俄乌冲突对钨制品市场与价格的影响

IMPACTS OF RUSSIA-UKRAINE CONFLICT ON TUNGSTEN MARKET & PRICE

DR. HANNS
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www.ctia.com.cm
ceo@tungsten.com.cn

作者简介

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BRIEF INTRODUCTION TO THE AUTHOR

As the 1st E-commerce company of Tungsten (W), Molybdenum (Mo), Rare Earth (RE) in China, China Tungsten Online Manu. & Sales (CTOMS) was founded in 1997 based on China's the 1st and top tungsten website www.chinatungsten.com. As its specialized design, professional manufacturing, excellent service and powerful information database, CTOMS is not only the most authoritative information source of Chinese and English information of W Mo and RE products globally, but also the best comprehensive application solution provider of W, Mo and RE, both chemical materials and machined products, such as tungsten oxide, metal, cemented carbide and heavy alloys.

CTOMS has been created more than 1 million web pages and WeChat information message of W, Mo and RE news, price and market research, analysis. The web news.chinatungsten.com, www.ctia.com.cn are the world's top index websites of tungsten which have received 1 billion visits from 1997.

The major business of CTOMS is to complete product design, R & D with customers and provide customers with processing and integration services. In the past 2 decades, it has provided more than 100,000 different types of W, Mo & RE products to more than 10,000 customers all over the world. Years experience and technology accumulation have laid a foundation for promoting the flexible and intelligent manufacturing of customized products.

The professional research articles and reports of CTOMS are written by Dr. Hanns, Miss Sunny Zheng, professional analyst and its marketing team. Dr. Hanns is an expert of the main market and technical research of CTOMS has been engaged in e-commerce and international trade of tungsten and molybdenum products, production and manufacturing of cemented carbide and high specific gravity tungsten alloy since the early 1990s. He is a well-known expert in e-commerce, tungsten product design, processing and Market Research of tungsten and molybdenum products in the industry with more than 30 years of experience. Miss Sunny has been committed to the research of tungsten market, creating and promoting CTOMS social media form many years. She has strong professional delicacy and sensitivity to tungsten products market and price.

DR. HANNS
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ceo@tungsten.com.cn

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PART II OF X

Overview of Russia's Tungsten Resources and the Relationship with China Tungsten Industry

When it comes to Russia, my first thought word is "vast territory and abundant resources". As the world's largest country, Russia has 17 million square kilometers of territory across Euro and Asia, facing the Americas across the Bering Strait in the northeast and the Arctic in the north. Although 60% of Russia's territory belongs to permafrost and more than 80 land is not suitable for human habitation, the resource value of its vast land is naturally immeasurable. It can be seen only from the recent turmoil in the global commodity market. Russia is rich in oil, natural gas, coal and other energy materials, steel, tungsten, rare earth, aluminum, copper, titanium, nickel, palladium and other metal resources, as well as wheat, corn Rapeseed and other food crops and special gas neon have strong resource strength and status that are difficult to be replaced in the world. Among these resources, tungsten, rare earth, titanium and palladium are important strategic resources. Various military struggles, political games, economic sanctions and anti sanctions around the conflict between Russia and Ukraine will be carried out around or inseparable from these resources and their decisive role.



Moscow, the capital of Russian

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传真/FAX：0086 592 512 9797
邮箱/Email:sales@chinatungsten.com

1. Overview of Global Tungsten Resources

According to the report of China Tungsten online website, the global tungsten deposits are mainly distributed in the two metallogenic belts of the circum Pacific metallogenic belt and the Alps Himalayan metallogenic belt. The super large famous tungsten deposits distributed in the circum Pacific metallogenic belt include Zhuxi in Jiangxi, Dahutang in Jiangxi, Shizhuyuan in Hunan, Sisson and Northern dancer in Canada and NUI Phao in Vietnam, The total tungsten deposits in the circum Pacific metallogenic belt account for more than 1/2 of the total tungsten deposits in the world. The alpine Himalayan metallogenic belt is distributed with large and super large tungsten deposits such as verkhne kayrakty in Russia, hemer don in Britain, mittersill in Austria and barruecopardo in Spain. The world's tungsten deposits are mainly quartz vein type, porphyry type and skarn type. The skarn type tungsten deposit is the most important tungsten deposit in the world, and its reserves account for 1/2 of the world's total reserves.



Global tungsten resource distribution

The total reserves of tungsten resources in the world are estimated to be 7 million tons, of which about 30% are wolframite and 70% are scheelite. The world's tungsten resources are mainly concentrated in China, Canada, Russia, the United States and Bolivia, accounting for 87% of the world's total reserves. Other countries include Kazakhstan, Australia, Thailand, Portugal, Brazil, Myanmar, Austria, North Korea, Uzbekistan, Vietnam, etc. China is the country with the richest tungsten resources in the world, with reserves of 1.9 million tons and reserves base of 4.2 million tons, accounting for 68% of the world's tungsten resources. Russia has tungsten reserves of 400,000 tons, accounting for about 10.81%, second only to China; The total reserves of tungsten resources in Canada are 260,000 tons (tungsten content). If calculated on the basis of reserves, it is 490,000 tons. It ranks third in the world,

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accounting for about 8% of the world's tungsten resources. Canadian tungsten deposits are mainly concentrated in the Selwyn tungsten belt, and the most commercially valuable deposits occur in the extension zone from the Cassiar batholith in British Columbia to the Macmillan deposit on the border between the Yukon and the northwest. Followed by Russia, whose tungsten resources account for about 6.8% of the world's tungsten resources.

There are 21 provinces, autonomous regions and municipalities directly under the central government with proven tungsten reserves in China. Among them, there are 8 provinces and regions with reserves of more than 200,000 tons, which are Hunan 1,798,900 tons, Jiangxi 1,100,900 tons, Henan 628,500 tons, Guangxi 349200 tons, Fujian 306,700 tons, Guangdong 230,200 tons, Gansu 222,900 tons and Yunnan 216,600 tons, accounting for 91.7% of the national tungsten reserves (according to the statistics of the national tungsten reserves at the end of 1996). From the distribution of China's major administrative regions, the central and southern regions account for 58.2% of China's tungsten reserves, ranking first, followed by East China, 28%, northwest, 4.3%, southwest, 4.1%, northeast, 3.2% and North China, 2.2%. The proportion of tungsten reserves distribution in the three major economic regions: the eastern coastal region accounts for 17.1%, the central region accounts for 75.1%, and the western region accounts for 7.8%.

