

MINISTRY OF SCIENCE AND HIGHER EDUCATION  
OF THE RUSSIAN FEDERATION

Federal State Budgetary Educational Institution of Higher Education

**PENZA STATE UNIVERSITY**

Institute of Economics and  
Administration  
Field of study  
Master's degree programme

Department of Economic Theory and  
International Relations  
38.04.01 Economics  
International Economics

**GRADUATION THESIS**

**on**

**Russian-Chinese cooperation in oil and gas**

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**Department of Economic Theory and International Relations**  
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« \_\_\_\_\_ » \_\_\_\_\_ 20 \_\_\_\_

**ASSIGNMENT**  
**FOR THE GRADUATION THESIS OF**

Master's degree student Lyu Ping, group 19ЭЭМ(a)3, full-time mode of study

1 The topic of the graduation thesis: «Russian-Chinese cooperation in oil and gas»  
was approved by the university order  
dated « \_\_\_\_\_ » \_\_\_\_\_ 20 \_\_\_\_ no. \_\_\_\_\_

2 The deadline for the Master's degree student to complete the graduation thesis is  
11.06.2021.

3 The input data for the graduation thesis is the regulatory and legal framework,  
scientific literature and reference books, and Internet data.

4 The list of issues to be studied includes the evolution of Sino-Russian oil and gas  
partnership, China's energy production and energy demand structure, the current state of  
the oil and gas trade between Russia and China, obstacles to Sino-Russian oil and gas  
cooperation, prospects for strengthening and developing Sino-Russian oil and gas  
cooperation.

5 The list of visuals contains tables and figures.

6 The date of setting the assignment is 29.11.2019.

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(signature) (full name)

The assignment was accepted by Master's degree student \_\_\_\_\_ / Lyu Ping /  
(signature) (full name)

### Schedule for completing the graduation thesis

| No.                  | Content of the thesis                                                        | Deadline for completion | Due date, signature of the academic adviser |
|----------------------|------------------------------------------------------------------------------|-------------------------|---------------------------------------------|
| First year of study  |                                                                              |                         |                                             |
| 1                    | Analysis of scientific literature, choice and updating of the research topic | 01.09.2019 – 28.11.2019 |                                             |
| 2                    | Framing the scientific concept of research                                   | 29.11.2019 – 12.01.2020 |                                             |
| 3                    | Devising the detailed plan of the first chapter and draft of the thesis      | 13.01.2020 – 23.02.2020 |                                             |
| 4                    | Conducting theoretical research within the first chapter of the thesis       | 24.02.2020 – 30.04.2020 |                                             |
| 5                    | Preparing the first chapter of the thesis                                    | 1.05.2020 – 30.06.2020  |                                             |
| Second year of study |                                                                              |                         |                                             |
| 6                    | Collection of statistical data and material for the thesis                   | 01.09.2020 – 30.09.2020 |                                             |
| 7                    | Studying new literature sources within the topic of the thesis               | 01.10.2020 – 31.10.2020 |                                             |
| 8                    | Conducting research within the first and the second chapters of the thesis   | 01.11.2020 – 31.12.2020 |                                             |
| 9                    | Preparing the second chapter of the thesis                                   | 1.01.2021 – 1.03.2021   |                                             |
| 10                   | Preparing the third chapter of the thesis                                    | 2.03.2021 – 2.05.2021   |                                             |
| 11                   | Preparing the introduction and conclusion                                    | 3.05.2021 – 16.05.2021  |                                             |
| 12                   | Completing the graduation thesis                                             | 17.05.2021 – 30.05.2021 |                                             |
| 13                   | Handing in the thesis for compliance control and antiplagiat                 | 31.05.2021 – 9.06.2021  |                                             |
| 14                   | Getting acquainted with the feedback and review                              | 10.06.2021              |                                             |
| 15                   | Presenting the written thesis                                                | 11.06.2021              |                                             |

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## **Summary**

The graduation thesis comprises 64 pages, 3 chapters, 5 figures, 11 tables, 63 sources.

ENERGY COOPERATION, ENERGY RESOURCES, CHINA, RUSSIA, ENERGY TRADE

The object of this research is international energy markets.

The target of research is to analyze the current state and development prospects of China-Russia oil and gas cooperation.

The methodological framework of the paper is formed by system approach, analysis and synthesis, statistical and comparative methods. To display identified economic dependencies graphical method was applied.

The results of research include: economic development of China and Russia was studied; the importance of energy trade to China's economy was introduced; primary energy production in China and the energy demand structure of China were examined; the current state of Russian-Chinese energy cooperation was overviewed; the obstacles to oil and gas cooperation between Russia and China were examined; required directions for China and Russia in oil and gas sector were determined.

The novelty of the work is trends and prospects for the development of energy trade cooperation of China and Russia in oil and gas are revealed.

The theoretical and practical significance of the research is that the conclusions made in the thesis form the basis for further research of energy cooperation of China and Russia. The results of the research can be used in the teaching of educational disciplines «World Economy», «International Economic Relations», «International Trade».

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## **Introduction**

China and Russia are both major powers in the world today and the two largest economies in transition. China and Russia are friendly neighbors. As a big neighbor, the economic and trade cooperation between the two sides not only has obvious geographical advantages, but also is highly complementary. China and Russia have a long history of economic and trade exchanges. Even during the period of Sino-Soviet relations, the economic and trade exchanges between the two sides have not been completely interrupted. After the disintegration of the Soviet Union, strengthening foreign economic and trade cooperation was regarded as an important task of Russia's long-term development strategy, and Sino-Russian economic and trade relations began to gradually recover and develop. Since then, the strategic cooperation between China and Russia has been continuously upgraded. The Eastern focus involves strengthening ties with China. Asian markets have become a strategic focus of export diversification, with the fastest progress achieved in relations with China. Russia is known for its abundance of oil and natural gas in Siberia and her Far Eastern Region; however, energy cooperation between these two countries did not appear to be significant until recent decades. Russian-Chinese cooperation boomed in 2013, including export contracts and Chinese companies buying stakes in Russian projects. However, in the specific cooperation process between the two sides, there are still some problems such as the lack of actual cooperation level and cooperation potential, unreasonable trade structure, and imperfect policies and regulations. Correctly understanding and handling these issues is of great significance to promoting the stability, health and sustainable development of China-Russia good-neighborly relations.

The Chinese economy is in rapid development period of industrialization and urbanization is rapidly advancing, high economic development but also improve the oil and other energy resources consumption. And Russia with China, in the North is bordered by the world power, rich in energy resources, its oil production accounted for the world second total output, the oil reserves of the world's total reserves of 13 per cent. At the same time, Russia's natural gas, coal and other oil and gas mineral resources is quite sufficient; Russia has become the world's major energy exporter, but also become China's energy imports preference. China's rapid economic development continues to increase energy demand. Russia's territory spans the Eurasian continent and is rich in oil and gas resources. Therefore, Russia has been taking advantage of this unique energy advantage to improve Russia's overall integration by implementing energy diplomacy centered on its own economic interests. Oil and natural gas are the lifeblood of the economic development of modern industrial society, related to the security issues of various countries, and affect the global political, military, diplomatic and other aspects of international relations. Sino-Russian energy cooperation has been around for nearly two decades. During this period, Sino-Russian energy cooperation has continued to move forward, and many cooperation results have been achieved.

The object of this research is international energy markets. The subject is current state and prospects of Russian-Chinese cooperation in oil and gas.

The research purpose is to analyze the current state and development prospects of China-Russia oil and gas cooperation. In order to achieve it we need to complete the following tasks:

- introduce the importance of energy trade to China's economy, examine primary

energy production in China and describe the energy demand structure of China;

- overview the current state of Russian-Chinese energy cooperation;
- examine the obstacles to oil and gas cooperation between Russia and China;
- determine required directions for China and Russia in oil and gas sector.

The novelty of the work is trends and prospects for the development of energy trade cooperation of China and Russia in oil and gas are revealed.

The theoretical and practical significance of the research is that the conclusions made in the thesis form the basis for further research of energy cooperation of China and Russia. The results of the research can be used in the teaching of educational disciplines «World Economy», «International Economic Relations», «International Trade».

## **Chapter 1 The economic development in Russia and China**

### **1.1 Overview of economic development of China and Russia**

Looking back on 2018, the world situation is in turmoil and the relations between major powers are frequent. In the ever-changing world, as a permanent member of the Security Council and the largest neighbor, China and Russia adhere to the consensus reached by the two heads of state, adhere to the principle of consolidating and deepening bilateral relations, and strive to achieve the goal of common development and revitalization, and firmly defend international fairness. The determination of justice and world peace and stability revolves around the five main lines of political mutual trust, pragmatic cooperation, security cooperation, humanities exchanges and international cooperation. As always, we will carry out equality, mutual trust and win-win cooperation in the bilateral framework and on the world stage to promote the continuation of bilateral relations. Climb to a higher level, achieve new development, and establish a new model of international relations with mutual respect, fairness, justice, cooperation and win-win with practical actions.

According to the IMF (International Monetary Fund) forecast, China's per capita GDP exceed 10,000 US dollars in 2018, the US per capita GDP exceed 60,000 US dollars, and Russia's per capita GDP will continue to remain above 10,000 US dollars. If the forecast becomes a reality, it means that the per capita GDP of China, the United States and Russia is for the first time in tens of thousands of dollars. And China's per capita GDP has reached one-sixth of the United States, and is close to Russia's per capita GDP [63].

However, in 1990, China's per capita GDP was only 317 US dollars, and Russia's per capita GDP was 3,480 US dollars, about 11 times that of China's per capita (figure 1.1).

As listed in Figure 1.1 in 2017, Russia's GDP growth was at about 1.5 percent compared to the previous year. It was the first year of growth since 2014. In 2018, GDP actually grew by 2.3 %, with a total volume of about 1.647 trillion US dollars, about 8.04 % of the total US economy in the same period.

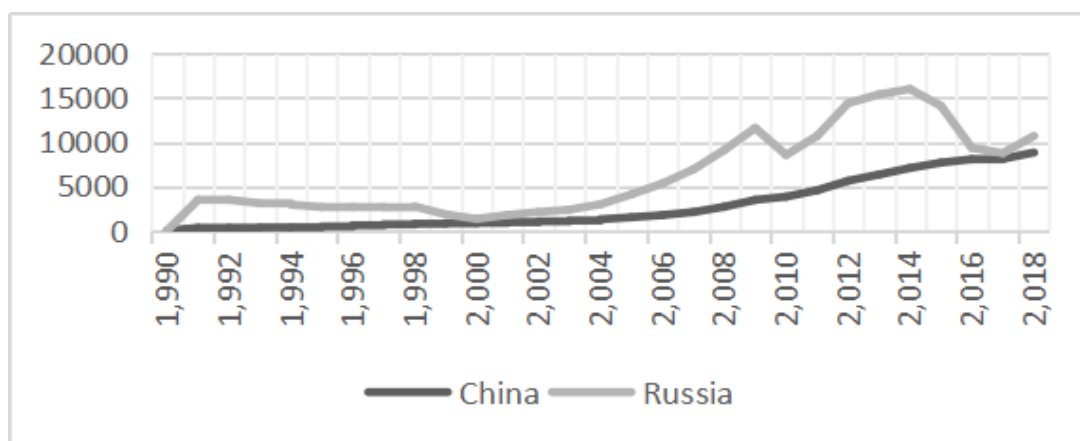


Figure 1.1 – Sino-Russian per capita GDP comparison, dollar

From 1990 to 2003, China's per capita GDP rose from 317 US dollars to 1,288 US dollars, an increase of about three times, and that low-income countries have entered the ranks of low- and middle-income countries. Russia's per capita GDP did not rise and fall, from 3,490 US dollars to 2,975 US dollars, and the lowest point during the period was only 1,330 US dollars. From 2004 to 2017. During this period, Russia's per capita GDP changed from a decline to an increase, from 4,102 dollars per capita to 10,700 US dollars, an increase of 161 %. During the period in 2014, due to factors such as oil price increases, Russia's per capita GDP was as high as 16,000 US dollars.

