

Chapter 1

Global Energy Outlook in the Context of Russia-Ukraine Conflict



Qiang Liu and Chen Pan

On February 24, 2022, the Russia-Ukraine conflict erupted in full force when Russian troops entered Ukraine on multiple fronts and launched a “special military operation.” The conflict has a complex geopolitical background. Russia’s military action was born out of its mainstream ideology on international relations—New Eurasianism, which centers on maintaining Russia’s geo-strategic security and global influence through territorial control and the formation of spheres of influence around the country. Under the far-reaching influence of this ideology, the outbreak of the conflict was precipitated by the special historical and political issues including Russia’s cross-border ethnic issues, the historical impact of the Holodomor and World War II in Ukraine, Ukraine’s nuclear abandonment and the Budapest Treaty, Black Sea control and the Crimea issue, and NATO’s eastward expansion and Russia’s countermeasures.

The outbreak of the conflict was immediately followed by unprecedented sanctions by the West against Russia and full assistance and support to Ukraine, with the possibility of a prolonged low-intensity war between the two countries around the borderline issue in the future. The conflict involving Russia, a major supplier to the global oil and gas market, continues to this day and has a huge impact not only on global politics and economics, but also on the global energy market. In view of this, this paper analyzes the impact of the Russia-Ukraine conflict on the global political and economic landscape, and, based on which, discusses the prospects for global energy development in the context of the conflict.

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The Impact of the Russia-Ukraine Conflict on the Global Political and Economic Landscape

The Russia-Ukraine conflict is the biggest geopolitical event since the twenty-first century, which has opened the way for the reorganization of the international political and economic order in the “post-Cold War” era and will inevitably promote changes and adjustments in the world’s geopolitics, political order, international rule system and economic relations. The West has been containing Russia by besieging and isolating on all fronts: politics, economy, science and technology, humanities and so on. On the one hand, they are imposing all-round economic and financial sanctions on Russia; on the other hand, they are providing all-round assistance to Ukraine, including military, financial and humanitarian assistance. The outbreak and continuation of this conflict will have a profound impact on the world political landscape, or reshape the global political structure.

Global Political Landscape

Instead of weakening the power of NATO and Europe and separating the US and Europe, the Russia-Ukraine conflict has led to a renewed awareness of the importance of the US and NATO among European countries, especially in Eastern Europe, leaving Russia in unprecedented isolation in international politics. Since the outbreak of the conflict, European countries that have been at peace for a long time, especially the Baltic States and Eastern European countries close to Russia, such as Finland, Sweden and Poland, raise their military budgets, purchase weapons and expand their armies as they feel the threat from Russia. Finland and Sweden, which had always been neutral, now are applying to join NATO. Under the impetus of the US and NATO, the Western world is forming an anti-Russian coalition to support Ukraine. There is also an anti-Russian sentiment in Russia’s neighboring regions. Even Kazakhstan, which had been supported by Russia during its political turmoil, became largely neutral about the Russia-Ukraine conflict, provoking an almost antagonistic pattern between Russia and Kazakhstan. The Russian-led Eurasian Union, the Collective Security Treaty Organization, and other regional organizations involving former CIS countries are at risk of disintegration and friction.

The Russia-Ukraine conflict has pushed the US to place greater emphasis on building global political alliances, while beginning to accelerate its efforts to draw in and geopolitically integrate with emerging markets and developing countries, in addition to its natural allies in the OECD countries of Europe, East Asia, and Oceania. The overall style of ASEAN countries in their diplomatic relations shows their increasing autonomy. In recent years, in response to some UN resolutions, ASEAN countries rarely follow the West blindly, but make choices based on their own interests. In this Russia-Ukraine conflict, the ten ASEAN countries, except Singapore, did not make substantial sanctions against Russia. On the balance of

interests, the Middle East and North African countries are neutral in their attitude toward the conflict. As the United Nations General Assembly adopted a resolution on Wednesday condemning Russia's invasion of Ukraine, Syria voted against, Iraq, Iran and Algeria abstained, and most Middle East countries did not join in the sanctions action against Russia. Latin American countries are generally unenthusiastic about international affairs in other parts of the world. For example, Brazil has remained neutral on the Russia-Ukraine situation and has stated that economic sanctions will not contribute to a peaceful resolution of the Russia-Ukraine issue, in line with its consistent moderate foreign policy.

Global Economic Landscape

The Russia-Ukraine conflict has serious implications for the world economy, both in terms of the direct impact of the war on commodity prices and European energy supplies, but also in terms of the long-term global impact through changes in the global political and economic landscape. This adds to the woes of a world economy just recovering from the pandemic. There is no certainty as to when and how the Russia-Ukraine conflict will end, but in terms of the global economic landscape, it will undoubtedly add to the uncertainty of the global economy in any case.

Global Commodity Prices Fluctuate Sharply

Russia is an important exporter of energy, food, metals and other commodities, while Ukraine is a major global food producer and exporter. The conflict between the two countries undoubtedly pushed up global commodity prices, and then the targeted economic and financial measures of Europe and the US made prices fall back. The dramatic fluctuations in commodity prices were quickly transmitted to global industries, which in addition to causing dramatic short-term shocks, made investment expectations more unstable and sometimes more damaging to the economy than simple price increases.

Russia and Ukraine account for about 80% of global sunflower oil exports, 19% of global corn exports and 29% of global wheat exports. Crop sowing and harvesting have not been spared from the dramatic impact of the conflict, with the suspension of commercial shipping at Odessa, Ukraine's largest port on the Black Sea coast, disruption of export shipments, reduced grain production and shipping restrictions, and a host of other factors pushing up global food prices. Although the food export agreement has eased the global food crisis, uncertainty remains.

Russia is the world's second largest exporter of crude oil and the largest supplier of natural gas to Europe, and the Russia-Ukraine conflict and sanctions against it by US and European countries continue to push up global energy prices. Russia is also a major exporter of metals such as palladium, nickel and aluminum, with its share of global exports of palladium, nickel and aluminum at 6%, 21.9% and 9.9%,

respectively, in 2021. Since the conflict, the market has seen dramatic shocks, with metal trading prices rising sharply, pushing up the costs of downstream companies in the electronics industry, auto parts, and military aerospace.

Subsequently, the US has gradually brought crude oil prices back down by promoting the appreciation of the US dollar, increasing domestic and other oil-producing countries' supply, releasing inventories and other measures, and crude oil prices have now fallen back to the level before the conflict. In parallel, the prices of copper, aluminum, nickel, gold and other metals have also basically returned to the previous levels.

The Global Supply Chain Crisis is Intensified

The Russia-Ukraine conflict is exacerbating the crisis of the global supply chain that has appeared less resilient since the outbreak of the COVID-19 pandemic, which sees international shipping and logistics prices soar in the short term, pushing up transportation costs. With more far-reaching effects, US and European countries imposed financial sanctions, oil embargoes and airspace closures on Russia, and European countries urgently adjusted their import channels for energy and other related materials, while banning exports of cutting-edge technology products to Russia and revoking Russia's most-favored-nation status, among other measures.