Reserve Distribution of World Tungsten(W) Resources (10000 MTs)				
Country	**W reserves**	**percentage**	**Reserve basis of W**	**Percentage**
China	77	40.5%	110	35.5%
Canada	26	13.7%	49	15.8%
Russia	25	13.2%	42	13.5%
US	14	7.4%	20	6.5%
Bolivia	5.3	2.8%	10	3.2%
Australia	0.9	0.5%	7.9	2.5%
South Korea	5.8	3.1%	7.7	2.5%
North Korea	-	-	3.5	1.1%
Myanmar	1.5	0.8%	3.4	1.1%
Thailand	3	1.6%	3	1.0%
Portugal	2.5	1.3%	2.5	0.8%
Brazil	0.9	0.5%	2	0.6%
others	28.3	14.9%	49	15.8%
Total	190	100.0%	310	100.0%
Retained reserves: total amount of exploitable industrial grade; Reserve basis: exploitable industrial grade and primary cut-off grade. Data source: USGS mineral commodity summaries				

Tungsten deposits in China are mainly distributed in five metallogenic belts: Sanjiang tungsten tin metallogenic belt, West Qinling Qilian Mountain metallogenic belt, Tianshan Beishan metallogenic belt, South China metallogenic belt and North China metallogenic belt. Among them, Nanling metallogenic area in South China metallogenic belt is the most intensive. Many large and super large tungsten deposits are distributed in this metallogenic

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belt, accounting for more than 70% of the national reserves, and China's tungsten reserves remain at 1.8-1.9 million tons. In 2014, the global tungsten reserves were 3.3 million tons, of which China accounted for 1.9 million tons, accounting for nearly 60% of the world. In 2013, China identified 7.014 million tons of tungsten reserves. There are 21 provinces, autonomous regions and municipalities directly under the central government with proven tungsten reserves in China, which are 1.8 million tons in Hunan, 1.1 million tons in Jiangxi, 630,000 tons in Henan, 350,000 tons in Guangxi, 310,000 tons in Fujian, 230,000 tons in Guangdong, 220,000 tons in Gansu and 220,000 tons in Yunnan. In terms of the distribution of major administrative regions in China, the central and southern regions account for 58.2% of China's tungsten reserves, 28% in East China, 4.3% in Northwest China, 4.1% in Southwest China, 3.2% in Northeast China and 2.2% in North China. In terms of the distribution of tungsten reserves in the three major economic regions, it is mainly concentrated in the central region, accounting for 75.1%, and the eastern coastal and western regions account for about 17.1% and 7.8%.

Statistics of Tungsten Ore Production in Major Countries 2020 to 2021

	Mine production		Reserves[9]
	2020	2021[e]	
United States	—	—	NA
Austria	890	900	10,000
Bolivia	1,350	1,400	NA
China	66,000	66,000	1,900,000
Korea, North	410	400	29,000
Portugal	550	620	5,100
Russia	2,400	2,400	400,000
Rwanda	860	950	NA
Spain	500	900	52,000
Vietnam	4,500	4,500	100,000
Other countries	960	1,200	1,200,000
World total (rounded)	78,400	79,000	3,700,000

World Resources:[9] World tungsten resources are geographically widespread. China ranks first in the world in terms of tungsten resources and reserves and has some of the largest deposits. Canada, Kazakhstan, Russia, and the United States also have significant tungsten resources.

In recent years, China has increased investment in tungsten exploration, with an average annual investment of about 300 million yuan. Large tungsten mines such as Dahutang and Zhuxi have been found one after another. In 2014, a new large porphyry tungsten mine was found in Hunan. From 2006 to 2013, China's proven tungsten resource reserves increased from 5.584 million tons to 7.014 million tons, with a cumulative increase of 1.43 million tons, with an average annual growth rate of 3.7%. From 2006 to 2013, China's newly identified tungsten resource reserves were 2,428,400 tons, with an average annual increase of 303,600 tons. In particular, the discovery of Jiangxi Dahutang super large tungsten mine in 2012 made the newly identified tungsten resource reserves reach a record high of 1,016,000 tons in 2012.

In China, wolframite was mainly discovered and exploited in the early stage, with less scheelite. However, China's tungsten reserves are dominated by scheelite and less wolframite. By the end of 1996, tungsten reserves were 5.2908 million tons, of which scheelite accounted for 71.1%, wolframite accounted for 26.4% and mixed tungsten ore accounted for 2.5%. For a long time, although wolframite reserves are small, it is rich and

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传真/FAX：0086 592 512 9797
邮箱/Emailsales@chinatungsten.com

easy to mine and beneficiate, accounting for more than 90% of the output of tungsten concentrate; Scheelite has large reserves, less rich ore and low grade, accounting for only about 10% of the output of tungsten ore; In recent years, with the improvement of mining and beneficiation technology, the utilization rate of scheelite is higher and higher. In order to adapt to the characteristics of Scheelite Concentrate, many enterprises have developed relevant mining, beneficiation and smelting technology and equipment to improve the recovery rate and reduce the production cost.



Dahutang Tungsten Mine Jiangxi, China

During their visit to Ganzhou Grand Tungsten Industry Co., Ltd., an upstream supplier, in mid March, China Tungsten online specially visited the company's new apt production plant with an investment of hundreds of millions of yuan. The plant uses mature smelting technology and can use black and white tungsten concentrates at the same time to taste high-quality ammonium tungstate products on the basis of high recovery rate, it is believed that the operation and successful operation of the plant will become another important new force in China's tungsten smelting industry.

For many years, China has been the world's largest country of tungsten resource reserves, exporters and consumers. For many years, China has almost always been a net exporter of tungsten products, so it has hardly imported tungsten raw materials from Russia. Therefore, the author optimistically estimates that the escalation of the conflict between Russia and Ukraine will not have a direct impact on the supply and demand relationship of tungsten products market in China, However, the supply gap in overseas markets may be further highlighted with the geopolitical tension of the conflict between Russia and Ukraine, which will promote the rise of global tungsten prices, and part of the import demand originally relying on Russian tungsten resources will also be transferred to China.

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www.chinatungsten.com
电话/TEL：0086 592 512 9696/512 9595
传真/FAX：0086 592 512 9797
邮箱/Emailsales@chinatungsten.com



High Pressure Filtration of Ammonium Tungstate Solution, Ganzhou Grand Tungsten Industry Co., Ltd

With the improvement of the awareness of the scarcity and importance of strategic resources and the strict control of environmental protection and production safety requirements, China's tungsten resources have also bid farewell to the era of "cabbage price". After the price of various tungsten products rises in the process of global economic recovery in 2021, it will remain at a relatively high level and it is difficult to decline significantly.



Zhuxi Tungsten Mine, Jingdezhen, Jiangxi is the largest Tungsten Mine with resource of tungsten trioxide (WO_3) in 2.86 million mts

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2. Overview of Tungsten Resources in Russia

Russia is not only the country with the largest land area in the world, but also one of the countries with rich mineral resources in the world. Russia's non-ferrous metals such as titanium, zinc, cobalt, tin, antimony, lead, mercury and other resources account for 37% of the world's mineral resources. In the country's mineral base structure, black and non-ferrous metals account for 13%, non-metallic mineral raw materials account for 15%, and diamonds and precious metals account for 1%.