And since the beginning of 1990, Russia's per capita GDP has risen from 3,480 dollars to 10,700 dollars, an increase of 207 %.

During this period, China's per capita GDP grew the fastest, from 1,509 US dollars in 2014 to 8,826 US dollars in 2017, an increase of 485 %, and entered the ranks of middle-income countries; if it counted from 317 US dollars in 1990 Then, China's per capita GDP has increased by 2,684 %.

From 1990 to now, Russia's per capita GDP has increased by 207 %, and China's per capita GDP has increased by 2,684 % [63].

The total import and export volume of goods traded by Russia in 2018 is about 687.12 billion US dollars. Among them, Russia exports 449.69 billion US dollars of foreign goods, imports 237.42 billion US dollars from overseas, and Russia's trade surplus is 212.27 billion US dollars [62].

Due to the strict monetary policy of the Russian central bank, the inflation rate continued to tighten. According to the data given by the Russian Federal Ministry of Economic Development, the inflation rate in September 2017 fell from 3.3 % to 3 %, and the price level fell by 0.1 percentage points. The Russian Federal Ministry of Economic Development predicts that the annual inflation rate will remain at an average of 2.7-3.2 %, lower than the previous forecast of 4 %. The tightening of inflation also prompted the central bank's benchmark interest rate to fall to 8.5 %, which also led to a decline in the interest rate of commercial loans for the livelihood, which also stimulated the growth of consumer loans, which has increased by 15 % compared with the same period last year. Will continue to grow to the end of the year. The benchmark interest rate is expected to be lowered to 8 % this year.

At the same time, the standard of living of the people is also improving. After 2015, the actual national income level fell by 9 %, and slowly increased by 1 % in 2016, and has increased by 3.4 % in the first eight months of 2017. By 2018, the national standard of living will increase by 4 % [63].

Since 2018, inflation in the world's major economies has generally shown an upward trend. Except for Argentina, which continues to be in severe inflation, inflation values in other countries are close to 3 %, which is about 0.2 percentage points higher than the average of the same period last year. According to data predicted by the IMF, global inflation will reach 3.5 % in 2018. Since the beginning of 2018, the prospect of inflation has become increasingly blurred. Although the economy in the first half of the year has maintained steady growth, the level of inflation is still fluctuating, and it seems that there is a lack of stamina (figure 1.2) [63].

As shown in the figure 1.2, Russia's inflation rate in 2015 was 12.9 %, the highest level since the inflation rate of 13.3 % in 2008. Earlier, Russian Economic Development Minister said that the economic pressure brought by Western sanctions and the fall in international oil prices led to high inflation in Russia. The inflation rate in Russia for the whole year of 2017 was 2.5 %, the lowest in recent years. In the past few years, due to the

economic situation, Russia's inflation rate has been relatively high, at 11.4 % in 2014, 12.9 % in 2015, and 5.4 % in 2016, 4.3 % in 2018 [63].

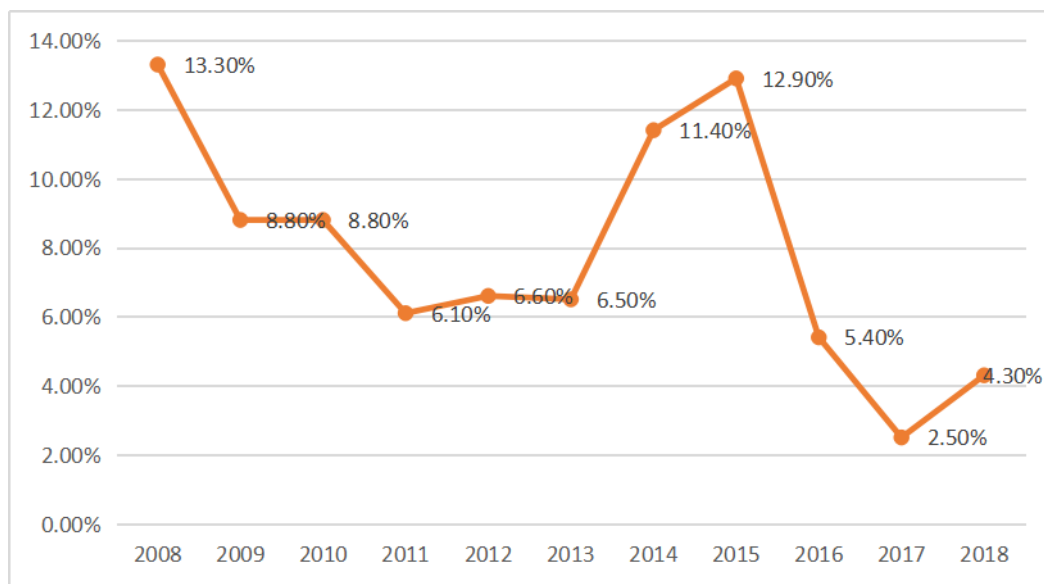


Figure 1.2 – Russia's inflation rate

Since the beginning of 2014, due to Western sanctions and large fluctuations in international oil prices, the Russian economy is facing greater downward pressure. In 2015, the Russian economy contracted by 3.7 % and fell by 0.2 % in 2016. Russian President Vladimir Putin said at the end of December last year that the Russian economy has ended its recession. From 2017 to 2018, Russian inflation increased from 2.5 % to 4.3 %. But in general, Russian inflation rate has shown a downward trend in the past decade.

In 2016, China's inflation reached the highest value in nearly ten years (figure 1.3).

As shown in the Figure 1.3, due to the impact of the 2008 financial crisis, the global economy was in a downturn, after which the country's inflation rate became negative. In 2010, the world economy gradually got rid of the recession caused by the financial crisis. In 2016, China's inflation reached the highest value in nearly ten years. The economies of developed countries such as the United States, the Eurozone and Japan are beginning to experience positive changes in recovery. Affected by this, as the major trading partners of

the United States, the United States, the European Union and Japan, consumer demand has gradually recovered, and the growth rate of imports has rebounded. In the past two years, the rise in electricity, water, natural gas, raw material prices and wages has increased the cost of enterprises, resulting in cost-driven inflation.

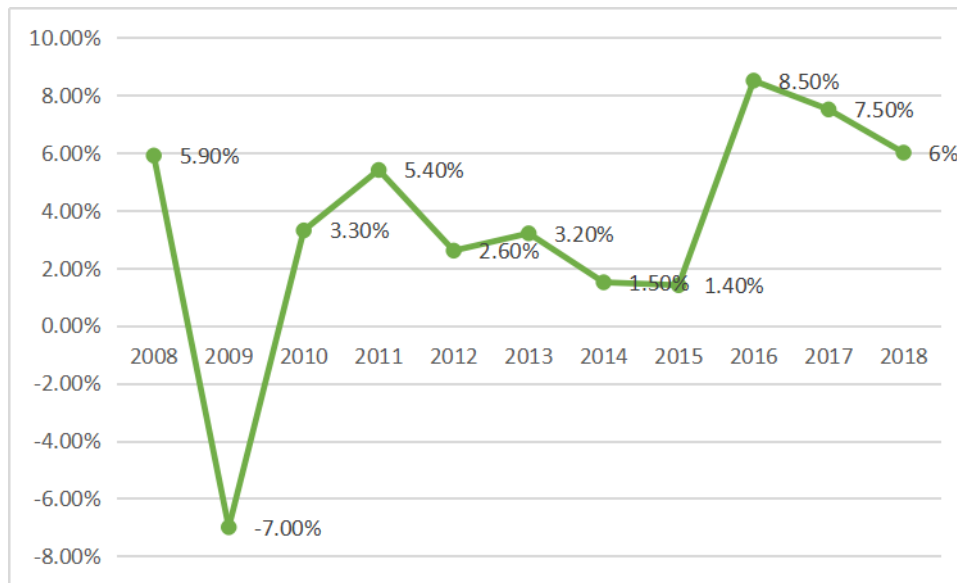


Figure 1.3 – China's inflation rate [62]

The investment and export-driven growth model has intensified the shortage of domestic energy and fuel resources and promoted price increases. In response to the international financial crisis, China has implemented an economic stimulus policy, with excessive currency issuance, resulting in excess liquidity and rising prices. The market economic system is imperfect, and social hot money is speculating on some agricultural products. In the case of excessive liquidity, the prices of agricultural products are rising and inflation is increasing. Due to the quantitative easing policy in the United States, the international commodity prices have risen sharply and spread to China, leading to imported inflation. In some countries, droughts and floods have caused food production to fall, and the rise in international agricultural prices has had an impact on China's domestic price rise. Foreign capital expects the appreciation of the renminbi, which will lead to a large amount

of foreign capital flowing into China, and the passive renminbi is too much, causing prices to rise. Overall, from 2008 to 2016, China's inflation rate is on the rise and then gradually lower [63].

The socialist market economy of China is the world's second largest economy by nominal GDP and the world's largest economy by purchasing power parity according to the International Monetary Fund (IMF), although China's National Bureau of Statistics denies the latter assessment.

Until 2015, China was the world's fastest-growing major economy, with growth rates averaging 10 % over 30 years. Due to historical and political facts of China's developing economy, China's public sector accounts for a bigger share of the national economy than the burgeoning private sector [24, p. 100].

On a per capita income basis, China ranked 71st by GDP (nominal) and 78th by GDP (PPP) per capital in 2016, according to the International Monetary Fund (IMF). The country has an estimated 23 trillion dollars worth of natural resources, 90 % of which are coal and rare earth metals. China also has the world's largest total banking sector assets of 39.9 trillion dollars (252 trillion CNY) with 26.54 trillion dollars in total deposits.

China is the world's largest manufacturing economy and exporter of goods. China is also the world's fastest-growing consumer market and second-largest importer of goods. China is a net importer of services products. China is the largest trading nation in the world and plays a prominent role in international trade and has increasingly engaged in trade organizations and treaties in recent years. China became a member of the World Trade Organization in 2001. China also has free trade agreements with several nations. The provinces in the coastal regions of China tend to be more industrialized, while regions in the hinterland are less developed. As China's economic importance has grown, so has attention to the structure and health of the economy [3, p. 150].

To avoid the long-term socioeconomic cost of environmental pollution in China, it has been suggested by Nicholas Stern and Fergus Green of the Grantham Research Institute on Climate Change and the Environment that the economy of China be shifted to more advanced industrial development with high-tech, low carbon emissions with better

allocation of national resources to innovation and R&D for sustainable economic growth in order to reduce the impact of China's heavy industry. This is in accord with the planning goals of the central government. Xi Jinping's Chinese Dream is described as achieving the “Two 100s” : the material goal of China becoming a “moderately well-off society” by 2021, the 100th anniversary of the founding of the Communist Party and the modernization goal of China becoming a fully developed nation by 2049, the 100th anniversary of the founding of the People's Republic.

To guide economic development, the Chinese central government adopts “five-year plans” that detail its economic priorities and essential policies. The Thirteenth Five-Year Plan (2016–2020) is currently being implemented [24, p. 90].

Like Japan and South Korea before it, China has grown steadily, raising the income levels and living standards of its citizens while producing goods that are consumed globally. Between 1978 and 2005, China's per capita GDP grew from 153 US dollars to 1,284 US dollars. Its current account surplus increased more than twelve-fold between 1982 and 2004, from 5.7 billion US dollars to 71 billion US dollars.

During this time, China also became an industrial powerhouse, moving beyond initial successes in low-wage sectors like clothing and footwear to the increasingly sophisticated production of computers, pharmaceuticals, and automobiles [24, p. 80].

