

NATIONAL TECHNICAL UNIVERSITY OF UKRAINE
 "IGOR SIKORSKY KYIV POLYTECHNIC INSTITUTE"
 FACULTY OF MANAGEMENT AND MARKETING
 DEPARTMENT OF INTERNATIONAL ECONOMY

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_____ Serhii VOITKO
 «___» _____ 2023.

BACHELOR THESIS
 for a bachelor's degree
 according to the educational program
 "International Economics"
 specialty 051 "Economics"

on the theme: **"INTERNATIONAL COOPERATION BETWEEN
 CHINA AND UKRAINE IN THE FIELD OF HIGH
 TECHNOLOGIES"**

Completed:
 student of the 2nd year, group US-93mp
ZHAO MENGYAO

Supervisor:
 Head of the Department
 of International Economics,
 Doctor of Economics,
 Prof. **Serhii VOITKO**

Reviewer:
 Professor of the Department
 of Economic Cybernetics,
 Prof. DSc. **Olha ILYASH**

I certify that in this
 master's dissertation
 there are no borrowings
 from the works of other
 authors without proper
 references

Student _____

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Department of International Economics

Level of higher education - second (bachelor's)

Specialty - 051 "Economics"

Educational and professional program "International Economics"

APPROVED

Head of the Department

_____Serhii VOITKO

«___» _____2023

OBJECTIVE

for a bachelor's thesis of a student

ZHAO MENGYAO.

1. The theme is “INTERNATIONAL COOPERATION BETWEEN CHINA AND UKRAINE IN THE FIELD OF HIGH TECHNOLOGIES”, scientific supervisor – Voitko Serhii Vasyliovych, head of Department of International Economics, Doctor of Economics, Professor, approved by the order of the University from _____2023 № _____
2. The deadline for students to submit a dissertation is June 24, 2023.

3. The Objective of research is process of conducting international scientific and technological cooperation for Ukraine and China.
4. Initial data: provisions of economic theory, periodicals and monograph publications, legal framework, materials of international scientific and practical conferences, as well as statistical materials of the Data World Bank.
5. List of tasks to be developed: Determine the economic substance and basic principles of international cooperation. Study the content and types of import and export strategies in the high-tech sector. Choose a method for assessing the efficiency and productivity levels of high-tech businesses. Study trends in the high-tech sector of the world, China and Ukraine. Evaluate the efficiency and productivity of investment projects. Analyze the development strategy of technology products in the global economy. Determine the direction of improving international cooperation between China and Ukraine in the field of high technologies. Propose high-tech diversification in international cooperation. Provide an economic justification for international science and technology projects.
6. Approximate list of graphic (illustrative) material: not less than 5 tables and not less than 10 figures.
7. Approximate list of publications: 0 publications
8. Dissertation section consultants *

Section	Surname, initials and position consultant	Signature, date	
		task issued	task accepted

9. Date of issuance of the task: June 01 2023

Calendar plan

№	Name of stages	Term of implementation	Note
1	Get the list of research area, make up the mind of research topic	March 01, 2023	done
2	Assignment of students to supervisors of bachelor's dissertations;	March 05, 2023	done
3	Selection of topics for bachelor's theses (with supervisors) and their approval at the meeting of the department;	March 05, 2023	done
4	Development of the content (plan) of the bachelor's dissertation and issuance of the task by the supervisor;	March 12, 2023	done
5	Selection of literature on the research topic and its analysis;	April 10, 2023	done
6	Preparation of the theoretical section and coordination of its content with the supervisor;	April 17 2023	done
7	General research of the economy of science and technology	April 17, 2023	done
8	Comprehensive analysis of the views of scientific and technological cooperation	April 17, 2023	done
9	A comprehensive analysis of the high-tech market perspective	April 20, 2023	done
10	Final completion of the second section of the thesis, bachelor's thesis;	May 07, 2023	done
11	Development of improvements and innovations, which are the basis of the third recommendation section;	May 10, 2023	done
12	Prepare the materials of market mechanisms the third section;	May 16, 2023	done
13	Generalization of the received scientific results, use the materials of world published data and experience for further analysis and preparation of the general conclusions;	May 28, 2023	done
14	Registration of the bachelor's dissertation and its submission for check to the scientific adviser;	June 09, 2023	
15	Elimination of the shortcomings revealed by the head and the reviewer, preparation of a report and visual materials for defense;	June 19, 2023	
16	Defense of the bachelor's dissertation before the EC according to the approved schedule.	June 24, 2023	

Student _____ Zhao Mengyao.

Supervisor _____ Serhii VOITKO

ABSTRACT

Pages 80	Drawings 4	Tables 4	Applications 0
Research by example:			
The aim of the study:	This study aims to reveal the origin and basic logic of high-tech international cooperation, investigate the theoretical basis of high-tech international cooperation, analyze the efficiency of science and technology enterprises, analyze the development strategy of science and technology in the global economy, and put forward the direction for the implementation of the main provisions of international cooperation between China and Ukraine.		
Objectives of the study	<ul style="list-style-type: none"> – Improving the theoretical basis for international high-tech cooperation. – Determining the economic substance and basic principles of international cooperation. – Studying the content and types of high-tech import and export strategies. – Assess the efficiency and productivity levels of technology businesses. – Conduct a systematic structural analysis of the efficiency of science and technology enterprises in the process of implementing international cooperation. – Study trends in the world, China and Ukraine in the science and technology sector. – Evaluate the efficiency and productivity of investment projects. – Analysis of high-tech development strategies in the global economy. – Orient the implementation of the main provisions of international cooperation in the field of high technologies. – Propose to improve international cooperation between China and Ukraine in the field of science and technology. – Propose scientific and technological diversification in international cooperation. – Provide an economic justification for high-tech international projects. – Form conclusions about the topic of the bachelor's thesis. 		
Subject of study:	Theoretical, methodological and applied basis for the operation of international scientific and technological cooperation between countries and enterprises of high-tech technology in the conditions of post-economic development.		
Object of study:	It is the enterprise development process of international high-tech cooperation.		

Scientific novelty	The scientific novelty of this work is the further development of the methodological basis for the transformation of the world economic scientific and technological system in the post-crisis period, on the basis of a gradual transition from traditional to more advanced technologies, in order to improve the international position and develop international scientific and technological cooperation.
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Key words: International cooperation, high technology, China, Ukraine.

Annotation

ZHAO Mengyao. High-tech international cooperation between China and Ukraine. –Manuscript.

Bachelor's thesis 051 "Economics" in the field of study, education and professional course "International Economics". - National Technical University of Ukraine "Ihor Sikorsky Kyiv Polytechnic Institute". - 2023.

This work defines the economic nature and basic principles of international cooperation in the science and technology sector. The author examines the content and types of high-tech strategies. The main methods for assessing the efficiency and productivity levels of technology enterprises have been identified. The development trends of the world and the science and technology sector in countries such as China and Ukraine were analyzed. The efficiency and productivity of investment projects in the science and technology sector were evaluated. It also analyzes the development strategies of high technologies in the world economy. The direction of improving international cooperation between China and Ukraine in the science and technology sector has been formalized. It is recommended that scientific and technological diversification be achieved in international cooperation. The economic legitimacy of international high-tech projects has been formed.

Research Theme: Theoretical, methodological and applied foundations of international scientific and technological cooperation between countries and enterprises of high-tech technologies in the post-economic development stage.

The scientific novelty of this work lies in the further development of the methodological basis for the transformation of the world economic scientific and technological system in order to enhance national status and develop international scientific and technological cooperation in the post-crisis period, on the basis of a gradual transition from traditional science and technology to modern high technology.

Key words: International cooperation, high technology, China, Ukraine

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INTRODUCTION

Actuality of theme. The topical nature of the topic depends on the current state of the world economic system, the possibility of conflict in many countries of the world, and the special conditions under which scientific and technological developments operate in conditions of uncertainty. The high-tech sector in the 21st century is key to ensuring the economic stability of countries. A steady supply of high-tech contributes to the normal functioning of the world economy as well as all spheres of politics.

The perfect mechanism of high-tech industrial operation ensures a comfortable life, the stable operation of industry and the development of the economy as a whole. In order to minimize the negative economic consequences of the transition effect, it is necessary to provide a list of phases of transition based on forecasts. Based on the forecasts, balanced management decisions will be made with limited resources.

Science has developed scientifically, but many issues have not been fully studied. This relates to the structure of the technology market and the outlook for technology. The issue of technological change in the science and technology sector and the evaluation of the effectiveness of the latest high-tech technologies are very important.

All this determines the choice of the topic of the bachelor's thesis, the rationality of its purpose, the task, and the logic of the study.

The purpose of this study is to reveal the origin and basic logic of high-tech international cooperation, investigate the theoretical basis of high-tech international cooperation, analyze the efficiency of science and technology enterprises, analyze the high-tech development strategy in the global economy, and put forward the direction for the implementation of the main provisions of international cooperation between China and Ukraine.

In accordance with the set goal, the following **tasks were defined and solved in the dissertation:**

—— Improving the theoretical basis for international scientific and technological cooperation.

— Determining the economic substance and basic principles of international cooperation.

— Studying the content and types of high-tech import and export strategies.

— Assess the efficiency and productivity levels of technology businesses.

— Conduct a systematic structural analysis of the efficiency of science and technology enterprises in the process of implementing international cooperation.

— Study trends in the world, China and Ukraine in the science and technology sector.

— Evaluate the efficiency and productivity of investment projects.

— Analysis of high-tech development strategies in the global economy.

— Orientation for the implementation of the main provisions of international cooperation in science and technology.

— Propose to improve international cooperation between China and Ukraine in the field of science and technology.

— Diversifying science and technology in international cooperation.

— Provide an economic justification for high-tech international projects.

— Form conclusions about the topic of the bachelor's thesis.

The object of the study It is the development process of technology of international science and technology cooperation enterprises.

Subject of study: Theoretical, methodological and applied basis for the operation of international scientific and technological cooperation between countries and enterprises of high-tech technology in the conditions of post-economic development.

Research methods. Commonly known research methods were used to achieve the goal and solve the tasks of the bachelor's thesis. The main general scientific methods of research include: the dialectical method of cognition; formal-logical method; method of comparison; generalization method; systematization method; classification method; synthesis method; methods of grouping; statistical and mathematical methods; graphical analysis; systematic approach; integrated approach; forecasting method, factor analysis, comparative analysis, analogy method.

Scientific novelty. The scientific novelty of this work is to further develop the methodological basis for the transformation of the world economic scientific and technological system on the basis of the gradual transition from traditional science and technology to modern science and technology in the post-crisis period, in order to enhance the international status and develop international scientific and technological cooperation.

Practical significance of the obtained results. The measures developed by the author and confirmed in the bachelor's thesis can be used by enterprises of China, Ukraine and other countries that carry out industrial and commercial activities in the high-tech sector and in the field of modern scientific and technological technologies

In order to develop international scientific and technological cooperation and improve the economic efficiency of these enterprises.

Structure and scope of the bachelor's thesis. The work includes an introduction, three chapters, conclusions, a list of literary sources used, and an appendix. The workload includes the printed text of the 80 page, including: 4 table, 4 pictures, 41 list of sources on 3 page.

CHAPTER 1.

THEORETICAL FOUNDATIONS OF INTERNATIONAL SCIENTIFIC AND TECHNICAL COOPERATION

With the in-depth development of a new round of scientific and technological revolution and industrial transformation, scientific and technological innovation is reshaping the global political and economic map and reconstructing the pattern of international division of labor. In view of the great changes in the paradigm of scientific and technological innovation, the coexistence of fierce competition and inclusive cooperation between countries in the field of scientific and technological innovation, and the integration of independent innovation and open innovation have gradually become a general trend. In the face of unprecedented historical opportunities and severe challenges, the changes in the scientific and technological innovation strength of China and Ukraine and the new concept of innovation cooperation, building a new model and clarifying a new path have at least three significances: helping each other to occupy a leading position in the high-tech field and achieve sustainable development; Promote the steady and long-term implementation of strategic partnership of coordination in the new era; Participate in global science and technology innovation governance and jointly promote the globalization of science and technology innovation. Scientific and technological innovation cooperation in the new era should be guided by the new concept of cooperation that is future-oriented, co-creation and sharing, open and inclusive, and complementary advantages, and promoted by a new cooperation model of multi-subject synergy, support from various platforms, and deep integration of innovation chain and industrial chain, to further give new connotation to the optimization of cooperation path: improve the top-level design of the cooperation mechanism; Deepen cooperation in basic research areas; Strengthen cooperation in high-tech industries and promote the deep integration of scientific and technological innovation and industrial development; Promote cooperation on key projects and strive for practical results; Give full play to the main role of enterprises in scientific and technological innovation cooperation; Strive to build a scientific and technological innovation cooperation service platform; Jointly promote global innovation cooperation under multilateral mechanisms.

China-Ukraine cooperation in science and technology innovation has a deep history and has established a solid foundation. Scientific and technological cooperation has played an active role in the establishment of the basic industrial system, the establishment of scientific research institutions and the cultivation of scientific and technological talents in New China. A new round of scientific and technological revolution and industrial transformation is developing in depth, and the world is in a critical period of transformation to digitalization and intelligence. Based on a new historical starting point, this paper takes the achievements and existing problems of the previous scientific and technological innovation cooperation between China and Ukraine as a guide, and starts from the new changes in their respective scientific and technological innovation strength and the new expectations of the two sides for scientific and technological innovation cooperation, adjusts the cooperation ideas, studies the new mode of scientific and technological cooperation between Ukraine and China, explores new paths of scientific and technological innovation cooperation, and provides intellectual support for the scientific and technological innovation cooperation between the two countries to open a new historical journey and build a new future.

1.1. Origin and process of development of high-tech cooperation and the innovative technologies

The rise of modern science and technology in the mid-15th century was an important period of transformation in European history. The bourgeois revolution provided the social conditions for the birth of modern natural science. At the same time, science itself waged an indomitable struggle to gain its own independent status and free itself from the shackles of religion. The rise of experimental science has given natural science an independent practical foundation.