Eight federal regions of Russia

Russia is the second largest tungsten resource reserve country and the third largest tungsten producer in the world. Its tungsten resources are mainly concentrated in the north Caucasus, East Siberia and the middle of the sikhote Alin mountains in the Far East. The larger mines are verkhne kayrakty. According to the data of the U.S. Geological Survey, Russia's tungsten production in 2021 was 2400 tons, the same as that in 2020, accounting for 3% of the total global tungsten production. Of course, in terms of reserves, China has the largest tungsten reserves in the world, with a total reserve of 1.9 million tons, while Russia, a large resource country, has only 250000 tons of tungsten reserves, and China's tungsten reserves are almost eight times that of Russia. Russia is a major military power in the world. Tungsten resources with high military value and strategic use are of great significance to the country and even the world.

In addition to tungsten resources, Russia is also one of the countries with rich molybdenum resources. In 2021, Russia's Molybdenum output was 2800 tons, an increase of 100 tons over 2020, accounting for 0.9% of the total global molybdenum output; Russia's rare earth minerals mainly include titanium niobate, apatite and fluorocarbonate. In 2021, Russia's rare

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earth output was 2700 tons, the same as that in 2020, accounting for 1% of the total global rare earth output; Russia is also the country with the largest palladium reserves and supply in the world, accounting for about 46% of the total palladium reserves in the world.

2.1 Russia's Far East Tungsten Reserves Rank First in Russia

According to the website of China Tungsten online on November 21, 2019, the Far East of Russia is the federal district with the largest area but the smallest population among the eight federal districts of Russia. It is also the region with the lowest degree of mineral development and the largest resource potential in Russia. It is very rich in mineral resources and supplies 30% of Russia's mineral raw materials, including gold, silver, uranium, tungsten, mercury, antimony, germanium.

The reserves of fluorite and helium ore rank first in Russia, and most of them account for more than half of Russia's total reserves.



Major Mineral Resources in Russia

According to the data of China Geological Survey, the Far East of Russia is rich in mineral resources, among which the minerals with reserves or output accounting for more than 90% of the total reserves or output of the Russian Federation include brucite, boron ore and tin; Diamond, antimony, uranium, gold, silver and tungsten account for 40-90%; Other important minerals include fluorite, lead, copper, iron ore and zinc, as well as oil and natural gas. Among them, 9 kinds of minerals such as oil, natural gas, tin, antimony, gold, tungsten, fluorite, copper and iron ore are listed in China's 24 kinds of strategic minerals catalogue, which are the key minerals of China in this area. The article "current situation and potential of mineral resources development in the Russian Far East" previously published in the China Mining Journal pointed out that the reserves of tungsten, tin, copper and other non-ferrous

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metal minerals in the Russian Far East are large, with reserves of 1.98 million tons, 40000 tons and 10.04 million tons respectively, ranking first in Russia. However, due to poor infrastructure and other reasons, tungsten, tin and copper deposits in most areas have not been developed except the coastal border area.

Rare metals in the Far East also play an important role in Russia. 92% of the proven reserves of tin in Russia are concentrated in the Far East, the reserves of mercury account for 57% of the reserves in Russia's Mercury balance sheet, the reserves of antimony account for 35.1% of Russia's reserves respectively, 57% of the predicted resources of molybdenum in Russia are concentrated in Chita Prefecture in the Far East, and 59% of the predicted resources of tungsten in Russia are also concentrated in the Far East.



Developing Russian Tungsten Mine

The data show that the total tungsten (W03) reserves in the Far East of Russia are 462,600 tons, accounting for 31.45% of the total tungsten reserves in Russia, half of which are distributed in the coastal border areas. The deposits are mainly polymetallic skarn and skarn greisen tungsten deposits, followed by scheelite sulfide skarn tungsten deposits. Tungsten mining in the Far East is mainly concentrated in the Dongfang No.2 tungsten deposit and lemonov tungsten deposit in the coastal border area. In 2015, 2,600 tons of tungsten trioxide were mined, accounting for 64.2% of the total mining volume in Russia. The predicted tungsten resources in the Far East are 1.12 million tons, accounting for 60% of the total predicted tungsten resources in Russia. The potential areas of tungsten are mainly distributed in the coastal border area and Amur state, among which the Malinov ore junction and gatkanqik ore point have the most prospect, and the predicted resources are more than 50,000 tons.

Russia is rich in many mineral resources, and most natural resources can be fully

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self-sufficient. It is estimated that based on the current industrial development and development and utilization of tungsten resources in Russia, tungsten ore can be mined for 37 years and molybdenum can be mined for about 40 years; Other resources, such as oil exploitation for about 30 years and natural gas for 81 years; 60 ~ 180 years of coal mining; 42 years of iron ore mining; Copper, nickel, zinc and lead ores can be mined for 18-20 years.

Output of Tungsten Concentrate in Russia,1995-2001

Products	Unit	Year						
		1995	1996	1997	1998	1999	2000	2001
Tungsten concentrate W content	10000 mts	0.54	0.3	0.3	0.3	0.35	0.35	0.3

2.2 Overview of Major Tungsten Mining & Development Enterprises in Russia

According to the historical data of USGS mineral commodity summaries, we have counted the main tungsten mining enterprises in Russia, but their reserves, production capacity and current production status are not clear. They are listed as follows for reference.

Overview of Major Tungsten Mining & Development Enterprises in Russia

Name of Tungsten Mine	Location	Output
Aginskoye deposit	Sakha (Yakutiya) Republic	NA
Antonovogorsk deposit	East Transbaikal,	NA
Balkan deposit	Northeast of Magnitogorsk, Ural Mountains	NA
Belukha deposit	East Transbaikal,	NA
Bom-Grokhom deposit	West Transbaikal	NA
Dzhida deposit		NA
Iultin deposit	Magadanskaya Oblast'	NA
Kti-Teberdaskoye deposit	North Caucasus	NA
Kvartz Artel	Dzhida region	NA
Lermontovo enterprise	Lermontovo deposit in Russian Far East	NA
Novo Orlovsk mining and beneficiation complex		NA
OAO Primorsk mining and beneficiation complex		NA
Solnechnoye deposit	Southern Khabarovskiy Kray	NA
Tyrnyauz tungsten-molybdenum mining and processing complex	Kabardino-Balkariya Republic North Caucasus	NA

At the 21st Annual Meeting of the International Tungsten Industry Association held in Xiamen, China in September 2008, delegates from Russia presented a report on a review of the Russian tungsten market and developments at a & IR mining. According to the data mentioned in the report, we can get a glimpse of the production status of tungsten products summarized from the former Soviet Union to Russia.