However, it remains unclear how long the Chinese economy can maintain this trajectory. According to the 11th five-year plan, China needed to sustain an annual growth rate of 8 % for the foreseeable future. Only with such levels of growth, the leadership argued, could China continue to develop its industrial prowess, raise its citizen's standard of living, and redress the inequalities that were cropping up across the country. Yet no country had ever before maintained the kind of growth that China was predicting. Moreover, China had to some extent already undergone the easier parts of development. In the 1980s, it had transformed its vast and inefficient agricultural sector, freeing its peasants from the confines of central planning and winning them to the cause of reform. In the 1990s, it had likewise started to restructure its stagnant industrial sector, wooing foreign investors for the first time. These policies had catalysed the country's phenomenal growth. Instead, China had to take

what many regarded as the final step toward the market, liberalizing the banking sector and launching the beginnings of a real capital market. According to an article in *Journal of the Asia Pacific Economy* by Mete Feridun of University of Greenwich Business School and Abdul Jalil from Wuhan University in China, financial development leads to a reduction in the income inequality in China. This process, however, would not be easy. As of 2004, China's state-owned enterprises were still only partially reorganized, and its banks were dealing with the burden of over 205 billion dollars (1.7 trillion RMB) in non-performing loans, monies that had little chance of ever being repaid. The country had a floating exchange rate, and strict controls on both the current and capital accounts [60, p. 100].

In mid-2014 China announced it was taking steps to boost the economy, which at the time was running at a rate 7.4 % per annum, but was slowing. The measures included plans to build a multi-tier transport network, comprising railways, roads and airports, to create a new economic belt alongside the Yangtze River.

During the winter of 2007–2008, inflation ran about 7 % on an annual basis, rising to 8.7 % in statistics for February 2008, released in March 2008.

Shortages of gasoline and diesel fuel developed in the fall of 2007 due to reluctance of refineries to produce fuel at low prices set by the state. These prices were slightly increased in November 2007 with fuel selling for 2.65 dollars a gallon, still slightly below world prices. Price controls were in effect on numerous basic products and services, but were ineffective with food, prices of which were rising at an annual rate of 18.2 % in November 2007. The problem of inflation has caused concern at the highest levels of the Chinese government. On 9 January 2008, the government of China issued the following statement on its official website: “The Chinese government decided on Wednesday to take further measures to stabilize market prices and increase the severity of punishments for those guilty of driving up prices through hoarding or cheating.” [60, p. 150]

Pork is an important part of the Chinese economy with a per capital consumption of a fifth of a pound per day. The worldwide rise in the price of animal feed associated with increased production of ethanol from corn resulted in steep rises in pork prices in China in 2007. Increased cost of production interacted badly with increased demand resulting from

rapidly rising wages. The state responded by subsidizing pork prices for students and the urban poor and called for increased production. Release of pork from the nation's strategic pork reserve was considered [14, p. 80].

By January 2008, the inflation rate rose to 7.1 %, which BBC News described as the highest inflation rate since 1997, due to the winter storms that month. China's inflation rate jumped to a new decade high of 8.7 percent in February 2008 after severe winter storms disrupted the economy and worsened food shortages, the government said 11 March 2008. Throughout the summer and fall, however, inflation fell again to a low of 6.6 % in October 2008.

By November 2010, the inflation rate rose up to 5.1 %, driven by an 11.7 % increase in food prices year on year. According to the bureau, industrial output went up 13.3 percent. As supplies have run short, prices for fuel and other commodities have risen. International trade makes up a sizeable portion of China's overall economy. Being a Second World country at the time, a meaningful segment of China's trade with the Third World was financed through grants, credits, and other forms of assistance. The principal efforts were made in Asia, especially to Indonesia, Burma, Pakistan, and Ceylon, but large loans were also granted in Africa (Ghana, Algeria, Tanzania) and in the Middle East (Egypt). However, after Mao Zedong's death in 1976, these efforts were scaled back. After which, trade with developing countries became negligible, though during that time, Hong Kong and Taiwan both began to emerge as major trading partners.

Since economic reforms began in the late 1970s, China sought to decentralize its foreign trade system to integrate itself into the international trading system. In November 1991, China joined the Asia-Pacific Economic Cooperation (APEC) group, which promotes free trade and cooperation in the economic, trade, investment, and technology spheres. China served as APEC chair in 2001, and Shanghai hosted the annual APEC leaders meeting in October of that year [9, p. 211].

The vast majority of China's imports consists of industrial supplies and capital goods, notably machinery and high-technology equipment, the majority of which comes from the developed countries, primarily Japan and the United States. Regionally, almost half of

China's imports come from East and Southeast Asia, and about one-fourth of China's exports go to the same destinations. About 80 percent of China's exports consist of manufactured goods, most of which are textiles and electronic equipment, with agricultural products and chemicals constituting the remainder. Out of the five busiest ports in the world, three are in China. The U.S. trade deficit with China reached 232.5 billion US dollars in 2006, as imports grew 18 %. China's share of total imports has grown from 7 % to 15 % since 1996 [31, p. 11].

Trade volume between China and Russia reached 29.1 billion US dollars in 2005, an increase of 37.1 % compared with 2004. A spokesman for the Ministry of Commerce, Van Jingsun, said that the volume of trade between China and Russia could exceed 40 billion dollars in 2007. China's export of machinery and electronic goods to Russia grew 70 %, which is 24 % of China's total export to Russia in the first 11 months of 2005. During the same time, China's export of high-tech products to Russia increased by 58 %, and that is 7 % of China's total exports to Russia. Also at that time period, border trade between the two countries reached 5.13 billion US dollars, growing 35 % and accounting for nearly 20 % of the total trade. Most of China's exports to Russia remain apparel and footwear. Russia is China's eighth largest trade partner and China is now Russia's fourth largest trade partner, and China now has over 750 investment projects in Russia, involving 1.05 billion US dollars.

China's contracted investment in Russia totaled 368 million US dollars during January–September 2005, twice that in 2004. Chinese imports from Russia are mainly those of energy sources, such as crude oil, which is mostly transported by rail, and electricity exports from neighboring Siberian and Far Eastern regions. In the near future, exports of both of these commodities are set to increase, as Russia is building the Eastern Siberia-Pacific Ocean oil pipeline with a branch going to the Chinese border, and Russian power grid monopoly UES is building some of its hydropower stations with a view of future exports to China [62].

Export growth has continued to be a major component supporting China's rapid economic growth. To increase exports, China pursued policies such as fostering the rapid

development of foreign-invested factories, which assembled imported components into consumer goods for export and liberalizing trading rights. In its 11th Five-Year Program, adopted in 2005, China placed greater emphasis on developing a consumer demand-driven economy to sustain economic growth and address imbalances.

## **1.2 The evolution of Sino-Russian oil and gas partnership**

The Sino-Russian oil and gas partnership is one of the few economic issues that fit the two geopolitical powers. Since the end of the Cold War, Beijing and Moscow started this energy partnership almost immediately. It has lasted for nearly 30 years and has witnessed political changes in the international and domestic fields. When reviewing the partnership, optimists believe that this is an undeniable success because it was developed while building bilateral political trust, and encouraged the increase in trade volume and the completion of several key energy large-scale projects. However, other scholars believe that contrary to the political statements of the leaders of the two countries, the Sino-Russian oil and gas partnership has developed slowly and sometimes even regressed in its history. The current literature that analyzes the gap between political rhetoric and reality is conducted from various angles [4, p. 14].

Some scholars explain this phenomenon mainly through the Sino-Russian bilateral political or economic relationship. For political scholars, this partnership, along with other diplomatic issues, such as leadership communication, military cooperation, arms sales, etc., should be regarded as a highly politicized derivative between China and Russia. Therefore, the slow progress of energy cooperation can be understood as the lack of political trust between the two countries. Russia wants China to pay higher energy prices, but China is

unwilling to accept it. At the same time, Russia does not want to take the risk of developing new oil and gas fields in Eastern Siberia alone. Finally, Russia plans to establish a regional market in East Asia, including Japanese and South Korean customers, but China hopes to commit to one-to-one energy cooperation. In addition to the bilateral perspective, some scholars have also noticed the influence of various factors related to domestic politics on the Sino-Russian oil and gas partnership, including the personal characteristics of politicians, political power struggles, the role of interest groups, and industrial policies. This partnership originated between two isolated countries that had major disputes during the Cold War. There was a lack of experience or consensus in economic cooperation in the early post-Cold War period. The foundation and framework of the partnership, both at the domestic and international levels, are constantly being rebuilt and transformed. This partnership is not only a product of established static transactions between the two countries, but also a dynamic process in which contact shapes the contact itself. This makes it difficult for any single point of view to explain the Sino-Russian oil and gas partnership.

After the comradeship in the 1950s, the decades-long split between China and the Soviet Union represented the possibility of a great war and economic isolation. By the time the relations between the two countries thaw in the 1980s, Moscow and Beijing were both major oil exporters. Therefore, it is economically unreasonable to export Soviet oil and natural gas to China. At the end of the Cold War, both China and Russia lacked good bilateral communication experience and had no realistic expectations for the establishment and operation of energy partnerships. In practice, both parties continuously obtain information and adjust their positions in the development of the partnership. Domestically, the oil industries of China and Russia changed around the end of the 1990s, from state

control in a highly centralized economic system to national oil companies. In China, the Ministry of Petroleum was gradually reorganized into several vertically integrated national oil companies in the 1990s, but they received considerable control and support from the state. In contrast, during the Yeltsin era, the privatization of the Russian oil sector was known for dramatic changes, but people soon saw the dramatic changes brought about by the powerful rise of Rosneft after Putin came to power in 1999. Due to structural factors such as global political common interests, economic reciprocity, and geopolitical security, China-Russia diplomatic exchanges are unimpeded at this stage [12, p. 160].

At the macro level of international politics, both China and Russia uphold the concept of multipolarity in the world and oppose hegemonism led by the United States, and this political dividend lubricates economic cooperation. Russia has always been an excellent producer of hydrocarbons, and China is becoming more and more important in the energy market. Geographically, China and Russia have a common border of more than 4,300 kilometers, which helps reduce transit costs and provide good security. In addition, neither China nor Russia can find a substantive alternative partner. The oil and natural gas production capacity of Central Asian countries is much lower than that of Russia, while Japan and the Korean peninsula are energy markets bound by geographical difficulties and political issues.

The idea of Sino-Russian oil cooperation can be traced back to Yeltsin's state visit to China in 1994, and finally reached a political agreement in 1999. In 2001, PetroChina and Yukos signed the Angarsk-Daqing Pipeline Agreement, which crossed the first stage in 1994-2001. However, the Angarsk-Daqing plan was quickly revised in 2002, and finally ended in 2003 with the demise of the Russian signatory Yukos. After that, the Russia-China

oil pipeline was finally merged into the East Siberia-Pacific (ESPO) oil pipeline as its Skovorodino-Mohe-Daqing (SMD) branch line to China. The SMD pipeline was agreed in 2008, completed in 2009 (Russia) and 2010 (China), and put into production on the first day of 2010. In 2011, the second phase of Sino-Russian oil cooperation started with Russia's revision of the Angarsk-Daqing pipeline plan, and it ended with the planned merger to enter the ESPO pipeline. As of the end of February 2018, Russia's cumulative oil delivery volume through the SMD pipeline reached 115 million tons and continued to expand. The post-ESPO-SMD period is the third stage of Sino-Russian oil cooperation. The main progress made at this stage is to promote Russia's oil exports to China and expand cooperation to the entire industrial chain, such as the joint venture refinery in Tianjin and China's role in the Yamal project [4, p. 25].

The proposal for cooperation was initially driven by structural factors. China's demand for oil has surged and is anxious about energy security, and Russia is rich in oil resources. After Deng Xiaoping's southern tour in 1992, China's economy entered a stage of rapid development. This immediately made China a net oil importer in 1993, and international cooperation seemed necessary.