The first industrial revolution, the main reason or political premise for the first industrial revolution in Britain was that the rule of the bourgeoisie in Britain was gradually established and increasingly strengthened; Through the enclosure movement, the United Kingdom generated and gathered a large number of labor forces, and also expanded the British domestic market; Years of overseas trade and colonial expansion have accumulated raw capital for Britain, providing a vast raw material land and

overseas markets. The century of science, century refers to the 19th century, when modern science flourished in an all-round way. The scale and maturity of scientific development in the 19th century far exceeded the scientific revolution in the 17th century, and major breakthroughs were made in thermodynamics, optics, electromagnetism, chemistry, geology, biology, anthropology and other disciplines, and most of them entered a new stage of theoretical synthesis. On the other hand, global protectionism and unilateralism are prevalent, the balance of international power has been profoundly adjusted, and the development of world multiploidization has accelerated. In terms of scientific and technological development, various countries are not only facing the malicious suppression of some external forces, but also facing the urgent need to promote high-quality development and build a new development pattern.

There are hundreds of enterprises and dozens of scientific research units involved in aerospace technology in Ukraine, the center and base of which are the Southern Design Bureau and the Southern Machine-Building Plant in the eastern city of Dnepropetrovsk. Four generations of strategic missiles, various types of carrier rockets, and multifunctional remote sensing satellites have been designed and manufactured here. Ukraine is a member of the International Space Station program, and there are "Ukrainian modules" built on the International Space Station. In 1995, Ukraine and the United States, Russia and Norway jointly established an internationally famous "sea launch" joint venture, using a floating launch platform on the sea to launch commercial satellites, and the launch vehicle used is Ukraine's famous "Зенит-3SL" rocket. In addition, Ukraine also has huge scientific and technological potential in earth communication satellites, earth and ocean resource satellites, space remote sensing, and small satellite applications.

Ukraine's machinery manufacturing industry with the military industry as the main body is relatively developed, Kharkiv produces advanced T-80 tanks, Kiev and Kramatorsk machine tool development and production history is long, strong strength, can process workpieces with a length of tens of meters and a diameter of several meters, the production of CNC machine tools, products are sold to the United States, Germany, France and other countries.

The development and production of new materials is Ukraine's strength, and the Institute of Materials Science, Superhard Materials, Crystallography, Strength and Metal Physics of the Ukrainian Academy of Sciences is concentrated in Ukraine, which was called the "Five Major Materials Research Institutes" in the former Soviet Union. The scope of the work and the magnitude of the results are impressive. Microelectronic materials, optoelectronic materials, functional materials, artificial superhard materials, everything.

The welding technology represented by the Barton Welding Institute of the Ukrainian Academy of Sciences is in a leading position in the world. Welding processes and equipment in rails and high-strength alloys; The welding technology and equipment of large-thickness titanium and its alloys, high-frequency welding pipe making technology, space welding technology and technology, underwater mechanized welding, and welding between metal and non-metallic phases have world-leading technology.

Ukraine's foreign trade accounted for a small proportion of the national economy in 1990, accounting for only 5.19% of the net output value of goods in 1990, and the government also recognized that in order to establish a market economy system, it was necessary to increase openness and deepen its involvement in the international market.

In the process of reforming the foreign trade system, the government has reduced the scope of licensing and relaxed the control of foreign trade enterprises. It is also important that the State no longer covers the profits and losses of foreign trade enterprises, privatize some foreign trade enterprises, encourage the establishment of trade trust companies, and distribute state orders to foreign trade companies in the form of auctions and tenders.

These reforms have effectively increased the dynamism of the foreign trade sector. As a result, foreign trade has developed significantly. In 1996, the share of foreign trade in GDP had risen to 30 per cent.

In order to expand stable export markets and gain access to energy, consumer goods and means of production, which are seriously lacking in the country, Ukraine is actively looking for new trading partners. Europe is a key target for Ukraine to expand economic and trade relations. This is not only related to the geographical location of Ukraine, but also to the traditional economic ties between Ukraine and the former

Economic Cooperation countries. At present, Germany, Poland, Italy and France have become the main trading partners of Ukraine.

The formulation of foreign investment policies aimed at encouraging the inflow of foreign investment and managing it as a necessary basis is an essential condition for the effective utilization of foreign investment. In accordance with the needs, Ukraine has formulated a series of laws and regulations on attracting foreign investment, including the Law on Foreign Investment, the Measures for the Administration of Foreign Investment, the State Framework Law on Encouraging Foreign Investment in Ukraine, and the Measures on Foreign Investment in Ukraine. At present, Ukraine's policy of attracting foreign investment mainly has the following characteristics:

First, the investment field is relatively open and the forms of investment are diversified. According to the regulations, foreign investment may be made in all areas not directly prohibited and restricted by Ukrainian legislation. The forms of investment can be as follows: investment in foreign exchange; Investment in various movable and immovable property and related property rights; Investing in stocks, bonds and other negotiable securities, investing in intellectual property rights with certain value such as copyrights, invention rights, trademark rights, and technological products; investing in natural resources; Wait a minute.

In addition, foreign investors can form joint ventures with Ukrainian legal entities or partially purchase existing enterprises; Establishment of a wholly foreign-owned enterprise or purchase of all the property of an existing enterprise; direct purchase of movable or immovable property (including land, dwellings, equipment, means of transport and other property) not prohibited by Ukrainian law, or direct purchase of property in stocks, bonds and other negotiable securities; Foreign-owned enterprises may own 100% of the land use rights and concessions for resource exploitation purchased solely or jointly with Ukrainian legal and natural persons.

Before the reform and opening up, there were very few scientific and technological cooperation and exchanges between China and foreign governments, and there were only a small number of non-governmental exchange projects with other countries. International scientific and technological cooperation during this period was mainly carried out before the Cultural Revolution. During the Cultural Revolution, China's scientific and technological undertakings suffered heavy losses, and

international scientific and technological cooperation was at a low ebb. In 1978, in order to improve the situation and enhance the country's comprehensive national strength, the Chinese government made a major policy decision on reform and opening up.

The first stage: the policy of international science and technology cooperation.

1978, the Chinese in the increase of economic opening to the outside world at the same time, strengthen international cooperation in science and technology as an important task of national science and technology development to grasp. Later, China introduced a series of policies and measures, in accordance with the results of "equality and mutual benefit, sharing, protection of intellectual property rights, comply with international practice" principle, in the form of bilateral, multilateral and officer of the people and, extensive international technology cooperation. China held a national work conference on science and technology for the first time foreign affairs, offered to foreign science and technology activities emancipate the mind, and how to carry out comprehensive cooperation of science and technology policy.

In 1981 at the second session of the national science and technology of the foreign affairs work revised the foreign policy of science and technology cooperation and communication, namely: "on the premise of independence, self-reliance, proceeding from domestic actual situation, pragmatic, study advanced countries to apply to the national science and technology, science and technology management experience, positive, safely, in-depth and solid international technology cooperation and exchange activities, for the development of China's national economy and science and technology service. "This approach in the first foreign affairs meeting request to emancipate the mind, to carry out activities on the basis of a step forward in the direction of deep, solid.

Under the push of the policy, China international technology cooperation gradually recover from the hit of the cultural revolution, restored relationship with science and technology from foreign countries, and eastern European countries in science and technology cooperation from recovery began to stable development, between the UN system and other international science and technology and scientific and technological cooperation and exchange have larger development, at the same

time, scientific and technological cooperation between the government and the western developed countries has begun.

In this period, China to determine the stage of international cooperation of science and technology of the specific guidelines, adjusted under centralized management of foreign affairs of science and technology, and established the talent introduction work management system, strengthen the foreign institutions of science and technology research.

The second stage: China international technology cooperation in an all-round way to strengthen and standardize the technology introduction and absorption of the work.

As China's reform and opening up, the introduction of western equipment and high technology. Foreign enterprises and scientific research units (especially multinational companies) in order to enhance their competitiveness, began to come to China joint ventures or wholly owned by foreigners set up scientific research institutions. International science and technology, it is to carry out the communication between countries in technology, to promote the development of science and technology important organization form, also shows the countries in the international influence and status of the important stage of scientific community.

State science and technology commission in 1986 at the fourth national conference on science and technology of the foreign affairs work, put forward the "foreign affairs work of science and technology to promote the China science and technology products and technology exports as an important task". Various departments and regions have attached great importance to this work, in international cooperation and exchange of science and technology at the same time, pay attention to scientific and technological cooperation to promote economic cooperation, promote foreign science and technology and economic integration. At this stage, China international technology cooperation scope, content, field, form, etc have made great progress, formed the basic pattern of foreign cooperation.

Join international organizations of science and technology.

Cooperation with developing countries from the early stages of reform and opening up the scope of development as the main to include with the western

developed countries, the world's major countries; Cooperation content in the original comparison single, on the basis of scientific research, technology transfer, started the broader industry research and development, etc.; Cooperation from the original field of traditional development to the biological technology, space technology, information technology, automation technology, laser technology and new materials, new energy and other high-tech fields; Form of cooperation from the initial personnel, technology import and development to the joint research project in China, sino -foreign joint or jointly organized scientific research institutions. A multi-level and multi-channel, multi-form all-round international cooperation of science and technology basic formation of a new situation.

The third stage: international technology cooperation

Entering the 21st century, science and technology increasingly complex problems, many of them are global problems, its scope, scale, cost and complexity is far beyond the ability of a country, international cooperation become the inherent requirement of the research and development. At the same time, China economy high speed development, society, science and technology, an unprecedented increase in the overall national strength, science and technology innovation ability also rises greatly. China has become not only attract investors around the world an important part of the country, but also become the focus areas and the national science and technology innovation in the world. International and domestic changes in the environment of our country's international cooperation of science and technology brings new opportunities and challenges. In this background, China established the "win-win", an omnidirectional, multilevel and wide-range international technology cooperation policy.

In this period, China's international cooperation of science and technology policies show the four major characteristics: from the national strategic level to promote the international cooperation of science and technology; Intensify international cooperation of science and technology, set up international cooperation of science and technology special funds; Actively participate in the organization and the international big science project plan; To strengthen technical assistance to developing countries. From the national strategic level to promote international cooperation in science and technology.

In 2000, China established the first international cooperation of science and technology development program, the international cooperation of science and technology development during the tenth five-year plan outline, to China during the period of "15" international s & t cooperation has made the overall deployment and arrangement, put forward to promote the cooperation, to speed up the implementation from general cooperation and exchanges to take the initiative to use strategic shift in the global resources of science and technology. Strategic shift includes: strategic objectives from the general international cooperation of science and technology to the long-term program for scientific and technological development as the goal, to demand as the guidance of the international scientific and technological cooperation, cooperation method from you to pay attention to the project cooperation to comprehensively "project - talent - base", the combination of cooperation from the focus on technology transfer to "introduction" and "going out", the combination of the principle cooperation from government and research institutions to government guiding, main body participation, task project was established from the "bottom-up" mechanism to "outline" oriented "top-down" initiation mechanism. Key areas of cooperation include: energy, water and environmental protection technology; Major disease prevention and control technology, traditional Chinese medicine, biological medicine development technology, such as improve people's health level of the field; Information technology, new materials, advanced manufacturing technology; Life science, nanotechnology, space technology, Marine technology, basic subject and science front, and other fields.

Other departments also responsible around yourself at the center of the work, puts forward the focus of the international science and technology cooperation and priority areas, such as the ministry of health to determine priority areas including the major infectious diseases prevention and control technology, major chronic diseases prevention and control technology, the public health prevention and control technology, key technology diagnosis and inspection, etc.; The environmental protection bureau to determine priority areas including regional environmental pollution, cross-border river basin water pollution control and water environment management

Intensify international cooperation of science and technology, set up special funds for international technology cooperation

2000 years ago, China has no special funds set up international technology cooperation. With the rapid development of China's economy and science and technology, the government realized that must be set up special funds, international technology cooperation so that more development is given priority to with our cooperation projects. In 2001, the state Ministry of Science and Technology set up a "international technology cooperation plan key projects. "The plan is the first and only national level through integration, as a whole, make full use of global resources of science and technology, improve the independent innovation ability of foreign international technology cooperation and communication platform.

Reform and opening up 30 years, in the international cooperation strategy and policy under the guidance of science and technology, China international technology cooperation gradually grow and mature. At present, China has signed with many countries and regions of the world science and technology cooperation agreement between the government or economic and technological cooperation agreement between the government, a relatively complete intergovernmental cooperation framework of science and technology has been formed. International s&t cooperation has become the focus of the country's diplomatic work, an increasingly important role in national diplomatic service 。

International technology cooperation is to strengthen the construction of mechanism, realize the innovation of the mutually beneficial and win-win cooperation model. The world is facing the global economic development imbalance, unilateralism and protectionist forces up challenges. In this background, the international technology cooperation is a road to innovation, it has increasingly become the important driving force of enhancing comprehensive national strength. It will in China's competitive capacity combined with the advanced technology of developed countries, developing countries, in order to solve some of the urgent demand has played a fundamental role.

1.2. Components and indicators of high-tech cooperation between countries

Starting from the changes in the scientific and technological innovation strength of China and Ukraine and the expectation of scientific and technological innovation development, combined with the new opportunities and challenges faced by the scientific and technological innovation cooperation between the two countries, and with the goal of jointly participating in global scientific and technological innovation governance, consolidating the strategic partnership of coordination in the new era, and seeking national strength and people's well-being, it is necessary for China and Ukraine to adjust the concept and mode of scientific and technological innovation cooperation.



Pic.1.1 (1) Reshaping of new concepts

Under the general trend of scientific and technological revolution development and industrial transformation, the concept of scientific and technological innovation cooperation between China and Ukraine should follow the past cooperation experience and solve the problems existing in cooperation, and should follow the trend and inject more new elements into the goal of promoting sustainable development.

