



Analysis on the Impact of the Use of Ruble Settlement for Russian-European Energy Trade

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Abstract. Nowadays, with the rapid development of the global economy, the energy issue has attracted the attention of all countries in the world. Russia, as one of the energy producing countries, has long considered European countries as the main energy trade objects, which makes energy trade a central issue in the process of establishing diplomatic relations between European countries and Russia. Since the collapse of the Soviet Union, Russian-European energy trade has gradually developed, and over time, the two sides have formed a known stable and efficient energy development relationship based on the level of their respective interests. However, after the outbreak of the crisis in Ukraine, the United States and the European Union jointly imposed sanctions on the Russian economy, which not only led to the devaluation of the ruble, but also made the development of Russian-European energy relations difficult and complicated, in this case, Russia needs to be alert to the many risks that may arise during the settlement of energy trade in rubles. In the face of the crisis, Russia and Europe need to actively adjust their energy strategies to ensure smooth energy trade using ruble settlement.

Keywords: Energy Trade; Ruble Settlement; Trade Settlement; Financial Sanctions

1 Introduction

It is an undisputed fact that Russia is rich in hydrocarbon resources worldwide and, as the leading energy generator and exporter, occupies a significant position in the energy trade market. Compared to Russia, the total oil and gas reserves of European countries are very small, so other European countries are the most important consumers of global energy trade. In the European market, the rapidly changing economic situation seriously affects the form of development of energy trade, and countries have to join the game in order to effectively defend their energy interests [1]. Russia and Europe, as opposites in energy diplomacy, were able to maintain good trading patterns for a long time, however, after the outbreak of the crisis in Ukraine, the United States, together with the European Union, imposed a series of economic sanctions on Russia, which led to a forced break in the diplomatic relationship

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between Russia and Europe in energy trade and a significant devaluation of the ruble, the settlement currency in circulation in Russia. The current economic crisis in Russia is intensifying and it is difficult to restore the Russian-European energy trade relations to their previous state, which is the main reason why the ruble settlement of oil and gas resources is facing many risks.

On the issue of Russia-EU energy trade diplomatic relations, Tian Feng pointed out in his study that since the outbreak of the conflict between Russia and Ukraine, Russia has proposed a number of countermeasures in response to the sanctions imposed by the U.S. and EU countries, the most prominent of which is the "Ruble Settlement Order", which stipulates that Russia must use the ruble as the settlement currency when supplying oil and gas resources to "unfriendly" countries and regions. However, there are different voices regarding the "Ruble Settlement Order". In order to gain a deeper understanding of the energy trade relations between Russia and Europe, the impact of the use of ruble settlement for Russian-European energy trade is studied.

2 Structure and Basic Approach of Russian-European Energy Trade

2.1 Product Structure of Russian Energy Exports

Russia is a major global energy consumer, with gas, oil and geothermal energy as the main types of consumption. Compared to other countries, Russia's demand for coal is low, and its share in electric energy is only 10%, so the overall energy structure is more evenly developed. In recent years, Russia has tried to invest in renewable energy in various ways, which on the one hand can ensure that the country has sufficient available resources on its territory, and on the other hand can maintain the stability of the Russian-European energy trade relations. In terms of reserves, Russia ranks among the top in the world in terms of oil, coal and natural gas reserves, especially in the natural gas category [3]. Since Russia has sufficient energy reserves and has the highest extraction capacity in the world, its demand for energy imports is always low and most of the energy extracted in its territory is exported to European countries, led by the EU. The basic product structure of Russia's energy exports is shown in Figure 1.