In China, further reforms in the oil industry in 1998 transformed China National Petroleum Corporation from a national oil company focused on upstream to a vertically integrated national oil company, which was listed on multiple international stock exchanges. This change gives PetroChina more autonomy in business operations and investment, especially outside China. In order to adapt to the cancellation of the Angarsk-Daqing Plan, PetroChina has accelerated its cooperation with other international partners in Central Asia and Africa. Cooperation. In 2003, the Kazakhstan-China oil pipeline (Atasu-Alashankou)

was completed, and the negotiations were deadlocked. The Chinese side adapted to the changes in Russia's domestic situation. In 2005, Rosneft took over Yukos assets in need of financial support. PetroChina provided loans of up to 6 billion U.S. dollars. Then, by responding to Rosneft's funding needs, it developed the oil mortgage loan model, which greatly accelerated the Sino-Russian oil negotiations. In the context of the Great Global Recession in 2009, the construction of the SMD pipeline started in 2009, and the Russian oil was finally shipped to China on the first day of 2011. During this stage of the negotiations, Rosneft and China National Petroleum Corporation used international strategies and domestic struggles to improve their respective positions. Finally, the oil-supported loan serves as a convergence point for specific actors in national oil participation and helps to finalize ESPO-SMD. The solution of ESPO-SMD is not only a milestone in Sino-Russian oil cooperation, but also reshapes the behavior of partners to a large extent [11, p. 308].

In Russia, with the consolidation of the Putin Group's strength, the domestic struggle has basically ended, and Rosneft has become the leader in cooperation with China, especially in the upstream business. On the Chinese side, the market-oriented One Belt One Road initiative has also strongly promoted energy cooperation in the Eurasian region, including Russia. PetroChina expands cooperation with Russia to promote ESPO's delivery of oil to China and develop downstream businesses. At the same time, with the reform of China's oil industry, PetroChina no longer monopolizes Sino-Russian oil cooperation. In May 2017, the Chinese government launched a new round of reforms in the petroleum industry, introducing more private capital into the entire industry chain. In addition to PetroChina, many Chinese oil companies, whether state-owned or private, have begun to develop oil business with Russia, from upstream business to downstream business. With the

extension of the Mohe-Daqing pipeline in October 2017, starting on the first day of 2018, PetroChina and Rosneft increased the delivery of crude oil from 15 million tons to 30 million tons [4, p. 32].

Rosneft agreed to pass Kazakhstan-5 +5 years Chinese oil pipeline. In the same year, PetroChina and Rosneft reached an agreement on the further development of upstream business in Siberia and the Tianjin joint venture refinery. Rosneft provided 9.1 million tons of annual supply guarantee for the refinery. Following PetroChina in 2012, China's largest Sinopec and Rosneft officially began to manage the Udmurt Petroleum Company acquired in 2006. In 2015, Rosneft and Sinopec reached an agreement to jointly develop the Russkoye and Yurubcheno-Tokhomskoye oil fields. Sinopec may acquire 49 % of the East Siberian Oil and Gas Company and Tyumen Oil and Gas Company [10, p. 390].

In 2017, CEFC China offered to acquire a 14.16 % stake in Rosneft from the Swiss energy company Glencore and the Qatar Investment Authority. Although this proposal was interrupted by China's domestic investigation of CEPC, this move is regarded as one of the most explosive moments in the history of Sino-Russian oil cooperation, because this is the first time that a Chinese private company has entered a traditionally controlled by China National Petroleum Corporation. In addition, a large number of small private companies are also engaged in trade and downstream businesses related to Russia.

Sino-Russian natural gas cooperation has also undergone a transition from a politicized structural contact to a multi-party development stage. Compared with oil partnerships, this is a similar but slower situation. Initially, China first signed natural gas supply contracts with Russian energy companies and local governments. Gas does not play a large role in China's energy mix at present. As a percentage of energy consumption, China

has one of the lowest gas usage rates in the world, but has had to change for Chinese energy use to become cleaner. The majority of Russian reserves (over 60 %) are located in West Siberia. Geological and engineering conditions of this region are well-studied and the country has remaining gas reserves for almost a century. At present, companies are gradually beginning to develop reserves located in East Siberia and on the continental shelf. The resource potential for the production of natural gas is reliable and sufficient to guarantee both domestic and export demand. Because of this, Russian energy strategies until 2035 emphasize attention on increasing exports to China. There is also little doubt about the future ability to satisfy demand. The major stream for this growth is cooperation between Russia and AsiaPacific countries, especially China. In 2014 gas production in Siberia (including Siberian and Far East districts) reached 47 bln cub.m [17, p. 104].

The original concept of natural gas cooperation is very similar to that of oil cooperation, including economic reciprocity, geopolitical security, and high-level political trust based on a structural perspective. The earliest natural gas cooperation can be traced back to 1994, when the two governments began to study the feasibility of building natural gas pipelines and jointly exporting Russian natural gas to China.

The process of China's natural gas cooperation will take longer than oil cooperation, because in a more unstable situation, all parties need more time to adapt. In Russia, although Gazprom acquired an export monopoly in the system in 2004, it still does not have the key resources to export to China and other East Asian countries, especially in the Kovykta and Chayandan gas fields. At the time, negotiations with China on natural gas exports and pipeline construction were meaningless to Gazprom. Therefore, in the Rosneft scenario, compared with Yukos, Gazprom adopted a similar preemptive strategy to obtain control of

these assets from other domestic and foreign gas producers. In addition, rebuilding its control over the Commonwealth of Independent States (CIS) is also a key policy focus for Russia. After obtaining control of the natural gas assets of Kovykta and Chayandan in 2008 and 2011, Russia's East Gas Plan plans to include China in its East Asia grand strategy. China has decided to independently construct the West-East Gas Pipeline, excluding foreign partners including Gazprom [26, p. 28].

In 2008, China and Russia established a ministerial-level negotiation mechanism to resolve disputes. After the shale gas revolution and post-Crimean crisis sanctions in 2014, China and Russia reached a final gas deal, although no details such as prices were announced. The 2014 agreement stipulates that Russian natural gas will be provided through the Siberian power pipeline. Gazprom and PetroChina signed a cross-border pipeline construction agreement in 2016, and began to send natural gas to China at the end of 2019. In addition to exporting natural gas from Eastern Siberia to China, Gazprom is also actively promoting possible natural gas routes from the Vladivostok hub of the Russian East Gas project to the resources of Sakhalin Island to the provinces of Northeast China. The plan aroused the interest of PetroChina, but it has not yet been finalized. In 2016, Gazprom and China National Petroleum Corporation began to explore opportunities to build gas-fired power plants and underground gas storage in China. Although the Sino-Russian natural gas cooperation has not yet completed the large-scale cross-border pipeline project operated by the two leading national oil companies, the development of commercial awareness began in 2013.

## **Chapter 2 The Status Quo of Russia-China Energy Cooperation**

## 2.1 China's energy production and energy demand structure

As an important energy resource, oil and natural gas have an important impact on the country's economic development. The reserves of oil and natural gas play an obvious role in national energy security and stable economic development. China's oil and natural gas reserves do not have an advantage in international competition. From 2015 to 2019, China's proven oil reserves continued to grow. In 2019, PetroChina's identified reserves were 26.19 billion barrels, but they accounted for a very low percentage of the world, only 1.51 %.

China's proven natural gas reserves are also increasing, and the growth rate fluctuates. In 2019, China's proven natural gas reserves were 8.4 trillion cubic meters, a significant increase from 2018, but on a global scale, they only accounted for 4.23 % of the world's total (Table 2.1).

Table 2.1 – China's oil and natural gas reserves [33, p. 6]

| Year | Oil reserves<br>(billion barrels) | Oil's share<br>of the world | Gas reserves<br>(trillion cm) | Gas share<br>of the world |
|------|-----------------------------------|-----------------------------|-------------------------------|---------------------------|
| 2015 | 25.63                             | 2.49                        | 4.68                          | 1.52                      |
| 2016 | 25.66                             | 2.87                        | 5.48                          | 1.52                      |
| 2017 | 25.95                             | 3.10                        | 6.07                          | 1.50                      |
| 2018 | 26.19                             | 3.23                        | 6.36                          | 1.51                      |
| 2019 | 26.19                             | 4.23                        | 8.40                          | 1.51                      |

In terms of oil and natural gas production, with the development of China's mining equipment and mining technology, production has continued to hit new highs. According to data from the National Bureau of Statistics, domestic crude oil production was 191 million

tons in 2019, an increase of 0.89 % year-on-year. Among them, the Bohai Bay (including sea areas), Songliao, Ordos, Junggar, Tarim, and the Pearl River Mouth Basins produced more than 10 million tons of crude oil. A total of 167 million tons, accounting for 87.6 % of the national total. Crude oil production will accelerate in 2020 and processing will slow down. From January to November 2020, the cumulative domestic crude oil output reached 180 million tons, a year-on-year increase of 1.6 %. It is estimated that in 2020, the total oil production in mainland China will be about 200 million tons [4, p. 69].

In terms of natural gas development, from 2015 to 2019, China's natural gas production has increased year by year, and the overall growth rate has increased. According to the National Bureau of Statistics, in 2019, natural gas production was 176.174 billion cubic meters, a year-on-year increase of 10 %. Among them, the Ordos, Sichuan, Tarim, Pearl River Mouth, Qaidam and Songliao Basins produced more than 5 billion cubic meters of natural gas. The output reached 135.268 billion cubic meters, accounting for 89.7 % of the national total. In 2020, 170.2 billion cubic meters of natural gas will be produced, a year-on-year increase of 9.3 % [62].

In terms of oil and natural gas demand, China is a big oil consumer, and oil consumption is increasing year by year, and the growth rate fluctuates. According to data from the China Petroleum and Chemical Industry Federation, in 2019, the apparent domestic crude oil consumption reached 696 million tons, a year-on-year increase of 7.4 %. The apparent consumption of natural gas reached 304.79 billion cubic meters, a year-on-year increase of 8.7 % (table 2.2).

Table 2.2 – China's oil and natural gas consumption [33, p. 7]

| Years | China's oil<br>consumption (100<br>million tons) | Oil consumption<br>growth rate | China's oil<br>consumption (100<br>million tons) | gas consumption<br>growth rate |
|-------|--------------------------------------------------|--------------------------------|--------------------------------------------------|--------------------------------|
| 2015  | 1932                                             | 5.60                           | 5.47                                             | 8.20                           |
| 2016  | 2058                                             | 5.70                           | 5.78                                             | 6.50                           |
| 2017  | 2373                                             | 4.80                           | 6.06                                             | 15.30                          |
| 2018  | 2766                                             | 6.90                           | 6.48                                             | 16.60                          |
| 2019  | 3047.9                                           | 7.40                           | 6.96                                             | 8.70                           |

China's oil and natural gas supply is in short supply. In terms of the proportion of China's oil and natural gas production and consumption, both have a steady downward trend since 2015, and both have obvious characteristics of short supply. In 2019, the proportion of China's oil production and consumption fell from 39.22 % in 2015 to 27.44 %; while natural gas fell from 69.67 % in 2015 to 57.80 % in 2019. It can be seen that China's oil and gas industry is heavily dependent on imports to meet domestic demand.

In the application of crude oil consumption, the downstream products of petroleum mainly include gasoline, liquefied petroleum gas, jet fuel, kerosene, diesel, fuel oil, lubricating oil, petroleum wax, petroleum pitch, petroleum coke and various petrochemical raw materials, and are widely used in Industry, extractive industry, petroleum and natural gas extraction industry, manufacturing industry, petroleum processing, coking and nuclear fuel processing industry, chemical raw material and chemical product manufacturing industry, electric power, heat production and supply industry and other industries.

Among them, petroleum processing, coking, nuclear fuel processing, chemical raw materials and chemical products manufacturing, and petroleum and natural gas extraction industries consume relatively large amounts of crude oil. In particular, the consumption of

crude oil in petroleum processing, coking, and nuclear fuel processing industries continues to increase.

In 2019, the industries with the largest demand for crude oil (petroleum) consumption in China are petroleum processing, coking, and nuclear fuel processing. Its crude oil consumption in 2019 accounted for approximately 89.51 %; secondly, the chemical raw materials and chemical product manufacturing industries also have a higher demand for crude oil. Large demand, crude oil consumption accounts for about 6.85 %, ranking second; oil and natural gas extraction, transportation, storage, and postal industries are also among the top five crude oil consumption; other industries consume relatively little crude oil .