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Production of the Tungsten Concentrate in the USSR at the End of 1980s

Miner	Miner Annual Production (WO3/mt)
Tyrnauzsky GOK	9000 Mt
Primorsky GOK	3000 Mt
Yultinsky GOK	1500 Mt
Lermontovskaya GRK	1500 Mt
Jidinsky GOK	900 Mt
Novoorlovsky GOK	1500 Mt
Solnechny GOK	600 Mt
Others	1800 Mt
TOTAL	19 800 Mt



Primorsky Region Tungsten Mine

Production and Consumption of W-concentrates in Russia in 2000-2007（WO3）

Year	2003	2004	2005	2006	2007
Output/mts	4600	3500	3600	3700	4000
Consumption mts	3400	3400	3100	3100	4300

Note: all data in the above table are equivalent to the physical quantity of tungsten trioxide; In addition, Russia consumes about 1500-2000 tons of waste every year. The consumption growth in 2007 was mainly due to the increase in the import of tungsten concentrate after the abolition of import tax (5%) in 2007. This became the main reason for the increase of tungsten consumption in Russia in 2007.

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Tungsten Concentrates Production in Russia in 2007

Company name	Location	Mineral	Average WO3 Content	Annual Production
JSC "A&IR Mining" *	Primorsky region	Scheelite	52%	2500 Mt
JSC "Lermontovskaya GRK"	Primorsky region	Scheelite	40%	200 Mt
ZAO "Novoorlovsky GOK"	Chitinskaya oblast	wolframite	60%	600 Mt
Prospecting artel "Quartz" LTD	Chitinskaya oblast	wolframite	60%	600 Mt
Kalgutinskoe rudoupravlenie LTD	Altai region	wolframite	52%	150 Mt
Others (prospectors)	/	wolframite	60%	120 Mt
TOTAL	/	/	/	4070 Mt

* The company has been decreasing production output since 2003 due to the exhaustion of prepared reserves. Today the company is a bankrupt.

The Tungsten Deposits of A&IR Mining and Primorsky GOK.

Deposit name	Mineral	Reserves Mt (WO3)	Average content of WO3, %
Vostok-II	scheelite	30000	0.7
Skrytoe	scheelite	90000	0.4
Zabytoe	wolframite	5000	0.6
Nezametnoe	scheelite	N/A	0.3



Russian A & IR Tungsten Mining

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2.3 Primorsky Tungsten Mine in Russia and its Difficulties

On May 24, 2017, China Tungsten online made a basic introduction to Primorsky mine, the main well-known tungsten mine in Russia.

Tungsten ores are mostly concentrated in Siberia and the Far East. The proven tungsten ores are almost primary deposits. At the same time, some ores also contain molybdenum, copper, bismuth, gold, silver and other elements. Although the reserves of tungsten are the world's leading, most of Russia's tungsten ores belong to scheelite which is difficult to select, and the mining and processing situation is not very optimistic. Primorsky mine is located about 650km north of Vladivostok in the Far East of Russia. Together with lemontov mine, Primorsky mine is one of the two largest tungsten mines in the Far East of Russia. The mine mainly produces scheelite, with reserves of about 120000 tons, ore grade of 0.2%, and annual output of tungsten concentrate of about 5000T, of which 60% is supplied to China and 40% is exported to Japan and the United States.



Primorsky Tungsten Mine

Russia's domestic metal processing, oil and gas drilling, military industry and other industries have a very large demand for tungsten, which is completely in short supply. However, at present, 45% of the metal tungsten required by Russia's industry depends on the CIS countries. Since Primorsky has tungsten ore, why export "fertilizer water to foreign fields" is actually the main reason for Russia's special geographical and climatic conditions, Because the Primorsky mine is located in the Far East near the port of Vladivostok in the Pacific Ocean, while Russia's heavy industry is distributed in the Ural region of Europe, one in the East and the other in the West. The transportation cost is huge. In addition, the land transportation conditions in Siberia, Russia are not good, and there is ice and snow all year

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round. In addition, the random shutdown of the mine will also affect the production cost and the livelihood of local workers, so for the normal operation of the mine, Primorsky tungsten mine will choose to export some tungsten mines when the conditions are bad and it is difficult to transport.

2.4 Lemontov Tungsten Mine

According to the previous reports of China Tungsten online, combined with the introduction of "geology, mineralization and fluid inclusion characteristics of reduced tungsten (± Cu, Au, BI) skarn deposit in sikhote Alin lermontovskoe, Russia" (ore geology reviews volume 89, October 2017, pages 15-39), published on pages 15-39 of volume 89 of ore geology review https://www.sciencedirect.com ） In the Far East of Russia, there is a tungsten mine named after the poet lemontov. In December 2016, affected by the cold current in Siberia, the tungsten mine chose to close down in winter in order to save money, which caused great trouble to the local residents who lived on tungsten mines. They were difficult to survive the winter due to their lower income. Therefore, as President Putin personally urged the mining companies to invest funds to resume the work of lemontov mine as soon as possible.



Lermontov Tungsten Mine

The Lermontovskoe Mine is located in the primorie region of the Far East of Russia and contains a large amount of tungsten and other (copper, bismuth, gold) mineralization. It is part of an emerging belt with reduced gold (± w) deposits related to intrusion, which coincides with the long-known tin tungsten metallogenic belt extending along the West Pacific coast. The deposit was discovered in 1970 and has been mined in open-pit since 1988. The total output and existing reserves are 48kt WO3. The average WO3 content of the ore is 2.6% (up to WO3 content of 0.1%), copper content is 0.24%, gold content is 0.23 g/T, silver

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content is 3.23 g/T, arsenic content is 0.5%, phosphorus content is 2.5%, and sulfur content is 7.06% (belyansky et al., 2011). Therefore, although the scale is small, it is a particularly high-grade tungsten deposit.

The lemontovsky deposit (~ 48kt WO3; average 2.6% WO3, 0.24% Cu, 0.23g/t AU) is located in the tungsten tin gold metallogenic belt formed in the collisional tectonic environment. The tungsten skarn deposit has the characteristics of w-au-as-bi-te-sb, indicating that it has affinity with intrusion related gold deposits. The deposit is related to intrusions in ilmenite series and high potassium peraluminous granite (granodiorite to granite) suite. These rocks are formed by melting of crustal source caused by mantle magma. The deposit is characterized by the limited downdip range of the mineralized zone and a large number of coarse-grained Muscovite quartz (+ apatite, scheelite) aggregates formed in the stage of leaf alteration. In addition, high-temperature, high-pressure and high salinity fluids seep directly from the crystalline magma, which indicates the root of the mineralized magmatic hydrothermal system of the reduced tungsten skarn deposit.