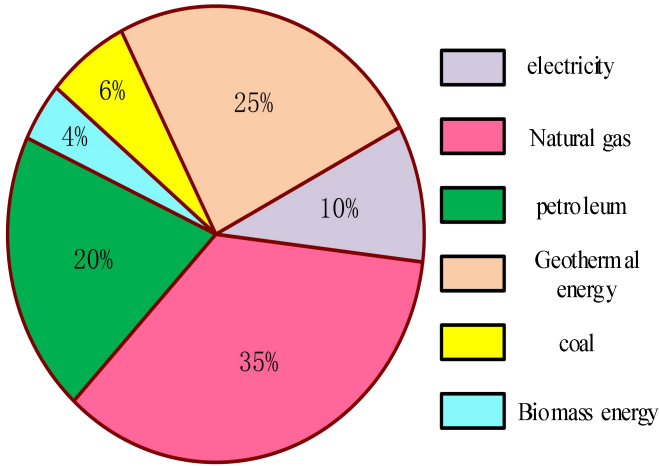


Fig. 1. Structure of Russian energy products

2.2 Russia's Energy Exports Heading

Since the outbreak of the Russia-Ukraine crisis, international organizations, led by the United States and the European Union, have been suppressing Russia's energy export trade, which has led to a significant reduction in the export of oil, gas and other energy sources, and this trade restriction has reached its peak with the issuance of the "Ruble Settlement Order. Official EU data show that European countries have a high dependence on energy, last year alone, European countries spent more than \$104 billion in imported energy, but only about 40% of this energy was imported from Russia, which means that the European energy market is not entirely dependent on imported Russian oil, and this phenomenon of energy exports is reflected in currency transactions is a significant decline in the ruble exchange rate [4]. The expression for solving the monetary volume solution for ruble settlement of Russian energy export trade is:

$$M = \frac{C\bar{X}}{Z} \quad (1)$$

where C denotes total energy exports per unit of trading time, \bar{X} denotes the average price level, and Z denotes the speed of ruble circulation used for energy trade transactions between Russia and Europe.

2.3 Country Differences in European Energy Imports

About 30% of the energy consumed by European countries comes from nuclear and renewable energy sources, while the remaining part is mainly provided by fossil fuels,

such as common crude oil, hard coal, natural gas, lignite, etc. However, because Europe has limited energy reserves, most of its energy needs can only be met through imports. The table below provides a brief summary of Europe's energy import capacity.

Table 1. Energy import capacity of European countries

Country	Energy Type	Import volume
Hungary	Natural Gas	35.4%
Malta	Oil and Related Products	80.1%
Estonia	Shale Oil	11.2%
Greece	Petroleum and Related Products	80.6%
Austria	Natural Gas	32.5%
Romania	Natural Gas and Oil	24.1%
Sweden	Oil and Related Products	81.0%
Italy	Natural Gas	33.7%
Denmark	Natural Gas & Oil	23.9%

From the data recorded in Table 1, there are obvious country-specific differences in European energy imports, and countries with more frequent energy trade have relatively higher consumption and demand for oil and gas, such as Malta, Greece, Sweden, etc. Countries such as Estonia, for example, are basically self-sufficient in energy, so their energy import needs are relatively small.

3 Russian-European Energy Trade Settlement

3.1 EU Financial Sanctions Against Russia after "Crimea" Incident

Since the unrest in Ukraine, pro-European forces have been gaining strength, and in this situation, Russia has been forced to sample extreme high-handedness against Ukraine, which is the main reason for the deteriorating situation and eventual war in Ukraine. However, in terms of energy trade, the Russian invasion did not have a significant economic effect for the country, but instead provided an opportunity for the United States and other EU countries to impose financial sanctions against Russia [5]. For the United States, since its annexation of Crimea, Russia and Ukraine are not destined to have friendly relations in terms of energy trade, while other EU countries can take this opportunity to buy Russian energy exports, which will cause Russia's domestic economy to fall into deficit, so Russia has to propose the use of rubles for energy trade in order to break this stalemate, which avoids the further deterioration of the Russian economy, but leads to the intensification of separatism in Crimea, which eventually makes the EU continue to escalate financial sanctions against Russia.

3.2 EU's Escalating Sanctions Against Russia after the "Russia-Ukraine Conflict"

After the "Russian Ukrainian conflict", the leaders of EU Member States agreed to the regulation of "prohibiting more than two-thirds of Russian oil import trade" through multiple meetings and votes. This also forced landlocked countries and organizations, including Hungary and other countries, which are firmly opposed to the oil embargo, to make concessions. Foreign media said that this is also the most severe economic sanction measures formulated by the EU against Russia since the "Russian Ukrainian conflict". The new sanctions regulation stipulates that "EU member states are not allowed to import Russian exported crude oil and various petroleum products by sea". This move undoubtedly denounces Russia's special military actions and provides strong support for weakening the source of funds for Russian military actions. On the premise that the ruble currency transaction volume is constant, the expression for the implementation intensity of EU economic sanctions against Russia is:

$$B = \frac{M\sqrt{\alpha_{\delta}^2 - v_{\delta}^2}}{\beta \times |\Delta N|} \quad (2)$$

Where, δ represents the occurrence node of the "Russia Ukraine conflict", α_{δ} represents the intensity of economic measures, v_{δ} represents the intensity of energy export trade sanctions, ΔN represents the total energy export after the "Russia Ukraine conflict", and β represents the trade solution vector.

