The Russia-Ukraine War and Energy Security: Impact and Policies, From a European Perspective

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Abstract. Since February 2022, the conflict between Ukraine and Russia has exacerbated the global energy crisis resulting from COVID-19. The war has disrupted world energy trade and pushed energy prices surged significantly. This paper tends to analyse the effects of the war on energy security and policies and provide some feasible coping strategies, mainly from a European perspective. It is expected that the analysis of the issue could assist policymakers in combining short- and long-term strategies when making relevant energy policies. In summary, two possible energy policy directions from which European countries may choose involve focusing national energy security and accelerating energy transition. Nevertheless, this research suggest that it is better to combine short-term and long-term energy policies to mitigate current crisis and reduce energy vulnerability in future. Feasible energy strategies involve postponing the phase-out of coal, stricter conservation requirements in housing and transportation sectors, accelerating the deployment of renewable energy, increasing energy efficiency, and mandating obligation to increase energy storage. Moreover, EU member states should cooperate to respond to the current, otherwise, it will cause serious social and political issues.

Keywords: Ukraine War; Energy Crisis; Energy Security; Energy Policy; European Energy.

1. Introduction

Over the past few years, energy security and policy problems have come to fore in the field of international relations. Since 24 February 2022, the global energy problem resulting from the COVID-19 pandemic have been exacerbated by the war erupted in Ukraine, turning the situation into a full-blown crisis. The conflict between Russia and Ukraine along with sanctions and embargoes imposed on Russia has disrupted the world's energy trade and led to energy prices spiking significantly. According to the data reported by the World Bank, energy prices will increase by around 50 percent in 2022 [1]. As the Europe Union is highly dependent on Russian energy supply, most European countries have to face enormous challenges of redefining their energy policies. Without active policy responses, the surged energy prices and energy shortage will ultimately trigger social and political disorder. Therefore, the objective of this paper is to provide some feasible energy strategies that are helpful for European countries to mitigate the current energy shortage crisis and to reduce energy vulnerability based on the analysis of the influences of the war on energy security and policy.

This paper is divided into three sections. The first section explores the reason that the war has threated the global energy security. The second section will analyse how the war threats European energy security and why it can trigger social and political issues. Finally, section three displays the possible directions of energy policy that European countries may choose in respond to energy crisis and offers feasible strategies under short-term and long-term considerations.

2. The Reasons That the War Threatens Global Energy Security

2.1 Important Roles that Russia and Ukraine Play in the Global Energy Market

Discussion about global energy security usually focuses on reliable supply of energy resources without interruptions at reasonable price. The main threats to energy security are disruption of energy

exports, instable transportation system. From these two aspects, Russia and Ukraine, as two parties to the war, play essential roles in the global energy market and energy security.

Possessing the world's richest deposits of energy resources, Russia is a major producer and exporter of almost all of fossil fuels in the global energy market. In 2019, Russia was the second largest oil and natural gas producer, just behind China and the United States, with production achieving 560 mtoe and 750 bcm respectively [2]. In 2022, Russia is responsible for approximately 10% of the global energy production [3]. As one of the most important energy exporting countries, Russia's export of gas reached 265 bcm in 2019, was the number one exporter in the world natural gas market. In the same year, it ranked second and third on the list of oil and coal exporters, exporting 260 mtoe and 189 mt [2]. When it comes to 2020, Russia becomes the leader of world energy resources exporter, with net energy exports increased to 701.3 mtoe [2]. And its export of oil, natural gas and coal accounts for 8%, 10% and 15% in the global energy export market [3]. These abundant energy resources make Russia a world energy superpower.

As a transit country, Ukraine also plays an important role in energy security. Ukraine is a gas corridor for Russia to export its gas to European countries. In 2014, 62.2 bcm of gas was transited from Russia to Europe across Ukraine, accounts for 40% of total gas exports [4]. In southern Europe, countries receive all their Russia gas through Ukrainian transit corridor [5]. Ukraine becomes a critical corridor for Gazprom's export to European countries because its transit route is shortest for Russia to deliver its gas to southeast European countries. It contributes to both commercial interest and physical security of transit. However, the military conflict between Russia and Ukraine has produced serious deterioration in relations among these two parties in terms of both economic and social areas, and this would further influence the transportation of Russian gas export.

