

The European Energy Crisis and its Implications

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Abstract: *In the context of the Russian-Ukrainian conflict, due to the sanctions adopted by Western countries led by the United States against Russia, coupled with the fragility of the European energy system, there are both long-term structural constraints on energy supply and the impact of short-term energy supply. coupled with the fragility of the European energy system, there are both long-term structural constraints on energy supply and the impact of short-term events such as geography and weather, Europe is experiencing a serious and sustained energy crisis. Despite the positive measures taken by European countries to overcome the crisis, the economic and social situation has not been favourable. Despite the positive measures taken by European countries to overcome the crisis, the economic outlook for Europe remains gloomy. On the basis of analyzing the reasons leading to the EU energy crisis, this paper innovatively puts forward further measures to be taken by the EU as well as the inspiration brought to China by this energy crisis.*

Keywords: *energy crisis; clean energy; Russia-Ukraine conflict; European economy*

1. Introduction

Since the winter of 2021, Europe has been in an energy crisis, which is getting worse and worse. The energy crisis in the European market has also led to an imbalance in the global gas market, and the global economy and finance are not optimistic. The Russia-Ukraine conflict has affected the lifeblood of Europe's energy security. After the outbreak of the Russian-Ukrainian war, the United States and Europe immediately imposed a full range of economic sanctions against Russia: a variety of freezing its national and central bank assets, will be kicked out of the SWIFT financial trading system, commodity export restrictions, etc., the sanctions against Russia further triggered the fuse of the energy crisis in Europe, which makes the resource scarcity of Europe and add to the woes. In the face of Europe's energy crisis, European countries have begun to unite to actively find ways to address the oil and gas shortfalls, engage in energy diplomacy, make the transition from traditional energy sources to the development of renewable and clean energy sources, and commit themselves to strategic autonomy from being used as a gun by the United States under the Russian-Ukrainian conflict. In addition, based on the global impact of the EU energy crisis, which will also indirectly affect our overseas energy cooperation and energy security, China needs to respond to the EU energy policy adjustment.

2. Reasons behind the energy crisis in Europe

There are many reasons for the Energy crisis in Europe, among which the long-term structural factors and short-term event shocks in Europe are the main reasons for the crisis.

2.1. The impact of long-term structural factors

On the one hand, the European energy crisis cannot be separated from Europe's long-term structural factors. First, Europe's traditional fossil energy is highly dependent on the outside world, and the sources of imports are concentrated. In 2021, the European Union's natural gas imports from Russia accounted for 32 per cent of all supplies, making it vulnerable to geopolitical risks. Europe itself is limited in size and does not have many mineral oil well reserves, yet Europe is a gathering place for developed countries, requiring massive energy consumption every day. Russia is the largest country in the world in terms of area and has very rich oil and gas and other energy reserves, Russia has next to Europe. Naturally, Europe is geographically dependent on Russian energy. In the European countries of the radical low-carbon environmental protection goals to guide, although the economic development of Europe's leading the world, but its energy dependence on the outside world has always maintained a

high level, especially Europe's dependence on the outside world of natural gas up to 90%. Russia supplies 30.3 per cent of Europe's oil, 38.8 per cent of its coal, 39.8 percent of its natural gas, and Countries such as Austria, Finland and Latvia used to be 100% dependent on gas imports from Russia.^[1]

Secondly, Europe's long-term promotion of clean energy has led to a decline in the stability of energy supply and a rise in vulnerability. European energy reflects the trend of "retreating from coal and nuclear, wind and light", but wind, photovoltaic and other new energy sources are highly dependent on weather conditions, and power generation is unstable. 2021, Europe's renewable energy growth is insufficient, and the performance of solar power and wind power is weak, with a year-on-year decline of 6-11 per cent. Some European countries have to rely again on fossil energy to make up for the energy gap. In particular, coal generation has risen sharply by 15-20 per cent, resulting in a 108 per cent year-on-year increase in the price of traded carbon allowances. The growth in demand for natural gas following the decline in the economics of coal power generation further pushed up gas prices.^[2]