Future-proof. Scientific and technological innovation is an important variable in the great changes unprecedented in a century. On the one hand, the new scientific and technological revolution is a subversion of the traditional knowledge system, which is likely to make major breakthroughs in the fields of new generation information technology, new energy technology, biotechnology, new material technology, intelligent manufacturing technology, quantum technology, etc., thereby accelerating

the evolution of industrial transformation, giving birth to a large number of new products, new industries and new formats, and then reconstructing the development model. On the other hand, the new scientific and technological revolution has also brought many uncertainties to global development, and the risks that may arise from individual technological development will have a strong impact on social morality, social ethics, social order, ecological security, government governance, etc., causing people to worry about the future of the country and even the fate of mankind. While consolidating the traditional cooperation fields and cooperation projects, scientific and technological innovation cooperation needs to carry out forward-looking layout according to the future direction of scientific and technological development and industrial development, and at the same time carry out beneficial exploration of global scientific and technological innovation governance schemes.

Co-creation and sharing. The world has entered an unprecedented era of "big technology", and innovative products from R&D design, technology integration, production organization, value realization to benefit distribution, are inseparable from the interaction of all parties across national boundaries. The interaction and cooperation between researchers, investors, developers, producers, service providers and applications jointly promote the continuous expansion of the knowledge base and the continuous iterative upgrading of technology. The goal of further promoting scientific and technological innovation cooperation between China and Ukraine is to promote the integration of all participants into the global innovation network, obtain innovation resources from a broader space, and realize the sharing of innovation results while deepening the responsibility and risk sharing of R&D promotion, so as to continuously improve the overall scientific and technological innovation capacity and scientific and technological innovation efficiency of the two countries as a whole.

Be open and inclusive. Today's world has entered the era of "fusion innovation". Interdisciplinarity, technology integration, and industrial cross-border have gradually become trends, and the boundaries between the physical, biological and digital worlds are no longer clear. This requires deeper and broader exchanges, integration and integration between disciplines, industries and even countries. No country can solve all innovation problems on its own. Abandon the outdated traditional security concept and zero-sum game thinking, smooth the communication channels of scientific and

technological personnel, eliminate obstacles that are not conducive to technology transfer and transformation, and create a more convenient environment for the transnational flow and global integration of innovation factors.

As we all know, the level of basic research development determines the depth and breadth of a country's scientific and technological innovation, and is a strong support for the core technology system. China's basic research field is still weak, and major original achievements are relatively lacking. But China has at least three advantages.

First of all, the enthusiasm for innovation and entrepreneurship is high. China's scene innovation provides a new scientific research infrastructure for entrepreneurial innovation, so that different links and various elements of the innovation chain converge in the same time and space, promoting the growth of entrepreneurial enterprises. A large number of unicorn enterprises, gazelle enterprises, and platform-based organizations have emerged as the times require, and new formats and models have developed actively.

Second, R&D funding is relatively abundant. From the perspective of R&D intensity, the academic community divides the technological innovation process of the country (region) into three stages according to the intensity of R&D investment: technology use stage, technology improvement stage and technology creation stage. When the R&D intensity is less than 1%, it is the stage of technology use; 1%~2% is the technical improvement stage; More than 2% is in the stage of technological innovation. At present, China's R&D intensity has exceeded 2%, and according to the above standards, it has entered the stage of technological innovation. From the perspective of the abundance of venture capital funds, China's attractiveness to venture capital has risen rapidly since 2013, and in 2014 it has become the second largest recipient of venture capital after the United States.

Third, it has a broad market space and a good industrial foundation. China's huge and diversified market demand and relatively complete industrial system provide a broad space for scientific and technological innovation and development, and a large number of future industries with digital intelligence as the main feature have the basic conditions for outbreak in China. Ukraine's advantage lies in basic research and talent reserves, and China and Ukraine can play their respective advantages to explore a

"dual-engine" driven integrated innovation path, that is, basic research and core technology supply path and demand-induced path complement each other and drive the road of two-wheel drive.

(2) Exploration of new models

International cooperation in science, technology and innovation is an important way to build an open innovation mechanism on a bilateral or multilateral scale. From a hierarchical point of view, it includes both official and non-governmental cooperation; In terms of coverage, including bilateral cooperation, including multilateral cooperation; From the perspective of cooperation forms, it includes intergovernmental scientific and technological innovation dialogue, scientific and technological assistance, technology introduction or transfer, joint scientific research funding, establishment of joint research centers or joint laboratories, joint construction of scientific and technological innovation bases, etc., as well as personnel exchanges, academic exchanges or training, joint application projects, cooperative publication of papers, information sharing, etc. between research institutions. From the perspective of participants, it includes innovative subjects such as government management agencies, colleges and universities, scientific research institutes, enterprises, and scientific and technological societies, as well as third-party organizations such as consulting institutions, intermediary organizations, financial institutions, and insurance institutions. The differentiation of cooperation levels, the diversification of cooperation subjects, the wide coverage of cooperation, and the diversification of cooperation forms determine the complexity of promoting international cooperation in science and technology innovation. However, the in-depth advancement of the new round of new scientific and technological revolution and industrial transformation has created an unprecedented "window of opportunity" for narrowing the gap with technologically advanced countries, and seizing the opportunity in a timely manner and exploring a scientific and technological innovation cooperation model that gathers the efforts of all parties and makes up for shortcomings as soon as possible is an issue that should be considered in the current international cooperation of science and technology innovation between China and Ukraine. In summary, the reconstruction of the science and technology innovation cooperation model between China and Ukraine should include at least three aspects:

Multi-subject synergy. As the top-level designers, builders and maintainers of the innovation cooperation ecosystem, the governments of the two sides should formulate clear cooperation rules, technical standards, personnel exchange procedures, information exchange standards, etc., so that all participants in scientific and technological innovation cooperation have laws to follow and rules to follow, guide all innovation cooperation participants in "intelligent government, industry, academia and research" to perform their respective duties, do their best and effectively connect, participate in scientific and technological innovation cooperation through multi-party linkage, close cooperation, multi-dimensionality and multi-path, and effectively improve the innovation resource allocation capabilities of all participants. Improve the embedding rate and contribution of all parties in the scientific and technological innovation cooperation network, and realize "collaborative innovation" oriented by co-creating value.

Various types of platform support support. Scientific and technological innovation cooperation is inseparable from the support of talents, information and finance, and even more inseparable from the commercial support of project landing and implementation. It is necessary to guide the establishment of talent information platforms, science and technology information platforms, science and technology policy release platforms, science and technology service platforms, technology incubation platforms, technology industry transformation platforms, and industrial innovation platforms. Through effectively promoting the flow of talents, exchanges and cooperation between scientific research institutions, and scientific and technological services such as prediction of scientific and technological development prospects, scientific and technological information consultation and suggestions, and scientific and technological evaluation, we will promote the transfer and transformation of technology, promote the organic integration and optimal allocation of innovation resources, and support the stable and long-term development of scientific and technological innovation cooperation.

The innovation chain and the industrial chain are deeply integrated. Both China and Ukraine have strong demands for scientific and technological innovation as a new driving force to promote the development of strategic emerging industries and modern manufacturing. In essence, an important criterion for testing the success or failure of

scientific and technological innovation is to see whether it can promote industrial upgrading and economic development. Realizing the precise docking of innovation chain and industrial chain, transforming innovation results into real productivity as soon as possible, and realizing benign interaction, interaction and integrated development between innovation and industry are reasonable paths tested by developed countries. The problems encountered by China and Ukraine in the development of scientific and technological innovation, as well as the obstacles in the previous scientific and technological innovation cooperation between the two sides, are to a large extent related to the disconnect between the innovation chain and the industrial chain. Therefore, to deepen the cooperation between China and Ukraine in science and technology innovation, we must play a leading role in industrial development driven by innovation on the one hand, and solve the problem of disconnection between innovation and industry on the other hand, guided by industrial demand.

In short, the improvement of China's scientific and technological innovation capacity is mainly due to seven factors. First, the quantity and quality of human capital elements have increased. From the perspective of the construction of scientific and technological talents, the number of R&D personnel per 10,000 employed persons in 2019 reached 62. In the 2020 "Highly Cited Scientists" list released by Clarivate, 770 scientists were Chinese mainland selected, accounting for 12.1%. Second, investment in scientific research has increased significantly. At comparable prices, the average annual growth rate of China's actual scientific research investment in 1990~2018 was 14.4%, which was 1.5 times the GDP growth rate in the same period, and the scientific research intensity also increased from 0.66% to 2.19% in the same period. Third, the innovation ecological environment has been continuously improved. The main structure of the reform of the science and technology management system has been basically established, the rapid development of science and technology finance, the multi-level capital market has provided strong support for the incubation and transformation of scientific and technological innovation achievements, and the science and technology innovation board, achievement transformation guidance fund, and public innovation space have created a good environment for enterprise innovation and entrepreneurship. Fourth, the basic conditions for scientific research have been

greatly improved. A number of major scientific and technological infrastructures such as China's spallation neutron source and 500-meter aperture spherical radio telescope have been established, and many state key laboratories and national engineering research centers have been established. Fifth, the status of enterprises as the main body of innovation has been improved. In 2019, there were 225,000 high-tech enterprises in China, of which 507 enterprises entered the top 2,500 global R&D investment in the global industrial R&D scoreboard released by the European Union, accounting for about 1/4. Sixth, regional innovation clusters are booming. According to the results of the WIPO assessment, 18 regions in China entered the top 100 global innovation clusters in 2019, with the Guangdong-Hong Kong-Macao Greater Bay Area, Beijing and Shanghai ranking in the top 10 global innovation clusters. Seventh, actively integrate into the global innovation network. China has signed intergovernmental agreements on scientific and technological cooperation with 114 countries and regions, participated in more than 200 international organizations and multilateral mechanisms related to scientific and technological cooperation, participated in and led the organization and implementation of international scientific plans and projects, and pragmatically promoted the "Belt and Road" scientific and technological innovation action plan.

Needless to say, the original innovation ability is not strong, the proportion of high-end scientific and technological output is low, and the core technology of the industry is subject to people. Up to now, the self-sufficiency rate of China's key components and components is only 1/3, about 52% of key materials rely on imports, at least 35 technologies and more than 60 core technologies have not yet been mastered, in high-end CNC machine tools, chips, lithography machines, high-end sensors and other fields rely heavily on imports. For a long time, China's technological development has mainly been based on tracking and imitating foreign innovation achievements, and has taken a road of "introduction, absorption, digestion and re-innovation" of scientific and technological catch-up. With the institutional advantages of concentrating on big things, although the gap with advanced countries can be rapidly shortened, and even some technologies have reached the forefront of the world, the problem of insufficient supply of core technologies has not been fundamentally solved. The crux of the problem lies in the neglect of basic research. Taking funding as

an example, China's basic research investment accounted for only 6% of total R&D investment in 2020, 11 percentage points away from the United States. Insufficient investment in basic research leads to the lack of ability to independently propose major scientific propositions and solve key industrial problems, and the direct consequence is insufficient original innovation and lack of subversive technological achievements. The weakness of China's basic research is also reflected in the quality of papers and patented technologies. The data from 2008~2018 show that the average citation volume of Chinese SCI papers ranks only 16th in the world. In terms of patents, although China's patent applications have ranked among the top in the world, according to the number of standard essential patents owned by the three major international standards organizations (ISO, IEC, ITU), China is only 1/25 of the United States, ranking 11th in the world. Core technology is subject to people, which is also the main reason why China's manufacturing is large but not strong. Although China is currently a global manufacturing country, and its industrial system covers all industrial categories of United Nations standards, many key components and high-end equipment still rely on imports in high-tech industries and high-end equipment manufacturing, and there is a big gap with the world's advanced level.

In recent years, China has actively promoted the construction of an innovative country, and its scientific and technological innovation capabilities have achieved major changes in history, integrity and pattern, and are moving from quantitative accumulation to qualitative leaps, and from point breakthroughs to systematic capabilities. In some fields, such as quantum communication, 5G, computer vision, supercomputing, deep-sea exploration, lunar exploration and other fields have leapt from "following" to "running" and even "leading". According to the WIPO Global Innovation Index, China's ranking has jumped to 14th in 2020. From the perspective of scientific research output, the number of international scientific and technological papers and the citation of international scientific and technological papers ranked second in the world, and the number of invention patents authorized ranked first in the world; From the perspective of cutting-edge technology and key core technology development, a number of major original achievements have been produced in the fields of iron-based superconductivity, quantum communication, stem cells, and brain science; From the perspective of the development of high-tech industries, scientific

and technological innovation has provided new momentum for industrial optimization and upgrading, and high-speed rail and 5G mobile communication have entered the forefront of the world.

Under the guidance of the new concept of cooperation with future-oriented, co-creation and sharing, openness and inclusiveness, and complementary advantages as the main elements, and under the cooperation mode supported by the collaborative linkage of multiple subjects, the support of various platforms, and the deep integration of innovation chain and industrial chain, it is appropriate to deepen the cooperation in science and technology innovation between China and Ukraine from the following direction.

As we all know, driven by the new round of scientific and technological revolution and industrial transformation, the global scientific and technological innovation paradigm has undergone profound changes, which are highlighted as: the role of basic research is becoming more and more prominent; The investment scale of material and intellectual resources selected for cutting-edge technology routes is unprecedented, and the risks have increased sharply; Interdisciplinary, cross-field and cross-industry integration is gradually becoming a trend; Scenario-driven reverse ecological innovation with the participation of scientists, entrepreneurs, investors, governments and other parties came later; Independent and controllable open source innovation is gradually becoming a trend; The trend of networking, digitalization, platform and socialization of technological innovation has emerged; Scientific and technological innovation achievements are mainly based on group breakthroughs. The change in the paradigm of scientific and technological innovation extends to the national level, and the profound impact is that any country, regardless of its innovation ability or not, needs to participate in international scientific and technological innovation cooperation, integrate into the global innovation chain, and use global innovation resources while adhering to independent innovation, so as to achieve the goal of reducing innovation costs and risks and improving the efficiency and level of scientific and technological innovation. As a result, fierce competition and inclusive cooperation in the field of scientific and technological innovation between countries have coexisted, and the integration of independent innovation and open innovation has become a general trend.