In terms of land transport, given that both Russia and Ukraine are important nodes of the "Belt and Road", the near disruption of land transport routes caused by the conflict made it impossible to continue the operation of the China-Europe train, which in turn seriously affects the economic and trade relations between China and the countries bordering the Black Sea. On the one hand, the conflict has interrupted the transportation of China-EU trains via Ukraine, and on the other hand some customers who were worried about sanctions withdrew their orders. Most of the goods shipped to Europe via the China-EU trains are high-value electronic goods and other manufactured products, thus inevitably affecting China's related manufacturing industry.

In terms of pipeline transportation, European countries are most dependent on Russia for energy imports, mainly oil and gas, with gas being the most essential as its transportation benefits even more from the pipeline infrastructure. Immediately after the outbreak of the conflict, Europe announced plans to scale back its oil and gas imports from Russia, but this shift will take some time as it calls for new import facilities, mainly LNG import terminals.

In the financial sector, the West promptly kicked Russia's major banks out of the SWIFT system and froze Russian financial assets abroad. This measure had a serious impact on Russia's foreign trade and affected Russia's international investment and trade cooperation.

In the field of technology, Europe and the US restrict the export of electronic products such as chips and related manufacturing products to Russia; large e-commerce companies and social networking platforms from Western countries, such as Amazon,

Twitter and Google, have left Russia and carry out autonomous sanctions against Russia.

The World Economy Falls into Stagflation

The Russia-Ukraine conflict has had an impact on monetary policies of various countries, causing the risk of stagflation. The conflict and sanctions against Russia have undermined the confidence of European consumers and investors, and coupled with the EU's high dependence on Russian energy imports, high energy prices have forced the EU to accelerate its exit from accommodative monetary policies. The US has similarly accelerated its monetary tapering operations in order to reduce high inflation caused by high oil prices, which also carries the risk of causing stagflation. With the outbreak of the conflict, the international financial community reacted quickly, and as an emergency hedge against value preservation and long-term expectations, the US dollar began to appreciate and, correspondingly, the euro depreciated rapidly against the dollar. By mid-July 2022, the US dollar was almost equal to the euro for the first time in 20 years. The Russian ruble depreciated rapidly in the aftermath of the conflict, then recovered rapidly following strong intervention by the Russian government and is now above its pre-conflict value.

The conflict dampened venture capital's and private sector's confidence, which in turn impacted demand in the real economy and will ultimately slow down the global economic repair process. The world is now in a post-pandemic era, with the economy gradually warming up from the cold winter of the COVID-19 pandemic, but the basis for economic recovery is weak. The Russia-Ukraine conflict and the sanctions imposed on Russia by the US and European countries further increase the uncertainty of the global economic recovery prospects. The conflict weakens economic recovery prospects while fueling inflation expectations, complicating the challenge of trade-offs between curbing inflation and supporting the economy. The conflict severely undermines investor confidence and significantly reduces the willingness of multinational companies to invest. Rising market risk aversion is accompanied by rising financial risks in emerging countries.

The Trend of Reverse Globalization in the World Economy Accelerates

The regionalization and localization of the global economy occurred long before the outbreak of the Russia-Ukraine conflict, and the disruption of global supply chains due to the COVID-19 outbreak contributed to the acceleration of this dynamic. Thus, when the conflict broke out, the global political landscape was shaken. In the short term, the Western camp is weighing its interests and moving closer to the US, while a considerable number of developing countries choose to remain neutral and wait and see in order to protect their own interests. In the long run, European countries will be more determined to promote their "strategic autonomy," and in the future will enhance their independent status in more economic and trade fields, actively

expanding their geopolitical influence. Developing countries will also adjust their diplomatic attitudes to lean more toward autonomy. It is foreseeable that the chaos and the economic sanctions imposed on Russia mainly by the US and Europe will accelerate the reorganization of the global economic landscape and further regionalize and localize the global economy amidst greater uncertainty.

The trend of counter-globalization in the world economy inevitably has a significant impact on China, which is deeply involved in the world economy. The US and Western countries have begun to deliberately reshape the international industrial chain in an attempt to weaken China's influence in the international economic arena. The US is encouraging the return of manufacturers to the US and the transfer of manufacturers and supply chains that cannot return to the US to India and Southeast Asian countries, and there will be more restrictions and suppressive measures in the field of science and technology in the future, which will pose new challenges to the long-term sustainable development of the Chinese economy. At the same time, the efforts of the US and Western countries to establish a trade and economic integration system outside of the World Trade Organization (WTO) in accordance with Western market rules will significantly change the international economic environment that China will face in the future.

The Impact of the Russia-Ukraine Conflict on the Global Energy Development

The Russia-Ukraine conflict has had a direct impact on the global oil and gas market, and the post-conflict spike in energy prices has exacerbated the inflation crisis in major economies, while the world economy stands at another crossroads. Changes in the energy supply structure will reshape the global energy market landscape. For the vast majority of countries, especially in the EU, the conflict has brought about a more long-term energy security issue, prompting countries to make energy security a top priority in its future energy policies.

Direct Impact on the Global Oil and Gas Market

Forecast of Crude Oil Market and Crude Oil Prices

The Russia-Ukraine conflict has led to drastic fluctuations in crude oil prices, seriously disrupting the global energy supply and demand order. The conflict forced European countries, which are highly dependent on Russian oil and gas resources, to switch their import sources, which will change the global oil and gas supply and demand pattern. Europe, which is most affected by the Russia-Ukraine conflict, including the EU and the UK, has proposed plans to reduce and eventually get rid

of oil and gas imports from Russia. The EU released the *REPowerEU: Joint European action for more affordable, secure and sustainable energy* on March 8, 2022, which, based on the Fit for 55 package, proposes to reduce the EU's Russian gas imports by two thirds by 2022, and to free itself from dependence on Russian oil and gas resources as early as possible by 2030. The main measures are to promote the diversification of gas imports in the near term (accounting to more than half of the alternatives) and to focus on increasing the use of renewable energy and energy efficiency in the medium and long term. The leaders of the 27 EU member states agreed to the action plan on March 11, and the European Commission will issue further implementation details.

For the US, the Russia-Ukraine conflict represents a unique business opportunity for its oil and gas industry. With Russian oil accounting for only about 3% of all crude oil imports that arrived in the US in 2021 and the US not importing any Russian natural gas, the ban on Russian energy imports will have little impact on the US domestic energy supply system. After the conflict broke out, the US was the first to announce a halt to imports of Russian energy products, and as an alternative to Russian natural gas, US LNG will see a larger international market. Recently, the US has started another diplomatic public relations campaign to limit the price of Russian oil exported. The basic policy adopted by the US, Europe, Japan and other developed countries is, on the one hand, to push European countries to get rid of their dependence on Russian oil and gas; on the other hand, to try to convince developing countries like China and India to import Russian oil at a limited price.

The Russia-Ukraine conflict has undoubtedly pushed up crude oil prices in the short term, an inevitable reaction to tight supply and psychological tension. But in the long term, as the situation becomes clearer, crude oil prices will return to the fundamentals of market supply and demand after their surge higher.