From 2013 to 2019, the consumption of crude oil in China's petroleum processing, coking and nuclear fuel processing industries has shown an increasing trend year by year from 443 million tons in 2013 to 549 million tons in 2017. Looking forward, it is estimated that China's oil processing, coking and nuclear fuel processing industries will consume about 600 million tons of crude oil in 2019 [52, p. 5].

In terms of natural gas demand, natural gas is mainly used in residents' daily life, manufacturing, power generation and heating, transportation, chemical raw materials and chemical product manufacturing and other fields. It is also based on the acceleration of domestic urbanization, the increasing demand for energy conservation and environmental protection, and infrastructure with the continuous improvement of policies and the industrial background, after years of development, the scope of application of natural gas has been continuously expanded, and it has gradually moved towards the main energy source. The prospects are generally optimistic.

Among them, the production and supply of electric power and heat, residential consumption, transportation, storage and postal industry, chemical raw materials and chemical products manufacturing industries consume relatively large amounts of natural gas, especially the production and supply of electric power and heat. The amount of natural gas consumed continues to grow.

Compared with the structural distribution of oil demand, natural gas consumption demand is relatively scattered. At present, the industry that has the largest demand for natural gas consumption in China is the production and supply of electricity and heat. The industry's natural gas consumption in 2019 accounted for about 20.77 % [52, p. 13].

In addition, the demand for natural gas in domestic consumption, transportation, warehousing and postal industries is relatively large, and natural gas consumption accounts for more than 10 %.

And chemical raw materials and chemical products manufacturing, extractive industries, petroleum processing, coking and nuclear fuel processing industries, and petroleum and natural gas extraction industries account for a relatively large proportion of natural gas consumption, leading other industries.

From 2013 to 2019, the consumption of natural gas in China's power and heat production and supply industries has shown an increasing trend year by year. From 24.45 billion cubic meters in 2013 to 44.61 billion cubic meters in 2017. It is preliminarily estimated that China's electricity and heat production and supply industries will consume about 59 billion cubic meters of natural gas in 2019 [52, p. 14].

## **2.2 The current state of the oil and gas trade between Russia and China**

Oil and natural gas are important energy sources for the development of the national economy and people's lives, and are related to national security and sustainable development. As a rapidly developing country, China has a great demand for oil and natural gas. Since China became a net oil importer in 1993, its dependence on foreign countries has gradually increased. In 2011, China's oil dependence on foreign sources exceeded 55 %, and China's current domestic reserves cannot meet market demand. Geographically neighboring Russia has abundant oil and natural gas resources. The power of oil and natural gas supply and demand drives China and Russia to carry out effective cooperation. China and Russia started oil and gas cooperation in 1992, but there was no substantial progress in the cooperation. Until 2004, the oil and gas cooperation between the two countries advanced by leaps and bounds. Russia-China oil and gas cooperation has realized China's energy import diversified development strategy, and China's energy supply is in short supply. Similarly, the development of oil and gas cooperation between the two countries is of great significance to the two countries. Russia will also help realize its development strategy of diversifying energy exports. Russia-China oil and gas cooperation has gone through more than 20 years of development. Although cooperation is mutually beneficial, it also comes with many problems [39, p. 204].

The imbalance between supply and demand has become a future social development trend, and oil and gas trade has developed globally. As one of the countries with rapid social and economic development, China's demand for oil and natural gas is also growing rapidly. These energy sources provide the necessary material foundation for the survival and

development of the people, and provide important support and guarantee for the rapid development of the national economy. With the rapid economic growth and the acceleration of industrialization and urbanization, China has begun to experience an imbalance between the supply and demand of oil and natural gas. Due to this imbalance, China's economic development has been restricted and restricted. Russia's oil, natural gas and other energy reserves and production are relatively large. Therefore, China and Russia have good prospects for cooperation in oil and gas trade between the two countries. Since China became a net importer of crude oil in 1993, China and Russia have continued to strengthen in the energy sector. According to statistics from the Ministry of Commerce, as of 2012, China's energy imports from Russia were 9.63 trillion U.S. dollars, and China has become one of Russia's largest trading partners. In terms of oil trade, in June 2013, China and Russia signed a long-term oil supply contract to increase oil supply. China reduced its oil supply by 360 million tons (14.40 million tons per year) in 25 years. According to the United Nations International Trade Database (Figure 2.1), China's crude oil imports from Russia in 2019 were 36.49 billion dollars.

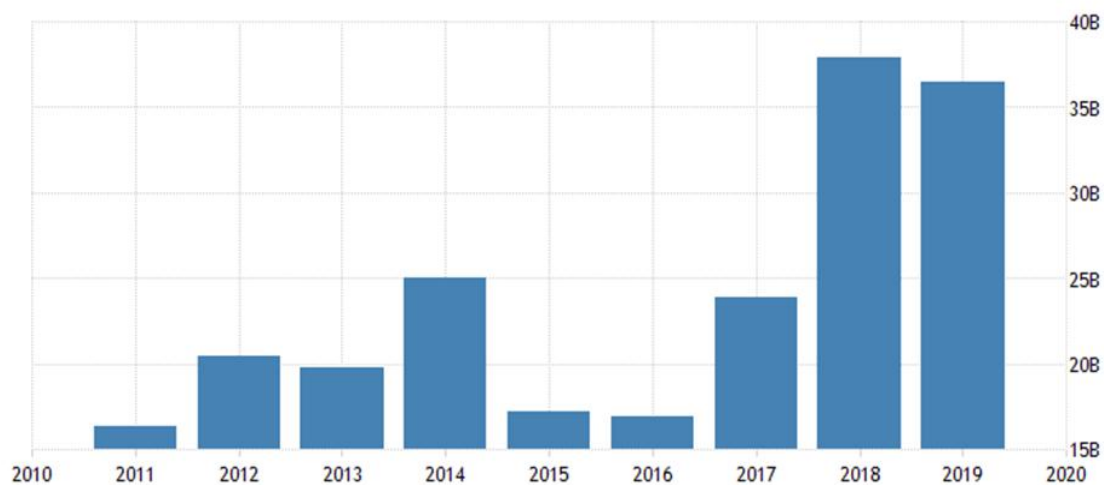


Figure 2.1 – China Imports from Russia of Crude Oil [62]

In terms of natural gas trade, the natural gas cooperation project signed on March 22, 2014 on the Russian Middle East route set the Sino-Russian long-term contract period to be 30 years. The supply of natural gas started in 2018, with an annual supply of 38 billion cubic meters of gas, which can be increased to 60 billion cubic meters in the future. This will account for one-third of China's total natural gas consumption. For China, it consumes 1 billion natural gas produced in 140 years cubic meter. Natural gas exports are still the backbone of Russia's economy. In 2018, they accounted for 59 % of total value Russia's exports and 46 % of Russia's total federal revenue. On the other hand, in 2018, 70 % of Russia's natural gas was exported to the European Union, while Russia's share of China's total natural gas imports was only 1 % (Figure 2.2).

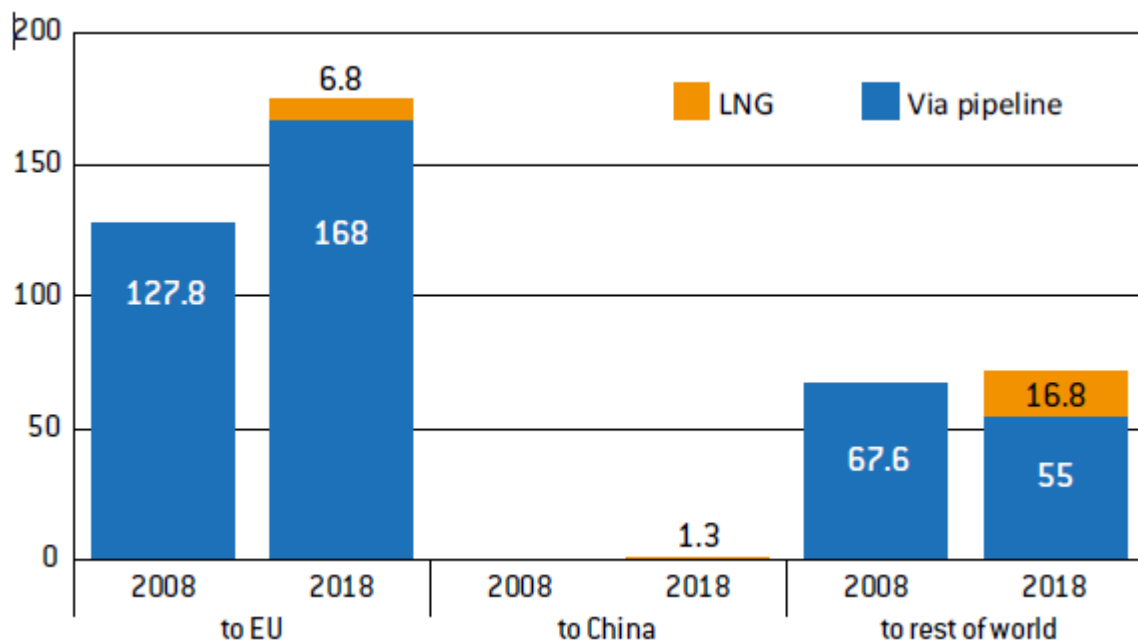


Figure 2.2 – Russian gas exports (billions of cubic meters) [62]

The production and consumption of China and Russia can reflect the country's overall oil and natural gas resource levels. To understand the Chinese government's concerns about

the growth of energy consumption, statistics show the main trends of energy production/consumption in China and Russia in 2018 (Table 2.3).

Table 2.3 – Energy production/consumption in China and Russia [44, p. 32]

|        | Oil production (tons/day) | Oil consumption (tons/day) |
|--------|---------------------------|----------------------------|
| China  | 4155                      | 10221                      |
| Russia | 10643                     | 3174                       |

The oil production/consumption of the two countries shows that Russia's oil production is almost the same as China's oil consumption. China's domestic oil production is slightly higher than Russia's oil consumption. Secondly, China is the world's second largest oil consumer after the United States. The first table in the following table shows that although China's crude oil imports increased from 2015 to 2018, domestic crude oil production showed an upward trend. Tables (2.4–2.5) show that China's energy exports are less than energy imports.

Table 2.4 – China's domestic oil production [44, p. 32]

| Year | China's oil production<br>(million barrels/day) | Net oil imports<br>(million barrels/day) |
|------|-------------------------------------------------|------------------------------------------|
| 2018 | 4.5                                             | 5.7                                      |
| 2017 | 4.2                                             | 5.4                                      |
| 2016 | 4.1                                             | 5                                        |
| 2015 | 4.1                                             | 4.7                                      |

Table 2.5 – China's crude oil import and export [62]

| Crude Oil (China 2018) |                     |
|------------------------|---------------------|
| Export (barrel/day)    | Import (barrel/day) |
| 33000                  | 5.664               |

The Strategic Petroleum Reserve (SPR) is considered a powerful response to any commercial energy supply emergency that may threaten the country's economy. In the context of energy cooperation, in order to analyze energy demand and energy supply, further data on crude oil reserves in the world, Russia, and China are indispensable (Table 2.6–2.7).

Table 2.6 – Proved Oil Reserves in the World [51, p. 362]

| 2015 (billion barrels) | 2019 (billion barrels) |
|------------------------|------------------------|
| 1668.9                 | 1878.7                 |

Table 2.7 – Proved oil reserves of Russia and China [51, p. 362]

| 2019 proved oil reserves |                         |
|--------------------------|-------------------------|
| Russia (billion barrels) | China (billion barrels) |
| 87.2                     | 17.3                    |

At the end of 2012, the world's proven oil reserves reached 1.6689 billion barrels. Based on the R/P ratio (reserve-production ratio), China may use proven oil reserves for more than 11 years. The use of world reserves may last less than 53 years. Fourth, someone mentioned that according to the Chinese government's five-year plan on the 12th, the goal is to increase natural gas consumption by 11.2 %. According to China Data Online (2014), China produced 117.1 billion cubic meters of natural gas in 2013; it consumes even more, 150 billion cubic meters. China's exports are less than imports, at 2.4 billion cubic meters and 53 billion cubic meters (Table 2.8–2.9).

