities for gas transportation and storage. The ultimate goal of these steps is to form a single European gas market instead of a few dozen of national markets.
6. The increase in the share of alternative energy sources in the overall energy consumption has already become a traditional article in the EU energy documents.

However, not all of the above initiatives were supported equally. For example, Great Britain opposed the idea of creating an energy union and a mechanism of concluding collective agreements with Gazprom, stressing the need to respect market conditions and

arguing by the fact that the energy systems of the countries are too different, as well as their energy consumption structure, while the implementation of the scheduled steps requires considerable time. In the end, parties came to an agreement that the best way to reduce energy dependence on Russia is to reduce actual energy requirements, on the one hand, and the decarbonization of power industry, on the other hand.

A new energy strategy did not contain references about increasing energy efficiency, and this became its significant disadvantage. Although, the European Commission declares the necessity of adopting more stringent standards of increasing energy efficiency until 2030, part of the EU countries opposed it. We have to remember also the specifics of economic development of each EU country, because exactly this will determine their attitude to energy strategy and the energy community. So, for example, the Polish economy requires incentives to achieve the average European level, while for Germany enhancing energy efficiency is just an additional way to retain economic leadership and increase the efficiency of the economy. Therefore, Poland is in greater need to implement new energy initiatives and is actively lobbying them (Formuszewicz and Gawlikowska-Fyk, 2014). Comparison of Poland’s and Germany’s attitudes once again demonstrates the existence of tectonic rift in the EU between the old and new member states, their objectives, priorities, and capabilities. And this is not the only conflict. More fundamental is the issue of the further EU development whether the states are ready to lose part of their sovereignty in the energy security context. The point is that the implementation of the assigned tasks cannot be carried out until a variety of energy strategies are implemented. Exactly implementation of previous initiatives (for example, in renewable energy sphere) was the victim of the diversity of national priorities and energy strategies. Finally, one way or another, all initiatives come into conflict with the 194<sup>th</sup> article of the Treaty on the Functioning of the EU, which defines the sovereign right of each EU member state on making the independent decision on the issues concerned the energy security and the energy consumption structure. And so far just a few countries wish to give up this right.

In general, we can say that the characteristic feature of the current European gas market consists in a significant dependence on imported gas supplies, most of which, mainly transported by pipelines. At that, until recently gas was supplied under long-term oil-indexed contracts. At the same time, there is operating spot market, which mostly offers LNG. Currently, the share of long-term oil-based contracts gradually decreases. In particular, for the period 2010-2015, just two new contracts were concluded. These were contracts between Qatar and Poland (1.4 billion m<sup>3</sup>), and Algeria and Spain (0.8 billion m<sup>3</sup>) (Kulagin and Mitrova 2015). The Netherlands has recently ended the last oil referenced contract. Oil indexation was maintained only when renewing contracts, however even here contracts are tied to spot market. At the beginning of 2016, Gazprom agreed on significant concessions to the German company E.ON and French Engie in terms of changing the pricing mechanism: Gas price, which is currently tied to the price of oil, will be determined based on quotations of the spot market (Gazprom Gets Out of the Basket of Petroleum Products, 2016).

Over the past 10 years, the volume of gas trade has grown by almost 30%, while the share of gas deliveries through pipelines increased by 45%, and LNG - by 110%, that is, LNG is playing an increasing role in the global gas trade. According to experts of the IEA (Medium-term Gas Market Report, 2014), the next 20 years will be characterized by further globalization of the natural gas market because LNG integrates regional markets and leads to greater consistency of price changes of this energy source. Analysis of the LNG market (IGU world LNG report, 2015; Global LNG market outlook 2014/15/BG Group) showed that the trends of recent years remain unchanged. Thus, LNG shipments in 2014 were at around 243 mln tones, that is by 1.5% more than in 2013. That is, we can speak about LNG market stabilization at the level of 2011. According to all strategic predictions, the LNG market will continue growing, although it is expected that it will become more volatile. In the next few years there may be periods when the balance between supply and demand will lead to the redirection of certain volumes of LNG to the European market. At the current level of oil prices, the range between the prices of LNG on European and Asian market will decrease.

The ratio between gas consumption and its production in the European countries is another important factor influencing the prospects of the gas market. Gas import volume to European countries depends on gas production in these countries. The extraction of shale gas development in Europe faces a number of challenges. Therefore, no significant growth of its production is expected by 2040. By 2020, Norway plans to increase gas output up to 130 billion m<sup>3</sup> (against 110 billion m<sup>3</sup> in 2013). Most of this gas is transported via pipelines to the EU countries. Nevertheless, Russia still remains the largest net exporter of pipeline gas to Europe.

## 5. CONCLUSION

EU member countries have a different focus for ensuring energy security and addressing the pressing problems depending on their different economic development, energy infrastructure, availability of energy resources, and political relations with oil and gas importers. According to experts, energy security in the European energy market can be achieved through the coordination of the EU member countries national policies and the completion of the integrated energy market, diversification of import sources and provision of secure supply, as well as meeting consumer needs for low-carbon energy, providing decarbonization of the power balance, enhancing energy efficiency and proportion of renewable energy, and increasing investments in critical infrastructure and innovative technologies.

The Russian energy policy, especially in the gas sector, is greatly influenced by factors such as the energy policy of the EU member countries, as well as the production of natural gas in Europe, gas consumption in these countries, the LNG supply to the European and other global markets, the global economy, world market prices for energy resources, and the level of competition between LNG and pipeline gas (Dudin et al., 2016a; Dudin et al., 2016b).

As for the prospects of the Russian energy policy, we should note large-scale industrial advancement of Russia into the Arctic zone,

where even now more than 11% of GDP is generated, and about a quarter of energy exports are provided.

So far there are no precise estimates of the volume of Arctic hydrocarbon reserves. Thus, according to the UN estimates, the Arctic contains about 100 billion tons of oil and 50 trillion m<sup>3</sup> of gas. The expert services of the United States and Denmark estimate the oil reserves in the Arctic at 83 billion tones, while gas volumes can reach 1550 billion m<sup>3</sup>. At that, the main gas fields are located at the Russian coast.

As for offshore production, unfortunately, the Russian industry was not ready for the production of equipment necessary to develop offshore fields, while global companies are not allowed to supply required facility because of sanctions. However, speaking about the projects on the continental part of the Arctic, we should note that Russian companies have long proved the effectiveness and environmental security of technologies developed and applied beyond the Arctic Circle. This applies to the first stage of the Bovanenkovo oil and gas condensate field on Yamal, launched by Gazprom, as well as to the construction of "Yamal LNG".

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