In recent months, the policy goals of the US and European countries have become very clear: one is to reduce Russia's share of the global oil market as much as possible, and the other is to lower oil prices. They hope to reduce, if not completely divest Russia from the oil market, the country's oil export revenues, which would also help reduce high inflation in the US and European countries and ease the pressure on their domestic economy due to support for Ukraine. To this end, the US has pushed for both domestic tapering to reduce the dollar supply and international support from Saudi Arabia, the pivotal oil producing nation in the Organization of Petroleum Exporting Countries (OPEC). Both of these measures have begun to work recently, so international oil prices have fallen significantly since July (Fig. 1.1) and are now back to around \$96 per barrel. The pullback in international oil prices is expected to continue until at least the second half of 2022.

Forecast of Natural Gas Market and Natural Gas Prices

Europe is highly dependent on Russian gas resources (see Table 1.1), so the Russia-Ukraine conflict has the most significant impact on the European gas market, especially in Germany. In turn, the loss of the European market would be very damaging

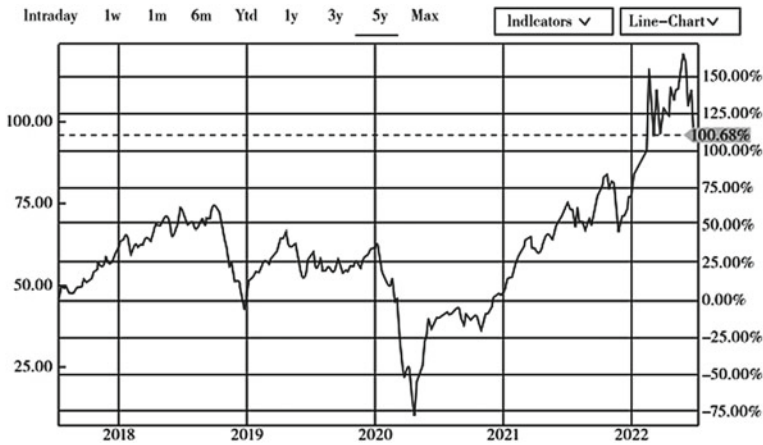


Fig. 1.1 Crude oil price (WTI) curve (\$/barrel). *Source* <https://markets.businessinsider.com/commodities/oil-price/usd?type=wti>

for Russia: in 2020, Russian exports to Europe accounted for 51.4% of total European imports and 70.4% of total Russian exports (see Table 1.1); if the volume of transit and re-exports is excluded, it is even 73.8% of Russia's net exports. In relative terms, however, the conflict affects Russia more than Europe. While the EU can find alternative sources of gas by comprising on cost effectiveness, Russia, whose gas exports are dependent on pipeline facilities, would need to build LNG facilities or ultra-long-distance pipeline facilities to replace its gas export targets. In the context of Western sanctions, such long-term investments are difficult.

In the future, Europe will have to look for new sources of gas supply in order to break away from its dependence on Russian gas resources. Europe's import structure in fact has many options, with differences mainly in terms of price. From the point of view of sources, gas from Azerbaijan and Turkmenistan in the Caspian region can be delivered to Europe via the Baku-Tbilisi-Ceyhan pipeline to the Black Sea terminal, while gas reserves in the Eastern Mediterranean and the Black Sea (after the war) can also provide a source of gas imports for the South-East European region. In addition, Algeria and Libya could also increase their gas exports to countries in southern Europe through submarine pipelines. Examples include expansion of the capacity of the Medgaz gas pipeline linking Algeria and Spain, Bulgaria's connection of its gas network to Romania and Serbia, Poland's connection to Denmark, and Bulgaria's promotion of further connections to Greece. The largest incremental volumes will come from US shale gas exported in the form of LNG. The US coordinated emergency exports to European countries as soon as the conflict erupted and will continue to build additional terminal facilities to meet more of the European countries' natural gas needs in the future. In the first half of 2022, US exports reached 11.2 billion cubic meters of natural gas, an increase of 25.7% year-on-year. For the first time in history, US LNG supplies to European countries exceeded Russian pipeline deliveries in June 2022, the International Energy Agency said.

Table 1.1 Europe's international gas trade with Russia in 2020

	Trade volume (billion m ³)	Global market share (%)
Europe		
Pipeline natural gas imports	211.3	22.5
Including: Russia	167.7	17.8
African countries	25.2	2.7
Other CIS countries	13.4	1.4
Middle East	5.1	0.5
LNG imports	114.8	12.2
Total imports	326.1	34.7
LNG exports*	5.6	0.6
Total exports*	5.6	0.6
Russia		
Pipeline natural gas imports	11.0	1.2
Total imports	11.0	1.2
Pipeline natural gas exports	197.7	21.0
Including: Europe	167.7	17.8
Other CIS countries	26.1	2.8
LNG exports	40.4	4.3
Total exports*	238.1	25.3
Global pipeline trade	452.2	48.1
Global LNG trade	487.9	51.9
Total global trade	940.1	100.0

Source BP Energy Statistics, 2021

Note * LNG exports include re-exports

While global oil prices have soared, natural gas prices have continued to hit record highs. Immediately after the conflict erupted, the EU proposed to reduce its gas dependence on Russia to more than half in order to quickly respond to the sanctions. The proposal, while reflecting the elevated energy sanctions concerns of European countries, also significantly increases their reliance on LNG in the spot market, thus pushing LNG prices even higher. The Dutch TTF gas price, the benchmark for natural gas prices in European countries, reached a high of €200/MW-h in futures in early March. On July 16, the TTF price was €159.57/MW-h (see Fig. 1.2).

It cannot be ruled out that there will be more price fluctuations in the future, as the Russia-Ukraine conflict continues and the outlook is unpredictable. Perhaps only when the conflict is over or the outlook is clear will gas prices in European countries stabilize. As it will take a long time to adjust the supply structure, it is estimated that European countries and the world will face significant price volatility in the next 2–3 years.

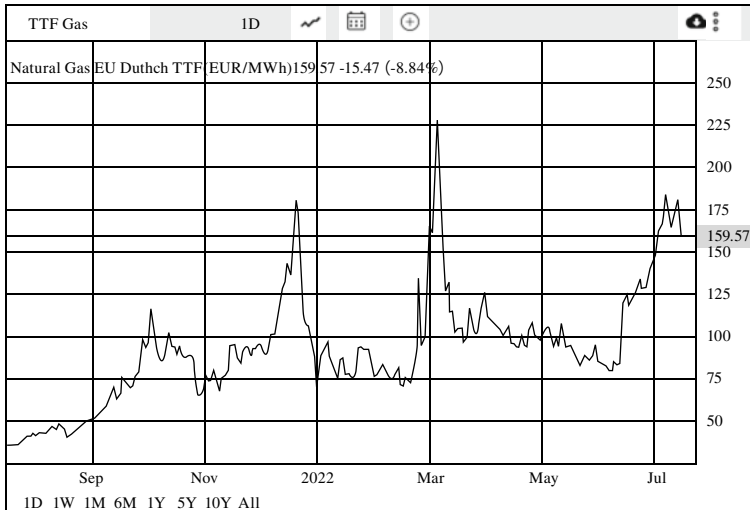


Fig. 1.2 Curve of the Dutch TTF gas price (€/MW-h). *Source* <https://tradingeconomics.com/commodity/eu-natural-gas>

Global Oil and Gas Market Landscape

What is clear is that after the outbreak of the conflict, and especially after the boycott of Russian oil and gas exports by the West gradually takes effect, both international oil and gas markets will undergo fundamental changes. These changes will be manifested in two main ways.