Table 2.8 – China's natural gas production/consumption [51, p. 363]

| Natural Gas (China 2018)   |                          |
|----------------------------|--------------------------|
| Produce                    | Consume                  |
| 117.1 million cubic meters | 150 billion cubic meters |

Table 2.9 – China's natural gas imports and exports [51, p. 364]

| Natural Gas (China 2018) |                         |
|--------------------------|-------------------------|
| Import                   | Export                  |
| 2.4 billion cubic meters | 53 billion cubic meters |

With reference to the government's goal of increasing natural gas consumption, China's natural gas resources are as follows. There are six major oil and gas fields: Sichuan Oil and Gas Field, Datianchi Gas Field, Changjing Fasi Oil and Gas Field, Bohai Offshore Oil and Gas Field, East China Sea Oil and Gas Field, and South China Sea Oil and Gas Field. Oil and gas fields are located in North, West and Northeast China, and their total output accounts for 90 % of the country's total natural gas output. In 2009, the natural gas reserves reached 2.5 trillion cubic meters. Nevertheless, the R/P ratio is almost at the same level. Both Russia and China have formulated national plans to promote energy efficiency, and each country must solve the energy intensity problem (Table 2.10), which is 10 years for Russia and 5 years for China. Although the terms of these plans are different, the estimated energy investment to achieve the set goals is almost the same.

Table 2.10 –Energy consumption share by fuel [37, p. 22]

| Share of energy consumption by fuel | Russia, % | China, % |
|-------------------------------------|-----------|----------|
| gas                                 | 55        | 4        |
| oil                                 | 21        | 18       |
| nuclear power                       | 6         | 1        |
| hydropower                          | 2         | 7        |
| coal                                | 5         | 70       |

The investment in Russia and China was taken from the energy efficiency report provided by the global energy efficiency solution leader ABB, and was certified by the Russian Energy Efficiency Reporting Notice of the International Energy Agency ; in terms

of the amount of energy efficiency investment in China, the Chinese government Major energy-saving projects invested 373 billion U.S. dollars. Refer to Table 2.11 for gas and coal.

Table 2.11 – China's total energy consumption [52, p. 11]

| Year | Crude, % | Coal, % | Gas, % |
|------|----------|---------|--------|
| 2016 | 19.0     | 68.0    | 4.4    |
| 2017 | 18.6     | 68.4    | 5.0    |
| 2018 | 18.8     | 66.6    | 5.2    |

The data shows that the energy consumption rate of coal is declining, while the consumption of natural gas is increasing. These figures also show that the above-mentioned energy measures of the Chinese government will achieve positive results. China has produced 1.8 trillion tons of coal. There are 137 companies in China working in the oil and natural gas fields. China does not only use coal as an energy source. Increasing energy demand has caused China to import crude oil and natural gas from Africa, the Middle East, Central Asia, and the Asia-Pacific region. By using traditional energy, China is becoming an important player in the global energy market. The global energy market is composed of dependent and independent energy resource countries, which may face challenges in the process of rationally managing energy resources.

As non-renewable resources, oil and natural gas are particularly important under the premise that the world's energy problems have not yet been resolved. In the face of China's oil and gas supply and demand problems and the imbalance of Sino-Russian oil and gas trade, we need to work hard to reduce these problems. The negative impact of oil and gas trade is increasing. Optimizing China's industrial structure and putting forward diversified

and feasible countermeasures for Russia-China trade will help China seize opportunities in the international market and achieve new and lasting economic growth.

Russia-China oil and gas cooperation lacks a unified price mechanism. In the process of Sino-Russian oil and gas trade, both sides seek to maximize their own interests, and price differences are prone to appear. This is also a problem that Russia-China oil and gas cooperation has been difficult to solve. The price mechanism is not unified. This also reflects the game between China and Russia.

Russia requires crude oil prices to be higher than in the Middle East, pushing up oil prices on the grounds of the high cost of building oil and gas pipelines. After the 2008 financial crisis, international oil prices plummeted. However, in recent years, oil prices have rebounded and maintained their growth momentum. The future oil price game between China and Russia will be inevitable. The gas pricing issue between China and Russia will continue. Russia hopes to achieve the same price as exported to Europe, while China hopes to control it at a level similar to domestic natural gas. In this way, the expected price gap between the two countries exceeds that of the ambassador-level talks. The Russian-Chinese oil and gas cooperation model is also relatively simple, lacking energy technology cooperation and exchanges. Russia-China oil and gas cooperation is dominated by trade and lacks technical cooperation. In today's energy field, the more advanced energy technology is, the more energy security can be guaranteed. Oil and gas cooperation is an industry that requires high investment and high technology. High-level industrial technology can effectively improve industrial efficiency and speed up energy exploration and development. Although China has made certain achievements in oil and gas exploration and development technology, it is still far from the world's advanced level. China and Russia should pay

attention to how to improve efficiency, save costs, and improve technology. This is the direction that the two countries should work together for long-term cooperation in the future [4, p. 55].

Really attach importance to Russia-China oil and gas cooperation. China and Russia are very different in terms of social system, economic system, ethnicity, religious beliefs, and culture. China and Russia deepen educational exchanges and cooperation. China established the Confucius Institute Russia spreads Chinese culture, teaches Russian students to learn Chinese, and understands the cultural heritage of Chinese for five thousand years. At the same time, Russia is also a palace of art, where you can cultivate the artistic accomplishments of Chinese students. It is also necessary to carry out various forms of cultural exchange activities to increase friendly exchanges between the two peoples. China and Russia enhance mutual trust between the two countries and create a good cultural atmosphere for Russia-China oil and gas cooperation. This is of great significance to the political and economic exchanges between the two countries and has laid a solid humanistic foundation for Russia-China oil and gas cooperation.

Energy is the main guarantee for economic development. Only with sufficient energy supply can the economy achieve greater potential. The Chinese government should increase policy-based financial support for oil companies and actively encourage oil companies to «go global» and cooperate with Rosneft. Compared with developed countries in Europe and the United States, China's economy started late, and only after reform and opening up did it really begin to «open to the outside world» and develop its economy. Sino-foreign energy cooperation began after the 1990s. To ensure the smooth development of China's energy cooperation with foreign countries [12, p. 162].

Study Russian energy policies and related laws and regulations, and guide Russia-China energy cooperation practices to develop in a more reasonable and complete direction. At the same time, China should make appropriate investments in the Russian energy sector according to its own economic development needs, actively participate in the upstream activities of Russia-China oil and gas cooperation, and participate in oil and gas exploration and development and technical cooperation. Some Russian energy companies have outdated equipment and outdated technology and management experience. China's capital and technological advantages can be used to cooperate with Rosneft or establish multinational companies to complete the joint development of oil and gas fields and improve the level of energy cooperation between the two countries.

Energy has become an important factor affecting economic development, and energy cooperation also plays an important role in cooperation between countries. China and Russia have superior geographical advantages. China and Russia match the supply and demand of oil and gas resources. The two countries have a sound foundation for oil and gas cooperation. Although due to political, economic, cultural, and international constraints, Russia-China oil and gas cooperation has experienced some twists and turns. Russia is rich in energy reserves, and China's rapid economic take-off determines its demand for energy will increase. With future development, Sino-Russian oil and gas cooperation is in line with the long-term interests of the common development of the two countries and has broad prospects.

## **Chapter 3 The ways of China and Russia to develop and improve economic relations in the oil and gas field**

### **3.1 Obstacles to Sino-Russian oil and gas cooperation**

The current energy cooperation between China and Russia is mainly embodied in cooperation in conventional fields such as crude oil, natural gas, coal, and electricity. As early as 1996, the leaders of China and Russia made a major decision to strengthen strategic cooperation in oil and gas and build a Sino-Russian crude oil pipeline. The Sino-Russian crude oil pipeline is an important part of the implementation of the Sino-Russian cooperation project agreement on the construction of the Sino-Russian crude oil pipeline, the strengthening of crude oil trade, and the support of loans. Russia, as a major energy exporter, is facing the issue of export direction selection, while China as a major oil consumer. Most of the oil imports go through the Strait of Malacca, and maritime transportation faces great pressures and risks. Land pipeline transportation is conducive to increasing the stability of oil supply and also increasing the demand for Sino-Russian energy trade [6, p. 49].

Now Rosneft and Rosneft Pipeline Transport Company supply 15 million tons of oil to China each year through the Eastern Siberia-Pacific pipeline branch, and plan to increase the supply. Rosneft is considering exporting oil to China via the Atasu-Alashankou oil pipeline crossing Kazakhstan. In terms of natural gas, Russia plans to supply 30 billion cubic meters of gas to China along the new Altai gas pipeline from 2015 and 38 billion cubic meters along the eastern main gas pipeline. However, due to the long-term disagreement between the two parties on the issue of gas prices, Gazprom missed the opportunity to enter

the Chinese market on a large scale. China is now the world's largest energy consumer. Although the proportion of natural gas consumption is still relatively low, with the gradual implementation of clean energy utilization, the future demand will continue to grow substantially, and this is undoubtedly an energy cooperation between China and Russia. Provides basic conditions. In terms of coal cooperation, Russia's Siberian Coal Energy Company began supplying coal to China Datang Power Generation Group via railway in 2007. At the Fifth Baikal Economic Forum held in 2008, there was news that Russia plans to sell coal by 2015. The export volume will increase from 95 million to 130 million tons, and the proportion of exports to Asia-Pacific countries will increase from 25 million tons to 40 million tons. Russia's coal exports to China have considerable potential. In the next five years, China will introduce market mechanisms through natural gas price reforms, and increase cooperation mechanisms with Russia in the fields of traditional energy and new energy such as nuclear power and clean coal, forming a new pattern of Sino-Russian energy cooperation with diversified scale effects [10, p. 402].

China and Russia should follow the laws of market economy, adhere to the principles of benefit-sharing and risk-sharing, and clarify their respective rights and obligations by creating effective ways of cooperation, so as to jointly solve the problems existing in energy cooperation and put forward proposals acceptable to all parties. Equal and mutually beneficial solutions. Chinese President Xi Jinping chose Russia as his country for his first visit. This visit will focus on strengthening China-Russia energy cooperation, especially in practical cooperation to a new level. However, there are still many problems in energy cooperation between China and Russia.

Russia has misgivings about energy cooperation with China. This political and social

misgiving, worrying that Russia will become China's energy vassal state and the so-called theory of China's expansion in the Russian Far East, has made some voices in Russia hope that Russia will still rely on the European market. China's energy exports have weakened its dependence on China, a huge energy consumption market, and there has been a "non-active and non-cooperative" attitude towards China's energy cooperation. The conflicts between corporate interests and national interests have existed for a long time. Companies care about profits, and national leaders care about ensuring energy exports (Russia) and stable energy supply (China) to ensure normal economic operation and social stability. Because companies and governments have different concerns, it is difficult for companies to implement decisions made by state leaders. Natural gas pipeline laying external competition and natural gas price factors have long been the main obstacles to Sino-Russian cooperation in the clean energy field of natural gas. The Russian side advocates that the Sino-Russian gas pipeline should first be laid for the Altai gas pipeline from West Siberia to the Chinese border, while the Chinese side hopes to speed up the implementation of the construction of the eastern main gas pipeline from Yakutia and Sakhalin in the Russian Far East. The natural gas transmission pipeline from the offshore natural gas fields around Sakhalin Island to Khabarovsk and finally to Vladivostok is 1,800 kilometers long. The annual natural gas transportation volume can reach 30 billion cubic meters. Russia expects this Far East. The gas pipeline can also send Russian natural gas to Japan and increase branch lines to enter the Korean market. The competition between China and Japan for Russian natural gas is bound to enable Russia to obtain superior economic benefits. China has already built the China-Kazakhstan crude oil pipeline and the Central Asia-China natural gas pipeline with Central Asian countries, and hopes to achieve a diversified and multi-directional energy

import model, so that China will have more room for price imagination in the future. In addition, since 2012, Europe, supported by the US shale gas revolution, has become increasingly tough on Russia, which has also reduced the attractiveness of the European market to a certain extent. Russia is bound to pay more attention to the energy consumption market of China. Fundamentally speaking, China has sufficient time and capital advantages in negotiating natural gas prices with Russia [32, p. 65].

