

The Impact of the Russia-Ukraine Conflict Situation on China's Energy Industry

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Abstract: The Russia-Ukraine conflict has triggered a global energy crisis, which has brought extensive and profound impacts on China's energy development. This paper analyzes the impact of the Russia-Ukraine conflict on China's energy industry, discussing the changes in the international crude oil and natural gas markets, the global energy restructuring, and the acceleration of energy transformation. In response to the energy market volatility that may be brought about by the conflict, the paper proposes strategies for China to cope with it, including diversifying energy supply, strengthening geopolitical risk management, and building an energy community. In addition, the paper analyzes Russia's position in the international energy market and focuses on the impact of China's crude oil and natural gas import costs, the stability of the energy supply chain, and Sino-Russian energy cooperation and investment. Finally, the paper emphasizes the importance of accelerating energy green and low-carbon transformation and building energy communities, providing ideas for the sustainable development of China's energy sector. This paper figures out that China's energy industry should adopt a more flexible and resilient approach to respond to unforeseen circumstances such as the Russia-Ukraine conflict.

Keywords: Russia-Ukraine Conflict, Energy Industry, Transformation

1. Introduction

Energy is an essential material basis for economic and social development, which is related to national security and people's well-being. Nowadays, the world's energy development is faced with resource constraints, environmental pollution, climate change and other prominent problems, which seriously threaten the survival and development of mankind [1]. On February 24, 2022, Russia took special military action against Ukraine, which aroused strong concern from the international community. The Russia-Ukraine conflict has triggered a global energy crisis, bringing extensive and profound impacts on the world's political, economic, and social development. The energy issue has received unprecedented attention and become the focus of the game of all countries. Accurately grasping the current global energy situation and judging the future progress trend of energy is of great significance to the scientific planning of energy transformation path and the promotion of sustainable development in the world.

This paper focuses on the impact and inspiration of the Russia-Ukraine conflict on China's energy development, and is mainly divided into two parts. Firstly, it comprehensively analyzes the impact of

this conflict on the global energy market, especially in China, and summarizes the impact of the energy crisis on economic and social improvement. Furthermore, this paper analyzes and summarizes the inspiration brought by the Russia-Ukraine conflict to China's energy development, explains the necessity, feasibility, and economy of accelerating the green and low-carbon transformation of energy and constructing an energy community, with a view to providing a reference for the study of the world's energy transformation.

2. Russia's Position in the International Energy Market

Russia is the second largest producer of crude oil. According to "the BP Statistical Yearbook 2021", Russia's proven oil reserves in 2020 were 107.8 billion barrels, accounting for about 6.2% of the world's reserves, ranking sixth in the world after Venezuela, Saudi Arabia, Canada, Iran, and Iraq, and slightly above the United States (U.S.) [2]. The U.S., Russia and Saudi Arabia are the world's top three oil producers, and in 2020 their output will be 16,476,000 barrels/day (b/d), 11,030,000 b/d and 10,667,000 b/d, respectively. In 2021, Russia's crude oil and condensate production will be 10,520,000 b/d, ranking second in the world.

Russia is the second largest producer of natural gas. According to "the BP Statistical Yearbook 2021", Russia's proven natural gas reserves in 2020 were 37.4 trillion cubic meters, accounting for about 19.9% of the world's reserves, ranking first in the world, followed by the U.S., Qatar, and Turkmenistan [2]. The U.S. and Russia are the world's top two natural gas producers, with production of 914.6 billion cubic meters and 638.5 billion cubic meters in 2020, respectively.

3. The Impact of the Russia-Ukraine Conflict on the World Energy Market

3.1. Sharp Fluctuations in International Crude Oil Prices

In terms of factors affecting oil prices, oil prices fluctuate sharply in the short term mainly due to geopolitical influences, but the long-term fluctuations in oil prices are still mainly influenced by market supply and demand. Out of concern over further escalation of the Russia-Ukraine conflict, international crude oil prices soared to \$137 per barrel in March 2022, reaching the highest point in 14 years. As a result, international energy organizations urgently implemented oil reserve strategies. Among them, the United Arab Emirates (UAE) expressed its willingness to increase production, and the U.S. turned to Venezuela for help, all to no avail. Because of the epidemic, economic activity in Asian countries, including China, is reduced, and the logistics of major e-commerce platforms, such as Amazon, are hampered. Overall, restricted economic activity and lower energy consumption in major energy-consuming countries have a significant negative impact in crude oil prices.