The US and Saudi Arabia, two major oil and gas producers, will have a significantly higher “energy voice.” As the world’s largest producer of oil and natural gas, the US has great export potential despite not ranking first in the world in both oil and gas exports due to its huge domestic demand. Data for 2020 show that the US is the fifth largest exporter of crude oil (behind Saudi Arabia, Russia, Canada, and Iraq) and the second largest exporter of natural gas (after Russia, and with total exports even greater than the entire Middle East region combined). While the US has achieved a shale gas revolution, it still has many untapped offshore reservoirs and reserves in Alaska, thus its potential for future production increases remains a concern. Saudi Arabia, on the other hand, is the traditional OPEC production hub, retaining significant mobile capacity. Saudi Arabia’s role as a determinant of oil prices was exemplified by President Biden’s visit to Saudi Arabia on July 16, when talks with the Saudi king essentially resulted in an agreement to increase oil production.

This dominance of the US and Saudi Arabia in the international oil and gas market is determined by their respective characteristics. The US has hegemony over the US dollar, which translates into a large part of pricing power over international oil prices, enabling it to manipulate oil prices through the dollar exchange rate and its huge production capacity. Saudi Arabia has the world’s largest oil reserves and

production capacity (16.6% of the world's oil production in 2020) and almost the lowest cost of oil extraction in the world. These two factors determine Saudi Arabia's position in the international oil market.

Russia will not be able to return to its former position in the sector due to the impact on its oil and gas production. Before the conflict broke out Russia was the world's most important oil exporter and largest gas exporter outside of Saudi Arabia, and it is difficult for European countries to quickly decouple from Russian oil and gas because of the infrastructure-based tie-ups between the two sides. However, economic costs have given way to political fears, and Europe has developed firm plans to achieve its decoupling goals. Once such decoupling measures begin to be implemented, and old refineries are adapted to smelt crude oil from other sources, new LNG receiving terminals will begin to accept gas from the US, African countries and Middle East countries. The continuation of the carbon neutral program will also lead to a reduction in demand for oil and gas, and then the decoupling from Russian oil and gas will become permanent. Once the large market of Europe is lost, it will be difficult for Russia to find alternative markets elsewhere.

In the case of the Chinese market, the current share of Russian oil and gas, which China has actually cut from other competitors in order to support Russia, has essentially reached its limit. In the first half of 2020, Russia overtook Saudi Arabia as China's largest source of crude oil imports, but the right crude oil for each refinery is different, and the high price of Russian oil puts a lot of cost pressure on Chinese refineries. In the natural gas sector, it is difficult to increase supplies to China because of Russia's limited capacity in East Siberia. Meanwhile, there are no pipelines from West Siberia to China for natural gas yet. Under Western sanctions, the lack of funding and technology has made it almost impossible to start construction of the originally planned western Russian-Chinese gas line.

Therefore, the impact of the Russia-Ukraine conflict on Russian oil and gas exports can be considered irreversible. Russian oil and gas, unable to find alternative markets, have no other choice but to sell at reduced prices. As time goes on, some wells may have to be shut down.

Impact on Energy Structure and Energy Transition

Rising oil and gas prices and potential changes in global energy supply and demand patterns may have an impact on countries' future energy structures, but in the long run, the general trend for countries to transform their energy structures to green and low-carbon is inevitable. The surge in oil and gas prices and potential supply shortage brought about by the Russia-Ukraine conflict has warned countries of the importance of energy security. In the future, no matter how countries' energy structure is adjusted, energy security has become an important base point of energy transition.

Europe and US

European countries are undoubtedly the most affected by the Russia-Ukraine conflict, and their energy security, energy transition policies and related industries are all profoundly affected. European countries have a high dependence on energy supplies from outside their borders, while Russia is the main supplier of oil and gas to Europe (Figs. 1.3, and 1.4).

The share of renewable energy in the energy structure of EU countries is increasing year by year. In terms of electricity structure, the electricity structure varies among

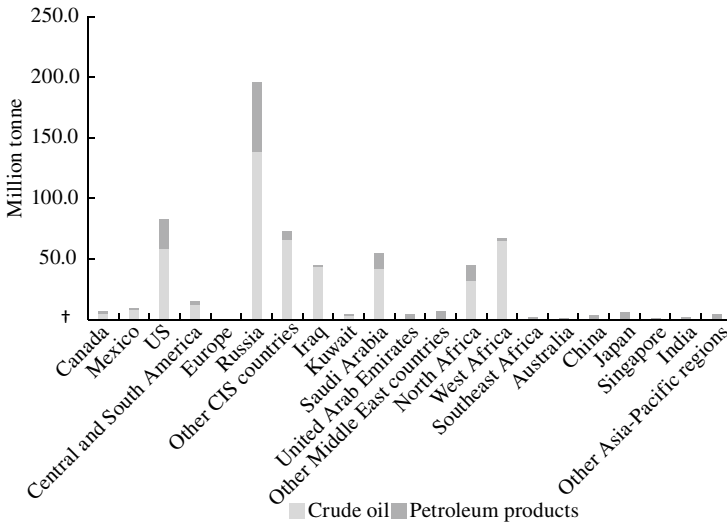


Fig. 1.3 Sources of Europe's oil and oil product imports (2020). Source BP Energy Statistics, 2021

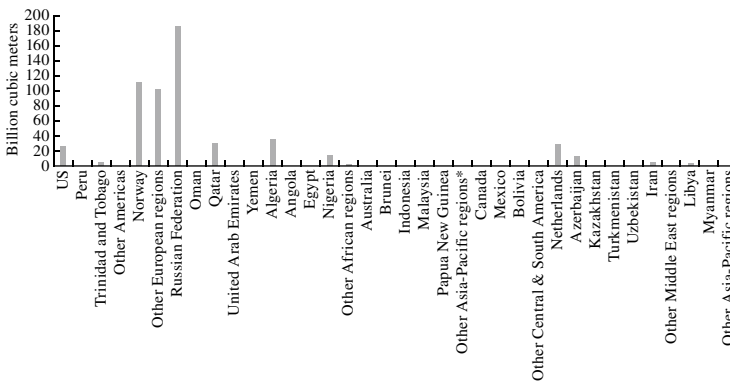


Fig. 1.4 Sources of Europe's natural gas imports (2020). Source BP Energy Statistics, 2021

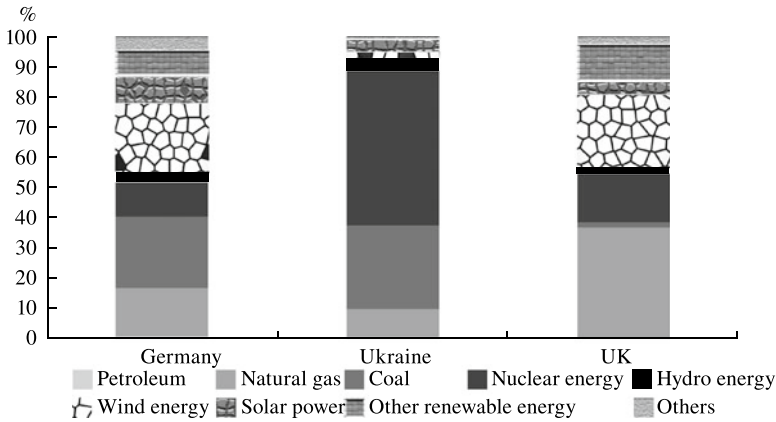


Fig. 1.5 Power generation structure in selected European countries (2020). *Source* BP Energy Statistics, 2021

European countries (see Fig. 1.5), with a generally high share of electricity generated from low-carbon sources. Germany is vigorously developing low-carbon electricity in an orderly manner, and by 2020, wind power, solar power and other new energy power generation methods will already occupy a high proportion in its power structure. Ukraine is dominated by nuclear power and coal power.