In recent years, the successful development of unconventional oil and gas represented by shale gas has become an important breakthrough in the turning point of US oil dependence on foreign countries. The shale gas production is now equivalent to 23 % of the total US natural gas production, and the US has surpassed Russia as the world's largest natural gas resource and producer. It has basically achieved self-sufficiency, and there is no need to worry about the threat of gas-producing countries monopolizing the natural gas market. , It can even export liquefied natural gas to European markets and other countries, weakening the influence of Russia and other countries' energy resources. This is indeed a huge challenge for Russia, which has long been the world's largest annual output of conventional natural gas reserves. Even Russia's Lukoil said in May 2011 that the company would cooperate with North American companies to participate in US shale gas and shale oil projects. China is a big shale gas reservoir. Recently, the Ministry of Land and Resources of China also disclosed that the geological resource potential of shale gas in the country's land area is 134.42 trillion cubic meters, and the potential for recoverable resources is 25.08 trillion cubic meters. Without more cooperation, this is mainly due to Russia's energy mining innovation and lack of technological advantages, and China also needs more Western technology to develop its own shale gas revolution [39, p. 205].

Therefore, it is hoped that more effective energy cooperation between China and Russia will be strengthened, and the China-Russia energy cooperation plan will be truly realized. Now that both China and Russia are members of the World Trade Organization, a relevant market coordination mechanism for Sino-Russian energy cooperation should be established as soon as possible. Based on the laws of the market economy, adhere to the principles of benefit sharing and risk sharing, create effective ways of cooperation, clarify their respective rights and obligations, and jointly solve the problems in energy cooperation and propose equality and mutual benefit acceptable to all parties. Based on the principle of mutual trust and mutual benefit, China and Russia should carry out diversified and multi-line upstream and downstream integrated cooperation, strengthen joint development, increase financing support, expand crude oil trade and network management, and improve the monitoring and emergency response of the energy markets of the two countries. Mechanisms to deepen cooperation in information exchange, personnel training, and coordinated actions. China and Russia successfully implemented the Tianjin joint oil refining project, and the exploration work carried out by the energy companies of the two countries in two oil and gas blocks in Irkutsk Oblast and Udmurtia Republic is also in operation. At the same time, energy companies of the two countries are also discussing Chinese-funded participation in the development of the Sakhalin 3 block, and China and Russia are jointly investigating the Magadan 1 and Magadan 2 oil and gas on the continental shelf of the Sea of Okhotsk. Cooperative projects such as joint exploration of the block are undergoing feasibility demonstration. At the same time, the two sides have also strengthened power cooperation. China and Russia have built a 500 kV transmission and distribution line in 2011. After this line was put into commercial operation in 2012, Russia's

annual export to China has increased to 4.5 billion kWh. The completion and commissioning of the power transmission project is of great significance for improving the energy efficiency of the Russian Far East, expanding cooperation in energy projects between China and Russia, promoting the establishment of China's Northeast power grid, and strengthening the economic development and complementarity of China and Russia.

Over the years, China and Russia in the oil and gas and other energy fields expand widely cooperation, and has made a series into. It, reached a good cooperation consensus and basis. Chinese-Russian energy cooperation has a unique advantage. But Russian and Chinese energy infrastructure is still relatively backward, the issue of energy security has not been effectively resolved, geo-political influence of the two countries has interests of the cooperation, the imperfections of the energy of the financial system and other issues need to be resolved [49, p. 52].

China and Russia between the two countries on energy cooperation back and forth the experience of nearly twenty years, the cooperation results have good and bad, prior to the establishment of the infrastructure not only dilapidated and do not meet current energy delivery and, most importantly, with the new field of energy cooperation continue to expand, as new energy cooperation in the construction of the infrastructure is still lacking. The current transnational oil and gas pipelines construction, cross-border power grid interconnection construction and a large infrastructure has not kept pace, the impact of the Sino-Russian energy cooperation in the process. For a long time, Russia's industrial development is mainly concentrated in the Western region, energy development and utilization of the supporting infrastructure is also mainly concentrated in the Western region. Russia in Far East, sparsely populated, accounting for land area of 36 % of the Far Eastern

Federal District only 630 million inhabitants and where economic development lagged behind, supporting infrastructure, energy development and utilization costs are very high. Therefore, many of China's large state-owned enterprises are unwilling to Siberia investment to build the plant. In addition, the region's energy transportation mainly on the railway, the transport capacity is insufficient, construction of new infrastructure requires a large investment, and cost recovery is slow, also dispelled the China enterprise investment enthusiasm. China and Russia's energy infrastructure through the country is more, the countries along the route for different interests to consider, so that its communication is quite difficult, and China and Russia planning some line through the region of the geographic ecology of the natural environment is harsh so that construction of the infrastructure of the difficulty of construction is further increased. So, for now, Russia and China to the energy infrastructure or the use of the previous facilities, the past of the energy infrastructure not only old behind, but also cannot meet the growing energy supply and demand, it does not meet the “One Belt and One Road” strategic planning under the new Sino-Russian energy cooperation line. China and Russia are the international energy market on an integral of two powers, one is a major energy consumer, one is the energy producing countries, both neighboring countries and strategic partners, the two countries on energy cooperation has a unique advantage, but the reality is often unsatisfactory, between the two countries on energy cooperation is affected by many factors, at multiple levels expand the interests of the game. One is the economic and political interests of the game. Sino-Russian energy cooperation is the biggest obstacle to the geopolitical difficult to release away. The Russian energy sector problems, economic factors are the main obstacles, as it is the geopolitical goal of the ground edge of the economic target penetration as a result, lead to

political problems at the economic level. Sino-Russian cooperation more imported the field of security, and the non-economic areas. The second is the strategic interests of the game. Sino-Russian energy cooperation to a sustained and stable development, we must have a clear Sino-Russian energy cooperation strategy to guide, but so far, it didn't work out between the two countries recognized the practical Sino-Russian energy cooperation strategy, the main reason is that Russia will be the two countries on energy cooperation as the long-term planning project, hoping to drive the entire Far East region's economic development, while China put the two countries on energy cooperation as an urgent short-term work projects, expectations as soon as possible to resolve the current “energy bottleneck”, as well as energy sources diversification issue. The third is the price of the game. China and Russia in the oil and gas price divergence has become current cooperation problems to be solved. For China, the high oil price will greatly increase China's national economy running costs; and for the “energy economy” dominated by Russia, then hope that oil and gas can maintain high prices. These years, at what price to export to China Energy become plagued Russia's a big issue, but also hinder China-Russia energy and rapid development of important factors.

To conclude we can say that there are main challenges for Chinese-Russian relations in the energy field. Firstly, it is a blow that caused by low oil prices to China-Russia cooperation in the oil and gas sector. The collapse in oil prices led to a reduction in Russia foreign exchange earnings and financial difficulties; moreover, it blocked the prospects for the oil and gas development strategy. China was under a double influence, as low oil prices have reduced the cost of foreign oil and gas assets bought by China at a high price. A large amount of imported oil stayed in storage facilities with no chance for further use, which led

to idle equipment and employees of the oil and gas industry. It is very disadvantageous for Chinese enterprises, which operation goes according to the strategy of “going outside”. However, low oil prices strengthened China's negotiating positions, lowered the buying cost of oil and gas, and especially reduced foreign exchange costs. The fall in oil prices dragged down the price of other energy resources, for example, iron ore, coal, etc.

Secondly, under the impact of low oil prices, Russia's strategy of import substitution in the oil and gas sector may have a certain impact on the export of Chinese enterprises, especially oil and gas equipment manufacturing enterprises.

Thirdly, the trend of diversification of energy resources development, and the fact that Russia, due to the impact of low oil prices, has faced financial difficulties, exert psychological pressure on bilateral large-scale projects on cooperation in the oil and gas sector.

### **3.2 Prospects for strengthening and developing Sino-Russian oil and gas cooperation**

Sino-Russian energy cooperation is the field with the heaviest weight, the most results, and the widest scope in the cooperation between the two countries. Moreover, the space for development is still vast and the potential is huge. On the basis of adhering to the main body of enterprises and commercial principles, the two sides can continue to find the point of convergence and the greatest common divisor, tap new potentials to promote the integration of interests, deepen the all-round integrated cooperation between the upstream, middle and downstream, and promote China-Russia energy cooperation to open a new era [53, p. 189].

According to the official statistics of the Russian Ministry of Energy, in 2018 Russia extracted nearly 556 million tons of oil (including condensate) (a record of nearly 30 years, close to the historical high of 569 million tons in 1987), extracted 725.4 billion cubic meters of natural gas, and 4.39 coal. 100 million tons of electricity and 1.09 trillion kilowatt-hours of electricity have become the world's third largest energy producer after the United States and China. Its primary energy production accounts for 10 % of the global total and 16 % of the global energy trade [4, p. 54].

In 2018, the consumption of Russian oil (including condensate) was about 150 million tons, and the remaining export volume was 410 million tons. Since 1990, the proportion of exports has increased from 47.7 % to 73.6 %. The main reason for this is that Russia's domestic oil consumption has gradually declined over the past 20 years and natural gas consumption has grown rapidly and has accelerated its replacement of oil consumption. In terms of consumption structure, 52 % of Russia's primary energy consumption is natural gas (natural gas consumption in 2018 is 44.5 billion cubic meters). Under this overall trend, Russia has become the world's fourth largest energy consumer, accounting for 5 % of global energy consumption [4, p. 58].

According to statistics from the General Administration of Customs, Russia exported 260 million tons of crude oil, 150 million tons of petroleum products, 220.6 billion cubic meters of pipeline natural gas, and 36.7 million cubic meters of liquefied natural gas in 2018. From the perspective of export direction, Russian oil exports have largely shifted from Europe to Asia, of which a large amount was exported to China. In 2018, Russia exported 71.5 million tons of petroleum products to China, a year-on-year increase of 20 %; Russian natural gas exports, the current main direction is still In the European market, 2008 billion

cubic meters of pipeline gas was exported to Europe in 2018. The main importing countries were Germany (58.5 billion cubic meters), Turkey (24 billion cubic meters), Italy (23 billion cubic meters), and the United Kingdom (14.3 billion cubic meters). Meters) and France (13 billion cubic meters); LNG is mainly exported to countries and regions such as Japan, South Korea and China (including Taiwan). At the end of 2019, the eastern route of China-Russia natural gas will start supplying gas (38 billion cubic meters per year), and China's position in the Russian natural gas market will become more prominent [4, p. 60].

Russia is rich in oil and gas resources and is a key country along the Belt and Road initiative. The strategic partnership of cooperation between China and Russia has been continuously strengthened in recent years, and the governments of the two countries have attached particular importance to the field of energy cooperation. Witnessed by Chinese President Xi Jinping and Russian President Putin, Dai Houliang, Chairman of Sinopec, and Dmitry Konov, Chairman of the Management Committee of SIBUR, exchanged the Amur natural gas chemical project cooperation agreement. According to the agreement, Sinopec will own 40 % of the shares in the project. Dai Houliang, Chairman of Sinopec's Board of Directors, said: The Amur Natural Gas Chemical Project is another in-depth and pragmatic cooperation since Sinopec became a strategic investor in Russia's SIBUR Company. Both parties will work together to share industry best practices, give full play to their advantages, The project has become a model for the extension of the energy cooperation between the two countries to the downstream petrochemical field. Dmitry Konov, chairman of the management committee of SIBUR, said: The partnership with Sinopec will allow both parties to expand their common expertise and expertise. Experience to maximize the efficiency of new large-scale projects. In addition, the companies of both parties announced

that they will also strengthen strategic partnerships in China, Russia and other countries, and at the same time carry out sales cooperation for polyolefin products exported to the Chinese market [13, p. 52].