2.2 Sanctions and Retaliations have Disrupted the Global Energy Market

Sanctions imposed by Western world and corresponding responses taken by Russia have further disrupted the global energy market and resulted in high energy prices, especially for European countreis. Western countries try to suppose Ukraine by cutting off Russia's energy revenues, which can be used to finance the war. The EU has banned imports of oil, coal, and petroleum products from Russia [6, 7]. However, the strict sanctions and import embargoes have caused serious damage to worldwide energy flows [8]. Oil and gas are two core energy sources in energy market, more than 50% of the total energy supply in 2022 are made up of these two types of energy [9]. Therefore, the strict embargoes on energy resources would not only harm Russia and European countries, but also all states relying on Russia's oil and gas supply through disturbing the oil and gas supply chain. It would ultimately result in supply shortfalls, which can undermine global energy market stability and push energy price skyrocket.

A series of countermeasures taken by Russia in response to the sanctions imposed by the Western world has exacerbated the disruption in global energy flows. Russia adopted two means of retribution against sanctions, including cutting off supply and disturbed energy transmission. For example, Russia refused to supply 'unfriendly states' by cutting down energy exports, closing gas pipelines and receiving payments in roubles [10]. On 2 September 2022, Russia shut down the Nord Stream 1 natural gas pipeline and cut off all gas flows to Germany. The effects of actions taken by Russia has been felt most in the European countries due to their heavily dependence on Russia's natural gas. Moreover, Russia tries to squeeze European countries and force them to cancel the embargoes. Gazprom continues the threats of cutting off the gas pipeline and no improvement can be expected before the embargoes removed. These actions taken by Russia have resulted in oil and gas price increased and have intensified Europe's energy crisis [8].

3. The Effects of War on European Energy Security

The root of the current energy crisis is the outbreak of Covid-19 pandemic, and the war has further tightened the energy market, aggravating this crisis. As major energy producer and exporter, the

conflict between Russia and Ukraine has caused significant shocks in energy security. The disruption in energy supply and transmission have caused global energy price surge, especially for oil and natural gas. Europe, with its highly dependence on Russian energy resources, has been mostly affected by the war.

3.1 Energy Crisis Caused by COVID-19

Before the Russia-Ukraine war, the global and European energy market experienced extreme price volatility due to an economic disruption caused by the outbreak of COVID-19. At the beginning of the pandemic, energy demand dropped due to lockdown policies, which further resulted in severe disruption in supply chains [11]. The supply of energy commodities, technologies, as well as relevant services was impeded, especially those involved in inter-continental trade routes. In addition, energy poverty problems arose due to increased energy prices. Ordinary people in many regions do not have enough capacity to pay more for their bills [12]. Specifically, the rate of the population in Europe that is unable to fully heat their home rose from 6.9% to 8.2% in the first year of the outbreak of Covid-19 [13]. With the cancellation of lockdown restrictions in some countries, and economic day-to-day activities in many industries resumed at the beginning of 2021, energy prices further surged due to increased demand for energy resources and services transports [14]. Statistics shows that gas prices in Europe increased by 560% between February and December 2021 [15]. Global energy demand already outstripped supply, and the imbalance was expected to grow to 2% in 2022 [9].

3.2 The Effects of the War on European Energy Security with Political Consideration

European countries have been most seriously affected by the conflict because of their highly dependence on Russia energy imports. All the EU member states are net importers of energy, and some of them are heavily dependent on Russian fossil fuel and natural gas. According to the statistics, purchased 24.4% of its overall domestic energy from Russia, oil and gas imports from Russia made up 36.5% and 41.1% respectively in 2020 [16]. Among EU Member states, Germany is the largest economy in the European Union, it created more than one quarter of community's GDP in 2020 [17] and accounted for one fifth of EU's gross domestic energy (GAE). Nevertheless, almost 50% of German net imports of fossil fuels (7,630 PJ) came from Russia [18]. In terms of natural gas, EU countries imported 155 bcm of natural gas from Russia in 2021, accounting for 45% of their total consumption [19].

