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**“ Energy policies in Russia and Kazakhstan and how they affect the
global energy markets ”**

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List of Abbreviations :

OPEC : Organization of the Petroleum Exporting Countries

EU : European Union

USA : United States of America

NATO : North Atlantic Treaty Organization

GDP : Gross Domestic Product

GHG : Greenhouse Gas Emissions

USSR : Union of Soviet Socialist Republics

Mwh : megawatt hour

LNG : liquefied natural gas

Mt : one million tons – one metric ton

BCM : Billion cubic meters of natural gas

KGB : committee for state security (was the main security agency for the soviet union from 13 March 1954 until 3 December 1991)

GHG: greenhouse gas

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Abstract :

A component of foreign policy and economic policy is energy policy as well as regional and global security policy. Energy policy has historically attempted to ensure supply, price, and minimal effect on the environment . According to the Bush administration's `` *National Energy Policy should be reliable , affordable and environmentally sound* `` . Until recently energy policy was dominated by oil policy since oil has been the leading fuel in the United States and most industrial economies and it has been subject to price volatility and the vagaries of the world oil market that is greatly influenced by the OPEC cartel .

The role of energy in economic growth and development is significant. Because almost all goods and services require energy as an input for production, distribution, and consumption. As a result, increasing economic growth calls for more energy to fuel the production of goods and services.

Kazakhstan is a net exporter of energy. Kazakhstan has deposits of oil, gas, coal, and uranium. Kazakhstan is the Commonwealth of Independent States' top energy producer (CIS). It is a major producer of oil, gas, and coal, as well as the world's largest producer and exporter of uranium ore.

Kazakhstan has set a lofty aim of becoming carbon neutral by 2060. It has recently increased the share of renewable energy in total electricity output to 4 percent. This large country relies on the sun and the wind for its green energy transition.

The Russian Energy Strategy highlights numerous important targets, including increased energy efficiency, reduced environmental impact, energy development and technology development, as well as better effectiveness and competitiveness.

Scope of this paper is to provide general information about Russia's and Kazakhstan's energy policies and how important they are on energy markets.

This paper also is divided into 6 chapters. To be exact, chapter 1 tries to explain the energy situation of these countries and how it was in the post-Soviet era. Chapter 2 , one of the most important chapters goes through the affection of Russia and Kazakhstan on energy markets and some of their most important energy companies. Due to global warming renewable energy plays a significant role , so chapter 4 is dedicated to this issue . The last parts talk about the energy security Europe's dependence on Russia's natural gas .

Research Questions and Methodology

Research Questions

1. How much significant energy power Russia and Kazakhstan hold in their hands ?
2. How important is the study of the energy policies of these countries to understand their role in the international energy markets ?

Aim

The aim of this paper is to analyze the energy policies of Russia and Kazakhstan , their energy goals for the future and to show whether their role is important in the global energy markets .

Methodology

Methodologically , this paper is a collection of materials from internet sources . I was reading the news , while searching on google scholar with terms such as “ energy policies in Russia” , “energy policies in Kazakhstan ” and “ global energy markets ”

Furthermore , I tried to present all the energy policies that I have found for Russia and Kazakhstan and their role on energy markets .

I have chosen to write about those countries because they are resource-rich countries with full potential and I am interested in their worldwide energy influence .

Chapter 1 Introduction general energy information about Kazakhstan and Russia

1.1. Kazakhstan

On December 16, 1991, Kazakhstan made public its proclamation of independence from the Soviet Union. After the signing of the Belovezhskaya Pushcha accords by Boris Yeltsin on the Russian side, Stanislav Shushkevich on the Belarusian side, and Leonid Brezhnev on the Ukrainian side, the Soviet Union was in the process of dismantling. Kravchuk represented Ukraine at a meeting held near Minsk on December 8, 1991.

As Russia and independent Kazakhstan became neighbors, Kazakhstan attained independence following nearly 150 years of Russian rule, whether Czarist or Soviet. This event had a transformative impact, but it also raised a number of issues that must be resolved.

Kazakhstan has the largest economy in Central Asia, the ninth largest oil reserves, and the fifteenth greatest natural gas reserves in the world. In crude oil export, Kazakhstan is tenth in the world. Since 1995, Kazakhstan's oil exports have consistently increased. Mineral resources account for more than 75% of Kazakhstan's total exports, including crude oil (40%), refined copper (6,3%), petroleum gas (5,9%), radioactive chemicals (5,7%), ferroalloys (4,6%), and refined petroleum (2,5%). It should be highlighted that possesses the most hydrocarbon resources in the world.

According to the World Bank (2018) *Approximately 60% of the assets (in the fuel and energy complex) belong to the state , while the majority of the assets are concentrated in the Samruk – Kazyna holding , which owns in whole or in part many important state-owned companies in the energy , transport and finance sectors .*

Kazakhstan has the opportunity to profit on its own mineral resources on international markets, thereby generating sufficient cash inflows for the growth of other economic sectors.

Coal, oil, and gas are all produced in significant quantities in Kazakhstan. Kazakhstan produced 108 Mt of coal in 2018, making it the world's 9th largest coal producer. In terms of crude oil output, it ranked 17th in the world, at 91.9 Mt, and in terms of natural gas, it ranked 24th (38.7 bcm). First among EU4 Energy priority countries in terms of energy production (and 16th in the globe in 2018). More than twice as much crude oil is produced as in Azerbaijan, but only about half as

much natural gas as in Turkmenistan. In 2018, Kazakhstan's overall energy production (178 Mtoe) met or exceeded the country's energy demand by more than 100 percent.

1.2.Russia

Russia is the biggest producer of natural gas and is tied with Saudi Arabia for the top spot in oil output. Between 1998 and 2004, accounted for 48% of the global oil supply increase. Additionally, owns 22% of global natural gas production and 27% of known reserves.

It provides 25% of the gas consumed by the EU and 40% of the gas imported by the EU. In 2007, produced 9.8 million barrels of oil per day, or roughly 12 percent of the world's supply. Russia accounts for around 20% of Europe's oil consumption.

In addition, Russia regulates the export of oil and gas from Kazakhstan and Turkmenistan since their export pipelines pass Russian territory. European leaders are alert to disruptions in the Russian supply chain. Russia has only 5% of the world's confirmed oil reserves.

Russia is constructing new pipelines across the Baltic and Black Seas to prevent being held hostage by Belarus and Ukraine during transit problems.

The European reliance on Russian oil and gas is not a new phenomenon. In the 1960s, the oil and gas resources that continue to account for the majority of Russia's output were discovered.

Energy resources are the most important product group for the Russian economy .

The growth of the financial sector has a substantial impact on energy demand. Financial development improves a country's ability to manage its finances, enables the movement of financial capital and foreign direct investment, stimulates banking activity, reduces financial risk, and increases transparency between lenders and borrowers, which reduces loan costs and has an effect on the growth of energy consumption and fixed investment.

Due to the shutdown or deterioration of the industrial sector following the fall of the Soviet Union, energy consumption in the years 1993-2000 decreased dramatically. During the years 2000-2014, the relative increase in energy consumption was accompanied by some volatility.

Since 1996, the GDP has increased persistently. Prior to 1996, the fall in oil prices and the financial crisis in Russia caused a decline in the gross domestic product. In the 2000s, the economy grew steadily due to higher oil prices.

From 1997 to 2007, there was a significant increase in the number of available credits. For the period 2015-2017, a relative decline in credits can be observed. This decline can be attributed to the 2008 global financial crisis, which precipitated a significant decline in foreign exchange revenues.

Kazakhstan's financial system makes it easier and less expensive for businesses and households to obtain capital to launch or expand their operations and to purchase durable goods. Both economic growth and financial development have a positive effect on energy demand; consequently, it becomes especially important for policymakers to formulate energy policies that account for lower oil or energy prices.

1.3. Energy Policy in the Soviet Union

The development of Soviet and Russian energy resources stretches back to the Baku oilfields during the Imperial Russian Empire, when energy resources were added to the list of essential commodities as a method of advancing the growth of Tsarist Russia. In addition, the Russian Empire encouraged the entry of Western energy corporations by easing limitations on foreign finance, resulting in a sharp growth in crude oil output from the 1870s through the 1980s.

As a result of the nationalization of Baku assets in 1921, when Vladimir Lenin instituted a new economic strategy, and the seizure of the Baku oil field by the German army during the time of World War II, the output volume thereafter declined drastically. With the expansion of the Volga Ural oil field and the discovery of the Romashkino oil field in 1948, however, oil output steadily rebounded. Notable is the domestic refining industry's reliance on coal and hydropower as key energy sources, whereas the contribution of oil and gas was very modest.

In reality, oil and natural gas came to the attention of Soviet Union policymakers in the late 1950s, when energy resources were profoundly ingrained in the center of the Russian economy. Against this backdrop, other industrialized nations saw an energy revolution from coal to oil, which resulted in the quick motorization and expansion of heavy chemical industries. This led to the rapid production and export of oil and gas, which was the primary objective of Soviet energy strategy.

There, industrial investment for future growth of production and the development of new plants exceeded technical innovation by a significant margin. During the execution of the Fifth Five-Year

Plan beginning in 1955, heavy industry infrastructure, particularly the petroleum sector, was prioritized for development reasons. Brezhnev, who became the first secretary of the Soviet Communist Party in 1964, viewed energy resources as a panacea for resolving the major problems of the Soviet Union, such as strengthening military power, improving the living standards of residents, improving relations with the West, and establishing the Soviet era, and he turned his attention to expanding production and exports. New commercial fields were discovered in Western Siberia one after the other in the 1960s as a result of this continuous quantitative expansion strategy with the explicit goal of maximizing energy production and then exporting for profit, and a subsequent increase in the production of these fields was realized from the mid-1970s to the late 1980s.

The ratio of crude oil exports to crude oil production, which was only 5.2% in 1955, surpassed 20% in 1960 and continued to climb thereafter. There was a twofold aim underlying the expansion of energy exports. Due to a chronic lack of finance and technology for developing energy resources, the Soviet Union sought to generate foreign currency by exporting energy resources to industrialized nations with high energy demand. This ultimately made it cheap for the Soviet Union to acquire key facilities and invest in additional manufacturing.

Under the planned economy, oil and gas development expanded in the 1950s. This type of exploration was conducted in the oil industry sector by the "Ministry of Geology (Mingeo)" and the "State Geological Committee (Gosgeolkom)", while development, production, and transportation were handled by the "Ministry of Oil and Gas (Minneftegazprom)", the "Ministry of Petrochemical Industry". Both the Ministry of Oil and Gas and the Ministry of Petrochemical Industry stipulated quantity requirements for energy resource generating firms and refineries, respectively. By expressing political goals, the government was able to achieve its policy objectives to expand energy production and exports through a top-down approach.

In addition, energy was viewed as a type of public benefit under the socialist economic system. As a result, its production, transportation, and labor costs were kept low, allowing the Soviet Union to export energy at a price below the international market price. Under the Soviet socioeconomic system, the quantitative growth policy based on the five-year plan made it feasible to boost energy output, allowing the Soviet Union to acquire foreign money through the export of energy. This

loop might enable the mechanism of ongoing production and export while environmental consequences are neglected.

Chapter 2 Energy Policy

2.1. Russian Energy Policy

The effective management of Russia's natural energy resources is the primary focus of the country's energy policy.

The following are the shifts that have taken place in Russian policy:

In the late 1800s and early 1900s, the Russian empire produced 31% of global exports. In addition, during the 1950s and 1960s following World War II, oil production in the USSR doubled, and the Soviet Union became the world's second-largest oil producer and a major supplier of fuel to Eastern and Western Europe. Oil prices were 50 percent lower than in the Middle East, and oil was not efficiently extracted. The oil crises in the Middle East have increased oil prices in the 1970s. In 1975, the Soviet Union raised prices for Eastern Europe and then the rest of the world. By 1976, the prices have increased by twofold. And the development of the energy sector in Russia after 1992, as outlined in the "*Energy Strategy until 2020*" document.

One of the major goals of the Russian energy strategy is to ensure the socio - economic growth of regions on the basis of an efficient, dependable, and secure energy supply at the lowest possible cost of production, transformation, transportation, and energy consumption.

The energy policy protects the rights and legal interests of citizens and business entities, ensures state defense, and advances the energy sector to a new qualitative state. The State energy policy ensures: overcoming the financial recession and establishing the basis of a new economy; a transition to innovative development; and the development of an innovative economy.

After its system shift, Russia's first energy plan was formulated and subsequently executed. In September 1992, the Resolution of the Government of the Russian Federation No.26 "Russia's basic policy on energy policy under the new economic conditions" was approved, followed by the adoption of the decree of the President of the Russian Federation No.472 "Basic policy of structural reform and the energy strategy of the Russian fuel and energy complex until 2010."

Russia's initial long-term plan simply outlined the general direction of its energy policy, with no specific production and export objectives. However, there was a clear knowledge of the need to expand energy output, with one of the most critical policy challenges being the elimination of the

lack of investment in the country's domestic energy sector, which persisted after the transition process was declared. Priority was given to a provision for enhancing the efficiency of energy use, which was enacted in April 1996 as Law No. 28 of the Russian Federation "On energy conservation."

Since the early 2000s, a rising trend in global crude oil prices and a relative decline in dollar-valued production costs owing to the depreciation of the rouble might revive Russian energy output.

Encircled by growing worldwide energy costs, "Basic energy strategy rules until 2020" was created on November 23, 2000, and the Resolution of the Government of the Russian Federation No.1234 " Russian energy plan till 2020" was enacted on August 28, 2003. Priority was given in this plan to the new development of the Yamal Peninsula, Eastern Siberia, the Far East, and the continental shelf of the Barrents Sea, as well as the achievement of economic growth by expanding energy exports.

Energy exports expanded dramatically during this time period, resulting in a boom that did not exist during the transition era and becoming an engine of economic growth, as the 2020 energy plan intended. In order to maximize output even further, Russian energy businesses bought machinery and equipment from Europe and the United States using foreign currency obtained from energy exports.

The emergence of the global financial crisis has intensified Russia's need for economic modernization, despite the fact that it was already necessary to reform its economy's heavy reliance on energy resources. By pushing energy savings as one of the pillars for modernization, which was explicitly linked with competitiveness development and climate change policy, the government of Dimitry Medvedev emphasized Russia's departure from its energy mix that was concentrated on hydrocarbon resources (conversion to renewable energy sources). In short, there was an increase in the need for modernization as a solution to energy, environment, and economic issues, and as a means of achieving a low-carbon society.