High quality wolframite

2.5 Export Tariff of Russian Tungsten Ore and Concentrate

According to the report of China Tungsten online on January 3, 2014, the government of the Russian Federation stipulates that the export tariff rate of tungsten ore and its concentrate is 10% of the customs value. Relevant decrees have been issued by the Prime Minister of the government of the Russian Federation Dmitry? Medvedev signed and published it on the government's official website. Before 2012, Russia did not impose export tariffs on tungsten concentrate. On November 19, 2012, the Russian government issued an order to impose export tariffs on tungsten concentrate, which is due to the increasing demand for tungsten raw materials by Russian steel enterprises. Russian

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domestic suppliers have been unable to meet the needs of Russian steel enterprises. Even the duty-free import of raw materials is almost impossible. The Russian government expects that setting an export tariff of 10% on a normal basis will keep most - at least 50% - of the exported tungsten concentrate in the domestic market. According to the data of the Russian government, the export supply of tungsten concentrate accounted for 48% of the total output of tungsten concentrate in 2011 and about 74% in 2012. After the export tariff was levied at the end of 2012, the export volume of tungsten concentrate decreased by 30% in the first half of 2013, while the workload of metallurgical enterprises increased from 22% to 34%. However, the workload guaranteed by the normal working conditions of processing enterprises is less than 60-70% of the production capacity.

3. Major Tungsten Enterprises in Russia

According to the report of China Tungsten online, the 30th annual meeting of the international tungsten association was held in Russia from September 25 to 27, 2017. The conference was jointly organized by the Russian wolfram company CJSC and the international tungsten Association. The meeting was held when the price of Chinese tungsten products rose nearly 50% in two months. According to the registration at that time, major international tungsten products buyers and Chinese tungsten products manufacturers and suppliers attended the meeting one after another. 188 people from 89 enterprises in 24 countries, including more than 40 representatives of 18 Chinese Enterprises, including the main leaders of China Tungsten Association, Ganzhou Haisheng, Fujian Jinxin, Xiamen tungsten industry and China tungsten high tech. As Japan and other large countries in demand for tungsten raw materials have invested in the development and production of tungsten mines and raw materials in Russia, the participants visited the mining of tungsten mines and the production and processing of products in Russia, and were very interested in the production and processing technology and capacity of Russia. Liu Liang, then Secretary General of China Tungsten Industry Association, led the Chinese delegation to the meeting and visited unecha refractory metals of wolfram company in Russia. At that time, the meeting paid special attention to the high price and strong demand of global tungsten products, but the strategic reserves of tungsten resources in the United States, Russia and other countries were at a very low level.

In the past few years, Russia's tungsten products manufacturers have been active, mainly including technolom and wolfram company.

Technolom is a relatively young tungsten products company in Russia, located in zhkovsky, Russian Federation. The company has a license to collect and recycle waste products. It uses tungsten carbide waste to process calcium tungstate (synthetic calcium tungstate), and its final product is ferrotungsten. Its ferrotungsten production is carried out in a smelter in Moscow, with a capacity of 30 metric tons / month of ferrotungsten and 10 metric tons / month of yellow tungsten oxide (WO3 99% min.).

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Tungsten Trioxide Oxide Made from Tungsten Concentrate by CTIA GROUP

Wolfram company JSC is located in Moscow, Russia. According to the company, "Wolfram" JSC is the largest manufacturer of tungsten products in Russia and one of the main participants in the international tungsten market. The company is a vertically integrated holding company. It has the whole industrial chain from ore mining to finished product production. It has three factories to produce Tungstic Aicd, Sodium Tungstate, Yellow Tungsten Oxide(YTO), Blue Tungsten Oxide(BTO), Ammonium Paratungstate （APT）, Ammonium Metatungstate （AMT）Tungsten Metal Powder, Tungsten Carbide Powder, Tungsten Rod and other tungsten products.

4. Relationship Between Chinese Tungsten Industry and Russia

4.1 Brief History of China's Tungsten Industry

In 1882, a German (who was called Wu Liheng in Chinses) priest of Jiangxi Dayu Evangelical Church, found Xihua mountain tungsten mine and bought the right to go down the mountain from the monk Miaoyuan monk in Qingyun Temple of Xihua mountain with 500 silver yuan. He secretly mined the tungsten mine and transported it back to Germany to help his country develop the arms industry. In 1908, a Xijiang Dayu student brought Xihuashan ore to Nanjing and identified it as tungsten ore; Later, the Qing government redeemed the mountain right for 1000 silver yuan and officially mined it. Since then, China's tungsten mine has untied the history of official mining. Xihuashan Tungsten Mine in Dayu County began to be mined on a certain scale from 1915 to 1916. Since then, many tungsten mining areas have been found in Nanling area, and the production has been expanding. By the end of World War I, the output of tungsten concentrate reached 10000 tons, ranking the first in the world. Up to now, Xihuashan in Dayu County is also known as the "Tungsten Capital of the World".

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Wolframite of Xihuashan Tungsten Mine

In March 1932, the Provisional Central Government of the Chinese Soviet decided to establish Chinese Tungsten Mining Company in Yudu, Jiangxi Province, which was the first state-owned profit-making enterprise established by the Communist Party of China. As the only heavy industry of the Soviet Republic of China, tungsten mining increased the financial revenue of the Soviet Republic of China and effectively supported China's Soviet revolution. In the late autumn and early winter of 1932, after Mao Zemin (the younger brother of Mao Zedong, president of the Chinese Soviet), then president of the China's Soviet bank, was appointed as the general manager of the company, he expanded the workforce, improved the wages of workers, and uniformly purchased tungsten mines, which greatly increased the production and sales of tungsten sand in the area. By January 1935, Chinses Tungsten Mining was closed. During this period, it had been produced 4193 tons of tungsten concentrate, with a total output value of more than 4 million silver yuan, which replaced a large number of scarce materials in the Soviet Area, increased the financial revenue of the Soviet Republic and effectively supported the revolution. Therefore, China's tungsten products industry grew and expanded with the Communist Party of China. It can be described as the initial industrial foundation of Red China and Red Soviet, and also the lifeblood of red regime finance. Tungsten resources have made outstanding contributions to a group of Chinese Soviet central government under the guidance of Marxist thought from the Soviet Union.

In 1935, Jiangxi Province established the tungsten industry management office of the resources committee, and the Dajishan Tungsten Mine Engineering Office was established in 1937. In 1938, Xihuashan mine was established for pit mining. According to incomplete statistics, nearly 50000 tons of tungsten sand were mined from Xihuashan Tungsten Mine until the founding of new China. In the 1930s and 1940s, not only a large number of wolframites, but also scheelite were found one after another.