3.2. Reconfiguration of the Global Energy Mix

From a global perspective, the Russia-Ukraine conflict has broken the original energy pattern, and the world oil and gas map will accelerate the reconstruction. Firstly, the scale of natural gas trade between the U.S. and European Union (EU) will continue to expand. In 2021, the EU imported U.S. liquid natural gas up to 22 billion cubic meters, accounting for 6% of its total imports. After the outbreak of this conflict, the U.S. and Europe reached an agreement that the U.S. would supply about 50 billion cubic meters of Liquefied Natural Gas (LNG) annually to the EU before 2030 [3]. In addition, Russia is actively expanding its international oil and gas market, accelerating the layout of pipeline projects and LNG projects, and striving to increase its share in the Asia-Pacific region and the LNG market. Moreover, the U.S. is expected to replace Saudi Arabia as the world's top oil exporter and Russia as the world's top natural gas exporter. Saudi Arabia, Qatar, and other Gulf

countries will profit from this energy crisis, and Iran may also return to the international energy market this year.

3.3. Accelerating the Energy Transition

Geopolitical factors such as the Russia-Ukraine conflict will have a far greater impact on energy transition than climate change, and it is foreseeable that countries around the globe will adopt more radical strategies for emissions reduction and energy transition. Looking back to the two oil crises of 1973 and 1979, the embargoes imposed by Middle Eastern countries using energy as a weapon gave the U.S., Western Europe, and Japan a great warning that they could not rely excessively on oil imports. Since then, these countries have made great breakthroughs in the areas of energy conservation, development of in-country oil, nuclear energy, and renewable energy [4]. After the disruption of energy supply and the price crisis caused by this Russia-Ukraine conflict, countries will make the realization of fossil fuel independence their main goal, and in particular the time for natural gas to serve as a transitional energy source will be greatly reduced. The energy transition shows a step-shift between regions, with the less developed regions using coal, the industrially developed regions consuming more oil and gas, and the electrified regions using more cleaner and energy-efficient renewable energy. This will require them to cooperate with other regions in areas such as clean coal, energy-efficient technologies, and hydrogen energy, so that the less developed regions can reduce their dependence on high-carbon fuels, and ultimately achieve a global step-wise energy transition and worldwide carbon neutrality.

4. The Impact of the Russia-Ukraine Conflict on China's Energy Market

4.1. Changes in Crude Oil and Natural Gas Prices in China

The Russia-Ukraine conflict could have a multifaceted impact on China's energy import costs. On the one hand, this conflict could lead to instability in the global energy market, driving up international energy prices. This puts direct pressure on China's energy imports, such as oil and natural gas, and increases import costs. Moreover, the conflict may lead to geopolitical tensions that could disrupt the energy supply chain and increase transportation and insurance costs. This could indirectly raise the overall cost of China's energy imports. On the other hand, China may respond to potential cost increases by diversifying its energy supply channels, such as by finding alternative sources of energy or strengthening cooperation with other energy-exporting countries. In addition, China could reduce the overall cost of energy consumption by improving energy technology innovation and enhancing energy efficiency in order to alleviate the pressure that may result from the war.

4.2. The Stability of China's Energy Supply Chain

The Russia-Ukraine conflict leads to disruption or destabilization of the energy supply chain, posing a potential threat to China's energy security and industrial operations. Firstly, the conflict could make energy production and transportation in Russia and Ukraine difficult, which in turn could affect the stability of China's and the global energy market. Additionally, the Russia-Ukraine conflict could trigger tensions in state relations, leading to disruptions in some energy delivery corridors, such as pipelines or maritime transportation routes that may be threatened. Such disruptions or instability could make it difficult for China to obtain the energy it needs as planned, affecting the normal operation of domestic industries.

4.3. China's Energy Cooperation and Investment

Russia and China have always had close cooperation in the energy sector, covering a wide range of areas like oil, gas, and nuclear energy. The sustainability of this cooperation may be affected by the Russia-Ukraine conflict. On the one hand, the conflict causes difficulties in energy production and delivery in Russia, which could influence energy supplies to China. This could lead to uncertainty in contract fulfillment, making Sino-Russian energy cooperation negatively affected. On the other hand, the Russia-Ukraine conflict may increase the political risk of Sino-Russian energy cooperation. China may consider diversifying its energy supply channels to reduce its dependence on Russia, thereby mitigating potential risks. However, China and Russia share common economic and energy interests, so both sides may also seek to resolve potential cooperation issues through diplomacy. China is likely to adopt a flexible diplomatic approach to maintain the stability of energy cooperation and to resolve issues that may arise from conflict through negotiations.