In June 2008 , the decree of the President of the Russian Federation No.889 '*On some measures to improve energy and environmental performance of the Russian Federation*' was adopted in the context of economic modernization , and its goal was set to decrease energy intensity by 40percent , compared to 2005. Also, Russian Federal Law No.261 '*On energy saving*

, *energy efficiency improvement and a particular law revision of Russian Federation*’ revised the abovementioned law on energy saving in November 2009 , and for its implementation, the ‘*Plan for energy saving and energy efficiency improvement measures in Russian Federation*’ was announced in December 2009 and ‘ *Federal program for energy saving for national energy efficiency improvement by 2020*’ was formulated one year later .

There, the aim of reducing Russia's energy intensity by 40 percent compared to 2005 by 2020 was reiterated, and additional goals for reducing energy intensity by 7.4 percent during 2011-2015 and 13.5 percent by 2016-2020 were established. The objective of the 2030 energy policy was to decarbonize the energy mix by raising the proportion of renewable energies to 4.9% by 2030.

Five years following the adoption of the 2030 energy plan, a policy evaluation revealed that the majority of its primary environmental protection objectives were not met. It may be argued that policy objectives such as energy production/export volume and GDP growth, all of which were inherited from the preceding 2020 energy plan, and newly added energy security were met, despite the fact that GDP fell short of the target due to a transitory circumstance.

Increase in energy efficiency and conversion to a renewable-oriented energy mix were in a poor state of improvement from a longer-term viewpoint, despite being consistently emphasized in Russian energy strategy. In addition, the energy mix has not been transformed to dehydrocarbonized /renewable-oriented; rather, it can be said that Russia's energy mix has rarely altered in the thirty years since its system reform began.

As we have seen, Russia's energy strategy following its system transition has constantly attempted to retain its development expansion path.

Due to its tax reform of the planning system in the early stage of market transition, where state system and ownership relationship were changed, and especially in 'the concept of license system for resource utilisation was introduced,' Russia's method of utilizing resources, including energy, has undergone a significant transformation from the perspective of the government.

In Russia, where economic transformation began in the early 1990s, reorganization of ministries and privatization of the Oil, Gas, and Mining sectors also began. After September 1992, domestic crude oil prices were mostly determined by the international energy market, and they were liberalized in 1995. However, the government preserved natural gas.

Initially, the Ministry of Energy determined the price, but in 1997 the responsibility was transferred to the Russian Federation Energy Commission , and later to the Federal Tariff Service, but the price was kept low in comparison to the international price. As global energy prices continued to decline until the end of the 1990s, domestic prices that were maintained at a lower level resulted in greater production costs, which reduced energy companies' desire to invest further.

2.2. Energy Strategy of Russia

In November 2009, a new and comprehensive energy policy was established as part of the Russian energy plan until 2030. The objective of the energy strategy for 2030 is to enhance people's quality of life and strengthen their worldwide economic standing by maximizing the effective use of natural resources and economic expansion. The 2030 energy plan adopted the framework of the 2020 energy strategy and added four prioritised areas: energy security, energy safety, budget efficiency of the energy sector, environmental, and target setting for each item.

The objective was to maximize the effective use of natural energy resources and the potential of the energy sector in order to sustain economic growth, enhance the quality of life for the populace, and strengthen the country's economic position abroad.

In Russia's energy strategy for the period up to 2020, it was stipulated that the document should be updated at least once every five years.

One of the most important things to do is to build up the infrastructure of the energy market. Most of the directives highlighted in Russia's Energy Strategy have been implemented with the aid of all the mechanisms provided by the State Energy Policy.

Domestic consumption of energy resources increased by 10% relative to its level in 2000, with a deviation of 5% from the Energy Strategy of Russia for the period up to 2020 as a result of a decline in demand during the 2008 global economic crisis.

The energy sector should contribute to human capital reproduction.

One of the greatest threats is the need to overcome the instability of global energy markets and the volatility of global energy prices.

The primary objective of the strategy is to establish an innovative and efficient energy sector in Russia that can meet the growing economy's energy demands.

2.3. Plans up to 2030

The biggest difference between Russia and other countries is in their living standards. The Russian economy will become less dependent on the energy sector between now and 2030. Therefore, the proportion of the fuel and energy complex in the gross domestic product and the proportion of fuel and energy resources exported should each be reduced by at least 1.70 times in comparison to their levels in 2005. The proportion of energy exports to the gross domestic product should be reduced by at least threefold. The percentage of investments in the fuel and energy complex should be reduced by no less than 1.4 times and by more than twice their percentage in the total volume of investments, as should the energy intensity of the gross domestic product. The electricity intensity of the gross domestic product should be reduced by no less than 1.6 times by the end of the period.

2.3 European dependence on Russian oil and gas

The European reliance on Russian oil and gas is not a new phenomenon. In the 1960s, the oil and gas fields that continue to account for the majority of Russia's production were discovered. The Friendship oil pipeline was constructed in 1964, after West Germany agreed to purchase Soviet gas in 1970. (the Soyuz , Urengoi and Yamal pipelines were built). The United States of America voiced their opposition to Germany's purchases of Soviet gas and attempted to obstruct the construction of export pipelines, which resulted in a significant amount of controversy within NATO in the early 1980s.

Concerns about climate change and the potential peaking of global oil production undoubtedly contribute to heightened anxiety. However, the primary shift appears to be political rather than economic.

The pivotal turning point in Russia's relationship with the West occurred in 1999, when Moscow reacted angrily to NATO's war in Kosovo. Concerns were raised later that year when Yeltsin was replaced by KGB veteran Vladimir Putin. These concerns centered on the possibility that the Kremlin might begin attempting to rebuild a sphere of influence in what the Russians refer to as the "near abroad."

2.4 The impact of the Russia-Ukraine conflict on energy firms

The start of the military conflict between Russia and Ukraine has effects on supply chains and the availability of fossil fuels, which are especially important for making power around the world. The Russian invasion of Ukraine, starting on February 24, 2022, has generated an abnormal stock price reaction in energy firms.

As a result of the events in Crimea, Russia has been subject to EU sanctions and restrictions since 2014. The invasion by Russia and the war in Ukraine was the apex of its plight. According to information provided by the European Council, the European group has sanctioned 108 organizations and 1214 individuals. For instance, among the restrictions was a ban on the import of crude oil and coal from Russia, with clear effects on all levels. The export of natural gas to Germany from Nord Stream 1 has been temporarily halted by Russia until September 3, under the guise of pipeline maintenance, which is one day later than the deadline that was originally agreed upon. Reuters also reports that the German company Siemens Energy is incapable of maintaining the pipeline. Klaus Muller, the chairman of Germany's federal energy regulator, maintained in a Twitter post that the country is well-prepared with tanks up to 85 percent full, urging the German people to continue conserving gas.

Russian natural gas deliveries, on the other hand, have been totally suspended to the French group Engie beginning Thursday, September 1, unless its debts are fulfilled. According to Le Monde, France cut its exposure to natural gas at the end of July, demonstrating that Russia's decision was foreseeable. At the same time, French Prime Minister Elizabeth Bourne stated on TMC, without elaboration, that "Engie has found other sources of supply" and referred to Russia's gas cut as a "weapon of war."

Using the data from Gas Infrastructure Europe and Reuters, Europe's natural gas storage space is 79.94% full, while countries with full storage can maintain themselves for three months, according to Aurora Energy Research. Despite this, citizens should not get complacent. ICIS says that countries will need to lower their natural gas use by 15% per month, below the five-year average, to avert an approaching winter problem.

The idea is to minimize natural gas usage in order to lower prices. However, it is becoming evident that certain nations, such as Germany, rely and depend on natural gas, making it impossible for them to escape their dependence so simply. However, not just the largest nations confront an energy dilemma. Consider Greece, which on the last day of August became the most expensive country in Europe in terms of power, with a price of 697.41 euros per megawatt-hour. In addition, the worldwide price of natural gas decreased from 339 euros/MWh to 254 euros/MWh.

Europe faces challenges on a daily basis and faces an uncertain future. Preparing for any eventuality is the response to a looming disruption in the flow of Russian natural gas.

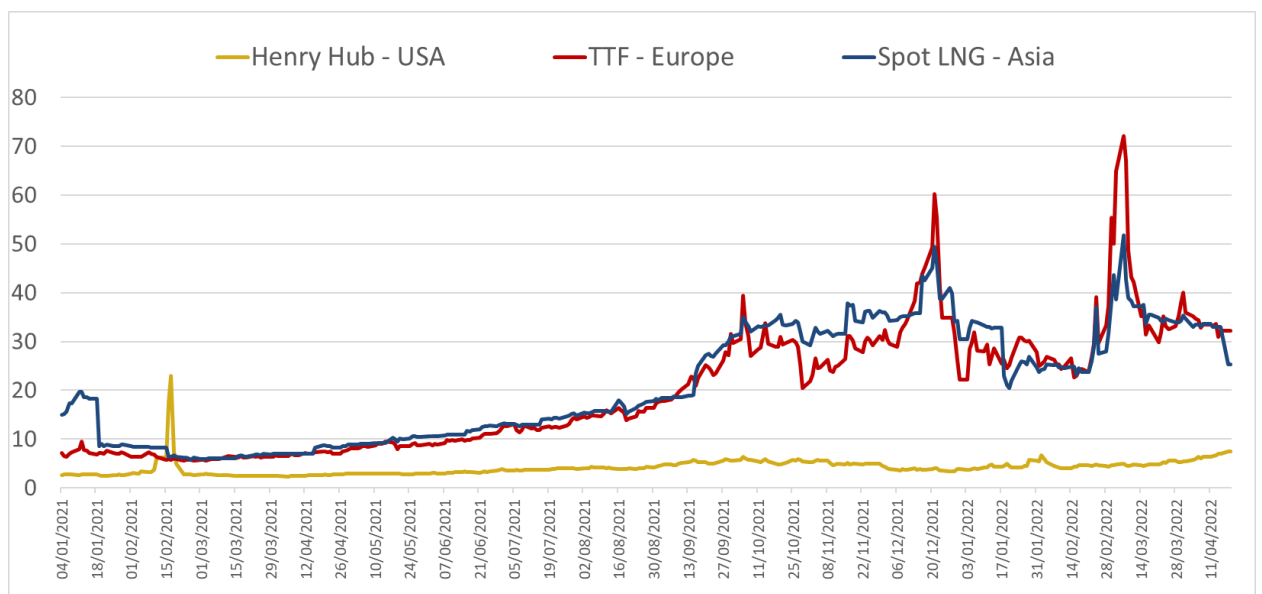


Figure 1 International gas prices , Source: Reuters, IFPEN, CEDIGAZ

2.5 Russian Challenges on energy

The reserves of Russia are huge, but geological obstacles must be overcome.

Many of the newly discovered fields are in areas that are permanently frozen, and the majority of them are offshore (most notably the Sakhalin deposits and the Shtokman gas fields in the Barents Sea). Most of the newly discovered fields are located much deeper than any of the prior discoveries. These reactors raise extraction costs and expenditure uncertainty, making it more difficult to conclude contracts with overseas partners.

There are governance issues in the Russian energy sector. Since the beginning of the 2000s, the oil industry has placed the future of Russian development in the hands of state-owned oil and gas enterprises controlled by Kremlin-appointed board members. Gazprom is a prime example. Since its formation in 1992, it has been a state-owned enterprise, and its export income have been utilized to subsidize local clients, leaving little room for the company to invest in growing new fields.

An energy-driven development plan entails significant political risks. The dangers of the "resource curse" are widely established. Global experience indicates that countries with a high reliance on energy exports are more likely to endure slower economic growth and are less likely to undergo a democratic transition. Russia could possibly overcome the resource curse. It has a diverse economy with a significant manufacturing sector, a modern literate culture, and a strong state tradition. During the tumultuous transition years of the 1990s, however, it was difficult to discern Russia's structural advantages. Under Putin, however, the Russian state has regained its ability to levy tolerable taxes on the oil and gas industry and has pursued a remarkable fiscal and monetary strategy. Both inflation and the actual appreciation of the ruble have been maintained at rates lower than 10% per year. Since 1999, the non-tradable sector of the Russian economy has been rising, and the OECD and World Bank estimate that oil and gas are responsible for half of the expansion.

The idea of an energy superpower is a little bit contradictory since it combines two quite different lines of reasoning: the logic of the energy market and the logic of military

superpowers. Russia is the greatest tsarist exception. Russia was land- and resource-rich, and it exported goods, but it established the world's largest empire.

The conflict in Chechnya is an effort by the Kremlin to protect Russian territory and prevent further erosion of Russian sovereignty in the face of international interference. The urge to protect the Sevastopol naval station from external military threats is driving this motivation.

Moscow is trying to safeguard itself from such dangers by increasing its military might and exploring the potential of its energy exports as a political weapon. The Russian Federation is a potentially catastrophic energy superpower. The Russian Federation's attempts to use energy as a political tool were completely unilateral. And it hasn't even bothered to try to work out a natural gas production and distribution plan with OPEC and others. There hasn't been much progress achieved by OPEC. According to Vladimir Milow, director of the Institute for Energy Policy and a former deputy energy minister of Russia, *energy and politics do not mix*.

There is more hyperbole than substance to the concept of Russia as an " Energy Superpower." It overstates Russia's ability to utilize oil and gas as " weapons " to increase its influence over its neighbors and on the international stage.

2.5 Kazakhstan energy policy

After the fall of the Soviet Union, Kazakhstan was in a deep economic recession and relied on extracting and exporting oil, natural gas, coal, uranium, and other minerals from its natural resources. Kazakhstan faces a number of challenges in the fuel and energy sector, many of which are a result of the Soviet legacy.

Some of these problems include the fact that many experts believe that the country will soon run out of energy because the economy is growing and more people are using electricity and heat. In addition to this, the purchase of new refineries is essential.

The export orientation of resource-based industries, the economy's reliance on energy exports, and the tendency to increase energy exports. The national currency is overly susceptible to energy market fluctuations.

Low levels of oil, gas, nuclear resources, and coal resources result in failed exports and low export revenues. Moreover, the technologies used in Kazakhstan's fuel and energy complex are not environmentally friendly and do not meet "green standards".

The high energy intensity of the nation's gross domestic product relative to industrialized nations is a further significant challenge. Kazakhstan's government is interested in developing more energy efficiency and energy conservation policies.

Kazakhstan has significant potential for increasing energy efficiency and saving energy. In developing the competitiveness of Kazakhstan's economy, energy efficiency and energy savings were regarded as a priority area. The government of Kazakhstan has approved the State Program of Industrial-Innovative Development for 2015-2019 and the Concept of the Development of the Fuel and Energy Complex through 2030. Kazakhstan has a lot of problems in the fuel and energy sector. Many of these problems are a result of the Soviet era and the fact that the country is very dependent on natural resource exports.