1.3. Methodical support of the strategic partnership between countries

Since 2014, Ukraine has made great strides in making the country attractive for international business. Successive governments have embarked on a series of economic, institutional and political reforms aimed at bringing the country closer to the European Union and promoting economic growth and competitiveness.

Ukraine now has 18 free trade agreements with 47 countries, including a union agreement with the European Union (EU) in 2014. This opens the door to ongoing conversations to establish a full Industrial Product Conformity Assessment and Certification Agreement (ACCA), which will create an "industrial visa-free regime" between the EU and Ukraine for a range of imports and exports. Achieving this status requires Ukraine to closely coordinate its legal and regulatory framework with the EU, making it more attractive and attractive to foreign investors in the process.

In May 2021, after an initial assessment of Ukraine's readiness for the ACCA, the EU reported that over the past 10 years, Ukraine has achieved significant results in implementing EU legislation in priority areas. The EU also commends the constructive and highly professional dialogue with Ukrainian experts during this process.

According to the State Investin Agency for Inward Investment, the country had FDI flows of \$16 billion between 2015 and 2019, leading to the construction of more than 100 manufacturing plants and tens of thousands of new high-value-added jobs.

Among the international investments, Bayer in Germany has invested \$200 million in a state-of-the-art seed processing plant, Cargill in the United States has invested in a \$150 million grain terminal, Jabil has invested in a second manufacturing base of \$16 million, and global brands such as General Electric, Ryanair, HEAD, IKEA, H&M and Decathlon.

Ukraine's economy has a long history of strength in sectors such as agriculture, energy production, metallurgy, chemical engineering and heavy manufacturing. However, in recent years, Ukraine has been attracting no less attention in cultivating innovative businesses and entrepreneurs within its high-tech industrial base and fast-growing IT and digital services sector.

According to the Good Country Index, a London-based NGO that measures countries' contributions to the world beyond their borders, Ukraine has ranked first in the world for its global contribution to "science and technology".

The country's ranking in this category is based on five indicators: the number of foreign students, the number of scientific journals and newspapers published and exported, the number of articles published in international journals, the number of Nobel laureates and the number of international patents, according to the World International Patent Organization.

Ukraine's well-educated workforce is highly regarded around the world, leading major tech multinationals including Oracle, Ring, Siemens, Cisco, and Samsung to establish major R&D facilities in the country.

It is estimated that the Ukrainian IT market has tripled in the last four years to 184,700 IT specialists. According to the 2019 CEE Report, the software development sector in Ukraine grew by 19% in 2018 and continues to grow steadily. The tech sector is one of Ukraine's major service export players, generating about \$5 billion a year for the country.

In addition to being seen as an increasingly attractive location for established tech companies, Ukraine has a reputation for being home to numerous tech start-ups, including Grammarly, Gitlab, Ahrefs, Depositphotos, MacPaw, YouScan, and Petcube. In StartupBlink's 2020 Global Startup Ecosystem Report, Ukraine ranked 29th out of 100 startup-friendly countries, up two places from the previous year. Kiev, the capital of Ukraine, ranks 32nd in the world and 8th in Europe, but the country also has a strong startup ecosystem, concentrated in other major cities, including Lviv, Odessa, Kharkiv, and Ternopil.

Since 2019, Ukraine's "State in a Smartphone" government program aims to provide every citizen with an online remedy to solve any government-related problems. The overall goal is to make Ukraine the most convenient country in the world for citizens and businesses.

The main application "Diia" ("Action") won the prestigious Red Dot Design Award in 2020. Digital documents in Diia have the same legal force as their plastic or paper documents. Ukraine, for example, was the first country in the world to bring a digital passport in a smartphone to a completely legal analogue to a paper document.

More than 10 million Ukrainians are using the services of the DIIA ecosystem. Diia 2.0 is an updated mobile app that allows Ukrainians to access their digital files, including ID cards and foreign biometric passports, student IDs, driver's licenses,

vehicle registration certificates, vehicle insurance policies, tax identification numbers, birth certificates, and IDP certificates.

The world's fastest business registration has been launched on the DIIA portal: you can now apply for a private entrepreneur in 10-15 minutes and an LLC in 30 minutes. The service has been used by 250,000 private entrepreneurs and more than 2,500 companies. A convenient online service for obtaining permits and licenses is also available on the Diia portal.

Ukraine has also made significant progress in renewable energy in recent years, including its integration into ENTSO-E (European Association for Cooperation of Operators of Electricity Transmission Systems) as part of efforts to reduce Ukraine's dependence on natural gas and strengthen the country's energy security and independence.

In 2018, 347 renewable energy projects supplied electricity to the Ukrainian wholesale electricity market at feed-in tariffs in 2018. According to the regulator, the number of solar PV contracts between energy supply companies and households has also tripled. In 2019, the deployment of renewable energy projects was further accelerated, with a total investment of 3.7 billion euros and a more than threefold increase in total installed capacity. To date, major renewable infrastructure projects include DTEK's state-of-the-art Botievska and Prymorska wind farms and DTEK Pokrovska solar power plants. The latest estimates indicate that renewable energy accounted for 6.8% (10,284 GWh) of Ukraine's total energy consumption in 2020.

In 2008, Ukraine officially launched negotiations on visa exemption with the European Union, and the two sides put forward a series of requirements, mainly focusing on the following four aspects: the first is the certificate itself, Ukraine should ensure the security of the document, including the use of biometric technology to enter relevant personal information; The second is to strengthen government management, Ukraine should increase efforts to combat illegal immigration and improve border management; Third, in the field of public security, Ukraine should vigorously combat organized crime, including drug smuggling and trafficking in human beings; Fourth, Ukraine should maintain good diplomatic relations with European countries. In November 2010, at the Brussels Summit, the two sides signed the "Visa Exemption Action Plan", marking that the two sides have basically negotiated the conditions for

visa exemption, and Ukraine only needs to follow the conditions listed by the EU to sign a visa exemption agreement with the EU. In May 2011, Ukrainian Deputy Prime Minister Kryuev said that he would actively fulfill his commitment to the European Union and introduce biometric passports within this year. Although there is no exact date yet, on the whole, this is a milestone for Ukraine. The Ukraine-EU FTA was also proposed in the EU-Ukraine Action Plan adopted in 2005. On February 18, 2008, Ukrainian President Viktor Yushchenko and EU Trade Commissioner Mandelson announced in Kiev that the two sides had officially begun negotiations on the establishment of a free trade area. Fifteen rounds of negotiations had been held by February 2010, and the two sides are expected to sign an agreement establishing a free trade area by the end of 2011. The EU said that the EU fully supports the development path chosen by Ukraine and agrees to zero tariffs on the export of Ukrainian steel products and textiles to the EU. In agriculture, the EU will give zero tariffs on 80% of Ukrainian agricultural products.

Actively develop friendly relations with world powers

As part of balanced diplomacy, Ukraine has also accelerated the development of relations with other major world powers, holding meetings with the leaders of China, Germany, France, Canada, Japan and other major countries, and has gained a lot. As early as April 2010, Yanukovich met with Chinese President Hu Jintao in Washington. In September 2010, only half a year after Yanukovich came to power, Yanukovich visited China, and the two sides signed a series of cooperation documents such as the Joint Statement of the People's Republic of China and Ukraine on Comprehensively Enhancing the Level of Sino-Ukrainian Friendly and Cooperative Relations, and the Main Development Directions of China-Ukraine Relations from 2010 to 2012, covering bilateral relations, aerospace, infrastructure, finance, inspection and quarantine, customs, commerce, rail transit, power and many other fields. This includes financing and undertaking the construction of a rail transit line from Kiev, the capital of Ukraine, to the airport and supporting facilities at the airport. In addition, the two sides have also established a cooperation committee at the level of vice premier, under which there are subcommittees for cooperation in economy and trade, science and technology, agriculture, aerospace, culture and education. Yanukovich said that China's rapid economic development, deepening relations with China is in Ukraine's

national interests, and the two sides have great potential for cooperation in almost all fields. Yanukovich's visit to China has rapidly warmed up Sino-Ukrainian relations, which were "cold" during the Yushchenko period. In April 2011, Ukrainian Prime Minister Azarov visited China to implement the agreement reached between the two sides. Azarov stressed that strengthening relations with China is of strategic importance for Ukraine.

Germany, France, Japan, Canada are all major economies in the world, and Germany and France are also traditional European powers, and they are naturally the focus of Ukraine's development of bilateral cooperation. On August 30, 2010, Yanukovich visited Germany and held talks with German Chancellor Angela Merkel to garner German support for the Ukraine-EU Free Trade Area. On October 8, 2010, Yanukovich visited France and signed the "Roadmap for Ukraine-France Relations for 2011-2012" with France, and both sides expressed their intention to expand bilateral exchanges. In October 2010, Canadian Prime Minister Stephen Harper visited Ukraine upon invitation and expressed his continued consolidation of friendly and cooperative relations. In January 2011, Yanukovich visited Japan, the two sides signed a memorandum of cooperation between Ukraine and Japan, decided to hold capital day activities for each other, and Ukraine pledged to support Japan as a permanent member of the Security Council. The two sides also signed a series of cooperation agreements covering urban management, transportation, energy and other fields. In March 2011, Yanukovich visited Vietnam, Singapore, Brunei and other countries to seek sales markets and help Ukrainian companies enter the local capital markets and learn from the economic reform experience of various countries. It is clear that Ukraine's focus is not limited to Europe, but on finding partners and finding a balanced pivot in a larger international space.



Pic.1.2. (Between 1992 and 2020, Ukraine's GDP)

In 2018, Ukraine's foreign trade continued to pick up, with annual imports and exports reaching \$104.2 billion, a year-on-year increase of 12.3%; China is Ukraine's second largest source of imports, accounting for 13.4% of imports. In addition, China is also one of the fastest growing countries in Ukraine's import value, with its imports from China increasing by 34.6% year-on-year, second only to Turkey's 35.8% among the top 15 countries in terms of import value;

From the overall situation of Ukraine's exports to the world, base metals and products and plant products are the top two categories of Ukrainian export commodities, with exports of US\$11.65 billion and US\$9.89 billion respectively in 2018, accounting for 45.5% of Ukraine's total exports. This is mainly due to Ukraine's rich mineral and plant resource endowments.

China's policy support for foreign science and technology cooperation.

China has established scientific and technological cooperation relations with more than 160 countries and regions, and at present, the world's unprecedented changes in a century are accelerating, and all countries in the world need to strengthen scientific and technological openness and cooperation. Since the 18th National Congress of the Communist Party of China, in order to promote international exchanges and cooperation in science and technology innovation, China has continued

to strengthen intergovernmental scientific and technological cooperation, actively participated in global innovation governance, deeply implemented the "Belt and Road" science and technology innovation action plan, and continued to promote foreign scientific and technological cooperation and exchanges.

In terms of strengthening intergovernmental scientific and technological cooperation, up to now, China has established scientific and technological cooperation with more than 160 countries and regions, and signed 114 intergovernmental scientific and technological cooperation agreements. Since the "13th Five-Year Plan", through the national key research and development plan intergovernmental key project of international science and technology innovation cooperation, a total of more than 60 countries, regions, international organizations and multilateral mechanisms have supported joint research cooperation with more than 60 countries, regions, international organizations and multilateral mechanisms, involving agriculture, energy, environment, resources, information and communication, life and health and other fields, and supported nearly 2,000 projects with a total project funding of nearly 10 billion yuan.

In terms of participating in global innovation governance, China has deeply participated in international big science programs and big science projects, and has participated in nearly 60 international big science programs and big science projects, such as the International Thermonuclear Experimental Reactor and the Square Kilometer Radio Telescope. Actively participate in global innovation governance such as public health and clean energy, and take the initiative to put forward innovative topics and issue cooperation initiatives in multilateral mechanisms such as the G20 Science, Technology and Innovation Ministerial Meeting, the SCO Science and Technology Ministers' Meeting, the BRICS Ministerial Meeting on Science, Technology and Innovation, and the Clean Energy Ministerial Conference.

In terms of in-depth implementation of the "Belt and Road" science and technology innovation action plan, China has actively promoted four actions: scientific and technological people-to-people exchanges, joint construction of joint laboratories, cooperation in science and technology parks and the construction of technology transfer centers. The construction of 53 "Belt and Road" joint laboratories was launched in three batches, supporting more than 3,500 young scientists to carry out

scientific research work in China for more than half a year, training more than 15,000 foreign scientific and technological personnel, and funding nearly 2,000 experts. It has built eight transnational technology transfer platforms for ASEAN, South Asia, Arab countries, Central Asia, Central and Eastern European countries, Africa, the SCO and Latin America, and established the "Technology Transfer South-South Cooperation Center" under the South-South framework of the United Nations, basically forming a "Belt and Road" technology transfer network. The "Belt and Road" international scientific organization alliance led by China has reached 67 member units.

In terms of continuously promoting foreign scientific and technological cooperation and exchanges, China Research has established a global-oriented scientific research fund to promote global knowledge sharing. Actively support foreign experts to lead or participate in Chinese science and technology programs. Since the establishment of the key R&D program in 2015, it has attracted a large number of foreign scientists as project or project leaders.

China encourages scientific research institutions, universities, enterprises and localities to actively carry out foreign cooperation, and the number of scientific and technological papers co-authored by China and foreign countries has reached 183,000 in 2021, involving 169 countries, an increase of more than 1.5 times from 71,000 in 2015. At present, China has joined more than 200 international organizations and multilateral mechanisms, and more than 1,200 Chinese experts and scholars have held senior positions in international science and technology organizations.