The UK has a high share of gas power generation, reaching 36% in 2020, but the UK relies on Norway for its gas imports,¹ so the Russia-Ukraine conflict will have little impact on its gas supply security.

European countries are clearly determined to turn this crisis into an opportunity to accelerate their transition to new energy sources. In the short term, the share of base-load power sources, such as coal and nuclear, is likely to increase over the next 5–10 years. The fact that natural gas has only half the carbon emissions of coal for the same calorific value has led to natural gas becoming an important energy source of green transition for European countries. Europe’s structure of the power source will see the impact of a change in the supply and demand structure for natural gas. First, more countries may decide to slow down the closure of coal and nuclear power plants in order to ensure a secure energy supply. Although replacing natural gas with coal or oil will result in greater greenhouse gas emissions, with energy security as a top priority, high-carbon fossil energy sources are likely to occupy a higher proportion of the energy structure in European countries in the short term, thereby suspending their process of energy transition for green growth. European countries such as Germany have already shown a major shift in their attitude toward high-carbon coal power—in March 2020, Germany, the Eurozone’s largest economy, called for a coal reserve that Europe should build to solve its electricity problem. At the same time, European countries will also try to speed up the construction process for renewable energy generation, in order to achieve a harmony between energy

¹ UK: oil and gas imports/Statista.

supply security and low-carbon energy transition for green growth. At present, wind power, solar power and other new energy generation methods still cannot perfectly replace gas power generation without the support of large-scale energy storage.

In the long term, the energy structure of European countries will accelerate the transition to new energy sources such as wind and light. At the same time, the Russia-Ukraine conflict has also reinforced the nuclear-based countries, represented by France, to adhere to this energy transition path, in order to balance the autonomous control of energy supply with the transition to green and low-carbon energy. In addition, higher fossil fuel prices due to the Russia-Ukraine conflict may further increase the value of net-zero emissions technologies such as carbon capture and storage (CCS) and green hydrogen energy. The EU has an ambitious plan to replace nearly half of Russian natural gas with clean hydrogen energy by 2030 (see Fig. 1.6).

Although the US energy structure has been affected only to a limited extent by the Russia-Ukraine conflict, there is a consensus reached globally, including the US, not only in Europe, that new energy sources are the mainstay of future energy increment. The US will account for nearly half of total newly installed capacity of PV in 2022. With a target of 80% clean electricity use by 2030, the cumulative installed renewable energy capacity in the US would rise to 885 million kW by that time. Not only has the Russia-Ukraine conflict raised the weight of energy security in the energy trilemma (energy security—environment sustainability—energy equity), but the potential of new energy sources to enhance energy independence and energy security has received further attention. As EU climate chief Frans Timmermans said in January 2022, renewable energy is the answer to ensuring energy security and affordability.

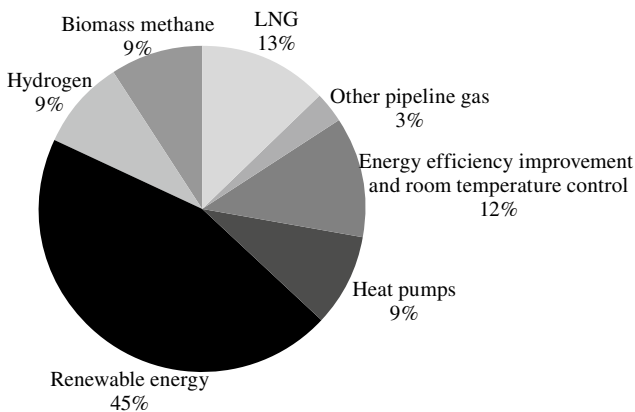


Fig. 1.6 EU's alternative solutions for Russian gas by 2030. *Source* Communication from the EU Commission: REPowerEU: Joint European Action for more affordable, secure and sustainable energy

Middle East and North Africa

Most Middle East and North Africa (MENA) countries, with the exception of Turkey, are primarily affected by the secondary effects of the Russia-Ukraine conflict. For the most part, MENA countries are rich in oil and gas resources, so they do not rely much on imports in terms of oil and gas resources (Fig. 1.7). For example, Egypt’s natural gas imports are almost zero in 2020. The UAE and Kuwait import 31.3% and 27.5% of their natural gas consumption, respectively, with Qatar as the main supplier. In contrast, Turkey has a high dependence on imports of natural gas resources, importing almost all of its gas consumption and having Russia as its largest source of gas, accounting for 34% of its gas imports. Therefore, the Russia-Ukraine conflict has had a direct impact on Turkey’s gas imports.

The power generation structure of MENA countries is closely linked to local resource advantages. Countries in this region are rich in oil and gas resources, and their power generation structure is dominated by oil-based and gas-based methods (see Fig. 1.8). In 2020, oil and gas power generation accounts for 91% of total power generation in Iran, and almost 100% in Saudi Arabia. Considering the increase in oil and gas prices brought about by the Russia-Ukraine conflict, the enhanced economics of new energy power compared to gas power generation, and the relatively abundant solar energy resources in the region, the future energy mix in this region may be reoriented toward renewable energy generation, especially PV generation.

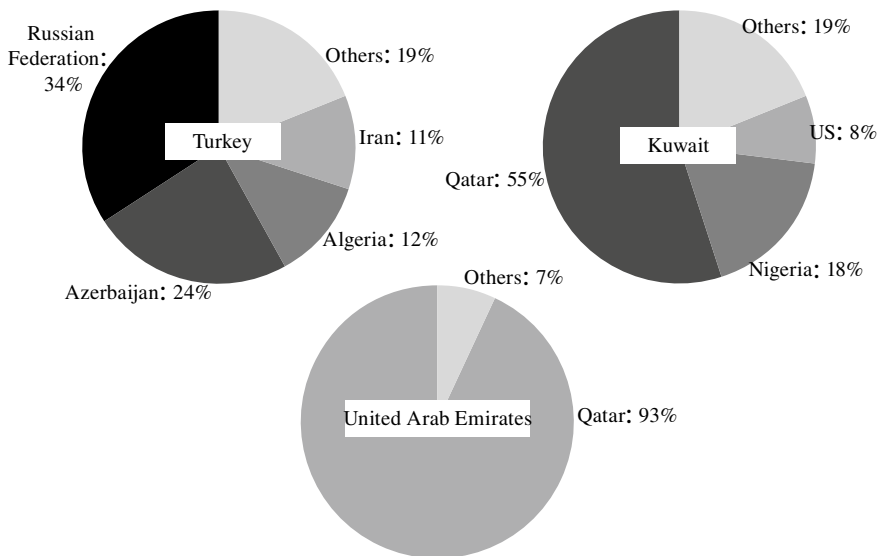


Fig. 1.7 Sources of natural gas imports for selected Middle East countries (2020). *Source* BP Energy Statistics, 2021