2.2. The impact of short-term event shocks

On the other hand, short-term event-based shocks have also contributed to the European energy crisis. First of all, the European Union to promote the Russian energy sanctions are too aggressive, incurred Russia cut off the supply of natural gas countermeasures. Local time on December 1, a number of foreign media reports, the European Commission has proposed to the 27 member states to set the Russian oil price limit of \$60 / barrel, that is, the Russian oil is only sold at \$60 or less than this price, in order to obtain the EU's shipping, insurance and financial services, if the consultation is passed, the price limit ban will be on December 5 landing. On the one hand, the sanctions are aimed at compressing Russia's oil revenues by limiting prices, and on the other hand to ensure that Russia continues to supply crude oil to the world. Therefore, Ukraine, Poland and other Eastern European countries want to limit the price as low as possible, in order to hit the Russian economy, while the United States seeks a higher ceiling in order to stabilize energy prices. The Russian government has repeatedly voiced its opposition and claimed that it will not sell oil to countries that impose price limits and is "ready for any outcome." Since the Russian-Ukrainian conflict, the international political and economic situation has become more and more severe, and geopolitical risks have increased steeply, especially affecting the development of economic globalization, and the global economy is seeking recovery in a difficult situation. This time, the European and American sanctions on Russian oil will further promote the process of anti-globalization, which is a huge challenge to global energy security and the international economic and political system.

Secondly, the extreme heat and dry weather have both limited traditional energy operations and impacted clean energy production. The drought in Europe has caused the waterline of navigation channels to fall, leading to a reduction in the amount of freight traffic, including coal, and resulting in a shortage of coal and electricity supply. High temperatures have led to increased evaporation from rivers and a drop in reservoir levels, with hydropower generation in Norway, the "battery of Europe", dropping by 10 percent year-on-year. France's nuclear power is facing aging equipment and weather problems, France's cumulative nuclear power generation from January to August fell 20% year-on-year. La Niña climate triggered by the cold winter directly led to Europe's crazy rush for energy. Energy price hike may continue. As the global economy recovers from the epidemic, energy demand is on the rise in Europe, the United States and Asia. At the same time, the La Niña phenomenon may recur this year, leading to plummeting global temperatures and intensifying the demand for natural gas.^[3]After 2000, there were six La Niña climates in the Northern Hemisphere during the winter months, and the futures prices of Brent crude oil and heating oil rose by an average of 19.3 percent and 16.1 per cent, respectively, which is significantly higher than the average for the same period in the past 20 years (1.6 percent and 1.8 percent).

In summary, the root cause of the current round of energy crisis in Europe lies in the fragility of the energy system, which is constrained by both long-term structural factors of energy supply and short-term shocks from geopolitical and weather-related events.

3. Impact of the energy crisis on Europe and response measures

The Energy crisis has had a huge impact on Europe. This is mainly reflected in the Energy crisis, which exposes the vulnerability of Europe, causes the deepening of differences in the European continent and the resurgence of populism.

3.1. Expose the fragility of Europe

First of all, the energy crisis has had an adverse impact on Europe's development and has fully exposed its vulnerability. Russia is the world's number one exporter of oil and natural gas and a major player in the coal market. Forty per cent of Europe's natural gas is imported from Russia, and many countries have significant trade and investment dealings in the Russian market. While there are temporary alternative sources of supply for European countries, the cost of completely replacing Russian gas is prohibitively high and almost impossible to realise. Europe's energy vulnerability portends a difficult winter for Europe.

3.2. Escalating differences on the European continent

Second, Europe's energy crisis has caused the continent's divisions to intensify. Even more worrying for Europe is the return of old-style geopolitical divisions. First, there is a growing East-West divide on the continent, with countries bordering Ukraine calling for sanctions against Russia and strong military support for Ukraine, while Western European countries tend to compromise with Russia. As the energy and economic crises deepen, countries far from the front line are more likely to push for a return to war. Secondly, there is a North-South divide, with the possibility of a recession or even stagflation in the near future, and a rise in the difference in borrowing costs between the northern and southern members of the European Union (especially Germany and Italy) leading to a North-South disagreement on the means of mitigating the energy crisis.