Kazakhstan adopted a number of regulatory and legal documents to boost energy efficiency and promote energy conservation. This was stated in the January 29, 2010 message of the

President of the Republic of Kazakhstan to the people of Kazakhstan titled " New Decade - New Economic Growth - New Opportunities of Kazakhstan " and the State program on the Accelerated Industrial - Innovative - Development of the Republic of Kazakhstan for 2010-2014.

The government of Kazakhstan adopted the Kazakhstan 2050 Strategy in 2012, charting the country's route for economic growth until the year 2050. It lays forth a set of social, economic, and political changes that will elevate Kazakhstan's economy to one of the world's top 30 by the year 2050. To stimulate economic expansion, it is necessary to expand exports, enhance the investment climate, and foster the growth of the private sector and public-private partnerships. According to the plan, "green" and alternative energy sources will be responsible for producing half of the world's energy needs by 2050. It also mandates that the whole mining industry switch to sustainable practices immediately.

In May 2013, the Green Economy Concept was established, establishing the ambitious goal of generating 50 percent of electricity from sources other than coal or oil by 2050, such as gas, nuclear, and renewable energy. The government intends to accomplish this through phasing out aging infrastructure, expanding the usage of these alternative fuels, installing energy-efficient technologies, and adhering to strict environmental regulations.

The objective of the 100 Concrete Steps initiative, which was initiated in 2015, is to increase openness and accountability through the implementation of structural changes that would, among other things: 1) establish a competent government apparatus; 2) guarantee the primacy of the rule of law; and 3) strengthen industrialization policy and foster economic expansion. Steps include privatizing agricultural lands to encourage their efficient use; optimizing tax and customs policies and procedures; introducing a "single window" principle for customs procedures for exporters and importers; integrating customs and tax systems; simplifying the legalization procedure for property and money; privatizing state-monopolised-design and design document examination; and replacing obsolete construction standards and rules with euro codification. As part of the concept, the Astana International Financial Centre (AIFC) opened in 2018 with investment residence as one of

its strategies for luring investors. In addition, the government has enacted measures to foster a favorable investment climate: in February 2015, guidelines for the establishment of a one-stop shop for investors were implemented, and the Law Investments was revised in December 2014, accompanied by a liberalized visa regime.

The objectives are to reduce the energy intensity of Kazakhstan's gross domestic product by at least 10 percent by 2015 and by at least 25 percent by 2020. In addition, the documents emphasized the need to reduce the energy intensity of the economy by 10% annually during 2013-2015 to reduce electricity consumption.

The 2012-2015 energy efficiency plan includes a list of measures for the electricity-heat production industry, the housing and utilities sector, and the budgetary sector. State energy register (SER) was one of the most essential measures to increase public awareness. The SER operator should collect data provided by local governments regarding the largest energy consumers and evaluate their energy efficiency performance.

The law of the Republic of Kazakhstan on Energy Saving and Improving Energy Efficacy was an additional crucial step in establishing a national legal framework for energy issues in the country. The primary emphasis of the law is on the following directions of state regulation in the field of energy conservation and energy efficiency (Paragraph, 2019):

Implementing technical regulation in the field of energy conservation and energy efficiency, Implementing a balanced tariff policy and pricing in the field of energy resource production and consumption, Stimulating energy saving and energy efficiency, including the use of energy-saving equipment and materials, Implementing state control over the efficient use of energy resources , Promoting the economic, environmental, and social benefits of telecommunications and Ensuring compliance with Kazakhstani legislation on energy conservation and efficiency.

The 2020 State Energy Conservation Program (2013). The objective of the program is to improve energy efficiency and reduce the energy intensity of Kazakhstan's gross domestic product by reducing energy consumption and the inefficient use of fuel and energy

resources. The two primary objectives are a 10% annual reduction in the energy intensity of GDP between 2013 and 2015, and a 40% reduction by 2020.

2.6 Kazakhstan's environmental challenge

Kazakhstan faces severe environmental issues as a result of its consumption of fossil fuels, which emits carbon dioxide. Therefore, the exploration of emission reduction in Kazakhstan is of considerable importance, and the acceptance of the Paris Agreement is a watershed moment for this fossil fuel-dependent nation. According to the Paris Agreement, Kazakhstan is committed to achieving its unconditional target of a 15% reduction in GHG emissions by 2030 compared to 1990. How Kazakhstan may attain environmental sustainability by reducing emissions is an important question that can be answered by analyzing the possible effects of economic growth, renewable energy consumption, and technical innovation on CO₂ emissions in Kazakhstan. For policymakers to achieve a balance between policies aimed at mitigating climate change and achieving sustainable development and executing both, a comprehensive understanding of Kazakhstan's capacity to reduce emissions is becoming increasingly crucial.

As Kazakhstan is one of the world's top oil and gas exporters and significantly relies on its coal for economic and industrial development, nearly 98% of final energy consumption is derived from fossil fuels. However, due to a variety of technological, institutional, social, political, and economic hurdles, renewable sources account for less than 2% of the nation's energy mix. In addition, the trajectory of technical innovation indicates that patent applications have declined in recent years.

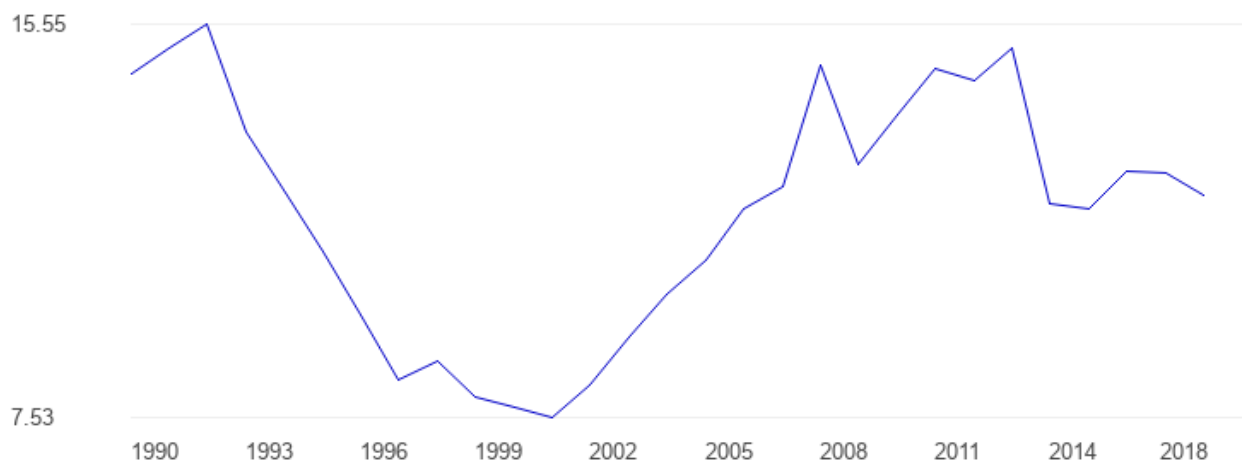


Figure 2 Kazakhstan Carbon Dioxide (CO₂) Emissions

Kazakhstan's economic development is now dominated by extractive sectors and the export of raw resources, making the transition to green growth a crucial priority. At the same time, in the majority of economic sectors, energy intensity, pollution, and energy efficiency are all rather high. The principal components of the concept of Kazakhstan's transition to a green economy established the criteria for conducting systemic changes for the transition of the national economy to a new level of development while reducing the anthropogenic impact on the environment. One of the targets of the green economy is a 40% reduction in the energy intensity of the GDP by 2050 compared to 2012 levels. Along with Kazakhstan's rapid socioeconomic development, the contradiction between excessive energy use and low energy efficiency has become a significant economic hindrance to green economic development. Kazakhstan's government has adopted a few steps targeted at reducing energy consumption, but the relationship between economic growth and CO₂ emissions remains weakly decoupled and will require urgent future optimization.

Kazakhstan's greatest challenge in transitioning to a green economy begins with the transformation of the energy base and reduction of GHG emissions by increasing energy efficiency across all economic sectors. Kazakhstan aspires to progress toward sustainable resource consumption by implementing low-carbon policies in order to reduce the demand and usage of energy by the various industrial sectors.

Consumption of renewable energy has a considerable impact on CO₂ emissions, meaning that increasing the proportion of renewable energy sources in Kazakhstan's total energy mix can aid in reducing CO₂ emissions. A 1% increase in the use of renewable energy can reduce Kazakhstan's CO₂ emissions by 0.21% over time. Kazakhstan has made significant efforts toward a low carbon

energy structure through the use of policy and technology, such as the "Green Economy in Kazakhstan" project, which aims to reduce carbon emissions by 40% in 2050 compared to 2012 levels. These efforts are intended to contribute to a global temperature rise well below 2 C relative to pre-industrial levels by the end of the century. Nonetheless, the primary sources of CO2 emissions in Kazakhstan are high-coal energy generation and sectors, such as domestic consumption and foreign trade. Coal-fired plants generate 80% of the world's electricity, which raises worries about greenhouse gas emissions and their effects on human health and the environment. Therefore, the most important policy is to establish a mature system of renewable energy to progressively replace coal. Kazakhstan initiated the development of renewable energy at the turn of the century, although coal-based energy production has not yet shifted. Utilizing renewable sources for energy generation is crucial to attaining sustainable development and mitigating climate change in light of the approaching threat of climate change. In addition to reducing carbon emissions, renewable energy provides major economic benefits, such as greater energy availability, enhanced energy security, and the use of local renewable resources.

In order to facilitate the use of sustainable energy sources and the development of an ecologically healthy ecosystem, it is essential that Kazakhstan's energy balance be shifted toward renewables in light of a growing global environmental consciousness. However, the country's solar, wind, hydro, and biomass renewable energy potential is substantial. Despite this, these resources have not been captured and utilized in a sustainable manner due to a variety of technological, institutional, social, and economic obstacles. *Renewable sources such as wind, solar, small hydro, and bioenergy currently contribute less than 2% of the country's energy mix (World Bank, 2021).*¹

The use of clean technologies in Kazakhstan's industrial activity has the potential to improve the country's environmental sustainability by lowering emissions. Kazakhstan's goal of a 25% reduction in carbon emissions by 2030 can be realized through the adoption of a transformative green economy and green technology. Kazakhstan's strategic goal of seeking green growth for sustainability and resiliency can be aided by green technologies.

Chapter 3 Global Energy Markets

3.1. Kazakhstan on global energy markets

The coronavirus pandemic and the restrictions that followed it did a lot of damage to the economy around the world, including Kazakhstan's. Kazakhstan experienced its worst recession in two decades in 2020, although the downturn was less severe than anticipated. The country's GDP decreased by 2.6% in 2020 because to reduced oil prices, diminished foreign demand for Kazakhstan's exports in general as a result of the pandemic, and the detrimental effect of lockdowns on domestic economic activity.

With the recovery of global demand in 2021, Kazakhstan's economy began to expand once more, resulting in a 4% GDP expansion. Kazakhstan's economy is highly dependent on the energy sector, thus global trends, such as dropping commodity prices, will continue to have a significant impact on the country, affecting performance not only in the fuel and energy complex but also in other energy-related sectors.

Kazakhstan, along with the world's leading economies, witnessed unprecedented levels of inflation in 2021 as a result of the continuous recovery of global supply chains, geopolitical uncertainty, and rising commodity prices, so it is not surprise that they are represented in this year's Issues Monitor. In response to growing inflation, which reached its height in autumn 2021, the government of Kazakhstan adopted a series of anti-inflationary measures for a three-year period, including price regulation and the implementation of state control measures. It is anticipated that the implemented changes toward a market economy and the recovery of the global economy will continue to encourage foreign investments, particularly in the vital energy sector.

So here are some information about energy regional markets and interconnections of Kazakhstan on electricity, gas, and oil.

In 2015, Kazakhstan's interregional power transmission totaled 37.89 terawatt hours (TWh), 10% of which was transit between Russia and Kazakhstan.

In the past, Kazakhstan has imported power from Kyrgyzstan's HPPs, primarily during the country's power-rich spring. However, in 2015, electricity was only exported and imported between Kazakhstan and Kyrgyzstan for irrigation purposes; the total amount of electricity purchased and sold was approximately 0.25 TWh. Kazakhstan did not provide any unscheduled power to Uzbekistan in 2015, while import flows from Russia to Kazakhstan were 1.5 TWh, which is 7.3% less than in 2014, while export flows to Russia were 1.03 TWh, which is 67% less than in 2014. The Supreme Eurasian Economic Council accepted the notion of a single power market in May 2015. Russia, Kazakhstan, Armenia, and Belarus have agreed on the parameters for developing spot markets and a unified electric power trading platform on the basis of bilateral contracts in order to give consumers the option to choose an energy provider.

Kazakhstan's infrastructure for gas transmission consists of the following pipelines: Central Asia-Centre: capacity 60,2 billion cubic meters per year; length 3,962 kilometers; operator Intergas Central Asia JSC Orenburg-Novopskov: capacity 14.6 bcm/y; length 382 km; operator Intergas Central Asia JSC Bukhara-Ural: capacity 8 bcm/y; length 1,576 km; operator Intergas Central Asia JSC Orenburg-Novopskov: capacity 14.6 bcm/y; length 382 km; operator Intergas Central Asia JSC Kazakhstan-China (A and B lines): 30 bcm/y capacity; 3,909 km length; Asian Gas Pipeline LLP operator. Zhanaozen-Aktau: capacity of 2.8 bcm/y; length of 432 km; operator KTG-Aimak JSC Beineu-Bozoi-Shymkent: capacity of 13 bcm/y (as of 2019); length of 1,448 km; joint venture between KMG subsidiary KazTransGaz and CNPC subsidiary TransAsia Gas Pipeline Bukhara gas-bearing region-Tashkent-Bishkek-Almaty: capacity of 5.8 billion cubic meters per year; length of 1,597 kilometers; operator Intergas Central Asia JSC.

These gas pipelines facilitate the international flow of Turkmen and Uzbek gas to Russia and China via Kazakhstan. Kazakhstan transited 78.6 bcm of international gas in 2014, including 49.3 bcm of Russian gas, 25.6 bcm of Turkmen gas, and 3.7 bcm of Uzbek gas. Exports of petroleum are vital to Kazakhstan's economy. Long distances must be traveled to transfer crude oil to markets, resulting in high transportation costs and export routes that pass via transit countries. The Atyrau-Samara pipeline, the Caspian Pipeline Consortium,

the Atsu-Alashankou pipeline, and the Aktau sea terminal are the primary operational oil export routes. In 2018, the Caspian Pipeline Consortium transferred the greatest quantity of Kazakh oil (54.3 Mt). The Atyrau-Samara line transported a total of 8.8 million tons to the Ust-Luga terminal on the Baltic Sea and 6.9 million tons to the Novorossiysk port on the Black Sea. In 2018, just 1,4 Mt was exported via the Kazakhstan-China pipeline, but in 2019, approximately 10,9 Mt passed through the line. Kazakhstan had to cease oil supplies to China in January 2020 due to poor fuel quality caused by an oversupply of organochlorine chemicals. Historically, the majority of Kazakhstan's crude oil exports have gone to Mediterranean nations (79 percent in 2003 and 73 percent in 2005), however since 2005 there has been a considerable increase in shipments to non-Mediterranean European countries and China in particular.