At the same time, since the outbreak of the new crown pneumonia epidemic, China has actively organized and implemented the "International Cooperation Action on Science and Technology against the Epidemic", held dozens of bilateral and multilateral expert seminars on the new crown pneumonia epidemic with the United States, the United Kingdom and UNESCO, carried out joint research on drugs, vaccines and testing with 17 countries including the United States, the United Kingdom, Malaysia and South Africa, supported Chinese enterprises and scientific research institutions to "go global", built three "Belt and Road" joint laboratories for infectious disease prevention and control, and launched the construction of BRICS vaccine research and development centers.

Since the 19th National Congress of the Communist Party of China, the Party Central Committee has comprehensively analyzed the international scientific and technological innovation competition situation, deeply studied and judged the development situation at home and abroad, and insisted on placing scientific and technological innovation at the core of the overall development of the country in view of the prominent problems and challenges faced by China's scientific and technological undertakings, and comprehensively planned scientific and technological innovation work. China adheres to the party's comprehensive leadership over science and technology, looks at the overall trend, considers the overall situation, grasps the fundamentals, and forms an efficient organizational mobilization system and an overall and coordinated model of allocation of scientific and technological resources. We firmly grasp the strategic goal of building a world science and technology power, seize the opportunity of global scientific and technological development with a sense of mission, responsibility and urgency, and strive to be the first in the basic frontier field. Give full play to the leading role of scientific and technological innovation, strive to make new breakthroughs in original innovation, achieve leapfrog development in important scientific and technological fields, promote independent and controllable key core technologies, and strengthen the integration of innovation chain and industrial chain. We have comprehensively deployed the reform of the science and technology innovation system and introduced a series of major reform measures to enhance the overall efficiency of the national innovation system. Strive to implement the strategy of strengthening the country with talents, create a good ecological environment for talent innovation, gather talents from all over the world and use them, and fully stimulate the enthusiasm, initiative and creativity of the majority of scientific and technological personnel. Expand open cooperation in the field of science and technology, actively integrate into the global scientific and technological innovation network, actively participate in solving major challenges facing mankind, and strive to promote scientific and technological innovation achievements to benefit more countries and people.

Conclusions on Chapter 1

1. At present, more scholars have studied the mode and level of scientific and technological cooperation between the two places through the analysis of data. It was found that the level of scientific and technological cooperation between China and the "Belt and Road" countries is not high, and it is necessary to further strengthen the relevant scientific and technological cooperation funding;

2. Ukraine is one of the first countries to respond to China's Belt and Road Initiative and hopes to become a hub for trade and logistics between China and Europe. Ukraine not only has a superior geographical location and abundant natural resources, but also has a strong agricultural foundation, strong industrial production capacity, and a high level of personnel development. Ukraine has tremendous technological advantages and cooperation potential in the fields of machinery manufacturing, renewable energy, aircraft engines, and nuclear technology.

3. The technical cooperation between China and Ukraine can not only raise the level of scientific and technological innovation and improve the economic and industrial structure of the Chinese side, but also meet the needs of the Ukrainian side for the transfer and transformation of achievements and the popularization of technology application.

4. Under the framework of the "Belt and Road" initiative, China and Ukraine reached consensus on further deepening cooperation in science and technology innovation, promoting technology transfer and transformation between the two countries, and cooperating on joint research and development, sharing of scientific research facilities, personnel exchanges, and information exchange. The pragmatic cooperation in science and technology between the two sides is expanding from limited key areas to all-round aspects, from single trade exchanges to high-end methods such as whole-industry chain cooperation and joint development.

5. With the joint efforts of China and Ukraine, the development momentum of China-Ukraine scientific and technological cooperation has been good, the intergovernmental scientific and technological cooperation mechanism has been

further strengthened, the Science and Technology and Space Subcommittee has been successfully held, the scientific researchers of the two sides have visited and exchanged closely, joint research and development projects have become the main direction of cooperation, and China-Ukraine scientific and technological cooperation has ushered in a new period of opportunity.

6. Based on the study of best practices, the importance of increasing the level of economic efficiency according to a number of criteria was studied. These criteria are classified according to the type of enterprise, the direction of activity, the purpose of operation, as well as cost minimization and profit maximization.

7. The methodological component of the bachelor's thesis consists of generalization, deduction, induction, comparison, analysis, synthesis, rating evaluation, graphic method, forecast, foresight.

CHAPTER 2

SYSTEMATIC ANALYSIS OF INTERNATIONAL SCIENTIFIC AND TECHNICAL COOPERATION IN THE CONDITIONS OF GLOBALIZATION

2.1. Basics of the foreign policy of Ukraine and the People's Republic of China in the state of international cooperation

The People's Republic of China and Ukraine, in accordance with the latest developments in bilateral relations and the profound changes in the international and regional situation, and based on the common desire to further deepen the Sino-Ukrainian strategic partnership, have decided to comprehensively promote exchanges and cooperation in the political, economic, trade and other fields between the two countries, and declare the following:

The Treaty of Amity and Cooperation between the People's Republic of China and Ukraine signed on December 5, 2013 is of great significance, marking a higher level of development of China-Ukraine relations. On the basis of summing up historical experience, the treaty summarizes the main principles and achievements of Sino-Ukrainian relations, and establishes in legal form the idea of peace between the two countries and the two peoples of friendship from generation to generation. The two sides are determined to take the treaty as the legal basis for friendly cooperation between the two countries, abide by the principles established in all documents signed by China and Ukraine since the establishment of diplomatic relations in 1992, and promote the continuous development of China-Ukraine strategic partnership for the benefit of the two peoples.

The two sides agreed that the important task facing deepening the China-Ukraine strategic partnership is to translate the advantages of the high-level political relations between the two countries into practical results of cooperation in various fields. To this end, the two sides approved the implementation of the Strategic Partnership Development Plan of the People's Republic of China and Ukraine (2014-2018), and will take practical measures to fully implement the Plan, focusing on strengthening the following cooperation to promote the common development of the two sides:

We will continue to maintain close high-level exchanges, promote comprehensive exchanges between the governments, legislatures and political parties of the two countries, improve mechanisms for high-level and other levels of meeting and dialogue, and expand local exchanges and cooperation.

Give full play to the role of the Intergovernmental Cooperation Committee of the two countries, vigorously promote the smooth development of the work of the Committee, and hold regular meetings of the Committee and its subcommittees. The two sides highly valued the results of the second meeting of the Committee held in Beijing on September 24, 2013, and expressed their willingness to establish new subcommittees or working groups within the framework of existing subcommittees according to the needs of cooperation between the two sides.

Priority will be given to carrying out and strengthening practical cooperation in agriculture, energy resources, infrastructure construction, finance, high technology, aviation, aerospace and other fields, and steadily advancing large-scale cooperation projects. We should tap the potential of cooperation in depth, actively explore new forms and directions of cooperation, and promote the balanced development of economic cooperation between the two countries.

Expand and support mutual investment by the business sectors of the two countries and work together to improve the investment and business environment.

Strengthen bilateral and multilateral cooperation in the areas of law enforcement security, justice, prevention and eradication of emergencies, and establish new dialogue and liaison mechanisms as needed.

Vigorously carry out all-round, wide-ranging and multi-level people-to-people cooperation, actively promote the institutionalization of humanities cooperation, strengthen exchanges and cooperation in culture, education, news, tourism, medical and health care and sports, and expand people-to-people exchanges and youth exchanges, so as to enhance mutual understanding and friendship between the two peoples and consolidate the friendship between the two countries from generation to generation.

In accordance with international law, bilateral treaties and respective laws, the two sides will take effective measures to promote personnel exchanges between the

two sides, protect the legitimate rights and interests of citizens and legal persons of the other country in their own territory, and create more favorable conditions for deepening cooperation between China and Ukraine in various fields.

The two sides will continue to strengthen dialogue and coordination within multilateral frameworks such as the United Nations, maintain close communication and cooperation on international and regional issues of common concern, and create a favorable international environment for the development of the two countries.

The two sides are willing to work together with the international community to promote the process of democratization of international relations, jointly address global and regional challenges, and promote the establishment of a more just and rational international order.

The two sides advocate strengthening macroeconomic policy coordination, actively participating in the process of global economic governance, promoting trade and investment liberalization and facilitation, and opposing all forms of trade and investment protectionism and discrimination.

Ukraine is one of the first countries to respond to the "Belt and Road" initiative, and in recent years, China and Ukraine have maintained close communication and cooperation in jointly building the "Belt and Road". In 2020, the two sides signed the "Belt and Road" cooperation plan, and combined with the current cooperation status of China and Ukraine, further clarified relevant cooperation principles, key cooperation areas and safeguard mechanisms, covering trade, industrial investment, agriculture, energy, science and technology, humanities, health and other fields. Cooperation in infrastructure construction and transport connectivity is one of the priority directions of China-Ukraine cooperation. In recent years, with the stabilization of Ukraine's macroeconomy and the progress of public procurement system reform, more and more Chinese enterprises have participated in Ukraine's infrastructure construction.

2.2. Analysis of the expediency of the mode of cooperation between Ukraine and China

In recent years, the bilateral trade volume between China and Ukraine has accelerated, and China has become Ukraine's sixth largest export market and second largest source of imports. As one of the countries that responded earlier to China's promotion of the "Belt and Road" initiative and one of the first 64 countries along the "Belt and Road" identified by China, the continuous advancement of the "Belt and Road" will open up a broader space for bilateral trade between China and Ukraine; At the same time, according to the "Ukraine 2017-2021 Trade Strategy Development Roadmap" released by Ukraine, China is also expected to leap to the second place in Ukraine's export market. It can be expected that the development potential of trade between the two countries in the future is still large, and the trade structure will continue to be optimized while consolidating the foundation, and China-Ukraine trade may show the following development trends:

First, inter-industry trade is still the main body of trade between China and Ukraine. At present, despite the accelerated expansion of bilateral trade between China and Ukraine, bilateral trade between China and Ukraine is still inter-industrial trade based on the comparative advantages of natural endowment differences, Ukraine's exports to China are mainly mineral products, plant products and animal and vegetable oils and fats, while China's exports to Ukraine are mainly concentrated in mechanical and electrical products. In the future, the two countries will continue to take inter-industry trade as the main body, make use of the characteristics of the two countries to complement each other economically and industrially, and further expand the scale of trade.

Second, the structure of China-Ukraine trade products will be continuously optimized. On the one hand, in terms of Ukraine's exports to China, in the past two years, more than 200 export products represented by boiler auxiliary equipment, steam turbines, ship propulsion systems, electric engines and generators have been added, while reducing the export of base metals and their products; On the other hand, in terms of Ukraine's imports from China, the amount of transportation equipment

imported from China increased significantly, while the import value of light industrial products such as shoes and umbrellas fell more. It can be seen that the trade structure of the products of the two countries is being continuously optimized by combining the advantages of resources, technology and production technology of the two countries.

Third, agricultural products will remain an important growth point for China-Ukraine trade. Ukraine has rich advantages in natural resources in agriculture, while China has advantages in labor, capital, agricultural product processing technology, modern agricultural production and logistics operation compared with Ukraine, and China is a big consumer of agricultural products, so agricultural products have been the focus of Sino-Ukrainian trade for many years. In addition, with the continuous development of agricultural trade between China and Ukraine and the strengthening of bilateral technical exchanges and cooperation, the added value of Ukraine's agricultural exports to China is expected to increase.

Analysis of Ukrainian exports to China

The main commodities exported by Ukraine to China are mineral products, plant products and animal and vegetable oils and fats, and the export value of these three categories of commodities in 2018 was 660 million US dollars, 570 million US dollars and 430 million US dollars, of which the export of mineral products and animal and vegetable oils and fats fell by 4.2% and 16.8%, and the export of plant products increased by 19.8%, and the three categories of commodities together accounted for 75.2% of Ukraine's total exports to China. In addition, Ukraine's exports of food, beverage, tobacco, plastic and rubber products and chemical products to China increased rapidly in 2018, increasing by 992.3%, 515.9% and 535.9% respectively.

From the perspective of the proportion of the main products exported by Ukraine to China in 2018, the proportion of minerals exported by Ukraine to China accounted for the largest proportion of Ukraine's exports to the world, with 15.2%, that is, China is the most important export market for Ukrainian mineral products.

Analysis of Ukrainian imports from China

China is Ukraine's largest import source of eight categories of commodities: mechanical and electrical products, base metals and products, plastics and rubber, textiles and raw materials, furniture and toys, shoes and umbrellas, light industrial

products, ceramic glass products, and optical clocks and medical equipment. In 2018, Ukraine imported 3.63 billion US dollars of mechanical and electrical products from China, an increase of 41.1%, accounting for 47.8% of Ukraine's total imports from China, making it the largest category of products imported by Ukraine from China. In general, in the Ukrainian market, in addition to mechanical and electrical products, China's labor-intensive products have a greater advantage, such as shoes, furniture toys, ceramic glass, textiles and other light industrial products, these products in the Ukrainian import market share of more than 20%.

Table A.1. Trade turnover between China and Ukraine in 2015-2019

year	2015	2016	2017	2018	2019
Total trade between the two countries	707383	670443	737669	966748	1191354
Chinese exports to Ukraine	351658	421682	504108	701900	739984
China imports from Ukraine	355725	248761	233561	264848	451370
balance of trade	-4066	172922	270546	437053	288613

2.3. Best practices of successful cooperation between Ukraine and China in the field of high technologies

Early in the field of aerospace cooperation

Ukraine is on China's lunar exploration program to offer help. Ukraine also provided China with a rocket engine and other key aerospace science and technology. Ukraine experts to China's long march rocket engine is developed. Ukraine are designed and developed a large number of rocket other parts in China. Ukraine space rockets cooperation with China is the main enterprise of the south "jack". The key of national defense and aerospace companies over the past few decades has developed a large number of various intercontinental ballistic missiles, medium-range ballistic missile and many spacecraft. Can carry on the train heavy intercontinental ballistic missile system is developed by the company. "The south's President jaeger," John said in 2014, his business with China in the field

of the dynamic system of lunar lander, China is very interested in Ukraine technical reserves and experience in related field.