3.3. Populism is making a comeback

Finally, Europe's energy crisis has caused a resurgence of populism. Increasing economic pressures have begun to have worrying consequences in European politics. In Italy and France, populist and right-wing nationalist parties were capitalizing on the costs of war to garner public support. Populists were briefly hit by the epidemic as their anti-vaccine narrative failed to impress Europeans. But the Russian-Ukrainian conflict overlaid with the energy crisis has given them a perfect opportunity to rise again. Over time, such a situation could trigger a new wave of populism, which would jeopardize not only European unity, but also the very existence of the EU as a whole.

In response to the negative impacts of the European energy crisis described above, European leaders are deeply concerned about the socio-economic consequences of the crisis and its geopolitical ripple effects. In response to pressure from Russia, European leaders must prepare for a difficult winter, when the choices they make about how to manage limited energy supplies will shape Europe's future.

4. European measures to deal with the Energy crisis

The Energy crisis in Europe has caused great damage to Europe and seriously affected the daily life of local people. We should find some ways to solve these problems. Here are some measures that I have come up with.

4.1. Looking for renewable alternatives

Measure 1: Europe should accelerate the transformation of new energy sources, find renewable alternatives to oil and natural gas energy, and completely get rid of its dependence on other energy powers such as Russia. France and Italy and other successive preparations to restart nuclear power, Germany plans to realize the construction of energy independence and diversification based on renewable energy a few years ahead of schedule, Germany's climate sector in February put forward new draft legislation, proposed to achieve 100% renewable energy power generation target 15 years ahead of schedule to 2035, of which the new photovoltaic installed capacity from 7GW in 2022 gradually increased to 20 GW in 2028, and then This level will be maintained until 2035, an increase of 64.8 percent compared to previous expectations. The EC's RePower EU program is designed to address the dual energy security and price challenges currently facing Europe. ^[4] Europe is facing an energy crisis, and as winter approaches, many European countries are implementing energy-saving measures to conserve energy. According to the British Broadcasting Corporation (BBC), reported that before February this year, Italy is Europe's second largest importer of Russian natural gas, Russian gas imports accounted for 40 percent of its total supply, while the proportion is now down to 10 percent. In response to the energy crisis, Italy's Minister of Ecological Transformation Roberto Singhani signed a

decree on the 7th, which includes a reduction in the number of days of central heating by 15 days from 2022 to 2023, and residential heating temperatures will be adjusted downward by 1 degree Celsius in some areas. In addition to Italy, many European countries have announced similar energy-saving measures. France's Ministry of Energy Transition announced its 2022 winter energy-saving plan on 6 October, with winter heating temperatures in homes, educational institutions, offices and places open to the public not to be higher than 19 degrees Celsius, and hot water will not be provided in some public facilities. The energy-saving plan also calls on the French to reduce the time of hot showers and completely switch off electronic devices in standby mode at night. ^[5]

4.2. Reduce differences and increase cooperation

Measure 2: The European Union should reduce its differences and coordinate its response to the energy crisis. In the face of the energy crisis, EU countries have tended to go it alone, but this is a good time for a joint response. Europe needs a major energy negotiation to pool resources, but this requires painful political compromises. For example, saving gas by allowing the use of coal or oil would temporarily lower pollution standards at large industrial facilities across Europe, but this would harm the quality of the environment and public health. These stopgap measures would only need to be in place for a short period of time and would be accompanied by accelerated development of clean energy. At the same time, progress on both fronts would enable Europe to emerge from the energy crisis in a greener and more resilient manner. As another example, the EU should create a fund to compensate countries that make energy trade-offs to help their neighbors and ensure that consumers are incentivized to reduce consumption demand.