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Hua Meiao Tungsten Mine, with a mining age of more than 60 years, is located in Xingguo, Ganzhou City, Jiangxi Province, South of China

Contact metasomatic scheelite deposit (skarn scheelite deposit) was first discovered in Laojunshan area, Wenshan County, Yunnan Province in 1943. Scheelite deposit was discovered in Yaogang xianshangtan, Yizhang, Hunan Province in 1947. After the founding of new China, during the first Five-Year Plan period (1953-1957), the "four famous mountains" wolframite deposits in the west of Southern Jiangxi, such as Huashan, Daji mountain, kumei mountain and Pangu mountain, were taken as key mine construction projects to carry out tungsten mine construction in southern Hunan, northern Guangdong and Northeast Guangxi.

From the 1960s to 1980s, in order to carry out a large number of geological explorations work successively and discover and explore a number of large and super large tungsten mines in South China and northwest Gansu, more than 20 mines directly under the central government and a large number of local state-owned small and medium-sized mines were built from the 1950s to 1970s. Since the 1980s, the total ore production capacity of state-owned tungsten mines has reached 8.7 million tons. The annual output of tungsten concentrate is 40000 ~ 50000 tons (WO_3 content). According to China's mineral resources report 2018, by the end of 2017, the identified resource reserves of tungsten mines in China were 10.3 million mts.

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In November 1981, Fang Yi, former Vice Premier of the State Council of China, took a group photo with representatives at Xihuashan Tungsten Mine Hotel, the special hotel which was built for the former Soviet Union Experts. (Photo, Shi Qianli)

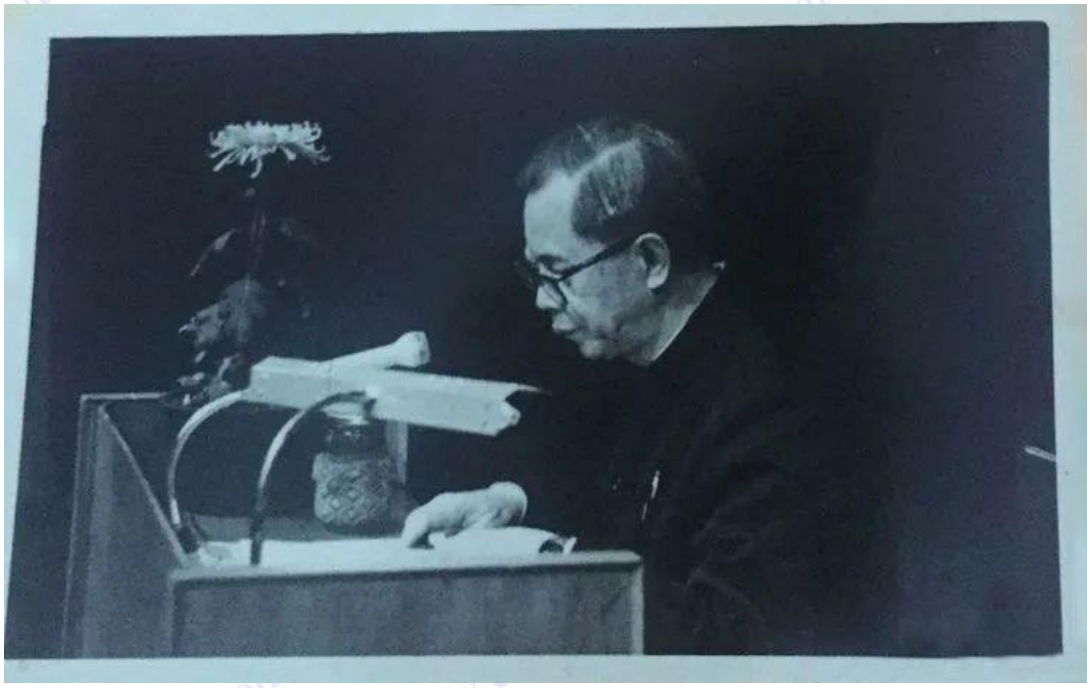
The first National Tungsten science and technology conference was held in Xihuashan Tungsten Mine from November 10 to 16, 1981. Vice Premier Fang Yi attended the meeting and delivered an important speech entitled "work hard, organize and revitalize the tungsten industry" to the relevant ministries and commissions of the State Council and more than 270 representatives from 140 units engaged in tungsten production, infrastructure, scientific research and design, colleges and universities in Jiangxi, Hunan and Guangdong. This meeting is the highest-level meeting held by the state at Xihuashan Tungsten Mine. At this meeting, vice premier Fang Yi inscribed "REVITALIZING CHINA TUNGSTEN INDUSTRY" for the tungsten industry. Since then, China's tungsten industry has made unremitting efforts from generation to generation to practice the spirit of revitalizing science and technology and serving the country through industry.

In September 1982, the people's governments of Jiangxi, Hunan and Guangdong provinces and the Ministry of metallurgical industry jointly submitted an emergency report on revitalizing the tungsten industry to the National Economic Commission and the State Council, suggesting the establishment of a National Tungsten company. In April 1983, the State Economic Commission approved the establishment of China Huaxing tungsten Co., Ltd. and co operated with Nanchang company of China Nonferrous Metals Industry Corporation in Nanchang.

In December 1985, China Tungsten Industry Association (CTIA) was established in Nanchang. The chairman of the mining branch of China Tungsten Industry Association is Mr. Li Qingyan,

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the old manager of Xihuashan Tungsten Mine. In the same year, the cemented carbide branch of CTIA was also established.



Vice Premier Fang Yi delivered an important speech at the first National Tungsten Science and Technology Conference. Photo, Cheng Qurong

In November 2001, experts, scholars and business people from China's tungsten industry gathered in Gulangyu, Xiamen, the hometown of Mr. Fang Yi, the former vice president of the State Council. The conference with the theme of "Scientific, Technological, Innovation and Industrial Upgrading of China's Tungsten Industry in the 21st Century" played an important role in promoting the development of China's Tungsten Industry in the next 20 years. Hanns himself attended this meeting. At this meeting, he had the honor to accompany Mr. Wang Diange, one of the leading figures in China's tungsten industry, and had a very deep and detailed understanding of the origin of Mr. Wang and China's Tungsten Industry and the development of Jiangxi tungsten industry. Here, we must not forget that he devoted himself to the revolution before liberation and worked silently in the field of China's tungsten industry for a long time after liberation. This is an old generation of revolutionist, Mr. Wang diange, who is very respected by the author himself. He was the former director of the tungsten, molybdenum, tin and antimony Bureau of China Nonferrous Metals Industry Corporation. He participated in the revolutionary work in March 1947 and joined the Communist Party of China in April 1948. He once served as the director of the tungsten, molybdenum, tin and antimony Bureau of China Nonferrous Metals Industry Corporation, His deeds were included in the book "records of the founding soldiers" published by China workers' Publishing House in August 2007. After the founding of the people's Republic of China, Mr. Wang worked in various tungsten mining enterprises in Jiangxi Province for a long time, led and participated in various tungsten mining projects assisted by the Soviet Union, and later worked in the Department of metallurgy of Jiangxi

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Province, supporting and leading the development of tungsten and molybdenum industry for a long time. He is the leader and successor of China's red tungsten industry and has made great contributions to the tungsten industry in Jiangxi Province and new China.