3.3 Energy Trade Settlement Before and after the "Ruble Settlement" Event

The "ruble settlement" incident is seen as a powerful counterattack by Russia against western countries at the most critical moment by using energy weapons. Since then, the prices of energy products such as natural gas and oil in Europe have risen significantly, and the economic indexes of major global securities markets have dropped significantly. However, the continuously falling ruble exchange rate has risen precipitously, and European countries have rushed to issue "early warnings", and quickly launched emergency plan measures, calling on the broad masses of people to save energy expenditure. Before the "ruble settlement" event, Russia Europe energy trade was mainly settled in US dollars or euros, which brought great convenience for the EU to impose economic sanctions on Russia; After the "ruble settlement" incident, Russia had to settle its energy exports to unfriendly countries in rubles. On the one hand, it guaranteed the stability of Russia's domestic economy, and on the other hand, it avoided another fall of the ruble exchange rate, which saved Russia's face in the international market.

4 The Impact of Ruble Settlement on the Russian and European Economies

4.1 Russia Stabilizes Exchange Rate, Vows Currency Sovereignty

The essence of the Ruble Settlement Order is to prevent the outflow of Russian funds, which, prior to the enactment of the Order, was the direct receipt of foreign currency by Russian companies in relation to their income from energy trade. The conflicting relationship between the international exchange rate, which cannot maintain a constant steady state, and therefore the level of Russian economic earnings, which has always been volatile, especially since the outbreak of the Russo-Ukrainian war, which has affected total energy exports, and the desire of European countries to buy more gas resources for less money in the midst of the turmoil, has led to a constant decline in the ruble exchange rate [6]. With the issuance of the Ruble Settlement Order, Russian companies receive only Rubles for their income from energy trade, Russia's monetary sovereignty is guaranteed, and European countries can only buy Russian energy exports in Rubles in order to guarantee a stable supply of energy, which makes it possible to increase the Ruble exchange rate. The chart below reflects the changes in the ruble exchange rate before and after the Russian-Ukrainian war and the issuance of the ruble settlement order.

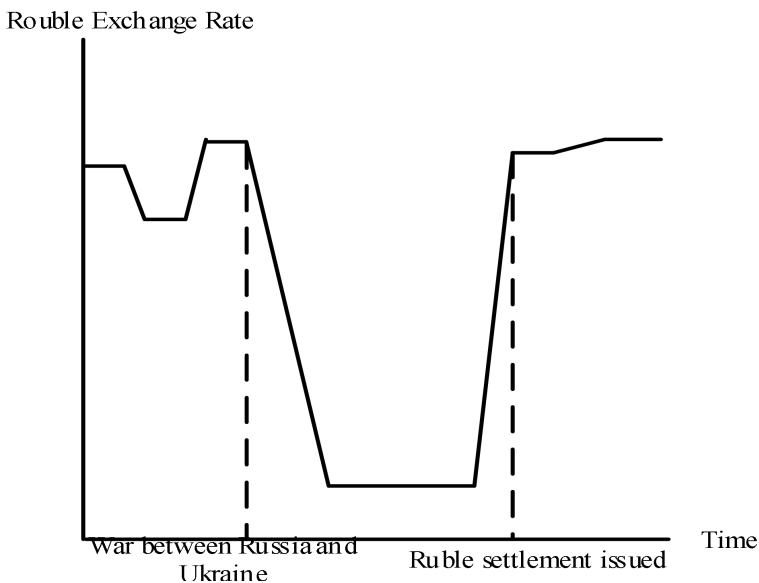


Fig. 2. Ruble exchange rate change curve

As far as the curve in Figure 2 is concerned, it is easy to see that before the Russo-Ukrainian war, the ruble exchange rate fluctuated, but the overall value level was relatively mild. Since the outbreak of the Russo-Ukrainian war, the ruble

exchange rate began to fall precipitously until it fell into a low state, and the low exchange rate level continued until the ruble settlement order was issued. Since the settlement order was issued, the ruble exchange rate has grown again off a cliff until it returned to the level of values before the Russo-Ukrainian war.