Exports of crude oil account for the vast majority of Kazakhstan's total exports. These make up between 50 and 60 percent of overall exports. At two places, Kazakhstan connects the worldwide energy markets. The CPC pipeline, which terminates in the Black Sea and carries 1.3 million b/d of crude oil, provides a direct connection to crude oil markets. The transportation of Turkmen gas to China provides a second indirect connection. In the case of a difficulty with its 37 bcm total supply from Central Asia, China would likely seek to replace this pipeline volume on the international LNG market. Global markets for oil and gas are tight. The extremely high gas prices observed in Europe over the past few months have become a highly political issue, and gas markets appear certain to stay tight for the foreseeable future. On the oil front, increased demand as economies recover from Covid-related contractions would likely result in a tightening of global oil markets as 2022 signs of progress. In addition, tight markets are less forgiving of supply issues.²

Kazakhstan production of fuels 2000-2020

	2000	2005	2010	2015	2016	2017	2018	2019	2020
Crude oil (millions tonnes)	35.3	61.5	79.7	79.5	78	86.2	90.4	90.5	85.7
Gas (billion cubic metres)	11.5	25	37.4	45.5	46.4	52.9	55.5	56.4	55.1
Coal (millions tonnes)	74.9	86.6	106.6	102.5	97.9	106.7	113.7	111.1	109.2

http://www.cisstat.com/eng/for_individual_country_fuels_production_data_monthly

Figure 3 CIS 1991-2015 Statistical Yearbook celebrating 25 ears of the CIS , CIS Stat 2016 CIS Stat website

3.2. Kazakhstan's dominant role on oil and gas exports

The majority of Kazakhstan's natural gas production has been related with the development of oil fields, and the majority of the natural gas has been re-injected into the fields. Natural gas is mostly generated in the country's northwest, whereas population centers in the east and south rely on natural gas supplied from Uzbekistan. Kazakhstan became a net natural gas exporter in 2009. According to the BP Statistical Review, Kazakhstan sold approximately 406 billion cubic feet of natural gas from its western resources, the majority of which went to Russia in 2011. In December 2007, Kazakhstan, Turkmenistan, and Russia signed an agreement to renovate a branch of the Central Asia-Center Pipeline that supplies natural gas to Russia and to build a new Caspian Coastal Pipeline, but these plans have been pushed back due to Turkmenistan's intentions to diversify its export routes away from Russia and Russia's decreased natural gas demand. Nonetheless, Kazakhstan intends to increase its natural gas exports to Russia and China in the next years.

Until recently, US foreign direct investment (FDI) dominated the development of Kazakhstani oil and gas resources, totaling to around \$16.5 billion in Kazakhstan between

1993 and 2012. 38 According to some reports, China invested and loaned nearly \$13 billion in Kazakhstan's energy sector in 2009, demonstrating the country's growing energy importance. In recent years, harsher Kazakh government terms, fees, and fines that some claim reflect corruption within the governing class have discouraged several American energy companies and other private foreign investors.

A framework agreement for the construction of a natural gas pipeline between China and Kazakhstan was reached at the end of October 2008. It will run from Beyneu, north of the Aral Sea, southeast to Shymkent, where it will join the Central Asia-China Gas Pipeline. The 932-mile Beyneu-Shymkent Pipeline link will initially supply 176.6 billion cubic feet to southern Kazakhstan and 176.6 billion cubic feet to China. Construction on the pipeline began in September 2011 and completed in 2015.

3.3. Russia on global energy markets

Russia is among the world's leading nations in the system of global energy resource circulation and holds an important position on the global hydrocarbon market. Over four fifths of Russian oil is exported to Europe, and Russia's market share in Europe is approximately 3%. Russian petroleum products are also primarily exported to European nations.

It accounts for 23% of the world's natural gas reserves and production annually. The country supplies 25 percent of the world's natural gas trade and dominates both the European and Commonwealth of Independent States gas markets.

Approximately 30% of the total gas consumption in Europe (including Turkey but excluding the Commonwealth of Independent States) is accounted for by Russian gas.

It ranks second in the world in terms of coal reserves (19% of global reserves), fifth in annual production, and accounts for approximately 12% of the global thermal coal trade.

Nuclear electric industry accounts for 5% of the global nuclear energy market, 15% of the global nuclear reactors market, 45% of the global uranium enrichment market, 15% of the global spent fuel conversion market, and 8% of the global uranium production.

Russia will continue to dominate the global hydrocarbon market and will actively participate in the growth of the electricity and coal markets while strengthening its position in the global nuclear electric energy sector.

The objective is to preserve stable relations with its traditional consumers of energy resources and development, as well as stable relations with new energy markets.

Russia is not currently represented on the global renewable energy market, but it has numerous scientific and technical capabilities to enter this sector. Until 2030, the export of energy resources will continue to be the primary driver of economic growth in Russia, but its influence will diminish. Last will concentrate on diversifying the economic structure and reducing the nation's reliance on energy exports.

3.4. Russia is out of global energy markets

Russia's invasion of Ukraine has unprecedented effects on global energy markets, governance, and policy since the invasion of Kuwait by Iraq in 1990.

In addition to the devastating humanitarian catastrophe, loss of life, and damage in Ukraine, the immediate impact on energy markets has been higher prices, greater volatility, and an extended period of uncertainty that poses a threat to the world economy.

Several major energy consuming nations immediately levied hefty non-energy penalties on Russia and changed their long-term energy security plans in response to the invasion. According to preliminary data, sanctions had an influence on Russia's energy exports in March, and market analysts anticipate a gradual decline in shipments in the coming months. The main consumers of Russian oil, gas, and coal have taken extraordinary measures to minimize their dependence on Russian energy in the near and distant future.

In light of Russia's invasion of Ukraine, the European Commission recommended on March 8 "an outline of a plan to make Europe independent of Russian fossil fuels well before 2030, beginning with gas."

It was stated that the new policy might lower EU demand for Russian gas by two-thirds by the end of 2022. As the situation has escalated, the EU has imposed five packages of progressively severe sanctions on Russia, with the most recent package voted on April 7 imposing an import restriction on Russian coal by August 2022.

On February 28, Canada prohibited the import of Russian oil, and on March 8, the United States prohibited the import of all Russian fossil fuels. The United Kingdom will similarly stop importing Russian oil by the end of 2022.

The United States and European Commission established a task force on March 25 to reduce Europe's dependence on Russian energy, reiterating their commitment to cease EU reliance on Russian fossil fuels by 2027. According to a White House statement, the task force will expand US LNG supply to Europe, permit additional US LNG export facilities, and upgrade European energy storage, among other steps.

The invasion's effect on worldwide efforts to expedite the transition to net-zero emissions is cause for alarm. In response to the invasion, Europe has established more aggressive goals for its Green Deal, although the effect will likely be inconsistent globally.

As global energy markets and governance rebalance and realign, the IEF continues to promote energy security, market stability, transparency, and reasonable and orderly transitions by facilitating conversation between producers and consumers. The IEF continues to assist member nations in combating climate change by decreasing greenhouse gas emissions and stopping methane leaks in the energy industry.

The IEF was founded in the aftermath of the fall of the Berlin Wall and the first Gulf War, amid a time of turbulence. As global institutions are once again put to the test by conflict, market turbulence, and global insecurity, the IEF continues to encourage discussion between energy producers and consumers to guarantee that the global energy market serves the requirements of humanity.

3.5. Russia's position in global gas markets before its invasion of Ukraine

After the United States, Russia is the world's second largest gas producer, generating 761 billion cubic meters (bcm) in 2021, or 18% of global gas output. Russia is the world's greatest gas exporter, with estimated exports of roughly 250 billion cubic meters in 2021, with 210 billion cubic meters transported via pipelines. Furthermore, Russia shipped over 40 billion cubic meters of liquefied natural gas (LNG), making it the world's fourth largest LNG exporter behind Australia, Qatar, and the United States. Russia will supply 32% of total gas consumption in the European Union and the United Kingdom in 2021, up from 25% in 2009. However, in the months leading up to its invasion of Ukraine, Russia was already decreasing its gas deliveries to Europe.

3.6. Chinese energy investments in Russia

Through its oil-for-loans strategy, China emphasizes the importance of resilient global energy supply chains in meeting its expanding energy needs. China's continuous economic expansion, fueled by broad-based capital investments and a booming industrial sector, has propelled it to the top of the world's energy consumption list. As a result, Beijing has found a trustworthy trade partner for energy commodities including as oil, gas, and coal in neighboring Russia, which is rich in fossil fuels. The mutual affinity and security challenges of this partnership have been studied and examined in recent years. The Ukrainian conflict, as well as the ensuing Western sanctions imposed on Russia, have pushed Russian interests eastward, towards China and India.

After the "Yukos incident," the era of strategic cooperation between state-owned Russian energy enterprises and Chinese national oil companies, particularly between Rosneft and China National Petroleum Corporation (CNPC), began in 2004. Yukos, one of Russia's largest private oil and gas suppliers, declared bankruptcy after being accused of tax evasion, allowing China to boost the ante. By allowing Rosneft to acquire back controlling shares from CNPC, CNPC supported Rosneft's acquisition of Yukos' subsidiary, Yuganskneftegaz, a large oil producer. In exchange, China received a steady supply of 49 million tonnes of oil each year.

A estimate of Chinese state businesses' investments in Russia from 2005 to 2021 showed that they invested an astounding US\$ 95 billion in energy infrastructure while also investing US\$ 48 billion in acquiring stakes in Russian state oil and gas companies.

Putin and Xi met 30 times between 2014 and 2019, emphasizing the stability and expansion of Sino-Russian energy relations. At the fourth China-Russia Energy Business Forum in November 2022, Xi referred to the energy collaboration as the bilateral's cornerstone. The growing convergence, convenience, and alignment of energy interests has resulted in the most cordial Sino-Russian bilateral ties in history. China is investing in energy infrastructure around the world in order to build resilient supply chains for itself.

3.7. Big energy companies

Russia

Because of their importance to the global economy, some of the largest energy businesses in Russia and Kazakhstan deserve to be included. The largest Oil and Gas corporation in Russia was created in 1989 and is called Gazprom. Gazprom is a multinational energy corporation that specializes in geopolitical exploration, the production, transportation, storage, processing, and sales of gas, gas condensate, and oil. It also generates and sells heat and electricity. The company's main office is in Russia. World's largest natural gas reserves are held by Gazprom. The Company holds 17 and 72%, respectively, of the world's and Russia's gas reserves. According to the world and national gas output, Gazprom is responsible for 12 and 68% of each, respectively. The company is the owner of the 172,100 km long world's longest gas transmission line. The major LNG producer and exporter in Russia is Gazprom. The yearly revenue for Gazprom ending in December 2021 is 10.241 billion rubles, and the annual net income is 2.093 billion rubles.

With its headquarters in Moscow, Russia, Rosneft Oil Company was created in 1993 and specializes in oil and gas production, refining, and petroleum refining. The annual revenue for the year ending in December 2021 is 8.171 billion rubles, and the yearly net income is 883 billion rubles.

Oil and gas corporation PJSC LUKOIL was established in 1991 and has its headquarters in Moscow. The company is ranked fifth in Russia. The annual net income for the year ending in December 2021 is 773.4 billion rubles, and the annual revenues are 9.220.

The Russian oil and gas company Surgutneftegas was formed by the merger of three previously state-owned firms that had substantial oil and gas deposits in Western Siberia. Khanty-Mansu Autonomous Okrug's Surgut is home to the company's headquarters. Surgutneftgas, founded in 1977, was listed as the 251st largest public company in the world in the 2020 Forbes Global 2000. Annual revenues in 2021 are 1063.62 billion rubles, with a net income of 153.01 billion rubles reported for the first fiscal semester of 2021.

The Moscow-based oil and gas transportation firm Transneft was established in 1993. More than 500 pumping stations and 68.000KM of pipeline are owned and operated by Transneft and transports over 83% of Russia's oil production. The company's third fiscal quarter of 2021 saw annual revenues of 276.3 billion rubles and a net profit of 47.11 billion rubles.

Tatneft is a Russian oil and gas business that is vertically integrated, with its headquarters in Almetyersk, Republic of Tatarstan, Russian Federation. Founded in 1950, it ranks as the fifth-largest oil corporation in Russia. The company's business operations include those in the rapidly developing industries of producing crude oil and gas, refining petroleum, producing petrochemicals, manufacturing tires, and operating a network of filling stations and services. It also has an interest in businesses in the financial sector (banking and insurance). Revenues for the company's fourth fiscal quarter of 2021 were 1174,86 billion rubles, while its net income was 54,12 billion.

Public Joint Oil Corporation Bashneft, founded in 1946, is a Russian oil company that was created as a result of Boris Yeltsin transferring the oil-related assets of the Soviet ministry in Bashkortostan to the regional government of the Republic of Bashkortostan. Annual revenues for 2021 are 796,51 billion rubles, with a net income of 78,96 billion rubles.

Yakutsk Fuel and Energy Company, a public joint stock company, runs an oil and gas company. In fields and authorized subsoil areas, the company concentrates on the exploration and production of natural, condensate, and liquefied petroleum gas. Since

1967, the company has provided clients in Russia. With 105,688 billion rubles in annual revenues and 12,795 billion rubles in net profits for 2021.

Yakutsk Fuel and Energy Company, a public joint stock company, is a producer of oil and gas. In fields and lignite-subsoil areas, the company concentrates on the exploration and production of natural gas, condensate, and liquefied petroleum gas. Since 1967, the company has been doing business in Russia. The yearly revenue for 2021 is 105,688 billion rubles, while the net income is 12,795 billion rubles.

Michail Gutseriev founded Russneft, a Russian oil company with its headquarters in Moscow, in 2002. It belongs to the Safmar financial and industrial company.

The 1993 formation of the public joint stock company Southern Kuzbass Coal was the result of the collaboration of many mining and processing businesses. The company makes steam coals and coking coals.