4.2 China's Tungsten Industry Aided by the Soviet Union

China's vigorous first five-year plan began in 1953, and its core is to develop modern industry. On the basis of self-reliance, China actively cooperates and develops with the Soviet Union. The Soviet Union also vigorously supports China's development of industrialization for the growth of the collective strength of the socialist camp. The former Soviet Union not only provided nearly 10 billion Rubles of loans, but also sent experts to China to participate in project construction and operation and production to provide technical and experience support. This is the famous 156 Soviet aid projects to China during the first five-year plan period, it is mainly concentrated in the field of heavy industry, involving iron and steel, metallurgy, coal mine, petroleum refining, heavy machinery, automobile, chemical industry, electric power and so on. By the late 1950s, these major projects had laid the foundation for the industrialization of new China and changed the situation that heavy industrial products were poor and white at the beginning of the founding of the people's Republic of China.

On May 15, 1953, Premier Zhou Enlai, on behalf of the Chinese government, signed in Moscow the "Sino Soviet agreement" on the Soviet Union's assistance in the construction of 156 projects in China. According to the agreement, the Soviet Union assisted China in the construction of Xihuashan Tungsten Mine (mining and beneficiation 1856 tons/day), Dajishan Tungsten Mine (mining and beneficiation 1600tons/day), kumeishan tungsten mine (mining and beneficiation 1570tons/day), Zhuzhou Cemented Carbide Plant (cemented carbide 500tons/year), etc.



May 15, 1953, Premier Zhou Enlai, signed in Moscow the "Sino Soviet agreement" on the Soviet Union's assistance in the construction of 156 projects in China.

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4.3 Zhuzhou Cemented Carbide Plant（also named 601 Plant）

Counting the development of China's major tungsten products production and processing industry, it is not difficult to find that China's tungsten products industry has long been deeply branded by the Soviet Union and Russia. Like China's two bombs and one satellite, the design and construction of our earliest tungsten products processing plant 601 not only involved a large number of Soviet experts, but also all its technology and equipment came from Russia. This situation was not until the 1990s, After Jinlu special alloy of Xiamen tungsten industry introduced the advanced production technology of Japan and Europe and America, the production technology pattern of tungsten products in China has gradually changed the situation that it is almost monopolized by Russian technology and equipment. It is no exaggeration to say that Russia shaped the early state of China's tungsten products industry.



Zhuzhou Cemented Carbide Plant（also named 601 Plant）

In the specific list of 156 projects assisted by the Soviet Union, it is not difficult to find that there are many tungsten and molybdenum production and processing enterprises and mines all over the north and south of China. Molybdenum products include Jilin Yangjiazhangzi molybdenum mine and Jinzhou Ferroalloy Factory; In terms of iron and steel and rare earth, Baotou Iron and steel company and Wuhan Iron and steel company. However, due to the lack of military superiority in the air at that time, many industrial modernization projects designed for national defense and military were located in the remote inland far away from the coastline, that is, the so-called "third line construction". Zhuzhou is an important town in these three lines of construction and projects aided by the Soviet Union.

During the first five-year plan period, Zhuzhou in Hunan Province was designated as one of China's eight major industrial key construction cities. Based on Zhuzhou's convenient transportation, proximity to the origin of lead, zinc, tungsten, antimony, manganese, coal,

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iron and other deposits in the province and neighboring provinces, sufficient industrial raw materials and geographical conditions in terms of climate, hydrology and geology, the state arranged the construction of 4 of the 156 key projects assisted by the former Soviet Union in Zhuzhou. In April 1954, the Preparatory Office of Xi'an tungsten products factory moved south to Zhuzhou and was renamed the Preparatory Office of Zhongnan cemented carbide factory. In November 1957, the factory was basically completed. This is Zhuzhou Cemented Carbide factory, formerly known as Zhongnan cemented carbide factory. It is an important tungsten products production and processing base in China aided by the former Soviet Union. The factory changed its name to "601 factory" on November 1, 1956, and was externally known as "Changjiang Smelter" and "Changjiang Tool Factory".



High speed slot cutter of Zhuzhou Cemented Carbide Group Co., Ltd.

According to the self introduction of the website, Zhuzhou Cemented Carbide Group Co., Ltd. is located in Zhuzhou City, Hunan Province, the core area of "Chang Zhu Tan Urban Agglomeration" and the transportation hub center of southern China. The plant was built in 1954. It is one of the 156 key projects built during the first five-year plan period and is known as "the cradle of China's cemented carbide industry". In December 2009, it became a subordinate enterprise of China Minmetals Corporation, one of the world's top 500 companies. It is a large-scale domestic cemented carbide production, scientific research, operation and export base. The company mainly produces six series of products, including metal cutting tools, mining and oilfield drilling and mining tools, hard materials, tungsten molybdenum products, tantalum niobium products and rare metal powder products, which are widely used in metallurgy, machinery, geology, coal, petroleum and chemical industry. At present, the company is a major member company of China tungsten high tech under China Minmetals. In the column of introduction to the historical development of the company, it is written that "from 1953 to 1960, 54 Soviet experts participated in site selection, infrastructure construction, equipment installation, trial production and stable production."

4.4 Zigong Cemented Carbide Plant (also named 764 Factory)

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In the 1960s, based on the judgment of the international and domestic situation at that time, Comrade Mao Zedong made the decision to strengthen the "third line construction". In September 1964, the Party committee of Zhuzhou 601 plant, which was under the Ministry of metallurgy at that time, sent personnel to Beijing to accept the task of internal relocation and construction, and decided to build 764 plants in Zigong "erhuangtan". The plant officially started its design and construction on November 20, 1965, Therefore, we say that Zigong Cemented Carbide Company is also a tungsten product processing enterprise with the blood of the former Soviet Union. In 2010, the world's top 500 China Minmetals successfully acquired Hunan nonferrous metals, and its Zigong Cemented Carbide Co., Ltd. became one of the core members of the cemented carbide and tungsten molybdenum industry of China Minmetals Corporation.



Zigong Cemented Carbide Co., Ltd

"At present, the self-hardening company has a registered capital of 870 million yuan, an asset scale of 1.87 billion yuan, more than 2500 employees, three branches, five holding subsidiaries and five alloy divisions, including branches in North America and Europe. After more than 50 years of development, the company has continuously formed an industrial layout with cemented carbide as the main body and hard surface materials and tungsten molybdenum products as the two wings. Its products are widely used in machinery, metallurgy, petroleum, mining and construction, electronics, aerospace and other fields. Based in the southwest, facing the whole country and radiating the whole world, the company continues to build a multi-level and multi-channel marketing network, and 40% of its products are exported to Europe, America, Japan and South Korea, Southeast Asia, the Middle East, Russia and other more than 40 countries and regions. With advanced equipment and perfect functions, postdoctoral scientific research workstation and provincial technology research and development center, it is the first batch of national intellectual property demonstration enterprises, and has obtained more than 300 authorized patents.