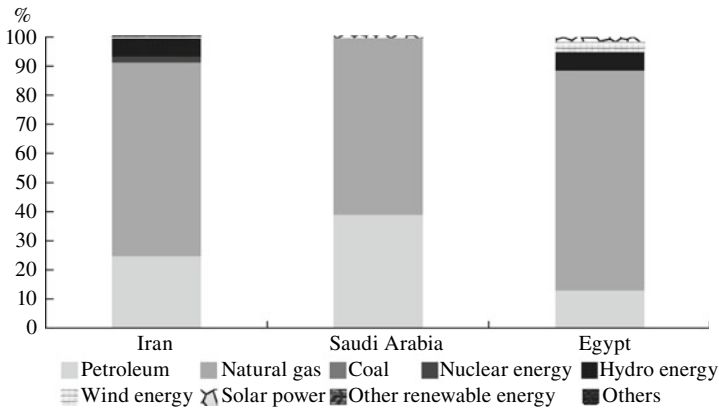


Fig. 1.8 Power generation structure in selected MENA countries (2020). *Source* BP Energy Statistics, 2021

Asia Pacific

The Asia–Pacific region is mainly indirectly affected by the Russia–Ukraine conflict, and large fluctuations in fossil energy prices may promote the development of renewable energy. Australia, Malaysia, and Indonesia are all exporters of natural gas, and the US, Canada, and Mexico on the east coast of the Pacific have the capacity to sell natural gas (LNG) to China and the rest of the Asia–Pacific region. Therefore, in general, the oil and gas supply in the Asia–Pacific region will not be affected much, and the risk facing this region is the price issue. In the short term, there will not be much adjustment in the energy structure of these regions, but rising oil and gas prices will drive the development of non-fossil energy sources in the long term, including nuclear, hydropower and renewables.

East Asian countries have different sources of imports, spreading the gas supply risk to some extent (see Fig. 1.9). Australian supplies are the main source of gas in East Asia, accounting for 29% of China’s gas imports, 39% of Japan’s, 20% of South Korea’s, and 27% of Taiwan, China’s; followed by supplies from the Middle East, such as Turkmenistan and Qatar. Russia’s supply of natural gas to East Asian countries is modest, accounting for 8% of China and Japan’s natural gas imports and 13% of Taiwan, China’s natural gas imports.

In South Asia, India and Pakistan’s gas imports come mainly from Middle Eastern countries and are relatively less dependent on Russia. Figure 1.10 shows the composition of the countries that cumulatively account for 80% of the gas imports of these two countries, without Russia being present. Therefore, the impact of the Russia–Ukraine conflict on the current gas supply to these countries is also not considered significant.

Southeast Asian countries have a more concentrated source of gas imports than East Asian countries (see Fig. 1.11). In 2020, Russian gas exports to this region are almost nil. Australia, the Middle East, and Southeast Asian countries such as

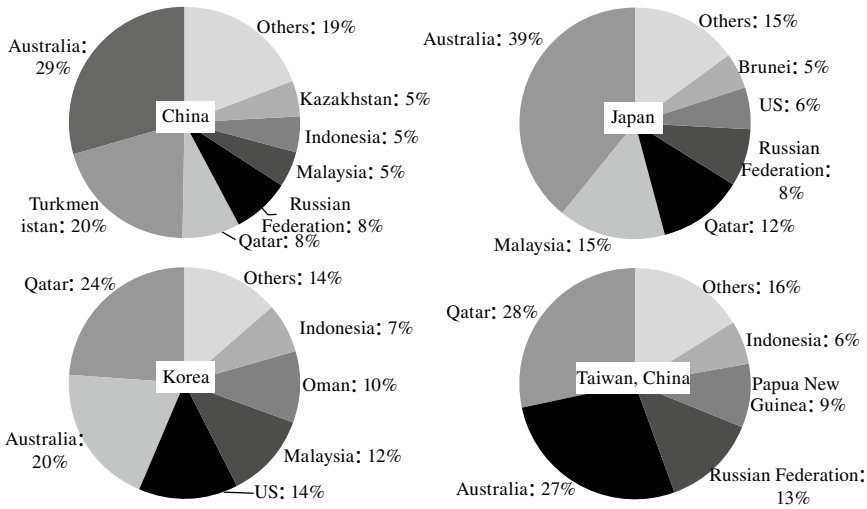


Fig. 1.9 Sources of natural gas imports for selected East Asian countries (2020). *Source* BP Energy Statistics, 2021

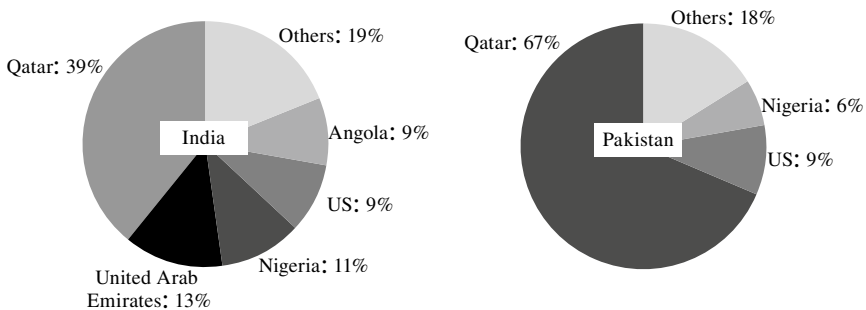


Fig. 1.10 Sources of natural gas imports for selected South Asian countries (2020). *Source* BP Energy Statistics, 2021

Myanmar and Malaysia are the main sources of gas imports to the region. Therefore, the impact of the Russia-Ukraine conflict on the current gas supply to these countries is also not considered significant. Coal power accounts for a relatively high share of the power mix in Southeast Asian countries, followed by natural gas power and hydropower. Due to the abundance of clean energy reserves in the Southeast Asian region, the region’s energy mix may begin to adapt to new energy directions such as PVs under the potential pull of electricity demand from its industrial development.

Australia is rich in coal and natural gas resources and has a high energy self-sufficiency rate. Coal power accounts for 54% of its power mix, followed by natural gas power generation at around 20% (see Fig. 1.12). Australia is one of the world’s major exporters of natural gas, with exports totaling about 10.6 billion cubic meters