Oil and gas firm Slavneft-Megionneftegas was founded in August 1994 in accordance with RF Government Ordinance and Regulation of the Council of Ministers of the Republic of Belarus. The sustainable and balanced development of the oil production and refining assets is a key component of Slavneft's business plan.

One of Russia's largest refineries is Slavneft-Yaroslavnefteorgsintez. Since it began operating in 1961, the refinery has been a leader in the production of high-quality goods. Slavneft-Yaro has a 15.0 MTA average raw hydrocarbon refining capacity.

The public joint stock company Varyogan Neftegaz engages in the acquisition, development, production, operation, and sale of oil, natural gas, and gas condensate. The company, a subsidiary of an independent oil and gas corporation holding, was established in 1993.

Kazakhstan

In Kazakhstan, a large number of oil businesses are involved in oil production and mining. They are advertised as both domestic and foreign businesses.

The national oil and gas company of Kazakhstan is called KazMunayGas (KMG). By combining CJSC Kazakhoil and CJSC Oil&Gas Transportation, it was established in 2002. Through the merging of Kazakhoil CJSC and Oil&Gas Transportation CJSC, it was created by the President of Kazakhstan's proclamation of February 20, 2002. In 1997, the Kazakhoil firm was established, with Nurlan Balgimbayev serving as its inaugural president. Timur Kulibayev served as Kazakhoil's Vice President for Economics and Finance from May 1997 to March 1999. Kairat Satybaldy, Nursultan Nazarbayev's nephew who in 2002 assumed the role of Managing Director for Social Affairs, Strategic Planning, and Telecommunications at KazMunayGas, was appointed Vice President of Kazakhoil in the summer of 2000. A strategic collaboration agreement was signed by JSC NC KazMunayGas and Abu Dhabi Ports Company in January 2023. The parties indicate a desire to work together to develop the Caspian and Black Seas' coastal infrastructure and maritime fleet. In the first nine months of 2021, revenue increased by 47.4% to 6,776 bn tenge (USD 14,774 million). The assets of the company are: Kazakhoil-Aktobe (67%), Mangistaumunaigaz (50%), PetroKazakhstan (33%) and Tengizchevroil (20%), and so on. Additionally, smaller oil firms in Kazakhstan operate, such as Aday Petroleum, Tolkynneftegas, Aktau TRANSIT, ANAKO (the first private oil company; founded in 1994), Ai-Dan Munai, and others.

Oil reserves in vast quantities entice foreign entrepreneurs, investors, and businessmen. Many foreign corporations have representative offices in Kazakhstan and work with local employees.

Lukoil and Rosneft conduct business in Kazakh oil fields. Lukoil extracts oil in the fields of Tengiz (2.5%), Karashyganak (15%), Karakuduk (62.5%), Arman, and others. Rosneft owns a 50% stake in the Kurmangazy field.

In 2008, American oil corporations (together with European partners) held 42% of the total shares in Kazakhstan's oil market.

The signing of the "Contract of the Century" on April 6, 1993, might be considered the beginning of collaboration between Kazakhstan and American oil firms. The Government of the Republic of Kazakhstan signed a 40-year agreement with Chevron Corporation. Chevron manufactures oil in Tengiz, Kashagan, and Karashyganak.

ExxonMobil (Tengiz, Kashagan) and ConocoPhillips (Kashagan) are two more American corporations that operate well in the Kazakhstan oil sector. European oil corporations are also involved in the Kazakhstan oil sector. The Republic of Kazakhstan, Agip (Italy), and British Gas (Britain) inked an agreement in 1992 to develop the Karachaganak oil and gas field. This marked the beginning of international collaboration in the oil sector between Kazakhstan and European countries.

Currently, the following European companies are involved in oil production at various oil fields in Kazakhstan: the Italian Eni (Agip - a commercial brand of the company), the French Total, the German Royal Dutch Shell, the British British Gas, the Spanish Repsol YPF, the Romanian Petrom, the Danish Maersk Oil, and the Italian Total (Dunga).

For fifteen years, Chinese oil corporations have been active in the Kazakhstani market. In September 1997, the Chinese government was granted complete access for the first time to the strategically important oil and gas sector of the Kazakh economy. One of the biggest oil businesses in Kazakhstan, "Aktobemunaigas" JSC, saw the acquisition of 60.33% of its shares by CNPC (China National Petroleum Corporation). The business additionally purchased 50% of Buzachi Operating Ltd. (North Buzachi) shares in 2001, and PetroKazakhstan in 2006. The combined proportion of these businesses—including Kazakhoil-Aktobe, which is also held by Chinese investors—accounted for 97% of the crude oil produced in the Aktobe region. A second Chinese corporation, CITIC, purchased 50% of Karazhanbasmunai's shares (Karazhanbas).

Since 2002, Japan National Oil Corporation (JNOC) has been attempting to forge connections with the oil industry in Kazakhstan. Japan is a big fan of Kazakhstan's oil. Even back then, 8.3% of "Agip KCO" belonged to the Japanese corporation Impex (International Oil Company, 50% controlled by Japan National Oil Corporation), which also took part in the North Caspian exploration project. Currently, the company works in the Kashagan sector.

Other Asian oil corporations, such as India's Mittal Investments (Karakuduk, North Buzachi, South Zhambay, Satpayev), India's ONGC Videsh Ltd (Satpayev), and Turkmen Kazakhturkmunai, have contributed to the development of Kazakhstan's oil industry (Saztyube, Yelemes).

The world's top companies are attracted to undiscovered oil deposits that experts say will exist in enormous quantities; as a result, it's possible that the list of oil companies could soon grow with the addition of new names.

Chapter 4 Renewable Energy

6.1. Renewable Energy in Russia and Kazakhstan

In response to global attempts to address climate change, new policies referred to as "energy transition" are beginning to play an increasingly crucial role in redefining political relations among and within nations. Environmental issues have always been geopolitical, but in recent years, this trend has accelerated. Kazakhstan and Russia's problematic environmental policy reputations are largely attributable to their important position in traditional hydrocarbon fuel markets.

Using the language of sustainability has been a component of the governmental and business sectors' efforts in both Russia and Kazakhstan to align themselves with the globally prevalent narrative about creating "green economies" and so build an image of the countries as modern and investment-friendly. Since obtaining independence in 1991, Kazakhstan has continuously placed a higher priority on earning Western favor than Russia.

In Kazakhstan, the United Nations Development Programme (UNDP) has been active in a few small-scale projects encouraging renewable energy, but the European Bank for Reconstruction and Development is obviously the most significant actor in facilitating the country's transition to renewable energy – objectively and from the bank's own perspective. In 2008, the EBRD and Kazakhstan's government signed a "Sustainable Energy Action Plan" that laid out what they would do together. In 2009, the Law on the Use of Renewable Sources of Energy became Kazakhstan's first law. The bill was rapidly deemed inadequate due to the absence of a regulatory component and a feed-in tariff scheme. Without this, it would be unrealistic to expect renewable energy providers to compete with traditional fuel suppliers, who have long benefited from artificially cheap electricity prices thanks to hefty governmental subsidies. Similarly to Russia, this has been a significant barrier to the development of renewable energy infrastructure. Kazakhstan implemented a new tariff structure in 2013 with further legislative backing from the EBRD, which guarantees a competitive market for renewable energy producers for 15 years. In addition to exempting

renewable energy producers from power transportation expenses, the same law created the "Cost Clearing and Settlement Centre," which centralized the purchase and selling of renewable energy produced by renewable energy facilities.

In addition, the EBRD has supplied the majority of finance for Kazakhstan's large-scale renewable energy projects. This includes the country's first large-scale wind power plant in northern Kazakhstan, Yereymentau, which received a \$70 million loan in 2014, to which the Clean Technology Fund (CTF) contributed \$21 million. The EBRD has also worked with the CTF to assist two big solar projects in southern Kazakhstan, Burnnoye Solar-1 and Burnnoye Solar-2 (each 50 MW), with a \$80 million loan in 2015 and \$44.5 million in 2017. (Bellini 2017). Samruk-Kazyna Invest, an investment arm of Kazakhstan's sovereign wealth fund, and United Green, a private British strategic investment group, have also provided funding for these projects, while the loans have been guaranteed by Samruk Energy, Kazakhstan's national energy company, which, according to the ERDB, has viewed these solar initiatives to diversify its portfolio.

Kazakhstan's energy decision-makers are likewise interested in a diversified portfolio, both in terms of sourcing and overseas investment. Political leaders stress the potential of renewable energy projects to attract FDI and emphasize the participation of foreign enterprises – both potential and actual – on a constant basis. "Several domestic and international firms, including ACWA Power (the Kingdom of Saudi Arabia), Sky Power (Canada), Shell, General Electric (the United States), and Goldwind (China)," announced a government announcement about a 2018 renewables auction. Attracting potential investors to Kazakhstan's renewable energy industry is a goal in and of itself for Kazakhstan's political and financial elites, but they also hope that these high-profile "green economy" initiatives will generate a wider FDI ripple effect.

However, attracting FDI to a sector as underdeveloped as renewable energy in Kazakhstan is not simple. Again, the EBRD has played a significant role. In May of 2018, a prominent Chinese solar panel manufacturer, Risen Energy, signed a mandate letter for a 63MW solar project in Kazakhstan, making it the second project for the firm to get funding from the EBRD (the first project received 40MW).

While Risen Energy will be the first Chinese solar business to operate in Kazakhstan, the EBRD has also encouraged the participation of other international solar companies, such as by providing ACME Cleantech Solutions with a \$26 million solar loan in 2016.

The breadth of state-backed and non-state-backed Chinese and Indian investments has rightly attracted the attention of many Central Asian analysts. In contrast, the connections between the post-Soviet republics and the Gulf states of the Arabian Peninsula have gotten little investigation to yet, despite quickly expanding, notably in the renewable energy sector. As with previous renewable energy initiatives in Kazakhstan, these initiatives have focussed on the solar power industry. Kazatomprom, one of the world's largest uranium producers, has been engaged in this industry in an effort to improve its public image. The press coverage accompanying the signing of an agreement with Qatar Solar Energy (QSE) by Azat Betekbaev, then-president of Kazatomprom's solar division, made this point abundantly evident. The 2014 arrangement, and a later agreement in October 2015 that apparently made Kazatomprom a "strategic shareholder" of QSE, essentially stipulated that Kazakhstan would supply silicon for solar modules to be manufactured in Qatar.

Qatar Solar Energy appears to be defunct based on the available news and the status of its website, abandoning its agreements with Kazatomprom. Even if it had been finalized, this supply agreement might not have significantly advanced Kazakhstan's solar industry. Fostering renewable energy technologies fits well into the technofetishism of both Kazakhstan and Qatar's state-led development objectives, as does promoting a "knowledge-based economy" Regardless of the actual breadth of the current collaboration, solar deals like this provide a handy platform for political and economic leaders in both nations to align their economic interests with dominant national and international paradigms for the promotion of "green" futures.

Kazakhstan's leadership has also pushed to strengthen bilateral ties with the United Arab Emirates (UAE), but this has had relatively little impact on the country's renewable energy industry. EXPO 2017 provided a suitable venue for describing their possible renewable energy agreements. The CEO of Abu Dhabi's iconic "carbon-neutral" Masdar city project,

Mohamed Jameel Al Ramahi (2017), wrote an opinion piece for the UAE's newspaper, The National, titled "Two nations charting a course towards a prosperous future by tapping into human energy: Expo 2017 in Astana demonstrates the partnership between the UAE and Kazakhstan in knowledge building and real-world innovation." The commentary provided few specifics regarding what such a "partnership" would entail in practice, but it did highlight the two countries' shared objective of achieving a 50% clean energy goal by 2050, before linking the UAE's sustainability agenda to its "founding father," Sheikh Zayed, who was described as having inspired "a generation of people who modernized the country through the responsible development of conventional energy resources."

It's notable that Al Ramahi, like many other Emirati authorities, shifts his focus from sustainability to responsible management of "conventional energy resources." Dr. Mohammed Ahmed Sultan Al Jaber, the UAE's Ambassador to Kazakhstan, does the same in an interview with The Astana Times. He begins by praising EXPO for bringing "new focus to our international efforts and achievements in the renewable energy technologies" before highlighting a memorandum of understanding (MOU) signed at the "Future Energy World Summit" held in Abu Dhabi in January 2017 between the organizers of EXPO 2017 and EXPO2020, which will be held in Dubai. When asked specifically about the "prospects for cooperation between the UAE and Kazakhstan in the field of renewable energy sources," Al Jaber gave a vague response about the importance of "technology transfer and original expertise," and then mentioned another MOU between Kazatomprom and UAE Nuclear Energy Corporation regarding the "peaceful use of nuclear energy" and Kazakhstan's role in supplying natural and enriched uranium for the UAE's ambitious nuclear energy program.

The Ambassador's response and the facts on the ground suggest that discussions about "renewable energy" are a convenient means of narrating a friendly and progressive relationship between Kazakhstan and the United Arab Emirates, rather than challenging the status quo surrounding conventional energy systems in the two states. Sheikh Mohammad bin Zayed Al Nahyan, Abu Dhabi's Crown Prince and Deputy Supreme Commander of the UAE Armed Forces, highlighted renewable energy as a source of collaboration during his July 2018 visit to Astana. However, he ultimately left with vague

promises to expand bilateral ties and no concrete agreements. In spite of this, as illustrated by the UAE and Qatar, renewables should be treated seriously as components of the reconfiguration of regional energy geopolitics in Central Asia and the Arabian Peninsula. The discursive repertoire of sustainability is crucial insofar as it permits actors in both regions to narrate a specific vision of modernity and define the rules for future involvement, even if – or perhaps especially because – it helps them to maintain existing political economies. However, the increasing relevance of renewable energy in international networks of finance, prestige, and politics makes it doubtful that mere rhetoric over renewables will remain merely that.

6.2. Russia

While international involvement in Russia's renewable energy sector has been relatively low-key, the country's first steps in promoting renewables have had to be the establishment of a supportive regulatory environment. The Federal Energy Efficiency Law of 2009 and the Federal Heat Law of 2010 are both predicated on the notion that by promoting renewables, energy efficiency is improved.

Renewable energy installations and infrastructure largely replace aging coal and heavy oil power facilities. However, the concept is also connected to the long-term ambition stated in the Russian energy strategy from the early 2000s, which is that renewable energy would supplant fossil energy, namely oil and coal, hence releasing these flows for export and more "efficient" use of these resources. The improvement of energy efficiency in energy extraction, transit, and consumption was initially justified by economic, environmental, and foreign-policy (soft power) gains, especially during the 2008–2012 push for modernization during the Medvedev administration. Obviously, it is debatable whether Medvedev's presidency had any significant impact on the economic, social, and political practices of the Russian state, given that Vladimir Putin remained *de facto* in power as the Prime Minister, despite resigning from the presidency after two terms from 2000 to 2008. On the discursive level, however, Medvedev's word was quite distinct. However, the conservative trend in Russian internal and foreign policy after Putin's re-election in 2012

has almost eliminated the environmental and soft-power grounds, leaving money as the key motive to improve energy efficiency in Russia.