4.4. China's Exchange Rate and Trade Balance

The Russia-Ukraine conflict could have ripple effects on the global economy, including on exchange rates and trade balances. Such effects are also relevant to China's energy imports and exports. First, regarding exchange rates, if the conflict leads to global economic instability, investors may seek safe-haven, causing an appreciation of safe-haven assets (e.g., the U.S. dollar). This trend has some negative impact on China's exchange rate, increasing the value of the Renminbi (RMB) relative to other currencies and creating challenges for exports. Furthermore, for the trade balance, the conflict could result in global trade turmoil, affecting China's exports and imports. China is one of the world's largest commodity traders, and its trade balance comes under pressure if global economic instability leads to a slowdown in trade. This could have a negative impact on China's energy imports and exports, especially if key energy suppliers linked to the conflict are directly affected.

5. The Implications of the Russia-Ukraine Conflict for the Development of China's Energy Industry

5.1. Accelerate the Green and Low-carbon Transformation of Energy

The Russia-Ukraine conflict reminds China's energy industry to pay more attention to sustainability and security, promote green and low-carbon transformation, and lay the foundation for building a more sustainable and stable energy system in the future. The Russia-Ukraine conflict has exposed the potential threat of geopolitical risks to energy supply. To mitigate this risk, China can accelerate its transition and diversify its energy supply channels to rely on more renewable and other green forms of energy. Firstly, a green and low-carbon transition requires a focus on the efficiency of energy use. China can increase its investment in energy efficiency technologies and innovations to reduce its dependence on traditional energy sources by improving energy utilization. This is essential for achieving the Sustainable Development Goals (SDGs) and reducing greenhouse gas emissions [5]. Moreover, developing a clean renewable energy industry is an important part of the equation. The turbulence in global energy markets caused by the Russia-Ukraine conflict may provide an opportunity to develop a renewable energy industry. China could promote the development of renewable energy in both domestic and international markets by expanding investment in renewable technologies and facilitating green energy programs. For example, the Climate Action Plan has the potential to guide the United States directly and completely away from fossil fuel consumption to a sustainable energy system [6].

In addition to making improvements to the energy source itself, a green, low-carbon energy transition includes an emphasis on energy security. By reducing its dependence on unstable regions

and strengthening its own energy production and reserves, China can better guarantee the stability of its energy supply. Furthermore, China should strengthen cooperation with other countries to jointly promote green low-carbon energy technology innovation. This will not only reduce China's energy production costs but also promote global renewable energy development and address the challenge of climate change.

5.2. Building an Energy Community

The lessons of the Russia-Ukraine conflict for China's energy industry lie in the importance of risk management, sustainable development, and international cooperation, which are all key elements in building a robust energy community. The Russia-Ukraine conflict highlights the instability of international relations, so that the building of an energy community requires attention to geopolitical risk management. China should carefully assess potential geopolitical risks when cooperating with other countries and formulate coping strategies to ensure the stability of energy supply. China should also establish a more solid regional cooperation relationship by promoting energy cooperation with neighboring countries to jointly maintain energy security. In addition, investment in renewable energy and technology innovation is key to building an energy community. This will help improve energy sustainability and reduce dependence on disputed regions while promoting clean energy development. Finally, building an energy community also requires strengthening international cooperation and political stability. Uncertainty due to geopolitical tensions can be reduced by cooperating with other countries, especially by establishing long-term and reliable relationships with energy-producing countries. Active participation in international energy organizations and forums would facilitate the formation of an energy community.

6. Conclusion

This paper focuses on the impact of the Russia-Ukraine conflict on the world's energy industry, especially China, and proposes future improvement directions and initiatives in response to the negative impacts. The Russia-Ukraine conflict has had a multifaceted impact on China's energy industry. Volatility in the international crude oil and natural gas markets has challenged China to increase the cost of energy imports, while instability in the energy supply chain may threaten China's energy security. To cope with this situation, China needs to take measures such as diversifying its energy supply, strengthening risk management, and promoting green and low-carbon transformation. This paper is not sufficiently detailed in its recommendations for improving the energy industry in China and may not be in line with the actual situation in China, so more academic research and realistic simulations are needed to make the measures more feasible and efficient.

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