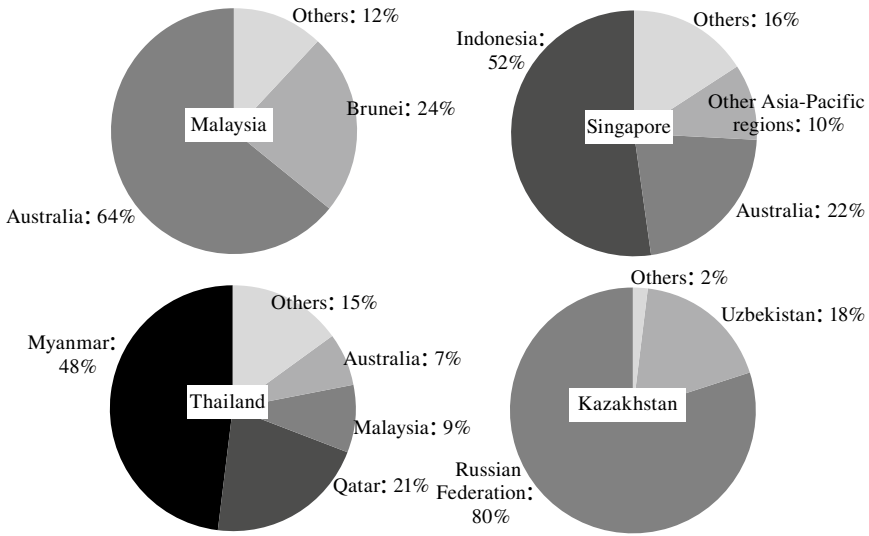


Fig. 1.11 Sources of natural gas imports for selected Southeast Asian and Central Asian countries (2020). *Source* BP Energy Statistics, 2021

in 2020, mainly to the Asia–Pacific region, with China and Japan accounting for an absolute share (76%, see Fig. 1.13). The Russia-Ukraine conflict has raised gas prices and stimulated consumer countries to seek alternative sources, which is good for oil and gas exporters in the short term. For Australia’s energy structure, coal is abundant and coal power is an important source of electricity supply. However, its relatively old and inefficient coal power facilities and high costs make it difficult to meet the demands of today’s modern and highly flexible power systems. Thanks to its abundant solar energy resources, Australia is likely to achieve a major development in its energy transition with PV power generation.

In general, the need for energy security is more urgent for developing countries, typically India and Southeast Asian countries. Therefore, the Russia-Ukraine conflict will not cause a change in direction in these countries’ energy policies in the short term. However, if gas prices remain high for a long period of time, it may cause a change in the energy choices of developing countries, such as improving the economics of renewable energy, thus making more renewable electricity available to these countries.

Other Countries and Regions

Regions such as Latin America and Africa have little dependence on Russia’s oil and gas resources, but highly volatile oil and gas prices have an indirect impact on them. For Latin America, volatile oil and gas prices may drive its energy structure toward hydropower, nuclear power and renewable energy; while for sub-Saharan African

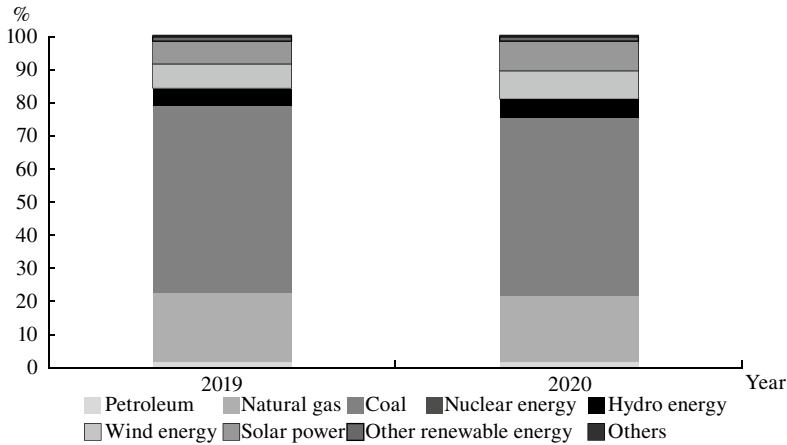
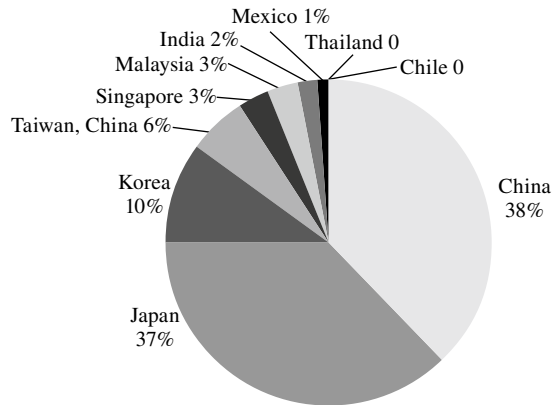


Fig. 1.12 Australia's power generation structure. *Source* BP Energy Statistics, 2021

Fig. 1.13 Australia's gas export destinations (2020). *Source* BP Energy Statistics, 2021



countries, development opportunities may arise from Europe's search for new oil and gas resources and the global demand for minerals for new energy development.

Latin America can be divided into two units: Central America and the Caribbean, as well as South America. Mexico, a major oil and gas producer in Central America, can meet its own and regional oil and gas needs and export to the US and other regions, including China. South American countries are not highly dependent on natural gas imports, with imports accounting for about 16% and 30% of Argentina's and Brazil's gas consumption, respectively, in 2020. The share is slightly higher in Chile, at 60%, but Chile's gas consumption is now high. The main sources of gas imports to South America are the US and Bolivia, while imports from Russia are almost nil (see Fig. 1.14). Brazil in South America is water-rich and its power generation structure is dominated by hydropower, which accounts for 64% of Brazil's

power generation structure in 2020. Argentina is dominated by natural gas power generation, accounting for 56% of its total power generation in 2020 (see Fig. 1.15).

Most of sub-Saharan Africa will not have sufficient policy space to cope with the impact of the shock when the Russia-Ukraine conflict breaks out, which is likely to exacerbate socioeconomic stress, increase vulnerability of public debt, and worsen the pandemic trauma for millions of households and businesses. Higher oil and gas prices will hurt Africa’s power markets, and rising interest rates will adversely affect renewable energy projects. However, the urgent need to move away from Russia will reignite European market’s interest in African oil and natural gas, opening up new opportunities for Africa; and the demand for key minerals such as copper, nickel, and platinum caused by global demand for carbon neutrality will stimulate the development of African mining.

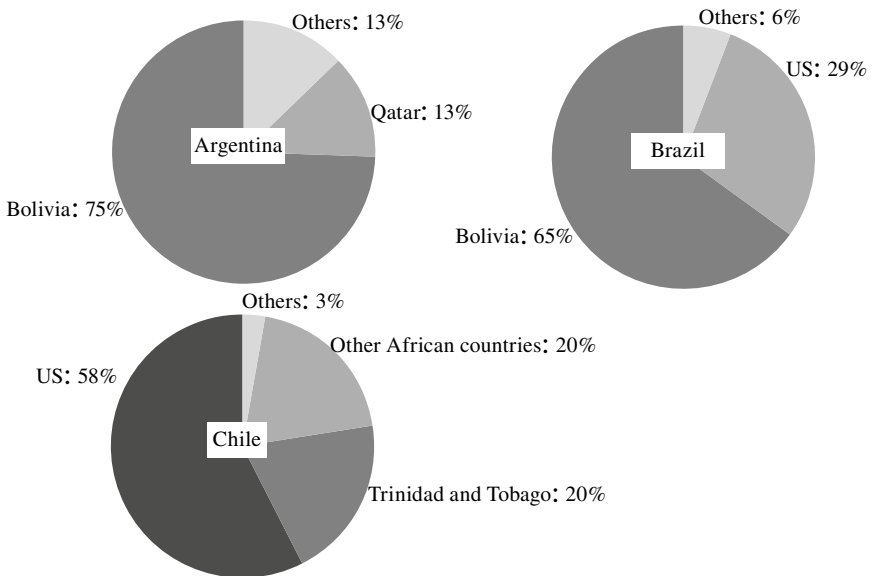


Fig. 1.14 Sources of natural gas imports for selected Latin American countries (2020). *Source* BP Energy Statistics, 2021