Even though Russia is trying to build a legal framework for renewable energy, there are still major legal problems. The system is not clear and is full of loopholes that small and medium-sized businesses can't deal with. In particular, the structure of the energy industry in Russia is significantly skewed, as it is dominated by massive parastatals and state-owned enterprises such as Gazprom, Rosneft, and Rosatom. Thus, in this institutional environment, promoting renewables is extremely challenging. However, in the bioenergy industry, particularly in the taiga region of Russia, there is the potential to implement renewables as they can replace the use of far-flung and hence expensive oil and coal. This is because the forest sector is a dominant force in the regions surrounding the three forestry clusters of Russia – the Northwest, Southern Siberia, and the Far East – and has an interest in expanding into bioenergy. Despite this strong potential impetus – according to national energy policies, the North is a trial region that would pave the way for broader bioenergy deployment throughout the country — bioenergy power plant projects have been limited. Surprisingly, the Northern Delivery system, which transports primarily heavy oil and coal from outside the region to local power plants, is one of the impediments to bioenergy development in forest-based regions of Russia. Despite being expensive for Northern towns, the power networks and rents involved in the system make it impossible to construct new renewable energy capacities. The export of bioenergy, primarily in the form of wood pellets and chips to the European Union, has evolved significantly more positively over the past decade, providing the Russian forest industry with new markets and revenue streams. In a world where huge fossil-energy industries are run by the government, it is hard to use renewables. In terms of infrastructure, the hurdles are also tied to the major role of gas, which accounts for fifty percent of Russia's energy consumption. Historically, the transition away from coal and heavy oil in a number of Russian industrial cities has been beneficial for human health and the environment, since emissions have dropped. Nonetheless, this dependence on gas, which is the result of both political and infrastructure path dependencies, has become a significant impediment to decarbonizing Russia. In addition, the Gazifikatsiia Rossii initiative, which aims to expand the gas-pipeline system

to Russia's national and regional peripheries, reduces the possibility for renewable energy deployment.

So, it shouldn't be a surprise that the only people who can build renewable energy capacities right now are big companies in the U.S. and other countries, not small or local energy companies that could change the energy market from the bottom up. For instance, Finnish corporation Fortum, which produces up to 8% of Russia's electricity after acquiring half of Uniper's active Russian energy market stock, is investing in both wind and solar power in Russia . The Russian state business Rosatom, which is responsible for nuclear power and weaponry, has also made substantial investments in wind generation. In contrast to Rosatom's deployment of additional nuclear-generating capacity, the corporation's renewable energy initiatives are quite modest. They can be viewed as an image construction effort, a showcase attempt that enables the nuclear titan to greenwash its extremely poor environmental track record and otherwise opaque actions.

These examples demonstrate that only large entities are capable of advancing renewable energy projects on a significant scale. Russia's online capacity (about 200 MW) and current wind-power investments (approximately 1800 MW) total approximately 2000 MW, which is an extremely low number for the world's largest country with a vast wind-power potential. According to the World Energy Council , Russia's economically feasible wind energy potential is an astounding 6,000 TWh per year. Comparatively, Germany, which has the third-largest wind-power capacity after China and the United States, generated 80 TWh from wind in 2016. The fact that China has more than 150 times the wind power capacity of the United States is revealing. To achieve a total wind-power capacity of 4.5 GW by 2030, a government decree issued in 2016 calls for the construction of more than a dozen wind farms larger than 100 MW. For the plan to be effective, Russia will need transparent rules of the game for all parties, major and small, lest it fall victim to the boom-and-bust cycle of policy pivots that is characteristic of Russia's economy.

6.3. Kazakhstan

Even if Kazakhstan has a great energy mix of fossil fuels, it has big potential in renewable alternatives.

A total of 15 major (450 MW) hydropower facilities with a combined capacity of 2.248 GW provide about 7.78 TWh, or about 13% of Kazakhstan's total generating capacity. There are several large hydroelectric power facilities, including the Bukhtyrma (750 MW), Shulbinsk (702 MW), and Ust-Kamenogorsk (315 MW) plants on the Irtysh River, the Kapshagai (364 MW) plant on the Ili River, the Moinak (300 MW) plant on the Charyn River, and the Shardarinskaya (104 MW) plant on the Syrdarya River. Because of its affordability, dependability, and seeming environmental friendliness, small (1-10 MW) and medium-scale (10-50 MW) hydropower projects have gained in popularity. In the east and south of Kazakhstan, in Zhambyl and Almaty, there are seven small hydropower facilities (<10 MW), with a combined installed capacity of 78 MW and an estimated potential of 13 TWh.

The steppe environment of Kazakhstan makes it suited for wind energy uses, and it is predicted that roughly 760 GW of wind energy has the potential to be economically generated. Average wind speeds of 4-6 m/s are present over around 50% of Kazakhstan's land area, with the Caspian Sea, central, and northern regions having the most potential. The Djungar (Dzhungarian) Gates, 600 km northeast of Almaty near the Xinjiang border, and the Chylyk Corridor, 100 km east of Almaty, are the two most probable individual locations in the Almaty region. With predicted wind potentials of 525 Wm² at the Djungar Gates and 240 Wm² in the Chylyk corridor, wind turbine power output might reach 4400 kW/h/MW and 3200 kW/h/MW, respectively. At Yerementau in the Akmola area, the first wind farm in Kazakhstan is being built. It will have 22 FWT2000 2 MW turbines, with a total installed capacity of 45 MW and a generating capacity of 172.2 kWh.

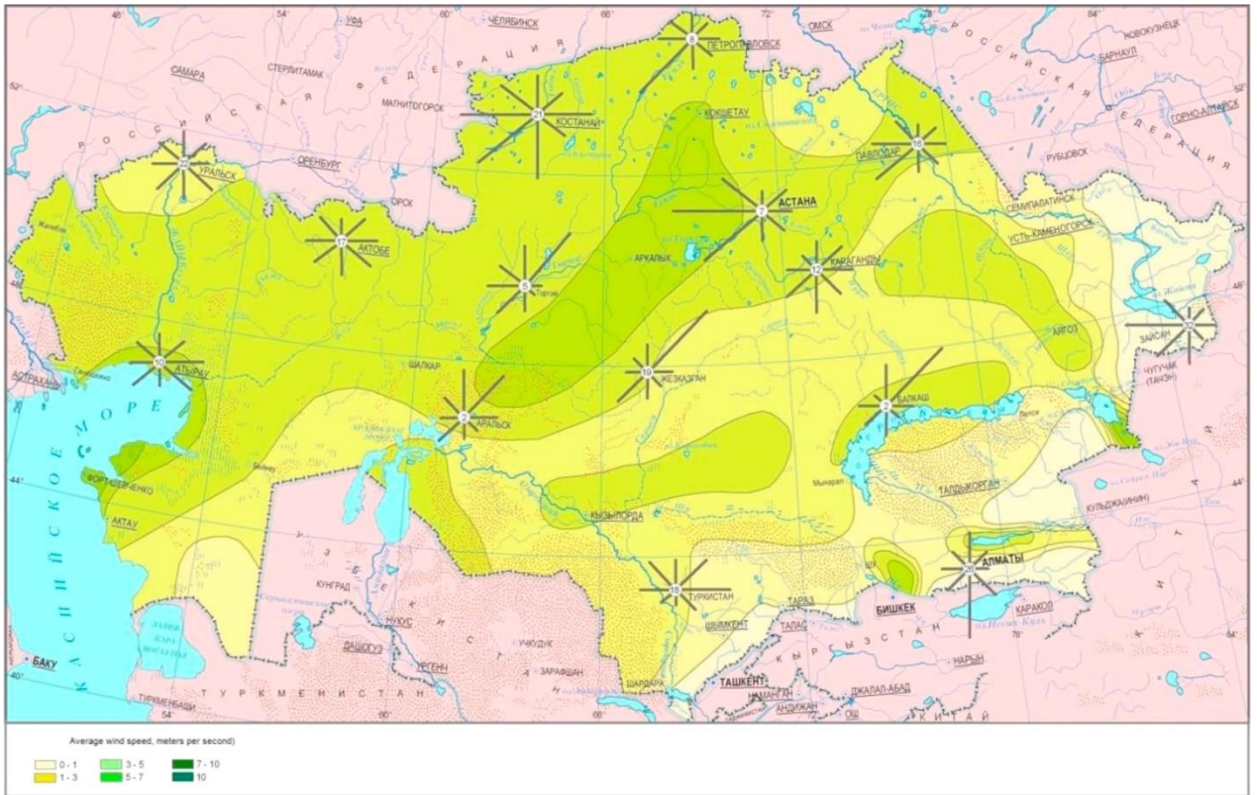


Figure 4 Wind potential of Kazakhstan

The south of Kazakhstan, which receives between 2200 and 3000 hours of sunlight annually, or 1200-1700 kW/m², has high insolation locations that might be appropriate for solar power. Solar photovoltaic (PV) and concentrated solar thermal both offer promise. There is a 2 MW solar PV plant close to Almaty, and six 300 MW solar PV facilities with a total capacity are currently being built in the southern Kazakhstani region of Zhambyl. Concentrated solar thermal is beneficial in addition to solar PV because it can be used in desert and semi-desert regions without the need for water, the materials (steel, glass, and concrete) are produced domestically in Kazakhstan and are readily available, and solar thermal plants store energy in the form of heat, which is much more efficient than the batteries used in PV systems and enables the production of electricity on demand, even after the sun has set. Although the government intends to build 1.04 GW of renewable energy capacity by 2020, there are currently no plans to construct a concentrated solar thermal plant.

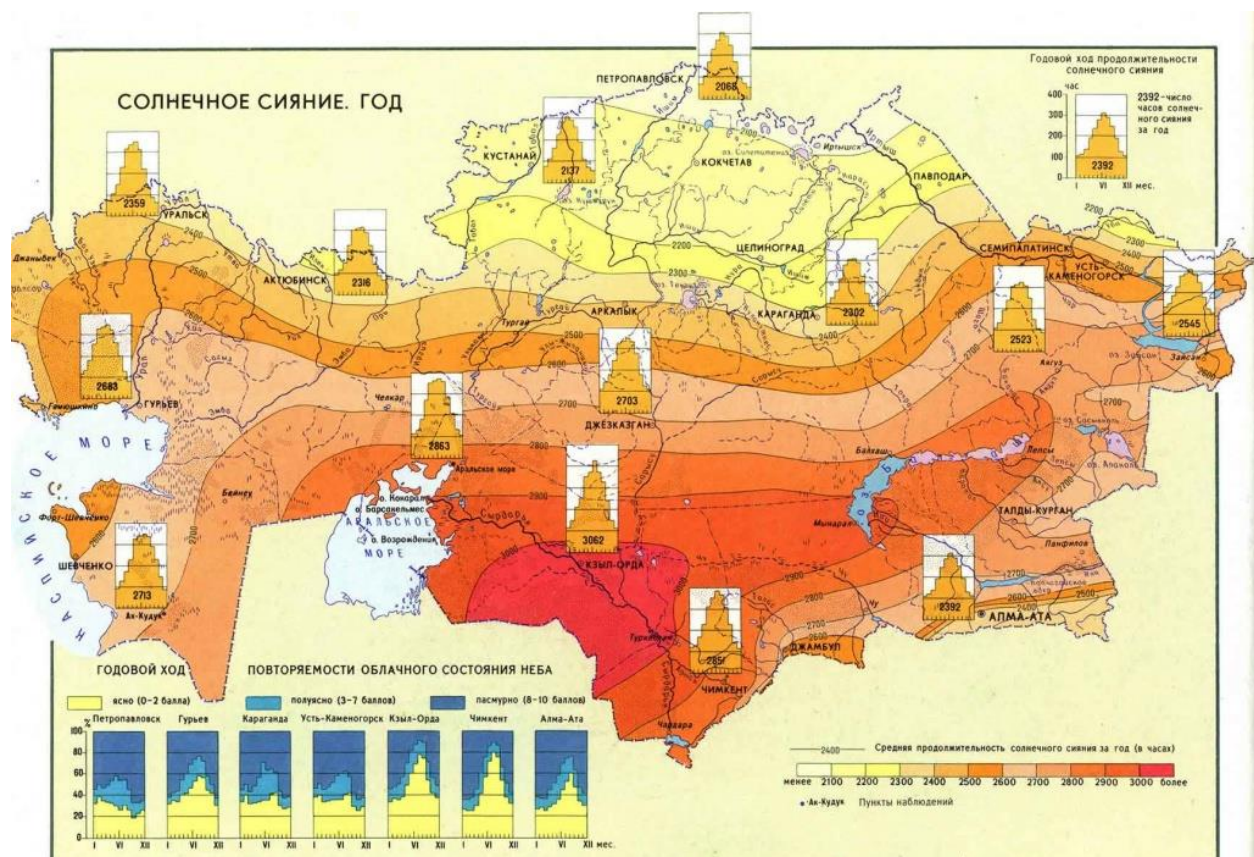


Figure 5 Annual solar radiation in Kazakhstan

Kazakhstan's 185 Mha of steppe grasslands, 10 Mha of forest, and 76.5 Mha of agricultural land together offer an abundance of biomass wastes and leftovers that have the ability to produce a variety of bioenergy services. With an average grain production of 17.5–20 Mt, Kazakhstan produces and exports crops such wheat (winter and spring), rye (winter), maize (for grain), barley (winter and spring), oats, millet, buckwheat, rice, and pulses. This translates to about 12–14 Mt of biomass wastes. Only 10% of the entire volume of biomass residues are now utilized, primarily as an animal feed addition. It is currently unknown how many rural homes use biomass cookstoves for both cooking and heating. Additionally, at least 400,000 families are known to keep cattle, horses, and sheep, making organic wastes another possible source of energy. According to estimates, biomass in Kazakhstan has the ability to produce 35 billion kWh of power annually and 44 million Gcal of heat. There is currently only one large-scale biogas unit operating in the nation, a 360 kWe biogas plant run at Vostok village in the Kostanai region. Various external funding agencies (UNDP, GEF, HIVOS Foundation) have supported the development of biogas initiatives, including the Biogas Training Centre at the Eco-museum in Karanga (2002-2003) and the "Azure Flame" Central Kazakhstan Biogas Education Center (2004-2005). The Vostok biogas unit consists of two 2400 m³ digesters that run on 40 t/day of dung from cows, sheep, and camels, as

well as 1 t/day of waste from slaughterhouses. To produce 3 million kWh of power per year, Karaman-K Ltd. and Zorg Biogas erected the facility in 2011 .