Last year, the Zhuhai airshow China "the south's" in their face the book says, the company through the video shows the cooperation with China to jointly develop some new achievements of the moon, including space freighter system, as well as the colonial to the moon, the establishment of a plan for settlement on the moon.

Ukrainian media said, "the south's" for the Chinese copied the Soviet lunar module production engine, the company also plans to put the new development of module power plant design data passed to China. Ukraine's defense and space cooperation with China for a long time. In Ukraine, with the help of China to solve a lot of technical problems.

1) the construction of Ukraine and China cooperation L - 15 pneumatic layout
 2) help China to Ukraine medium transport "eight" and the large transport aircraft development and improvement

3) to help China to build "Nita card" and similar facilities in the ground training system, training teaching for carrier-based aviation pilots, and to sell the 4 sets of cables. The world's advanced surface ships generally adopt with gas turbine, the new missile destroyer in China's decision to use gas turbine. But because of the Chinese independent research and development of gas turbine in performance cannot meet the need, at that time had planned general dynamics from the United States imported LM - 2500 type gas turbine, but then restart west of China arms embargo, technology, equipment, LM - 2500 type gas turbine to introduce

Since 1993, China began to introduce Shuguang machinery design bureaus UGT25000 gas turbine in Ukraine, Ukraine in to sell China 10 UGT25000 / DA80 gas turbine at the same time, the transfer of relevant technology and localization, this is China's later 052 b and 052 d new missile destroyer. China later on this UGT25000 gas turbine based on localization , and developed a new type of gas turbine. China's first aircraft carrier Liaoning purchased from Ukraine. China from Ukraine after a aircraft prototype was developed on the basis of their aircraft. Ukraine also involved in the development of the Chinese large transport aircraft. Engine of large surface ships and technology of China, some tank engine also from Ukraine. Can be used as light attack,

and the development of China's senior trainer, coach - 10 products used by the engine is Ukraine.

China and Ukraine space cooperation committee between the two governments at the end of 2017 the fourth conference was held in Beijing. The meeting decided to expand bilateral cooperation in the field of space, at the same time planning determines the long-term cooperation projects and goals, and signed the relevant documents. At this meeting, the two countries have modified the past space cooperation plans, added new content. But the new revision of the space cooperation plan between the two countries do not open, confidential. In 2020 to space cooperation plan between the two countries involved more than 70 cooperation projects, many of them with the Chinese lunar exploration project of developing rockets and other spacecraft, and the corresponding new materials research and development. During the meeting, the Ukrainian delegation also special access to some of China's enterprises.

In the late of science and technology cooperation between Ukraine and China

After June 2011, the Chinese investment in the Ukraine began to heat up, and focuses on large-scale infrastructure and agricultural projects. For the first time in 2019, China become the largest trading partner in Ukraine. According to data released by the National Bureau of Statistics, Ukraine in 2021, Ukraine and China import and export total \$19.335 billion, followed by Germany, Russia is again; In respect of export, also ranked first in China. In the field of investment, according to the country (region) of the foreign investment cooperation guidelines Ukraine (2020 edition) "(hereinafter referred to as" guidelines ")", by the end of 2019, China's nearly \$150 million in direct investment stock of Ukraine. In Ukraine in 2020 the actual operation of Chinese enterprises has 54, mainly concentrated in communications, electronics, infrastructure, agriculture, processing, manufacturing, and other fields.

According to China's Ministry of Commerce, the first 11 months of 2021, Chinese enterprises in the newly signed contract engineering value of up to \$6.64 billion, in a record at the same time, the same period as the Chinese national first in Eurasia. Ukraine is the hub of China into Europe, investment in China for the energy, transportation, and food industries, metal three largest investment from China machinery industry group, China's water and electricity, the state grid, investment amount is more than \$1 billion.

Industrial infrastructure

Chinese companies to invest in Ukraine's most distribution in the field of infrastructure investment. In September 2010, the Ukraine international airport in Indianapolis and China development bank, the machine group's China complete engineering co., LTD. (China), China's export credit insurance company signed a "Ukraine airport rail transit line and airport facilities framework cooperation agreement". The machine group and owned by China's complete set of construction respectively the Crimean Xie Erji gas-fired power stations and Kiev airport light rail "air express".

In November 2017, Kiev city with the China railway international group, China Pacific construction group (the Chinese consortium) signed in Kiev on Kiev subway line 4 construction cooperation agreement. In addition, China railway international group co., LTD. Supplies and affordable housing construction project contract to build the Ukraine. During the same month, China contracted in turbine hydropower 16th bureau in Ukraine M06 daycare mill ring road project.

Energy

In recent years, Ukraine's growing demand for renewable energy. Only 2021 years ago in October, Ukraine in the renewable energy generation rose more than 10%, to 10 billion KWH. In renewable energy power generation structure, photovoltaic power generation accounted for 60.4%, in the first place; Wind power accounted for 29.8%, the second; Followed by the biomass power generation (7.6%) and water (2.3%).Ukraine in the field of energy cooperation with China. In addition to the traditional fossil energy, bilateral cooperation in wind power in particular. In Ukraine of China energy investment company, China's biggest turbine.

In April of 2021, China Wind field in turbine and Ukraine co., LTD. (Wind Farm LLC) signed the Ukraine Nichols, and the man area of 800 mw Wind power project contract, the contract amount is \$999 million, about 6.716 billion yuan. The project is in Ukraine so far the biggest cooperation agreement in this area. According to reports in the public, date has not yet started the program. subsequent to the project plan, in turbine in China has said: "considering the situation over there (Ukraine), so may involve behind a sign the contract, will take further consideration.

"Other companies actively deploying wind power in Ukraine include Goldwind Technology and Longyuan Power. Goldwind officially entered the Ukrainian market in 2019. In September 2021, Goldwind signed another contract for a 337.5MW wind power project in Zophia, Ukraine and a 288MW wind power project in Ochakov, Ukraine.

Longyuan Power has a wind power project in operation in Ukraine, that is, the Ukrainian Yuzhny Wind Power Project. Located in Odessa Oblast, southwestern Ukraine, near the Black Sea, the project already generated 28,777 MWh in January 2022.

The project is the first project invested by the National Energy Group in Europe and is considered a milestone.

In addition to wind power projects, Chinese-funded enterprises have reached many cooperation projects with Ukraine in the construction of photovoltaic power plants.

In 2019, China Machinery Engineering Corporation (CMEC) and Ukrainian energy company Donbas Fuel and Energy Company (DTEK) completed a 200MW solar power project near Nikopol in the Dnipropetrovsk region of central Ukraine, which was the third largest photovoltaic power plant in Europe at the time.

In addition, Zhongli Group has set up a wholly-owned subsidiary in Ukraine to engage in photovoltaic power plant investment. Among them, Talesun Solar, a subsidiary of Zhongli Group, ranks among the top five in shipments in the local market of Ukraine.

A consortium formed by China Energy Construction International and Anhui Power Construction Company signed an EPC contract for the 100 MW photovoltaic project in Kalogist, Ukraine, with a signed amount of 100 million US dollars.

In addition to the above companies, Zhengxin Optoelectronics, JA Technology, Risen Energy and others have supplied high-efficiency PERC photovoltaic modules for large-scale photovoltaic projects in Ukraine.

In addition, China Dongfang Electric Group International Cooperation Co., Ltd. and Ukraine's Donbas Energy Company signed an agreement in Kiev, the capital of Ukraine, to plan to modernize the Slavyansk thermal power plant in eastern Ukraine.

Agriculture

In recent years, Ukraine has harvested bumper grain year after year, with an output of more than 70 million tons and an export volume of more than 40 million tons, making it the world's third largest grain exporter and the largest exporter of sunflower oil. Located at the southernmost tip of the Eastern European Plain, Ukraine has 30% of the world's black soil, and its relatively warm climate is ideal for growing crops such as wheat.

Agriculture is one of the pillar industries of the Ukrainian economy, so the Ukrainian agricultural market is highly open and investment by large international institutions is active. Most of the cooperation projects with China are led by large Chinese state-owned enterprises. The cooperation between COFCO and Ukraine in the field of agriculture has provoked the pillar of Sino-Ukrainian agricultural cooperation.

In 2014, COFCO International, a subsidiary of COFCO, entered the Ukrainian market. Today, COFCO has 7 strategic fulcrums in Ukraine and 4 granaries along the east and west of the Dnieper.

Ukraine is an important part of COFCO's global layout. On May 19, 2016, COFCO Agri, a wholly-owned subsidiary of COFCO Group, invested US\$75 million to build the DSSC terminal in Ukraine.

Located in the Nikolaev Maritime Commercial Port, the terminal is wholly owned and operated by COFCO Agri and exports corn. The total throughput of the terminal is 2.5 million tons/year, and the storage capacity is 143,000 tons. Once completed, the DSSC terminal will become the most advanced agricultural products transit facility in Ukraine.

In addition, COFCO Agriculture has also become the second largest exporter of vegetable oil in Ukraine by completing the acquisition of all shares of Noble Group in Ukraine, with an annual operating volume of 300,000 tons and a market share of 25%.

At present, COFCO Group purchases and trades corn, wheat, barley and other varieties of grain in Ukraine, exporting to North Africa and the Mediterranean, Iran, Southeast Asia and Europe, with an annual operating volume of 150-2 million tons and a market share of about 8%. In Ukraine, a local sunflower seed processing plant was built, with an annual crushing capacity of 300,000-400,000 tons, accounting for about 4% of the market.

COFCO's increased investment in Ukraine will not only increase its operating share in Ukraine, but also increase its share of grain and oil trade worldwide.

In addition to COFCO, the Export-Import Bank of China and China Complete Set, together with the Ministry of Finance of Ukraine and the National Food Group of Ukraine, signed the Framework Agreement on Cooperation in the Field of Agriculture between China and Ukraine, with an agreed financing amount of US\$3 billion. China Machinery and Equipment Engineering Co., Ltd. signed a memorandum of understanding with Ukragroleasing in the construction of modern grain depots (20 grain depots with a capacity of 50,000 tons).

Communication

At present, there are three major mobile telecom operators in Ukraine, namely Kyivstar, Vodafone Ukraine and Lifecell, in addition to Ukrtelecom, the largest fixed-line operator, and some smaller telecom operators.

In 2018, Ukraine officially launched its 4G network. The 4G equipment of Ukraine's three major mobile communication operators is mainly provided by Huawei, ZTE, Ericsson and Nokia. Among them, Kyivstar's 4G network equipment providers are only Huawei (60%) and ZTE (40%); Vodafone's 4G equipment is mainly provided by ZTE, Huawei, and Nokia; Lifecell's 4G equipment is mainly provided by Ericsson and Huawei.

Huawei also provides storage technology to JSB Pivdenny Bank, Ukraine's second-largest private bank by assets and one of the largest commercial banks.

In addition, the router "giant" TP-LINK occupies more than 70% of the Ukrainian router market. In the face of the market in the information and communication industry, Chinese enterprises have entered Ukraine.

In 2016, Xiaomi entered the Ukrainian market. At this time, Lenovo mobile phone is also the second largest brand in the Ukrainian mobile phone market after Samsung. Just one year later, in October 2017, the market share of Xiaomi phones in Ukraine rose to 17%, second only to Samsung. In the fourth quarter of 2018, Xiaomi mobile phones became the largest mobile phone brand in Ukraine with a market share of 26.7%.

According to IDC, the market share of cost-effective smartphones in Ukraine is constantly surging. Xiaomi phones are generally favored by Ukrainian users. In addition to Xiaomi, Huawei, OPPO and other domestic brands have also grown to varying degrees in the Ukrainian market.

Table B.1. In 2020, Ukraine's exports to China accounted for the proportion of total exports of this product (unit: %)

industry	proportion
minerals	15.2%
Animal and vegetable oils and fats	9.5%
Plant products	5.8%
woodwork	5.7%
Food Beverage Tobacco	5.1%
Electromechanical products	4.7%
Plastic rubber	1.9%
Paper	1.6%
animal	1.4%
Chemical products	0.7%
Metal products	0.2%
Transportation equipment	0.1%
Furniture toys	0.1%
textiles	0.1%

Conclusions on Chapter 2

1. Based on the study of trends in the development of high-tech sectors in the world, China and Ukraine, it turns out that now the high-tech sector is gradually transitioning to modern high-tech. It should be noted that international cooperation in this area could be undertaken by individual States. It turns out that countries' transition to high-tech technologies requires new technological solutions, financial support and engineering support.

2. The People's Republic of China and Ukraine, in accordance with the latest developments in bilateral relations and the profound changes in the international and regional situation, and based on the common desire to further deepen the Sino-Ukrainian strategic partnership, have decided to comprehensively promote exchanges and cooperation in the political, economic, trade and other fields between the two countries

3. The two sides will continue to strengthen dialogue and coordination within multilateral frameworks such as the United Nations, maintain close communication and cooperation on international and regional issues of common concern, and create a favorable international environment for the development of the two countries.

4. It can be expected that the development potential of trade between the two countries in the future is still large, and the trade structure will continue to be optimized while consolidating the foundation

5. According to the results of the statistics, it turns out that China has become the main economic partner of Ukraine in the Asia-Pacific region and one of the countries most interested in investing in the Ukrainian market, including high-tech technologies. In recent years, China has attached considerable importance to investments in the high-tech sector in Ukraine.

6. The international exchange of modern science and technology marks the overall level of a new partnership established between countries, which includes the generation and research and development of new knowledge and technology, development and exchange and its application in different ways. In today's conditions, these international exchanges are a necessary means for a country to

develop its potential and integrate into the international community. Ukraine and China have long-standing friendly relations and fruitful cooperation in various fields.