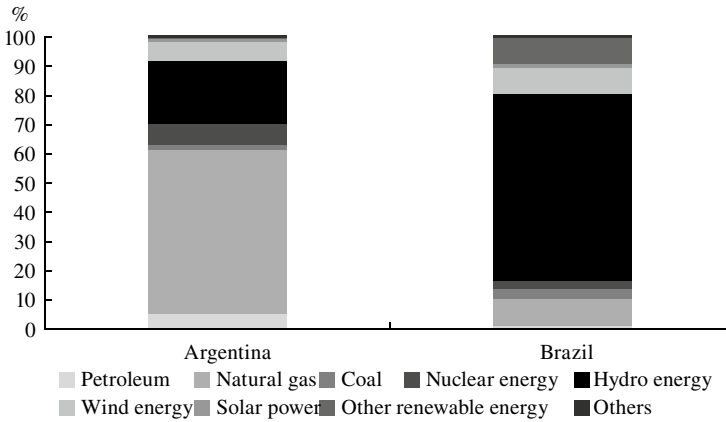


Fig. 1.15 Power generation structure in selected South American countries (2020). *Source* BP Energy Statistics, 2021

Conclusion

This paper, starting from the background of the outbreak of the Russia-Ukraine conflict, analyzes the impact of the Russia-Ukraine conflict on the global political economy, and then focuses on the impact of the conflict on global energy development, including the direct impact on the global oil and gas market and its expected direction, as well as the impact on the energy structure and energy transition process in various regions.

Overall, the outbreak and continuation of this conflict will have a profound impact on the world political and economic landscape, reshaping the global political and economic structure. The conflict has directly led to drastic shocks in global commodity prices, and exacerbated the global supply chain crisis, thus the world economy is caught in a dilemma of simultaneous stagflation and accelerated reverse globalization.

The Russia-Ukraine conflict has triggered a global energy crisis. There is a change in the global energy supply–demand landscape, where the US and Saudi Arabia, two major oil and gas producers, will have a significantly higher “energy voice,” while Russia will not be able to return to its former position in the sector due to the impact on its oil and gas production. The crisis has once again raised awareness of the importance of energy independence in many countries, and under the goal of carbon neutrality, new energy is undoubtedly a more suitable option to reduce the country’s dependence on fossil fuel imports. Although the conflict may have some impact on the process of green and low-carbon energy transition in the short term, this transition trend will not change in the long term. In fact, after this global energy price spike, on the one hand, the rising price of fossil fuels has stimulated green energy technology innovation; on the other hand, many countries have realized the importance of enhancing their energy independence and need to reduce their dependence on

fossil fuel imports through clean energy with relatively higher independence under the carbon neutrality target.

Bibliography

- Accenture (2022) Balkans regional power industry research report
- Benton TG, Froggatt A, Wellesley L, Grafham O, King R, Morisetti N, Schröder P (2022) The Ukraine war and threats to food and energy security cascading risks from rising prices and supply disruptions. <https://www.chathamhouse.org/sites/default/files/2022-04/2022-04-12-ukraine-war-threats-food-energy-security-benton-et-al.pdf>
- China-EU Energy Cooperation Platform (2020) China-EU power market and power system
- China Merchants Bank Research Institute (2019) Special report on the power construction industry-suggested focus on power investment in Southeast Asia to enhance cross-border services. Last Accessed 14 Nov 2019
- China New Energy International Alliance (2021) Study on promoting overseas investment in renewable energy by Chinese companies
- Downs ES (2007) The fact and fiction of Sino-African energy relations. *China Security*, 3(3):42–68
- EMBER (2022) Global electricity review. Last Accessed 30 Mar 2022
- European Commission (2011) Speaking with one voice-the key to securing our energy interests abroad. Press Release. https://ec.europa.eu/commission/presscorner/detail/en/IP_11_1005
- Greenpeace Sichuan Center for Circular Economy Research (2019) China's overseas investment in wind power is expected to help South and Southeast Asia achieve energy transition and sustainable development goals as soon as possible. Last Accessed 19 June 2019
- Joint Study of Asian Development Bank and Asian Development Bank Institute (2009) Improving infrastructure for a better Asia. Asian Development Bank and Asian Development Bank Institute
- Komlev S (2021) Evolution of Russian gas supply to Europe: contracts and prices. Presentation at 34th WS2 GAC. <https://minenergo.gov.ru/system/download/14146/158148>
- Lewis P (1982) Gas pipeline is producing lots of steam among Allies. *New York Times*. <https://www.nytimes.com/1982/02/14/weekinreview/gas-pipeline-is-producing-lots-of-steam-among-allies.html>. Last Accessed 14 Feb 1982
- Le Coq C, Paltseva E (2012) Assessing gas transit risks: Russia versus the EU. *Energy Policy* (4)
- Le Coq C, Paltseva E (2013) EU and Russia gas relationship at a crossroads, in *Russian energy and security up to 2030*. Oxenstierna S, Tynkkynen VP (eds) Routledge
- Le Coq C, Paltseva E (2020) Covid-19: news for Europe's energy security. FREE Policy brief
- Le Coq C, Paltseva E (2022) What does the gas crisis reveal about European energy security? <https://freepolicybriefs.org/wp-content/uploads/2022/01/freepolicybriefs20220124-1.pdf>
- Le Coq C, Morega J, Mulder M, Schwenen S (2018) Gas and the electrification of heating & transport: scenarios for 2050. CERRE report
- Luft G (2017) Silk road 2.0: US strategy toward China's belt and road initiative. Atlantic Council Strategy Paper No. 11. October 2017
- Ma X, China's global power database. Global Development Policy Center, Boston University
- Nedopil C (2021) Director IIGF Green BRI Center. China's Investments in the belt and road initiative (BRI) in 2020: a year of COVID-19. Beijing
- Office of the Leading Group for Promoting the Belt and Road Initiative (2019) The belt and road initiative progress. Contributions and Prospects, Foreign Languages Press Co. Ltd., Beijing, China
- Olofsgård A, Strömberg S (2022) Environmental policy in Eastern Europe. SITE Development Day 202. FREE Policy Brief. <https://freepolicybriefs.org/2022/01/10/environmentalpolicy-in-eastern-europe-site-development-day-2021/>

- Professional Committee on Renewable Energy (2020) China association of circular economy. Renewable energy investment trends in and suggestions for the belt and road countries.
- Stern J (2002) Security of European natural gas supplies-the impact of import dependence and liberalization. Royal Institute of International Affairs. http://www.chathamhouse.org.uk/files/3035_sec_of_euro_gas_jul02.pdf
- Tsinghua Wudaokou Institute for Green Innovation (2020) Renewable energy project investment and financing patterns, issues and recommendations in the belt and road countries
- United Nations (2022) Global impact of war in Ukraine on food, energy and finance systems. Last Accessed 13 Apr 2022
- Zachmann G, McWilliams B, Sgaravatti G (2021) How serious is Europe's natural gas storage shortfall? <https://www.bruegel.org/2021/12/how-serious-is-europes-natural-gas-storage-shortfall/>

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