This project is the first and largest chemical cooperation project between China and Russia, and it is the first case in the Russian Far East. As a supporting chemical project of the Sino-Russian gas east line processing plant, it fits the energy development needs of China and Russia at a strategic level, and is also more in line with the overall economic development plan of the Russian Far East. The successful breakthrough of this cooperation project will further enhance the cooperation between China and Russia in energy, investment, economy and trade, production capacity and high-quality development, inject new impetus and lay a new foundation, and will actively boost the social and economic development and people's livelihood in the Russian Far East. It will also provide a best practice case for the realization of the base and intensive development of the international business layout of Chinese energy and chemical enterprises.

With the deepening of mutual trust, full understanding and economic restructuring between the two countries, China and Russia will definitely build on the existing solid foundation of oil and gas and other energy cooperation, by leveraging their own comprehensive advantages and structural interconnection, and working together to extend value To further broaden and deepen mutually beneficial cooperation in the dimensions of chain, industrial chain, etc., considering that Russia's natural gas production will be released in large quantities in the future, for example, by 2036, natural gas exports may increase by 50 % on the current basis. Under the background of the implementation of the project, the Chinese market is actually more friendly and accessible to Russia in the actual options.

Therefore, if the price of gas meets the needs of China's market endurance and growth, and access is more convenient and effective, we believe that Russia's increase in natural gas exports to China will have very realistic prospects. Therefore, on the basis of the National Energy Administration's organization and issuance of the Enhancing the Fair Opening of Oil and Gas Pipeline Network Facilities Related Information Disclosure, we will continue to expand the location of LNG receiving stations along the southeast coast of China, and establish and improve receiving stations and local urban gas pipelines. The establishment and implementation of third-party access and corresponding market-oriented operation and price mechanisms for the network and the backbone pipeline network are aimed at truly opening up the key links for the huge amount of imported liquefied natural gas to enter the Chinese market. Supply can effectively control the price fluctuation of LNG market, which will help the healthy and sustainable growth of domestic natural gas market and consumption. The China (Heilongjiang) Pilot Free Trade Zone will soon be approved. Heihe City is one of the three areas. It will further focus on the comprehensive utilization of cross-border energy resources, trade and logistics, border finance, tourism and health and other industries, and build Heihe into a Sino-Russian border area. An important base for development cooperation with the best policies and the most active mechanisms may become a new hot spot for Sino-Russian energy cooperation in the next stage [8, p. 98].

Starting from the need to actively respond to European and American sanctions and avoid the risks of trade disputes, Russia is continuously strengthening oil and gas trade in many Asian countries, including China, and seeking in-depth cooperation in many new areas besides oil and gas. Facing a new direction of development, under the vigorous promotion of the politics of the heads of state of China and Russia, the regular meeting

mechanism of the Chinese and Russian prime ministers, the China-Russia Energy Cooperation Committee, the China-Russia Investment Cooperation Committee, the China-Russia Business Forum, the SCO Energy Ministers' Meeting, and Russia's The Eastern Economic Forum, the St. Petersburg International Economic Forum and other good mechanisms and platforms for consultation, joint construction and sharing will play an active and important role in the new strategic direction and related demands of Russia's concern, including industrial chain integration, value chain extension, and future development. Baikal and the Far East's priority development areas have formed an organic connection and key layout, and will gradually mature a number of large-scale projects and integrated cooperation projects that can promote the local labor productivity, infrastructure, foreign exports, and the development of small and medium-sized enterprises in Russia. . As far as oil and gas cooperation is concerned, China and Russia are engaged in high-end offshore manufacturing, natural gas liquefaction and gasification and refueling facilities, industrial products Internet trading platforms, bilateral petrochemical cooperation projects, and product import and export reciprocal policy packages (including fiscal, taxation, port , Customs clearance, commodity inspection and quality inspection, etc.), domestic currency exchange and settlement of oil and gas and chemical products trade, in-depth cooperation in Sino-Russian petrochemical free trade zone or start-up incubation park, petrochemical scientific research institutions and commercial development and utilization of related testing devices, There is huge potential in petrochemical automation and intelligent production management systems, cooperation between petrochemical enterprises and training institutions, petrochemical patent transfers, and cooperation between science and technology management institutions.

In the context of China-Russia energy cooperation entering a new era, in order to further sort out and plan the new goals, new connotations, new ideas and new strategies of China-Russia energy cooperation, a group of expert think tanks and consulting institutions familiar with Sino-Russian oil and gas cooperation They have been established one after another. They mainly come from experts in the fields of production and operation, finance and taxation, state-owned assets, diplomatic commerce, customs ports, transportation, standard commodity inspection, industrial information, emergency security, banking and finance, Internet economy, insurance and legal affairs, equipment manufacturing and other departments. The team uses the current Sino-Russian energy cooperation mechanism to carry out regular exchanges with the Russian energy regulatory authorities, research and consulting institutions, and the business and strategic planning departments of leading energy companies to observe the general situation, seek the overall situation, adapt to changes and welcome the new principles Next, discuss how to build a new project for high-quality development of Sino-Russian energy cooperation.

Nevertheless, radical changes in the international energy situation brought many opportunities for the development of energy cooperation between China and Russia. Firstly, the centre for the development of the global economy is increasingly shifting to the Asia-Pacific region, supply and demand proportion is becoming even closer in the space of Eurasia, and the status of the region in the global energy structure is clearly increasing. Secondly, new common interests has become evident. Thirdly, factors of cooperation internal driving forces were unprecedented [2]. The directions of the China-Russia energy cooperation are the following: 1) “Climb the mountain and look into the distance”, it means the updating of the cooperation. 2) The complementarity of economies is a main strength

source for bilateral cooperation, as well as the long-term strategic choice made up by the two countries. Correct regulation of interests of both parties. First, to coordinate the policy of China and Russia in Central Asia, the second, to coordinate all the links of industrial cooperation in the field of energy and financial reserves; 3) Coordination between China and Russia about discrepancies in energy prices; 4) Deepening and enriching the content of China-Russia strategic cooperation in the energy sector. China and Russia signed a Joint Statement on Cooperation in Combining the Construction of the Eurasian Economic Union and the Economic Belt of the Silk Road, which is of strategic importance for the two sides. The two countries need to continue effective developing in energy cooperation sphere and revealing the enormous potential and complementarity of cooperation. In the future, it is possible to continue deepening cooperation on the following aspects: the implementation of existing agreements, and the continued expansion of trade. Both sides should accelerate negotiations on the price of oil and gas on the terms of mutual benefit, they should further expand cooperation in the field of electric and nuclear energy, and in the coal sector as well. Moreover, Russia and China should implement the already signed agreements on trade in energy resources, and strengthen the achieved results of cooperation. At the same time, through negotiations on energy issues, which are held within the framework of the mechanism of two countries heads of government regular meetings, both sides should promote the expansion of trade in energy resources between the enterprises of the two countries in order to deepen interdependence [58, p. 26–27].

To conclude we can say about required directions for China and Russia in the energy sector.

- 1 Search for new conditions for investment cooperation. Both sides should find new

points of linking financial complementarity between the two countries, in order to open new conditions for investment cooperation systematically.

2 Strengthening the relationship in the field of energy resources. Accelerating the progress of the implementation of the plans for the construction of the western pipeline, promptly begins deliveries via the eastern gas pipeline, and facilitate the conclusion of a new agreement on the construction of the pipeline. At the same time, jointly build the China-Russia energy bridge, realize the concept of energy networks in South-East Asia, significantly increase transport capacity for the delivery of energy resources. It is important to conduct a study on the construction of the offshore oil and gas transport corridor, to diversify the ways of transporting energy resources, and to ease the pressure in transport safety issues through pipelines. Deepen the development of cooperation in the field of energy technologies. Chinese technology in the exploration and development of shale oil and shale gas is now continuously developing; there are large financial forces in this sector. As there are huge reserves of shale oil and shale gas in Russia, so there is a clear advantage regarding the size of reserves in relation to the size of the production.

3 Cooperation in the field of nuclear energy. It is possible to promote projects in the field of reactor technologies, floating nuclear power plants and fast neutron reactors. In the field of new Chinese-Russian energy technologies application, there are also many opportunities for cooperation. Enterprises of the two countries should also pay great attention to the issues of innovation in energy cooperation models, as they need to adapt to the reality of the ever-expanding scale of energy cooperation and its acceleration. For example, in the sphere of trade calculations, methods and channels of financing, exchange of interests and projects, research work in the field of technologies and equipment.

## **Conclusion**

China has become the global energy needs country, energy needs to be timely and effectively met; active seeking energy cooperation is the inevitable choice. Russia is a vast land and energy resources the abundance very rich, coupled with its economic and steady development is largely dependent on energy exports the realities of the Russian imperative is to seek a reliable energy-importing countries. China and Russia energy cooperation can be traced back to the early 90's, although the middle stranded for a period of time, but the two countries energy cooperation still continues. Russia and China in energy cooperation, though they have not a small advantage, but there are also a lot of issues: the Sino-Russian energy infrastructure, and Russia in Northeast Asia with China trust Foundation difference, energy security there is a certain risk, a culture native to hinder the two countries exchanges in Russian between the interests of the game.

Modern development of the global economy leads to growth in consumption of energy resources. In this case regional energy resources disproportions for the most number of regions isn't provided with the sufficient level of hydrocarbons. The same way, energy integration processes is a characteristic of the World economy' present stage and testifies a globalization energy market tendency by creating transregional economic relations contributing to the countries' development. From Russia's perspective, China's massive industrial and economic growth creates enormous demand for energy and natural resources. Russia's economy, which relies heavily on these exports, is now highly complementary to China's growth. It is in Russia's best interest to cooperate with China for its own economic growth.

Russia and China are always close in energy cooperation, constantly creating projects that are conducive to development, and have a profound impact on the economic development of the two countries. Deepening energy cooperation is not only an important basic factor in the relations between the two countries, but also a strategic move for the future of China and Russia, which is of great significance to the national interests of both sides.

In this new era, we should seize the opportunity. Russia and China should establish new cooperation concepts and innovate cooperation models, carry out cooperation in the energy field, release the powerful economic potential of the strategic partnership between the two countries, and make it a deep bond between the two countries. The solid cornerstone of relations and common interests. Sino-Russian energy cooperation will also have a profound impact on the global energy landscape. Energy cooperation that shows bright prospects has become an important symbol and strategic support leading the continuous rise of Sino-Russian relations. Sino-Russian energy cooperation is one of the most extensive cooperation between the two countries. In the energy cooperation, many achievements have been shown to the people of the world, and the future development path is still broad, with endless development potential, opening up Sino-Russian energy cooperation New era.

In terms of the future development environment, globalization requires a stable development environment to support economic development, which involves the stability of the international situation. To put it simply, the current international situation is complex, turbulent, changeable, and full of uncertainty, but peace, development, and cooperation are the trends of the times. The trend of world multi-polarization and economic globalization is deepening, science and technology are advancing with each passing day, and the world

economy as a whole maintains growth. Mankind is facing rare development opportunities. Security issues still exist, and non-traditional security threats such as terrorism, the proliferation of weapons of mass destruction, environmental pollution, natural disasters, and infectious diseases have become more prominent. The negative impact of economic globalization has increased, and the North-South gap and the gap between the rich and the poor have further widened. Under these circumstances, China advocates strengthening international cooperation to jointly seize opportunities and respond to challenges. China insists on working with the people of other countries to build a harmonious world of lasting peace and common prosperity.

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