Under the pressure of Russian retaliations, European countries have experienced energy shortfall, surged energy prices, as well as increased fiscal expenditure. Between 2021 and 2022, natural gas price in Europe surged from 20 to 80 €/MWh [20]. In early April, the document shows that Europe needs to bear at least €1 billion more every day to import oil and gas from Russia because of surged energy price [21]. The shut-down of NordStream 1 pipeline and suspension of certification of Nord Stream 2, lead to a reduction in supply of natural gas to Germany and EU by 60% and 15% respectively [21, 22]. With few alternative energy resources can replace these supplies in short term, Germany and other EU countries will experience a serious energy shortage due to the increase in gas demand with the approaching winter season.

Moreover, social and political issues may be triggered by the current energy crisis [23]. The current energy crisis put household under the pressure of energy poverty, people should pay more for their household expenses because of the surged prices [24]. This issue can ultimately affect 31-50 million European residents [25, 26], and will result in a large-scale impoverishment. Additionally, completely opposite opinions on the embargo policies against Russian oil has divided the EU [27]. With different needs for Russian oil and gas, EU countries are not aligned with the energy policy against Russia. For example, Lithuania, with importing 96% of energy resources from Russia, would bear more risk to be harmed by sanctions than Germany, which only imports 31% energy from Russia [28]. Contrary to aggressive policy raised by European Commission, a growing number of EU member states to signal their willingness to cancel previous sanctions [29]. All these issues, including energy poverty

and opposite opinions would undermine the authority and leadership of EU as a trustworthy political institution [30].

4. The War and European Energy Policy

4.1 Two Possible Models for Future Energy Policies in Europe

The prolonged war accompanying current energy crisis becomes a turning point for Europe's energy policies. Retaliation taken by Russia against European sanctions makes natural gas more geopolitically unreliable. This uncertainty has changed the perception of Europe against energy sources forced EU member states to reconsider their energy policies to relieve themselves from the current energy crisis and to reduce dependence on Russian energy supply [23]. There are two possible models from which Europe may choose, namely, ensuring national energy security and accelerating energy transition [31].

Focusing on national energy security is one of the most important choices for European countries. Energy securitisation always occurs at the wake of energy crisis [32]. Energy shortfalls and surged price has shifted EU's energy policies from focusing on decarbonisation to protecting their residents from energy poverty and securing energy supply [33]. European countries may adopt extra-ordinary measures to securitise their energy supplies in the wake of energy crisis caused by the war. For example, changing competencies within EU energy governance and boundaries of existing rules [23]. They will also reexam energy supply partnerships, especially the dependence on Russian energy sources and adopt a series of measures to phase out Russian away from European energy market [10]. Reduce the dependence on Russian energy becomes a basic case for EU's energy security since it is dangerous to be exposed to the prolonged military conflict [23].

Accelerating energy transition is another way to realise energy independence. This model includes strategies such as intensifying the switch from fossil fuels to renewable energy sources and modernising energy systems [31]. Increased energy price is always an incentive for investment in renewable energies [34]. Instability of Russian energy sources provokes EU starts to perceive developing renewable energy as a measure to realise energy independence [35]. EU, to be expected, will take more control over renewable energy in future construction of energy security. In terms of modernising energy system, increasing investment in energy efficiency, such as heating pumps in housing sector, cannot only replace fossil fuels in heating industry but also stabilise heating prices, which can help states protect populations against surged gas prices and energy poverty [36].

Nevertheless, neither of these two policy models have their own obvious deficiencies. The model of focusing national energy security also refers to nationalism, which has a potential for exacerbating environmental degradation and undermining the realisation of decarbonisation [37]. It is possible that Countries intend to reject international agreements on climate change. For instance, under the pressure of surged energy price, the United Kingdom government issued new gas and oil licenses in the North Sea on 7 April 2022 [38]. From another point, the policy model of accelerating energy transition needs a large-scale time investment, it cannot solve the current energy shortage crisis. Therefore, European countries should balance these two types of energy policy to resolve the current energy and environmental deterioration issues simultaneously.