6.4. Russia and Kazakhstan

Russia and Kazakhstan are becoming home to an increasing number of renewable energy projects, although it is impossible to forecast the rate of development or the size of these projects in comparison to hydrocarbon sources. As governmental and corporate leaders throughout the world increasingly adopt the concept of sustainability, emphasizing the positive, contemporary, and ostensibly progressive image of promoting "green" objectives, this tends to brush aside far more delicate issues. In Russia and Kazakhstan, as in much of the rest of the world, these include extremely inefficient energy systems hampered by "business as usual" approaches, failing or completely lacking infrastructures, regional development inequalities, widespread poverty among citizens, and painful foreign policy challenges that may appear to undermine state sovereignty – all of which require enormous political and financial capital to address properly, but none of which apprehensively threaten state sovereignty. However, the experiences of Russia and Kazakhstan demonstrate that, for the time being, the geopolitics of renewables is still geopolitics of oil and gas.

Chapter 5 Energy Security .

Energy security, according to the International Energy Agency (IEA), is "the uninterrupted flow of energy at a reasonable price." In reality, the International Energy Agency (IEA), an organization of the OECD and other countries working together to achieve secure and reliable energy, was founded in 1974 as a counter-balance to OPEC's efforts. Much like we began our discussion of sustainability with the Bruntland definition, we can begin our discussion of energy security with the IEA definition. The European Commission, the executive body in charge of legislation promoting the interests of the EU, broadened energy security considerations of uninterrupted supplies and affordability to include environmental concerns and sustainable development, just as sustainability frequently incorporates economic, environmental, and social dimensions.

Globally, many governments continue to be concerned with energy security. Typically, resource-poor nations are interested in long-term deals with fossil fuel exporters to assure an uninterrupted supply of inputs to suit their economy's demands. These nations, especially in Europe, have a significant interest in growing energy generation from renewable sources in order to continually increase the proportion of renewables in their energy mix, have a cleaner environment, and combat climate change. Since a result of their own fossil fuels, resource-rich nations appear to be in a better situation, as their energy demands are satisfied. However, the export of oil, gas, and coal from these nations is extremely dependent on fluctuating prices and political unpredictability in many areas of the world.

5.1. Kazakhstan.

Kazakhstan is a net exporter of energy and energy products, owing to its reliance on considerable fossil fuel resources. However, as natural gas reserves are in the western portion of the nation, population centers are in the north, east, and south, and the domestic pipeline system is underdeveloped, some inhabitants in northern and central Kazakhstan still do not have access to network gas. To meet domestic demand, Kazakhstan relies on gas imports from Russia and Uzbekistan: a gas-swapping agreement between Kazakhstan and Russia entails replacing Karachaganak gas, which has traditionally been supplied to

Orenburg for processing, with imports of Central Asian gas to the southern part of Kazakhstan and Russian gas to the Kostanay region.

However, efforts are being made to develop networks in order to increase overall access to gas. Following the former president's decision in 2018, building of the Saryarka gas pipeline began in 2018, with the goal of supplying gas to the capital city of Nur-Sultan, as well as central and northern Kazakhstan, by 2023. Construction on the pipeline began in November 2018, and the first section from Kyzylorda to Nur-Sultan was finished in October 2019.

The pipeline's capacity will be 2.2 billion cubic meters of gas per year, and gas would be delivered to 171 villages in the Karaganda and Akmola districts. These improvements are projected to enhance air quality in Nur-Sultan by reducing coal usage by 650 kt per year. The major gas pipeline installation in Nur-Sultan was completed in April 2020.

Strong economic growth and improved living standards are predicted to significantly increase energy demand in the coming years. To address this expanding demand in a dependable, cheap, and long-term way, the government intends to increase generation capacity from multiple fuel sources through new investments and modernization of current capacity. However, building of a 2 640MW coal-fired power station near Balkhash Lake was halted in 2016 when the Ministry of Energy determined that modernization of existing power plants, the establishment of significant reserves, and a drop in energy consumption increase make this project unneeded before 2022.

According to a 2015 assessment by Kazenergy, the availability of low-cost coal implies that the existing fleet of huge coal-fired power plants will continue to dominate until 2040, however gas-fired generation will also increase as Kazakhstan's gas network expands. Due to the intermittent nature of renewable energy and the technical and economic challenges of integrating renewables into Kazakhstan's unified energy system, Kazenergy expects only modest growth in renewable energy production unless there are significant changes

in technical reliability in either renewables production (particularly wind and solar) or grid operations.

Low liquefied petroleum gas (LPG) costs have increased product demand. The LPG market is regulated, with the government imposing a quarterly price cap on LPG, but there has been a shortage of LPG in the domestic market due to illegal exports to neighboring countries where prices are substantially higher. Because low maximum wholesale prices and increased domestic consumption have resulted in losses and worsening financial and economic conditions for LPG owners and producers, the Ministry of Energy had planned to phase out state regulation of wholesale prices, but regulation remained in place in 2019, with the Minister of Energy approving a maximum LPG price.

The completion of the three refineries' modernization in 2018 has reduced the requirement to import light crude oil products. In 2018, refinery throughput grew 10% to 16.4 Mt, supplying 93% of the domestic market's gasoline, 91% of its diesel, and 62% of its jet kerosene. New refinery capacity is planned to supply all domestic needs by 2030.

Kazakhstan and China's energy cooperation is primarily motivated by China's need to import energy for development and diversify its import sources, as well as Kazakhstan's desire to diversify its export routes and increase export volumes. China is an important strategic partner in the energy industry, with Chinese businesses active in Kazakhstan's energy development, primarily hydrocarbons, including upstream development and pipeline building, as well as domestic oil refining and gas processing. China's equity stake in Kazakhstan's oil production has grown rapidly, reaching 25% in 2009, and Chinese President Xi Jinping's 2013 visit resulted in the signing of energy deals worth USD 30 billion, including the China National Petroleum Corporation's (CNPC) acquisition of an 8.3% stake in Kashagan, the world's largest oilfield outside the Middle East. With the completion of the Beyneu-Bozoy-Shymkent natural gas pipeline in 2015 (capacity of 15 billion cubic meters per year), exports to China grew to 5.2 billion cubic meters in 2018.

The treaty establishing the Eurasian Economic Union (EAEU) entered into force on January 1, 2015, with Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia as founding

members. The primary goal of the single market was the unrestricted movement of products, capital, services, and people. Although the EAEU abolished customs taxes on intra-EU trade, it excluded most energy items from its general trade rules. Energy commerce among Customs Union members is instead handled mostly by separate bilateral trade agreements. The EAEU treaty required a common electricity market to be operational by 1 July 2019, and common markets for gas, oil, and petroleum products to be operational by 1 January 2025. The heads of the EAEU members reached an agreement on an unified power market in May 2019. It is expected to commence operations when the unified trade rules go into effect.

Oil product tariffs have been freed from direct state regulation (except for A-80 and LPG): in December 2014, gasoline grades A-80, A-92, and A-93, as well as diesel and LPG, were regulated, while state regulation was lifted for gasolines A-92 and A-93 in September 2015, and diesel was also excluded in July 2016. Until refinery modernization is complete, the government will continue to exert administrative influence over the prices of some types of refined products (A-80 and LPG).

Kazakhstan's retail pricing for petroleum products remain among the lowest in the world. Despite the fact that administrative price reductions were phased out between 2014 and 2016, Kazenergy (2019) reports that the Committee for the Regulation of Natural Monopolies, Protection of Competition, and Consumer Rights frequently fines retail stations for "anti-competitive" pricing practices, thereby keeping retail prices low. Large gas stations in Kazakhstan have decreased their retail gasoline and diesel fuel prices as a result of government support measures since April 2020, despite the fact that such administrative price reductions will impair their profitability from production to retail.

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Low liquefied petroleum gas (LPG) costs have increased product demand. The LPG market is regulated, with the government imposing a quarterly price cap on LPG, but there has been a shortage of LPG in the domestic market due to illegal exports to neighboring countries where prices are substantially higher. Because low maximum wholesale prices and increased domestic consumption have resulted in losses and worsening financial and economic conditions for LPG owners and producers, the Ministry of Energy had planned to phase out state regulation of wholesale prices, but regulation remained in place in 2019, with the Minister of Energy approving a maximum LPG price.

Kazakhstan and China's energy cooperation is primarily motivated by China's need to import energy for development and diversify its import sources, as well as Kazakhstan's desire to diversify its export routes and increase export volumes. China is an important strategic partner in the energy industry, with Chinese businesses active in Kazakhstan's energy development, primarily hydrocarbons, including upstream development and pipeline building, as well as domestic oil refining and gas processing. China's equity stake in Kazakhstan's oil production has grown rapidly, reaching 25% in 2009, and Chinese President Xi Jinping's 2013 visit resulted in the signing of energy deals worth USD 30 billion, including the China National Petroleum Corporation's (CNPC) acquisition of an 8.3% stake in Kashagan, the world's largest oilfield outside the Middle East. With the completion of the Beyneu-Bozoy-Shymkent natural gas pipeline in 2015 (capacity of 15 billion cubic meters per year), exports to China grew to 5.2 billion cubic meters in 2018. The treaty establishing the Eurasian Economic Union (EAEU) entered into force on January 1, 2015, with Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia as founding members. The primary goal of the single market was the unrestricted movement of products, capital, services, and people. Although the EAEU abolished customs taxes on intra-EU trade, it excluded most energy items from its general trade rules. Energy commerce among Customs Union members is instead handled mostly by separate bilateral trade agreements. The EAEU treaty required a common electricity market to be operational

by 1 July 2019, and common markets for gas, oil, and petroleum products to be operational by 1 January 2025. The heads of the EAEU members reached an agreement on an unified power market in May 2019. It is expected to commence operations when the unified trade rules go into effect.

Oil product tariffs have been freed from direct state regulation (except for A-80 and LPG): in December 2014, gasoline grades A-80, A-92, and A-93, as well as diesel and LPG, were regulated, while state regulation was lifted for gasolines A-92 and A-93 in September 2015, and diesel was also excluded in July 2016. Until refinery modernization is complete, the government will continue to exert administrative influence over the prices of some types of refined products (A-80 and LPG).

Kazakhstan's retail pricing for petroleum products remain among the lowest in the world. Despite the fact that administrative price reductions were phased out between 2014 and 2016, Kazenergy (2019) reports that the Committee for the Regulation of Natural Monopolies, Protection of Competition, and Consumer Rights frequently fines retail stations for "anti-competitive" pricing practices, thereby keeping retail prices low. Large gas stations in Kazakhstan have decreased their retail gasoline and diesel fuel prices as a result of government support measures since April 2020, despite the fact that such administrative price reductions will impair their profitability from production to retail.

5.2. Russia .

The most recent Energy Security Doctrine was authorized on May 13, 2019, to replace the previous document, which was approved on November 29, 2012. Prior to the Energy Security Doctrines, Russian ES could only be found stated as a means to assure security in extensive official documents such as the Law on Security of 1992 and the Russian Federation's Concept of National Security of 1997. (Bogoviz, Lobova, Ragulina, & Alekseev, 2018). ES was only tackled from afar in those two documents, which became "the key defining governmental policies in the sphere of security," within the context of Russia's deteriorating ecological condition and restricted to the issue of natural resource depletion.

The Energy Security Doctrines are official documents that specify the policies and measures that the government should take in order to develop an ES climate in Russia. External and internal threats to ES have been divided into two categories (Energy Security Doctrine of the Russian Federation, 2012). The dangers mentioned in the Doctrine appear to be based on the "robustness viewpoint" assumption outlined above, therefore spanning many various sectors, such as economic and political, and acknowledging that ES cannot be understood or attained in isolation. Among the external challenges, "international politics and economics could impair Russia's ES as a result of their collective activities or independently" (Bogoviz, Lobova, Ragulina, & Alekseev, 2018). Internal threats, on the other hand, are focused on the FEC itself and can be of economic, political, technological, or natural nature.

According to the Doctrine, Russian ES is defined by three factors: the FEC's ability to provide sufficient and high-quality energy resources at a reasonable price; the economy's ability to expand the availability of these resources while limiting their demand; and the attainment of a sufficiently high level of FEC sustainability to protect the country and its economy in the event of a disruption. In light of this, the 2012 Doctrine posed several problems and opportunities for Russia's ES.

This second version of the paper was accepted on May 13, 2019 and provides a more up-to-date scenario of ES in Russia, which must include all of the developments that have occurred since 2014. According to Security Council Secretary Nikolai Patrushev, "during this time, certain fundamental changes have occurred both in the globe and in our country, giving rise to new problems and threats that cannot be disregarded" (Gerejxanova, 2018). Given this, the new Energy Security Doctrine focuses on "strengthening collaboration with foreign partners, preserving Russian energy companies' legal rights and access to international markets, and further developing Russia's import replacement program" (Griffin, 2020).

5.3. The Russian energy security 35 .

The Russian ES-35 is the long-awaited successor to the ES-30, with the most recent document being a document approved by decree N°1715-r of 2009 (Ministry of Energy of the Russian Federation, 2010) with the goal of "maximizing the effective use of natural energy resources and the potential of the energy sector to sustain economic growth, improve the quality of life of the population, and promote strengthening of the country's foreign economic positions."

The long-term objective of the ES-35 is primarily focused on the development and protection of the Russian FEC. The validity of a secure FEC, as well as evidence that it is still too intimately related to the country's well-being, became self-evident following the oil price drop of 2014-2016, and has been reinforced yet again by the latest collapse in global oil prices and its effects. However, "since Russian officials have practically limitless access to domestic hydrocarbons, they are unconcerned about dependency on fossil fuels and supply diversification, and hence these components are largely ignored in the document."

According to Russian Federal law, the country's "Energy Strategy" document should be updated every five years (Mitrova & Yermakov, 2019) Thus, the ES-35 was a greatly needed and awaited document, both because of Russia's important involvement in energy and because of the legal flaws created by such a vacuum. Despite being the "best available indication of Russian energy policymakers' goals," the ES-35 fails to address key critical concerns, while at times making contradicting claims, particularly when compared to the Energy Security Doctrine. The primary points stated in the ES-35 as impediments to Russian energy sector development can be grouped into three categories: economic, sanction-related, and climate policy.

In terms of the economy, the main issues stem from the Russian economic model's low competitiveness, which is still heavily reliant on commodity prices and their global oscillations; low rates of economic development; an unstable and uneven economic

recovery; and significant changes in global energy markets, where new exporters, markets, and practices have emerged, resulting in the structure and volume of dissent.