4.2 Inconsistent Reaction to Ruble Settlement within Europe

Russia provides gas energy supplies to 23 European countries at the same time. Since the enactment of the ruble settlement policy, four European gas buyers have paid in accordance with the ruble settlement required by Russia, and at least ten European companies have set up buyer accounts with Russian banks and are meeting the payment requirements set by Russia with them in the next buying cycle. The European energy giant Eni Group of Italy has already indicated its intention to open an energy trade ruble account at Gazprombank, and Austria and other countries have subsequently announced their readiness to accept the ruble payments proposed by the Russian side [7]. Finland's demand for Russian gas energy exceeds 90 percent, but the government has made it clear that it refuses to use rubles for trade settlements, with a spokesman noting that the ruble settlement requirement is part of Russian geopolitics. Poland, Bulgaria and other countries, while categorically rejecting the ruble settlement order, actively searched for alternative sources of energy in an attempt to overcome their energy dependence on Russia, while the Russian government, upon receiving this information, immediately notified the supply of energy to these countries.

4.3 European Energy Stabilization Supply Replacement Program

Germany, the largest buyer of Russian energy in the European market, has started to turn to other countries such as the Netherlands, Norway, Denmark and the UK for energy imports. Norway is the leading exporter of energy trade within Europe outside of Russia, and the country has been working for only a century to find ways to increase energy production in order to help European countries completely break away from Russia's energy grip. In addition, in order to find new energy trade building countries, EU countries also import renewable and non-renewable resources such as nuclear energy, electricity, water power and coal to neighboring countries through the Internet and other means. However, with the gradual aging of nuclear power plant equipment in industrial countries such as France and the UK, the dream of transitioning from natural gas to nuclear power supply in these countries has been largely dashed. The following table reflects the energy supply capacity of the existing alternative countries in Europe and their comparison with the total energy exports from Russia.

Table 2. Comparison of energy supply

Resource Type	Russia	Beixi No.1	Beixi No.2
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Natural Gas	36 billion cubic meters	30 million cubic meters	10.5 billion cubic meters
Oil	229 million tons	5 million tons	7 million tons
Geothermal Energy	90 billion cubic meters	17 million cubic meters	50 million cubic meters
Other Energy	54 billion cubic meters	5 million cubic meters	7.9 million cubic meters

5 Conclusion

In the current situation, Russia-Europe energy trade relations are extremely tense, especially after the issuance of the ruble settlement order, and the attitude of European countries towards this policy is polarized, and this extremely volatile trade behavior will lead to the following problems in the future development process.

European countries are still dependent on Russian energy: As a region of rapid industrial development, Europe has a great demand for energy in its countries, but its reserves of natural gas, oil and other energy sources are relatively scarce, so in order to ensure the smooth development of industry, European countries have to import resources from Russia, which has richer energy reserves. However, as the conflict between Russia and Ukraine intensified, Russia enacted a ruble settlement policy to ensure its economic gains, which left European powers dependent on Russian energy but constrained by trade relations that prevented them from having their needs met.

Alternative importers and clean energy alternatives are yet to be tested: many countries, such as the UK and Norway, are able to moderately alleviate the energy crisis within Europe, but are unable to provide a stable supply to other countries for various reasons, so the position of these alternative importers in terms of energy supply is still not comparable to that of Russia. The search for clean energy alternatives is still in the early stages of the plan, in order to achieve the plan, European countries need to go through a longer period of time to verify.

Increasing contradictions lead to instability in Russian-European energy relations: If the existing impasse cannot be effectively alleviated, Russia will continue to adhere to the ruble settlement policy, which will reduce the volume of energy exports to a certain extent, but will keep the ruble exchange rate at a high level, which will have an obvious impact on the stabilization of the Russian economy. For European countries, guaranteeing the volume of energy imports is necessary to maintain normal national development, and if neither the ruble settlement order can be compromised, nor effective alternative importers with clean energy alternatives are found, it will continue to worsen Russian-European energy relations.

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