4.2 Feasible Energy Strategies for Mitigating Energy Crisis

Energy policy should combine shot- and long-term strategies. In short term, it is possible to extend the investment in certain traditional energy to resolve the shortage of energy supplies and to protect vulnerable populations from energy poverty. Meanwhile, considerations for national energy vulnerability and decarbonisation should be involved in long-term plans.

4.2.1 Short-term Energy Strategies

For countries under the pressure of energy shortage, the top priority is to ensure energy supply. In this respect, postponing the phase-out of coal can securitise energy sources in short term and protect

vulnerable people from energy shortage in approaching winter season because re-investment in coal can substitute for natural gas supplied by Russia. In addition, stricter energy conservation requirement in housing and transportation sectors can effectively alleviate the pressure caused by energy shortage. Housing and transportation sectors are two industries possessing enormous potential for energy saving. In housing sector, governments can mandate stricter energy saving requirement, such as turning down heating and cooling temperatures. According to statistics, Heating and cooling account for over 50% and 17% of global energy consumption respectively [39]. Air conditioner, in specific, is one of the highest energy dissipation appliances. The reduction in the set point temperature of air conditioner by 1 Celsius can cut down energy consumption by 10% [40]. In terms of transportation sector, according to the statistics, around 60% of global oil is used in this industry. Feasible policies, such as lowering car speed limits, replacing private cars with public transport, increasing the use of shared vehicles, can contribute to a decrease in energy consumption significantly. A report published by IEA shows if the speed of heavy trucks and cars can be reduced to 10 km/h, use of 140 and 290 thousands of barrels of oil can be saved respectively [39].

4.2.2 Long-term Energy Strategies

In the long term, policymakers should focus on reducing energy vulnerability and mitigating climate change. Accelerating green energy transition through investing in the deployment of renewable energy can promote the realisation of Europe's energy independence and securitisation of energy sustainability [42]. For example, the REPowerEU plan suggests EU member states to replace Russia's gas with renewable energy and hydrogen production [43]. Improving energy efficiency in housing sector is another indirect way to increase energy savings and to protect vulnerable populations against energy price volatility through replacing fossil fuels [36]. Europe can impel transformation from traditional heating systems to heat pumps, because the latter is 3 to 4 times as efficient as fossil fuel boilers in providing heat.

Finally, the most essential policy is mandating an obligation to increase energy storage. Achieving large energy stocks can tackle energy crisis and other supply-demand imbalances resulting from sudden energy shortage in the future. For example, about 240 million barrels of oil will be released from the emergency reserves of IEA member states in response to the strict strains in energy market caused by the war [39].

5. Conclusion

The Russia-Ukraine war will be a turning point for European energy politics. And which energy policy models will be adopted by European countries will depend on the duration of the conflict, the degree of dependence on Russian energy imports, and political stand in energy importing countries. From a practical perspective, relying on merely only single direction of energy policy is an extremely risky option. Either of two types of strategies has their deficiencies. Postponing the phase-out of coal will exacerbate environmental degradation, while exploiting of new renewable energies and improving energy efficiency require large-scale investment of funds and time. Developing new renewable energies requires at least two years, producing hydrogen needs a decade, and new nuclear power plants ask for more than 15 years to be constructed and qualified. Therefore, short-term policies referring to extending the deployment of certain traditional energy and long-term strategies involving accelerating energy transition, increasing energy efficiency, and mandating higher storage obligation should be implemented in combination. Only through comprehensive consideration, can the European countries not only relieve energy shortage and protect populations against energy poverty by the start of winter season, but also achieve the goal of decarbonisation and energy independence.

In general, challenges caused by the war can also be an opportunity for European countries to realise energy independence and speed up energy transition benefited by the political consensus to diversify away from Russian energy sources. Moreover, efforts made by Europe can promote the global phase-out of oil, which can further reduce the influence of countries that tend to utilise energy resources as strategic weapons to achieve political goals.

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