4.3. Carry out Energy diplomacy

Measure 3: The EU is seeking energy diplomacy around the world to replace Russian energy. EU representatives have contacted natural gas producers, including the United States, Israel, Egypt, Azerbaijan and Qatar, asking them to send more gas to Europe. These efforts should lead to a modest increase in the volume of natural gas, including liquefied natural gas (LNG) and pipeline gas from Azerbaijan. Imports from Norway will also increase, and the Netherlands is considering reopening a large gas field that was closed due to environmental concerns. France has taken the initiative to mend relations with Algeria, and the German chancellor has just completed a trip to the Middle East. Many gas-producing African countries have also become instant guests of honor in Europe. ^[6]

4.4. Development strategy autonomy

Measure 4: Europe is committed to strategic autonomy in development and must not be constantly led by the nose of the United States. The United States factor is the external variable influencing the European energy crisis. European countries are heavily dependent on the United States for their security due to the NATO relationship. After the collapse of the Soviet Union and the end of the Cold War, the core powers of the European Union, such as France and Germany, have shown greater autonomy in their foreign policies, but because of some pro-American countries, the autonomy of European policy towards China is still very much constrained by the United States. ^[7]After the outbreak of the Russian-Ukrainian conflict, Europe followed the United States to engage in sanctions against Russia, Russia has also carried out some anti-sanctions struggle. For example, the "Nord Stream-1" gas pipeline, which was discussed a lot some time ago, is still in a state of complete shutdown. As a result of these factors, Europe's energy problem has become so prominent that it has almost become a crisis in the context of the damaged relations with Russia. One of the few ways Europe could think of to deal with this energy crisis was to find new energy imports to replace its energy dependence on Russia. Europe has started to buy large quantities of liquefied natural gas (LNG) produced in the United States. In June this year, that is, more than four months after the outbreak of the Russian-Ukrainian conflict, it is said that the quantity of LNG bought by Europe from the United States has exceeded the quantity of piped natural gas purchased by Europe from Russia, which means that the United States is taking over from Russia, and it may become the largest supplier of energy to Europe. Therefore, the United States is the biggest beneficiary of this energy crisis. One of the purposes of the US malicious propaganda "invasion" of Ukraine is to cut off the operation of the Nord Stream 2 project, to intimidate, threaten and then control the European energy market, and to weaken the economic cooperation between Russia and Europe. ^[8]The United States has not only eliminated Russia's energy supplies to Europe, but has also replaced them, making Europe even more dependent on it in the future, not only for security, but also for energy. Europe is gradually adjusting its position, distancing itself

from the United States and emphasizing that it can still exert influence in the political and diplomatic spheres.^[9]

5. Implications of the European energy crisis for China

Based on the global impact of the EU energy crisis, which will also indirectly affect my overseas energy cooperation and energy security, China needs to respond to the EU energy policy adjustment.

5.1. Strengthening long-term and stable international energy cooperation

Implication 1: China should strengthen long-term and stable international energy cooperation. Reflecting on the intensifying energy crisis in Europe, China, which is also in a period of energy transition, must prepare for rainy days, make early plans and properly handle the relationship between energy transition and energy security. The current international energy market turbulence to many countries to bring trouble, especially the European countries have to re-examine the national energy policy, and even the short-term need for security beyond the need for transformation. In the face of the complex and volatile world situation, China should pay more attention to energy security, energy security as the basic requirements of energy transition and the bottom line, the safe and stable supply of energy as a curb on inflation, to ensure the basis of economic development. On the one hand, energy transformation must be "established before broken". Based on China's energy structure in favour of coal and other basic national conditions, before the new energy grid stability can not be effectively guaranteed, the enhancement of traditional energy production and supply of the role of the bottom should be achieved, and it should improve the production, supply, storage and marketing system, to ensure the stability of the industrial chain supply chain. In the process of stabilizing the stock, the gradual replacement of new energy sources will be realized, and the high-quality development of renewable energy will be accelerated, so that it will become the main body of incremental energy consumption supply as soon as possible. On the other hand, considering the high proportion of crude oil and natural gas extracted from China, strengthening long-term and stable international energy cooperation is conducive to reducing sanctions and embargoes.