CHAPTER 3.
MACRO-STRATEGIC ARRANGEMENTS FOR SCIENTIFIC AND
TECHNOLOGICAL COOPERATION WITHIN THE FRAMEWORK OF
THE STRATEGIC PARTNERSHIP OF COOPERATION BETWEEN
UKRAINE AND CHINA

3.1. The significance and strategic position of high-tech cooperation
between Ukraine and China

(1) The cooperative relationship has developed steadily

First, the foundation of cooperation is stable, Shandong Province started early in scientific and technological cooperation with Ukraine, and high-level mutual visits were frequent; Second, the institutions participating in cooperation are stable; as far as Shandong Province is concerned, the institutions that carry out cooperation with Ukraine are mainly concentrated in Jinan, Yantai, Qingdao, Weihai, Zibo, Binzhou, and other cities. The leading institutions for cooperation with Ukraine are mainly Shandong Academy of Sciences, Shandong University, Qingdao University, and other colleges and universities, as well as enterprises such as Yantai CIMC Raffles City and Jinan Sino-Ukrainian New Materials Co., Ltd., but the Ukrainian institutions participating in cooperation are relatively single, and the institutions that have long-term and stable cooperative relations with Shandong Province are mainly the Ukrainian National Academy of Sciences and the Ukrainian National Technical University.

(2) The content of cooperation is distinctive

Shandong Province and Ukraine science and technology cooperation projects mainly focus on medicine (such as blood lipid reduction, cardiovascular and cerebrovascular diseases), new materials (such as high-modulus carbon fiber preparation, magnesium alloy casting), machinery manufacturing (such as laser composite welding, plasma spray welding), modern marine industry technology (such as marine ship engineering, marine biomedicine) and other aspects. However, scientific and technological cooperation in these fields has not yet formed a scale to promote industrial development, and cooperation with Ukraine's aerospace, agriculture, food, and other advantageous fields has been carried out little or even none.

(3) The forms of cooperation are rich and diverse

Based on the good atmosphere of scientific and technological cooperation laid down by high-level mutual visits, Shandong Province and Ukrainian institutions have carried out cooperative research in the form of completing projects within the framework of bilateral agreements, joint scientific research research, holding scientific forums, scientific investigations, participating in conferences, establishing joint ventures, and establishing joint laboratories and scientific research and production centers.

3.2. Strengthen the industrialization of high technologies between Ukraine and China to increase the depth of scientific and technological cooperation

In order to pool the wisdom and strength of the global science and technology community and promote sustainable economic and social development, the first thing is to condense innovation consensus, innovate cooperation mechanisms, expand communication channels, promote mutual trust and mutual learning, and jointly build a scientific and technological innovation community with common concepts, integrated elements, connected facilities and smooth exchanges; The second is to build an open network, establish a cross-border, diversified and effective exchange mechanism, create an open, cooperative and shared scientific culture, and promote the global flow of knowledge, data, achievements and other resources; In addition, cooperation is to meet challenges, lead by inclusive innovation, expand a broader, broader and deeper pattern of open cooperation in science and technology, and strengthen all-round cooperation in climate change and green development, digital economy, connectivity, science and technology ethics and other fields.

To cope with the challenges related to the common destiny of all mankind, the global scientific and technological community needs to actively advocate the spirit and concept of open science without borders, barrier-free and non-discrimination, strengthen scientific knowledge exchange and technological innovation cooperation, and provide systematic and high-quality solutions with effective actions of high-level openness and cooperation, and effectively respond to the common concerns of people

around the world. Whether it is seeking new impetus for economic development, or addressing climate change, food security, human health and many other world problems, scientific research institutions and scientific and technological workers from all countries need to build consensus on the basis of enhancing understanding and mutual trust, so as to gather confidence, wisdom and strength to jointly respond to global challenges and provide impetus for serving the sustainable development of mankind.



Pic. 3.1. Sergei Kuzmichev, First Secretary of the Embassy of Ukraine in Beijing, interviewed by the media

Ukraine is one of the first countries to respond to China's Belt and Road Initiative and hopes to become a hub for trade and logistics between China and Europe. Ukraine not only has a superior geographical location and abundant natural resources, but also has a strong agricultural foundation, strong industrial production capacity, and a high level of personnel development; Ukraine has tremendous technological advantages and cooperation potential in the fields of machinery manufacturing, renewable energy, aircraft engines, and nuclear technology. The technical cooperation between China and Ukraine can not only raise the level of scientific and technological innovation and improve the economic and industrial structure of the Chinese side, but

also meet the needs of the Ukrainian side for the transfer and transformation of achievements and the popularization of technology application. Shandong Province is an important cooperation province of Ukraine in China; in recent years, cooperation and exchanges have become increasingly frequent; the two sides have achieved remarkable results in high-level mutual visits, joint research, joint construction of research and development platforms, and exchanges of scientific and technological personnel, and scientific and technological cooperation between the two places has tremendous potential.

3.3. Mutual construction and joint construction of the Ukraine and China Science and Technology Park are important strategic measures to accelerate high-tech cooperation between the two sides

Under the guidance of the new concept of cooperation with future-oriented, co-creation and sharing, openness and inclusiveness, and complementary advantages as the main elements, and under the cooperation mode supported by the collaborative linkage of multiple subjects, the support of various platforms, and the deep integration of innovation chain and industrial chain, it is appropriate to deepen the cooperation in science and technology innovation between China and Ukraine from the following direction.

First, improve the top-level design of the cooperation mechanism.

The governments of China and Ukraine should further strengthen forward-looking planning arrangements and overall planning, provide stable institutional and institutional guarantees for cooperation, and promote seamless docking of various cooperation fields. On the one hand, it is appropriate to give full play to the promotion and coordination role of the intergovernmental mechanism on scientific and technological cooperation, and improve and enrich the functions of the "Subcommittee on Scientific and Technological Cooperation" mechanism within the framework of the Committee for Regular Meetings between the Prime Ministers of China and Ukraine and the mechanism of China-Ukraine Innovation Dialogue under the guidance of the "Coordination Committee for Innovation Cooperation between China and Ukraine".

Under the mechanism of the "Subcommittee on Science and Technology Cooperation", it is appropriate to exchange their respective science and technology

innovation strategies, science and technology innovation policies, the construction of the national innovation system, the cultivation of science and technology innovation talents, especially the key points of international science and technology innovation cooperation policies, and on this basis, prepare medium- and long-term plans for science and technology innovation cooperation between China and Ukraine, and determine the medium- and long-term goals, key areas, priority directions and safeguard measures for cooperation; Under the innovation dialogue mechanism between China and Ukraine, in addition to the science and technology departments of the two countries, other government departments should be involved to exchange ideas with innovation institutions, think tanks, universities and institutes, consulting institutions and intellectual property legal consulting services to exchange ideas on the development trend of world science and technology innovation, share practical experience in cooperation, and communicate in a timely manner on the problems existing in cooperation, so as to give play to the multi-sectoral linkage effect and reach a realistic, practical and forward-looking cooperation consensus.

On the other hand, guide all participants to establish a long-term work docking mechanism, and continue to promote the establishment of a long-term work docking mechanism between Chinese and Ukrainian scientific research funds, between innovation institutions of the same type, between the National Science Center of Ukraine and the Chinese National Laboratory, between the China Industry-University-Research Innovation Alliance and the Ukrainian Technology Platform, between China's Independent Innovation Demonstration Zone and High-tech Development Zone and Ukraine's high-tech parks and technology promotion special economic zones, between China's technology transfer intermediary service institutions and Ukrainian technology promotion institutions, and Establish a long-term mechanism between China's innovative cities and Ukraine's Technological City, between Chinese financial investment institutions and Ukrainian venture capital funds, and between high-end industries (such as nuclear energy, aerospace, communication and information, bioengineering and other key cooperation areas), keep the channels of exchange and mutual visits open, promote effective docking in their respective fields, and then promote cross-field docking, and promote the rational allocation and effective integration of various innovative resources.

Second, deepen cooperation in basic research fields.

Basic research is the source of scientific and technological innovation. Ukraine has a tradition of attaching importance to basic research, which has so far remained at 15 per cent of total R&D investment (see table 3), thus nurturing strong strengths in mathematics, nuclear fusion, solid state physics, chemistry, biology, earth sciences and space science. China has always underunderstood the important role of basic research, and it was not until 2018, when China's State Council issued *Several Opinions on Comprehensively Strengthening Basic Scientific Research*, that the role of basic research was elevated to an unprecedented height.

The Opinions particularly emphasize that improving the internationalization level of basic research is one of the key directions. In view of the fact that the cooperation between China and Ukraine in basic research has lasted for more than 20 years, it has played a positive role in enhancing the communication and exchanges between the scientific research teams of the two sides, laid the foundation for cultivating substantive cooperative relations, and can be used as an important fulcrum for further deepening cooperation in science and technology innovation.

During the 14th Five-Year Plan period, China will significantly increase investment in basic research. In addition to expanding the scale of funding from the National Natural Science Foundation of China and the Ukrainian Basic Research Foundation, and increasing interdisciplinary research projects and youth research projects, it should also enrich funding methods and guide social funds and enterprise funds into the field of basic research cooperation between China and Ukraine.

In addition to mathematics, physics, chemistry, materials science, life science, earth science, information science, and medical science, the priority areas of basic research cooperation can further expand the research field, especially the cooperative research in the field of multidisciplinary integration. In addition, funding the joint publication of papers by scientists from both sides can be used as one of the ways to share results. At present, Ukrainian scientists mainly publish papers jointly with scientists from the United States, Germany, France and the United Kingdom, accounting for 26.6% of cooperative papers, and although the number of papers cooperating with Chinese scientists is increasing, the proportion is not high, and the cooperation potential is great.

Third, further strengthen high-tech industry cooperation, promote innovation and deep industrial integration.

Ukraine has technological advantages in aerospace, shipbuilding and other fields, especially in rocket and aircraft engines, nuclear-powered icebreakers, etc., while China has strong advantages in microelectronics technology. To this end, in the field of aviation, we will continue to build consensus, jointly promote the development plan of large aircraft, and promote cooperation in the field of engine manufacturing. In the field of aerospace, China will continue to promote the implementation of the "Outline of Space Cooperation between the National Space Administration of the People's Republic of China and the State Space Corporation of Ukraine for 2018~2022", and strengthen cooperation between China and Ukraine in the fields of lunar and deep space exploration, research and development of special materials, satellite system development, earth remote sensing, and space debris monitoring.

As the world's major powers intensify their competition for space, it is necessary for China and Ukraine to make use of their respective advantages to carry out more long-term and in-depth cooperation in manned spaceflight and lunar exploration projects. In the field of shipbuilding, Ukraine is the only country in the world with nuclear-powered icebreakers, China is still in its infancy in icebreaker manufacturing, and the strengthening of cooperation between the two sides will help promote the development of Arctic shipping routes, Arctic energy development and energy transportation, drive the construction of infrastructure such as Arctic ports, and at the same time will drive the development of engineering equipment manufacturing, information and communication and other industries related to shipbuilding.

In the field of digital economy, given that industrial digitalization and digital industrialization are the main areas for China and Ukraine to achieve innovation and growth in the future, relying on 5G technology, a new generation of information technology represented by big data, artificial intelligence, Internet of Things, mobile Internet and cloud computing will drive the rapid growth of the digital economy, and the cooperation between China and Ukraine in the field of digital technology research and development and industrial digitalization will help to achieve the deep integration of innovation and industrial development.

Fourth, work together to promote key projects, focusing on achieving practical results.

China's cooperation in science and technology innovation between China and Ukraine must focus on specific projects and focus on implementation, so as to enhance each other's confidence in cooperation. First, substantively promote cooperation on strategic projects. At present, the progress of the joint development of large aircraft projects between China and Ukraine is not smooth, and the negotiations on the joint development of heavy helicopter projects have continued for several years, so the two sides should find out the reasons, objectively and rationally deal with the problems existing in the cooperation, give full play to the demonstration and driving role of the successful operation of the large projects, and eliminate concerns for follow-up project cooperation.

Second, strengthen cooperation in "big science" projects. At present, China and Ukraine have reached an agreement that China will participate in the Ukraine-led superconducting heavy ion accelerator (NICA) project. Through in-depth cooperation in similar projects, China can learn from its experience in recommending, selecting, approving projects, managing, identifying core experts, proposing research problems, selecting technical routes, allocating scientific and technological resources, selecting facilities, coordinating cooperation, supervision and evaluation, risk prevention and control, intellectual property rights management, and using mechanisms in international big science programs and big science projects.

Third, we will further promote the stable operation of joint research centers and joint laboratory projects. China and Ukraine have successively established a number of joint research centers and laboratories, and as part of the Year of Scientific and Technological Cooperation between China and Ukraine, the Mechnikov Institute of Vaccines and Serum and the Institute of Microbiology of the Chinese Academy of Sciences signed a memorandum of understanding on the establishment of a joint laboratory for COVID-19 research. Future tasks should focus on the specific preparation and operation of joint research centers and joint laboratories, and the facilitation of work visas for scientific and technological personnel, so as to promote the joint efforts of scientific and technological personnel of the two sides to achieve expected research results.

Fifth, give full play to the main role of enterprises in scientific and technological innovation cooperation.

For a long time, the basic model followed by global scientific research is the linear model of basic research leading to applied research and applied research driving product development. With the in-depth development of scientific and technological revolution and industrial transformation, market demand plays an increasingly strong role in scientific and technological innovation, and the main position and important role of enterprises in scientific and technological innovation are becoming more and more prominent. On the one hand, enterprises have the ability to capture innovation needs, on the other hand, enterprises are also an important force driving the construction of innovation systems, especially innovation leaders.