Concerning the "green shift," the ES-35 sees tightening international climate policies as a hindrance to Russia's ES, while also addressing the need to create renewable energy systems (RES) and reduce the country's energy intensity and emissions.

Chapter 6. Europe's dependence on Russia's natural gas .

As a significant energy consumer, Europe confronts a number of difficulties in meeting its future energy needs. These difficulties include the rapidly increasing global demand for energy and the competition for those resources from developing nations like China and India, the Middle East's ongoing instability as a source of energy, the fragmentation of the European energy market, and the growing need to change fuels to address climate change policy. Security of the energy supply is now a top priority for the European Union and its member states (EU).

The switch to a higher use of natural gas has been a crucial component of the EU's energy supply plan. Natural gas is a common import into Europe as a whole. Russia continues to be one of Europe's most significant natural gas suppliers, even though it ranks second behind Norway as a provider to Europe.

When it comes to defending its share of the European natural gas market, Russia hasn't been sitting still. In an effort to thwart European support for pipeline alternatives, Moscow, including the state-controlled firm Gazprom, has proposed competing pipeline projects and sought to co-opt European businesses by offering them interests in those and other projects. It has tried to discourage potential suppliers from taking part in projects sponsored by Europe, particularly those in Central Asia. In an apparent effort to block supply options like unconventional natural gas, Moscow has also brought up environmental issues.

Some European authorities have grown more concerned over the past 10 years about the possibility of Russian natural gas supplies to Europe being cut off or reduced. The majority of Russian natural gas shipments to Europe, at least until recently, went through Belarus and Ukraine. Natural gas supply disruptions to areas of Europe have already occurred as a result of tense and occasionally hostile ties between Kyiv, Minsk, and Moscow, as occurred in 2006 and 2009. Some Eastern European nations, which in some cases depend nearly entirely on Russian gas imports, have been particularly vulnerable to these changes.

The construction of Nord Stream, whose capacity increased to 2 trillion cubic feet per year (tcf) in October 2012, and the plan for South Stream underscore the difficulties Europe faces in diversifying its natural gas sources. Russia has shown that it is prepared to go to tremendous lengths to keep control of the natural gas market share in Europe. While some European nations, like Germany, contend that the provision of alternative routes for Russian supplies will increase European security, a number of EU members, including Poland and Lithuania, have opposed Nord Stream and questioned Russia's dependability as an energy provider.

6.1. The Russian invasion to the Ukraine and the consequences to the European energy market .

The Russian invasion of Ukraine disrupted global energy supply, resulting in a sharp price increase and considerable worldwide condemnation. Many countries have made it a priority to reduce their reliance on Russian gas, notably by shifting to renewables. According to the International Energy Agency (IEA), Russian energy traded globally could fall from 20% in 2021 to 13% by 2030.

According to the IEA's Renewables 2022 report, renewables could overtake coal as the primary source of electricity generation by 2025. Wind and solar energy generation might more than double in the next five years.

According to a research released in October 2022 by the think tanks E3G and Ember, wind and solar have produced a quarter of EU electricity since the war began, saving the EU €11 billion in gas expenditures. Nineteen EU member states recorded record increases in electricity output; since February 2022, France's use of renewables has climbed by 14%, Italy's by 20%, Poland's by 17%, and Spain's by 35%.

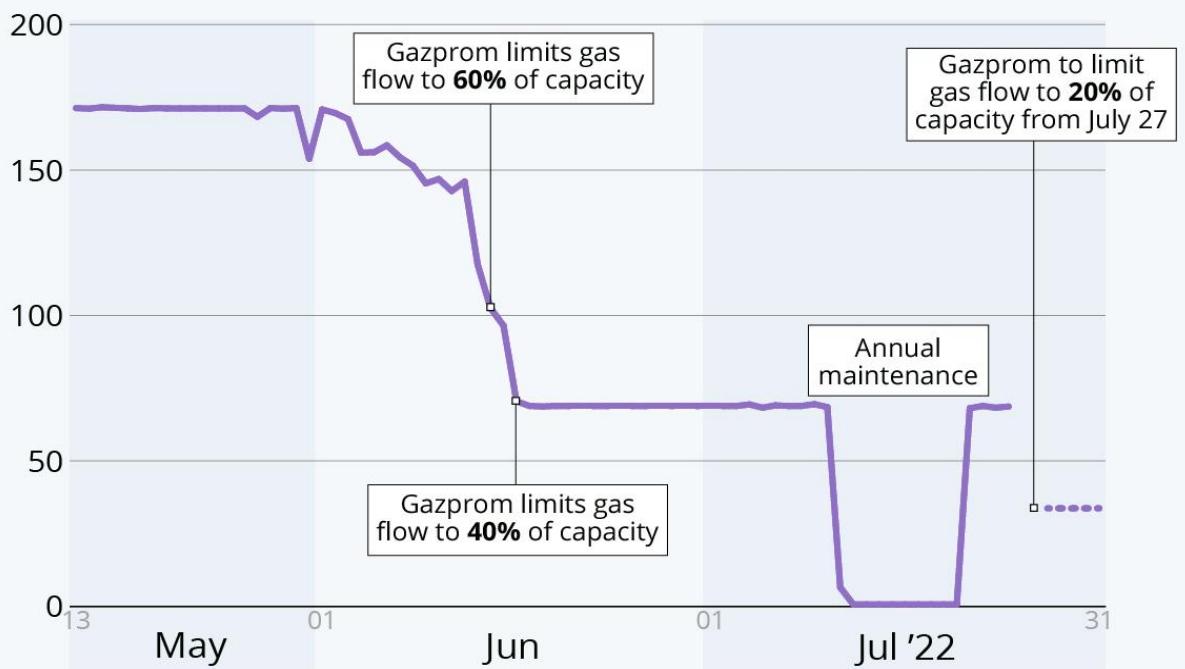
Several EU member states have amended their government policies in order to satisfy climate targets while also financing a more seamless energy transition. Germany upped its renewables spending by 30% year on year, while Spain committed 60% more money to

clean energy initiatives. Both countries have accelerated permitting for new wind and solar projects in response to an EU drive.

Throughout the last year, Ukraine's electricity demand has steadily declined. According to IEA data, the Ukrainian power market has decreased by 40%, with "no indication of recovery," as both supply and demand have been impacted. Ukraine inked a two-year agreement with the IEA in December 2022 to "assist the country's energy system in recovering from the destruction" caused by the Russian invasion. It focuses on hydrogen, renewables, power-system security, biogas, and cross-border collaboration.

Russia Tightens Squeeze on Gas Flow to Europe

Daily natural gas flow from Russia to the EU via the Nord Stream pipeline (in million cubic meters)



Sources: Bruegel, ENTSOG



statista

Figure 6 Russia Tightens Squeeze on Gas Flow to Europe

6.2. Alternatives of Russian's natural gas supplies

North Africa, as a whole, might provide a realistic alternative to Russian natural gas supplies. The change of regimes in Libya, in particular, and Egypt as a result of the "Arab Spring" represents a potential chance to enhance natural gas production and exports from these nations. Both Libya and Egypt have huge natural gas deposits, but domestic restrictions have impeded production and exports, and Egypt stated this year that it will need to purchase natural gas. For Algeria, the largest natural gas exporter in North Africa and the third-largest supplier to Europe after Russia and Norway, may also have significant untapped shale gas deposits in addition to massive conventional reserves. However, a terrorist attack and subsequent hostage crisis at a natural gas facility in Algeria in January 2013 raised security concerns that could be a major impediment to further development of these resources.

The Caspian area may have the greatest potential for additional natural gas supplies for Europe, but supplies from Central Asia must now transit Russia before reaching the European market. Due to delays in building and completely developing southern corridor natural gas pipelines to Europe, including trans-Caspian links, Central Asian countries have been compelled to go east rather than west to circumvent Russia and access new markets.

Imports of liquefied natural gas (LNG) provide another option to Russian natural gas. LNG accounted for about 20% of the EU's natural gas imports and 19% of its consumption in 2011. The EU has LNG import capacity to fulfill its peak winter demand for natural gas, but the facilities remain underutilized for the majority of the year. Nonetheless, some countries are exploring the construction of additional LNG import terminals in order to diversify their natural gas sources. Aside from LNG import terminals, the EU might benefit from strategically placed natural gas storage facilities to manage import capacity during off-peak hours, as well as new pipeline interconnections to deliver natural gas where it is required. Both improvements have been highlighted as objectives by EU officials, and they are being pursued, although not without difficulty.

The likelihood of considerable LNG exports from the United States may present an opportunity for the country to play a larger role in European energy security and global natural gas markets. The majority of proposed US LNG export projects are on the Gulf Coast or East Coast of the United States, making shipments to Europe likely. Furthermore, the natural gas market in the United States is one of the few in the world where natural gas is not priced against oil, giving it a cost advantage in much of Europe. If future US LNG contracts do not include an oil-indexed formula, pressure on other countries, particularly Russia, could increase. Russian firms, especially the state-controlled natural gas colossus Gazprom, have vehemently defended oil-indexed natural gas prices.

6.3. European natural gas consumption.

In order to have a better view of European Union's energy dependence on natural gas. It should be highlighted the European consumption of natural gas.

The EU is the world's greatest energy importer, importing around 55% of their energy supply, including approximately 84% of their oil and 64% of their natural gas. 15 EU member states are increasingly reliant on natural gas, particularly to meet ambitious carbon dioxide and greenhouse gas emission reduction targets. Natural gas accounted for 24% of the EU's primary energy consumption in 2011, with that figure predicted to rise to over 30% by 2030. 16 Oil accounted for almost 37% of the EU's primary energy source, coal for nearly 18%, and nuclear for 12%. Coal consumption increased between 2011 and 2012, owing in part to higher US coal exports. According to the European Commission, the EU would import more than 80% of its natural gas needs by 2030.

Russia has long been and will continue to be a major supplier of natural gas to Europe. Russia accounted for 34% of European natural gas imports in 2012, trailing Norway as the leading source. Algeria is the EU's third-largest supplier. Russian and European corporations have built a vast infrastructure network to deliver Russian natural gas over large distances to European markets. Natural gas is expected to play a big role in Europe-Russia ties for decades to come, according to observers.

Regardless of the foregoing initiatives, some experts believe Russia will continue to wield substantial influence over Europe's energy security. Indeed, some member countries have pursued bilateral energy accords with Russia, increasing their reliance on Russia for many years to come. Germany and Italy, the two main importers of Russian natural gas, have both reached long-term agreements with Russia to secure future natural gas supplies. Russia's role as a significant energy provider raises the importance of maintaining good relations with Moscow for Germany and others. Furthermore, bilateral agreements with Russia are not confined to the world's largest energy consumers. Over the last few years, Bulgaria, Romania, Hungary, Greece, and others have signed into long-term energy contracts with Gazprom.

Although it was previously hailed as the cornerstone of European energy diversification, the original Nabucco project has been replaced, at least in the short term, by a project with substantially less capacity. The TANAP pipeline will initially deliver 565 bcf of Azerbaijan gas from the Shah Deniz field, as scheduled, commencing in 2018. This would be roughly half the capacity of the original Nabucco project. Furthermore, 215 bcf of the 565 bcf would remain in Turkey, with the remaining 350 bcf bound for Europe via TAP. Although Russia has long been considered an opponent of Nabucco and any project related with the Southern Corridor concept, it has not been as outspoken in its opposition to smaller-scale initiatives like Nabucco-West or TAP. Nonetheless, Moscow is pressing ahead with its South Stream pipeline, which critics believe is intended to stymie European-backed diversification initiatives.

Chapter 7 Conclusion

There is no doubt that Russia and Kazakhstan are strong energy superpowers .

In terms of security cooperation, commercial relationships, and, increasingly, in the oil and gas sector, the Kazakh-Russian relationship remains the most crucial for Astana.

The Russian government has always struggled to accept that the republics of the former Soviet Union have become independent and sovereign entities.

During a period of relative weakness at the beginning of the post-Soviet era, Russia was unable to get a footing in Kazakh energy resources because it lacked the requisite funds to become majority investors in Kazakhstan's world-class development projects. Even though the Russian government never wanted to cede control of Kazakhstan's oil and gas deposits, the Kremlin had no choice but to watch the Kazakhs sell exploitation rights to international consortia for nearly a decade following the Soviet Union's demise.

Putin's top aim was securing Kremlin control over strategic decision-making in Russia's own oil and gas sector, which he recognized as a huge undertaking with no obvious formula for success. The Kremlin, on the other hand, saw the problem of obtaining long-term access to Central Asian deposits as less onerous because it did not involve threatening licences and attempting to entice or compel private owners to hand over blocks of stock to state-owned oil and gas corporations.

Russia developed a presence in Kazakhstan with the establishment of a new marketing company, KazRosGaz. This Kazakh-Russian joint company was formed to deliver Karachaganak gas to market, but it also created the possibility of securing a supply source for Gazprom's Orenburg refinery. The Russian government then affected the project's development further in 2006, when Putin and Nazarbayev inked an agreement guaranteeing the shipment of at least 15 billion cubic meters of Karachaganak gas to the Orenburg gas processing plant, just across the border. However, the global financial crisis has slowed the planned Stage-3 of Karachaganak, preventing the project from moving forward with plans to upgrade and expand the Orenburg facility.

The global crisis will drive Russia and Kazakhstan closer together, but whether it will result in successful economic integration remains to be seen. And even if it develops, it is

impossible to anticipate whether it will be on the basis of a true partnership or a relationship in which a stronger state dominates a weaker one. Nazarbayev may still be at the pinnacle of power, but a global economic catastrophe might be far from leveling the playing field.

Kazakhstan is of particular importance as it's large natural gas reserves are estimated to be three trillion cubic meters and proven onshore and offshore oil reserves are between 250million and 1,5 billion cubic metres. Kazakhstan has made a considerable effort to reach out to all potential international partners in order to become in President Nursultan Nazarbayev's words “ *A bridge between Europe and Asia* ” .

Despite the Russian-Ukrainian war Russia's revenues in 2022 from oil and gas sales increased by almost a third during the year .

Despite, the global warming It is important to take into account that we face a new era of the Global Energy crisis due to the Russian-Ukraine war and the consequences of these war will not delay to be revealed.

Just to remember that almost a year ago (24 February) the Russian government ordered the invasion to Ukraine , called it “ Special military operation ” . This is Europe's biggest war since World War 2 .

European Union tries hard to free from Russia's oil and gas dependence , looking for more sustainable ways for energy generation .

Lastly , it should be considered that energy remains part of politics , so some times energy has to serve political interests of the countries .

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