5.2. Ensuring China's Energy Security Transformation

Implication 2: Ensure our energy security transition. Security is the key to a country's energy system, which requires us to strengthen our external energy resilience. Avoid short-term event-based shocks, such as the impact of extreme weather and natural disasters. Of course, in today's rapid development of information technology, the threat from cyber security is also everywhere. In the context of the Russian-Ukrainian conflict, sanctions are constantly imposed by various countries, and our country also needs to pay attention to the risk of "embargo" triggered by diplomatic events. Therefore, China should not only strengthen the maintenance of traditional energy security, the government should also spend more time, energy and money to study the new energy system on the demand for key minerals. In addition, China also needs to further strengthen the security of some important strategic mineral chains, such as lithium, titanium, manganese and rare earths.

5.3. Saving energy and improving utilization efficiency

Implication 3: Conserve energy on a daily basis and increase its utilisation. Despite China's vastness, its population is so large that an energy crisis is imminent if preventive measures are not taken. Reducing energy consumption and increasing energy utilisation is an effective part of preventing the energy crisis. National People's Congress, deputy general manager of the State Grid Corporation, said Liu Zhenya, China's power industry also exists on the one hand, there is a serious shortage of electricity, and on the other hand, a serious waste of the phenomenon.^[10] In recent years, many provinces and cities in China have experienced tight power supply. The phenomenon of wasting electricity in people's daily life can also be seen everywhere. For example, the phenomenon of not switching off the lights. In addition, a large number of electrical appliances have standby functions, such as timer switches, remote control switches, etc. In the process of using electrical appliances, we tend to ignore these functions, thus resulting in a waste of resources. In addition to improve energy utilisation firstly, we need to strengthen publicity efforts to raise citizens' awareness of energy saving; secondly, we need to increase technological updating to improve energy utilisation; and at the same time, we also need to promote industrial upgrading and appropriately restrict the development of industries that consume a lot of

energy, so as to achieve the purpose of energy saving and emission reduction.

5.4. Strengthen energy cooperation and carry out Energy diplomacy

Implication 4: Strengthen energy cooperation with neighbouring countries and actively engage in energy diplomacy. On December 9, 2022, the first China-Arab States Summit and the China-Gulf Arab States Cooperation Committee Summit were held in the Saudi capital, Riyadh. This is the largest and highest specification diplomatic action of China towards the Arab world since the founding of new China. Energy cooperation is one of the important contents of this Sino-Arab summit. China has a broad consumer market, industrial system is complete, leading clean energy technology; Gulf Arab countries are rich in energy resources, renewable energy potential, economic diversification is booming, the two sides are natural partners. China should strengthen energy cooperation with neighboring regions and countries, and build a mutually integrated oil and gas reserve emergency response system with ASEAN, Central Asia and other countries, etc., in order to ensure all-around, multi-level energy security and enhance the power of energy transformation and development.

6. Conclusion

Against the backdrop of the Russian-Ukrainian conflict, the energy crisis in Europe has continued to fester, and the increasing prices of gas and oil in various countries have not only led to an increase in the cost of daily life for the population, but also heightened the risk of a global financial crisis and brought about instability to global stability. In the face of the negative impact of the energy crisis, the European Union has taken measures to speed up new energy changes, reduce internal differences within the European Union, carry out energy diplomacy, and develop strategic autonomy to cope with the crisis. At the same time, the European energy crisis has brought profound inspiration to our country. China should strengthen long-term and stable international energy cooperation; ensure energy security transition; conserve energy and improve efficiency; strengthen energy cooperation with neighbouring countries; and actively carry out energy diplomacy in order to cope with the energy crisis.

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