Some major innovations and industrial changes are usually led by innovative leading enterprises to make technological breakthroughs, and then a group of small and medium-sized enterprises are brought in to form an innovative industrial chain. If China's cooperation in science and technology innovation between China and Ukraine is to continue to advance steadily, it is particularly necessary for enterprises to truly become the main body of technological innovation. To this end, it is necessary to create conditions for enterprises to become the main body of input, implementation and income of scientific and technological innovation cooperation between China and Ukraine, take capital as the link, take the construction of industrial innovation alliance as the carrier, gather innovation elements, form a strong joint force, create a number of leading enterprises with outstanding core technical capabilities and strong innovation capabilities, and form a cooperation situation driven by engine enterprises, actively participated by small and medium-sized enterprises, and assisted by scientific research institutes and universities. In recent years, Chinese enterprises have actively undertaken national key R&D plans and played an increasingly prominent role in major basic research and system innovation.

Ukraine has a deep endowment of high-tech human resources and has grown a number of technology start-ups with good development potential. According to BCG's research, six companies in Ukraine have been included in the list of the top 100 technology leaders in emerging markets. Therefore, it will be a promising direction for cooperation to promote Chinese enterprises to establish R&D centers in Ukraine,

strengthen cooperation with research universities, scientific research institutions and science and technology enterprises, or set up offshore innovation and entrepreneurship bases to use local scientific research resources to carry out work. Chinese venture capital companies and technology-based enterprises can take Ukrainian science and technology start-ups as important partners in carrying out scientific and technological research and development and industrialization in Ukraine. At the same time, we can also adopt active policies to encourage Ukrainian enterprises to set up R&D centers and science and technology innovation bases in China, and invest in China's strategic emerging industries and high-tech industries.

Sixth, strive to build a scientific and technological innovation cooperation service platform.

The innovation cooperation service platform aims to achieve efficient integration and in-depth integration of scientific and technological innovation resources. First, build a database of scientific and technological information for China and Ukraine. Scientific and technological talents are the key to improving innovation capabilities, and by promoting the mutual flow of high-level talents between China and Ukraine, knowledge "spillover effect" can be produced, which is of great significance for activating innovation and promoting the in-depth development of scientific and technological innovation. Therefore, we should accelerate the construction of high-tech talent information database, build a "talent information sharing" platform for scientific and technological innovation, expand and deepen talent exchanges and cooperation, and promote the "two-way flow" of scientific and technological talents between China and Ukraine.

At the same time, we will promote the establishment of a database of well-known research institutions, timely release the research directions, research field distribution, research project dynamics, etc. of each research institution, so as to facilitate targeted cooperation between Chinese and Ukrainian research institutions. Second, establish a platform for the release of policies on scientific and technological innovation cooperation, and timely release relevant incentive policies, management measures, negative lists, talent introduction and talent mobility policies, etc., to improve the pertinence of cooperation between the two sides and avoid touching unnecessary policy red lines. Third, build a technology transfer service platform.

At present, the cycle of scientific and technological innovation is constantly shortening, and the cycle of acquiring new knowledge and creating new technologies, new products, new services and bringing them to market is greatly shortened. Therefore, the transfer and transformation of scientific and technological innovation achievements is the focus of attention of countries around the world, and it is also the intersection of various resources such as governments, scientific research institutions, and enterprises.

China and Ukraine each have shortcomings in the transfer and transformation of scientific and technological achievements, the conversion rate of achievements is not high, providing systematic and professional services, and promoting the rapid transfer and transformation of achievements is a problem that China and Ukraine should focus on in scientific and technological innovation cooperation. To promote the transfer and transformation of scientific and technological achievements, the support of the service platform is crucial.

Therefore, both sides should actively support technology assessment and consulting institutions, scientific and technological information provision institutions, and intellectual property legal intermediaries, and rely on the above-mentioned intermediary service institutions to establish a number of technology transfer and transformation service institutions to promote the effective connection between the innovation chain and the industrial chain. Finally, the technology finance booster platform. According to international experience, the success of a technology is expected to be 10% when venture capital enters; The success hope is 50% when commercial bank funds intervene. Therefore, it is crucial to give full play to the role of venture capital in China-Ukraine cooperation in science and technology innovation. The two sides can explore the use of guidance funds to attract private and financial capital into the field of technological innovation services in China and Ukraine through market mechanisms.

Seventh, jointly promote cooperation under multilateral mechanisms.

Cooperation in science and technology innovation is the fundamental way to address global issues such as climate change, energy shortage, food and food security, and natural disasters and promote sustainable economic and social development. During the epidemic this year, cooperation in the field of biomedical technology under

multilateral mechanisms has played an active role in epidemic prevention and control. China and Ukraine are both SCO members and are active advocates of cooperation between the Eurasian Economic Union and the Belt and Road Initiative.

In the future, China and Ukraine should jointly promote cooperation in science and technology innovation under the above-mentioned multilateral framework. On the one hand, build a community of scientific and technological innovation cooperation, respect the differences of countries in their development stages, seek common ground while reserving differences, tolerate each other, strengthen the docking of scientific and technological innovation development strategies and policies, promote mutual learning from innovation experience, jointly cultivate innovative and entrepreneurial talents, jointly build joint scientific research platforms, technology transfer platforms, and demonstration international science and technology cooperation bases, implement major scientific and technological cooperation projects, create an innovation cooperation system that closely integrates science and technology, education and industry, and promote the integrated development of scientific and technological innovation and the real economy through the integration of "intelligent government, industry, education and research", improve the level and quality of cooperation in science and technology innovation, provide a steady stream of impetus for multilateralism in science and technology innovation, and ultimately promote all parties to achieve innovative growth.

On the other hand, we should face up to the limitations of technology in terms of security, privacy and ethics, adhere to the equal emphasis on security and development, work together, inclusively and prudently formulate science and technology governance rules, further strengthen cooperation in the fields of intellectual property rights, technical regulations, standards, measurement and conformity assessment, create a fair, just and non-discriminatory business environment for the rational use of new technologies, and provide solutions to major development issues and challenges in the development of global scientific and technological innovation.

Conclusions on Chapter 3

1. Based on the research carried out, we note a feature of the 21st century. It is the formation of a new mission for the global science and technology industry, which includes increasing the level of efficiency in the use of scientific and technological resources and the potential of high-tech technologies in order to increase the economic indicators of the world economy and improve the quality of life of people. We have found that finite resources need to be optimally allocated among the various needs of society and used more efficiently.

2. The authors declare that the concept of "win-win cooperation" should be developed in the national economic policies of countries in order to ensure environmental friendliness and competitiveness within the framework of international scientific and technical cooperation. By introducing the latest high-tech technology and equipment, we can improve the problem of backward comprehensive national strength and scientific and technological strength.

3. The analysis of the regulatory framework signed by China and Ukraine shows that the following areas should be further developed: the field of high-tech technologies; Accept and support investments; cooperation in the field of agricultural safety and food safety; Aerospace field; Medical and health care.

4. Under the guidance of the new concept of cooperation with future-oriented, co-creation and sharing, openness and inclusiveness, and complementary advantages as the main elements, and under the cooperation mode supported by the collaborative linkage of multiple subjects, the support of various platforms, and the deep integration of innovation chain and industrial chain, it is appropriate to deepen the cooperation in science and technology innovation between China and Ukraine from the following direction.

5. The implementation of the strategy of increasing the level of competitiveness is therefore based on the use of competitive advantages, which in the case of high-tech industries include technological improvement, scientific and technological innovation and adequate financing for the scientific and technological development of science and technology industries, in particular

industry, based on successful international scientific and technological cooperation. Taking into account the findings, we will distinguish energy efficiency according to the following components: 1) socio-economic aspects; 2) Technical aspects. Thus, Ukraine is committed to the development of international high-tech cooperation. China is involved in a large number of projects in Ukraine, including industrial, aerospace, agricultural projects.

General conclusions

1. At present, more scholars have studied the mode and level of scientific and technological cooperation between the two places through the analysis of data. It was found that the level of scientific and technological cooperation between China and the "Belt and Road" countries is not high, and it is necessary to further strengthen the relevant scientific and technological cooperation funding;

2. Ukraine is one of the first countries to respond to China's Belt and Road Initiative and hopes to become a hub for trade and logistics between China and Europe. Ukraine not only has a superior geographical location and abundant natural resources, but also has a strong agricultural foundation, strong industrial production capacity, and a high level of personnel development. Ukraine has tremendous technological advantages and cooperation potential in the fields of machinery manufacturing, renewable energy, aircraft engines, and nuclear technology.

3. The technical cooperation between China and Ukraine can not only raise the level of scientific and technological innovation and improve the economic and industrial structure of the Chinese side, but also meet the needs of the Ukrainian side for the transfer and transformation of achievements and the popularization of technology application.

4. Under the framework of the "Belt and Road" initiative, China and Ukraine reached consensus on further deepening cooperation in science and technology innovation, promoting technology transfer and transformation between the two countries, and cooperating on joint research and development, sharing of scientific research facilities, personnel exchanges, and information exchange. The pragmatic cooperation in science and technology between the two sides is expanding from limited key areas to all-round aspects, from single trade exchanges to high-end methods such as whole-industry chain cooperation and joint development.

5. With the joint efforts of China and Ukraine, the development momentum of China-Ukraine scientific and technological cooperation has been good, the intergovernmental scientific and technological cooperation mechanism has been further strengthened, the Science and Technology and Space Subcommittee has been successfully held, the scientific researchers of the two sides have visited and

exchanged closely, joint research and development projects have become the main direction of cooperation, and China-Ukraine scientific and technological cooperation has ushered in a new period of opportunity.

6. Based on the study of best practices, the importance of increasing the level of economic efficiency according to a number of criteria was studied. These criteria are classified according to the type of enterprise, the direction of activity, the purpose of operation, as well as cost minimization and profit maximization.

7. The methodological component of the bachelor's thesis consists of generalization, deduction, induction, comparison, analysis, synthesis, rating evaluation, graphic method, forecast, foresight.

8. Based on the study of trends in the development of high-tech sectors in the world, China and Ukraine, it turns out that now the high-tech sector is gradually transitioning to modern high-tech. It should be noted that international cooperation in this area could be undertaken by individual States. It turns out that countries' transition to high-tech technologies requires new technological solutions, financial support and engineering support.

9. The People's Republic of China and Ukraine, in accordance with the latest developments in bilateral relations and the profound changes in the international and regional situation, and based on the common desire to further deepen the Sino-Ukrainian strategic partnership, have decided to comprehensively promote exchanges and cooperation in the political, economic, trade and other fields between the two countries

10. The two sides will continue to strengthen dialogue and coordination within multilateral frameworks such as the United Nations, maintain close communication and cooperation on international and regional issues of common concern, and create a favorable international environment for the development of the two countries.

11. It can be expected that the development potential of trade between the two countries in the future is still large, and the trade structure will continue to be optimized while consolidating the foundation.

12. According to the results of the statistics, it turns out that China has become the main economic partner of Ukraine in the Asia-Pacific region and one of the countries most interested in investing in the Ukrainian market, including high-tech

technologies. In recent years, China has attached considerable importance to investments in the high-tech sector in Ukraine.

The international exchange of modern science and technology marks the overall level of a new partnership established between countries, which includes the generation and research and development of new knowledge and technology, development and exchange and its application in different ways. In today's conditions, these international exchanges are a necessary means for a country to develop its potential and integrate into the international community. Ukraine and China have long-standing friendly relations and fruitful cooperation in various fields.

13. Based on the research carried out, we note a feature of the 21st century. It is the formation of a new mission for the global science and technology industry, which includes increasing the level of efficiency in the use of scientific and technological resources and the potential of high-tech technologies in order to increase the economic indicators of the world economy and improve the quality of life of people. We have found that finite resources need to be optimally allocated among the various needs of society and used more efficiently.

14. The authors declare that the concept of "win-win cooperation" should be developed in the national economic policies of countries in order to ensure environmental friendliness and competitiveness within the framework of international scientific and technical cooperation. By introducing the latest high-tech technology and equipment, we can improve the problem of backward comprehensive national strength and scientific and technological strength.

15. The analysis of the regulatory framework signed by China and Ukraine shows that the following areas should be further developed: the field of high-tech technologies; Accept and support investments; cooperation in the field of agricultural safety and food safety; Aerospace field; Medical and health care.

16. Under the guidance of the new concept of cooperation with future-oriented, co-creation and sharing, openness and inclusiveness, and complementary advantages as the main elements, and under the cooperation mode supported by the collaborative linkage of multiple subjects, the support of various platforms, and the deep integration of innovation chain and industrial chain, it is appropriate to deepen the cooperation in science and technology innovation between China and Ukraine from the following

direction.

17. The implementation of the strategy of increasing the level of competitiveness is therefore based on the use of competitive advantages, which in the case of high-tech industries include technological improvement, scientific and technological innovation and adequate financing for the scientific and technological development of science and technology industries, in particular industry, based on successful international scientific and technological cooperation. Taking into account the findings, we will distinguish energy efficiency according to the following components: 1) socio-economic aspects; 2) Technical aspects. Thus, Ukraine is committed to the development of international high-tech cooperation. China is involved in a large number of projects in Ukraine, including industrial, aerospace, agricultural project.

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Appendix

Appendix A.1.

Table A.1. Trade turnover between China and Ukraine in 2015-2019

year	2015	2016	2017	2018	2019
Total trade between the two countries	707383	670443	737669	966748	1191354
Chinese exports to Ukraine	351658	421682	504108	701900	739984
China imports from Ukraine	355725	248761	233561	264848	451370
balance of trade	-4066	172922	270546	437053	288613

Continuation of Table B.1.

In 2020, Ukraine's exports to China accounted for the proportion of total exports of this product (unit: %)

industry	proportion
minerals	15.2%
Animal and vegetable oils and fats	9.5%
Plant products	5.8%
woodwork	5.7%
Food Beverage Tobacco	5.1%
Electromechanical products	4.7%
Plastic rubber	1.9%
Paper	1.6%
animal	1.4%
Chemical products	0.7%
Metal products	0.2%
Transportation equipment	0.1%
Furniture toys	0.1%
textiles	0.1%