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Dajishan Tungsten Mine

4.5 Xihuashan, Dajishan & Kuimeishan are all Tungsten Mines in Jiangxi, China

Jiangxi Province is the most important province of tungsten resources in China, and it is also the place where tungsten ore was first discovered and mined in China. Among the 156 key projects assisted by the former Soviet Union, all projects in Jiangxi are to assist in the construction of three tungsten mines: Daji mountain, Xihua mountain and Kui Meishan. After these projects, China has successively built more than 20 state-owned tungsten mine bases including Xihua mountain tungsten mine through self-reliance throughout the country, mainly in Jiangxi, Hunan and other provinces.

Xihuashan Tungsten Mine is known as the ancestor of China's tungsten mine. The metal minerals in its vein are mainly wolframite. The cumulative proven reserves of the mining area are 81300 tons of tungsten trioxide and 6724 tons of rare earth oxide. Xihuashan Tungsten Mine was an important fund-raising place for the Red Army in southern Jiangxi during the agrarian revolution. After the founding of the people's Republic of China, it was one of the 156 key industrial construction projects in New China and one of the key projects assisted by the former Soviet Union. Xihuashan created two tungsten mining projects with the longest geological exploration project and the largest production output. It was an important mineral supply base of the country at that time and made great contributions to the development of the national economy.

Dajishan Tungsten Mine is located in Dajishan Town, QUANNAN County, Jiangxi Province. It was discovered in 1918. Before 1949, it was mostly manual mining and beneficiation. It was nationalized in October 1952. It is the backbone enterprise of 156 key projects during the first five-year plan period and the main tungsten mine construction project aided by the former Soviet Union. In January 1959, a gravity separation plant with an annual processing

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传真/FAX：0086 592 512 9797
邮箱/Email:sales@chinatungsten.com

capacity of 812000 tons of raw ore was put into operation. Minerals with industrial value include wolframite, scheelite, molybdenite and beryl, from which tungsten, bismuth, molybdenum and pyrite are recovered. Since 1949, a total of more than 100000 tons of standard tungsten concentrate have been produced.

After 1949, the construction of Xihuashan Tungsten Mine was one of the 156 key industrial projects in the first "Five-Year Plan" assisted by the Soviet Union. Since then, with the technical support and assistance of Soviet experts, Xihuashan, Daji mountain, Kui Mei mountain, Pangu mountain and other "four famous mountains" wolframite deposits have been used as key mine construction projects and tungsten mines in southern Hunan, northern Guangdong and Northeast Guangxi, it provides sufficient mineral resources, technology, equipment and human resources for the construction and sustainable development of China's tungsten industry.



Kui Meishan, one of the three tungsten mines built with the aid of the former Soviet Union, has gradually become lonely today

In 1955, experts from the Soviet Union assisted China designed the overall construction project of kuimeishan tungsten mine. In 1959, the construction of world-class ore transportation cableway and quasi loading mechanized large-scale beneficiation started simultaneously with Xihuashan Tungsten Mine and Dajishan Tungsten Mine. In 1960, kuimeishan tungsten mine was fully completed and officially put into production. Since then, kuimeishan tungsten mine has bid farewell to the history of traditional manual mining and beneficiation technology, and a modern tungsten mine has been completed. Xihua mountain, Daji mountain and Kui Mei mountain have become the backbone of tungsten industry in New China. After just a few years of construction and development, China's tungsten industry has established a leading position in the world. In the late 1950s, in order to provide supporting services for the core projects aided by the Soviet Union in the "first five-year plan", China built Ganzhou nonferrous metallurgy machinery plant, Ganzhou Nonferrous Metallurgy Research Institute, Ganzhou Nonferrous Metallurgy Chemical Plant, Shangyou Hydropower Station, Jiangxi Metallurgy College (former Southern Metallurgy

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邮箱/Email:sales@chinatungsten.com

College, now Jiangxi University of Technology) and other supporting auxiliary units in south of Jiangxi. After several generations of efforts, Ganzhou has become the tungsten capital of the world and one of China's important tungsten resources and processing centers.



Underground rail transportation in Kuimeishan Tungsten Mine

4.6 Historical Relationship between China and Russia Tungsten Industry

These famous enterprises we are familiar with, such as 601 (Zhuzhou Cemented Carbide factory), 764 (Zigong Cemented Carbide factory), 801 (Ganzhou cobalt tungsten Co., Ltd., Ganzhou, Jiangxi in 1958), 603 (Nanchang cemented carbide factory, Jiangxi Nanchang in 1966) were important tungsten products production and processing enterprises built with the aid of the Soviet Union or designed and constructed with the technology and equipment of the former Soviet Union and Russia; They are the forerunners of China's tungsten products industry and the pillar of China's tungsten industry for decades.

Therefore, we say that at the beginning of the prosperity of China's tungsten industry, it mainly relied on the support of manpower, technology and equipment of the former Soviet Union. The tungsten products industries of the two countries have a common technical concept, equipment, products and development context. With the strong support of the former Soviet Union, China's tungsten industry was able to plan, build and produce the whole tungsten industry chain that provides qualified hard alloy cutting tools for the construction of new China, from the exploitation, beneficiation and smelting of tungsten resources in Xihua mountain, Daji mountain and Kui Mei mountain, to the planning, construction and production of cemented carbide enterprises with advanced technology at that time, such as 601 and 764.

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Expert of the former Soviet Union and Chinese technican in the 1950s

Therefore, we say that the tungsten industry of China and Russia has a deep origin. Russia once played an important role in the development of China's tungsten industry. Our tungsten industry has been deeply branded by Russia in the decades after the 1950s. Today, China's tungsten products industry is no longer the same as Russia in terms of resources, technology, product quality and industrial chain scale.

The development of Russian tungsten products industry will play an important role in the current conflict between Russia and Ukraine, and have a great impact on the global supply and market of tungsten products. Our view is that: (1) the tension of the military situation will make countries around the world step up the production and reserve of relevant strategic materials, and take the principle of giving priority to self-protection. Therefore, we believe that the supply of tungsten resources will continue to be relatively tight in the next few years. From the perspective of supply and demand, the price without resources will maintain a stable rising pattern; （2）Even if the dispute between Russia and Ukraine will not cause substantial inflation in China in a short time, resulting in a sharp rise in the production cost and high price of tungsten products, the stable and strong Chinese currency will also lead to a rise in the price of tungsten products mainly originating from China due to the currency price; (3) As Russia's demand for tungsten resources is bound to increase significantly due to the war, it also urges Russia not only to restrict the export of its own tungsten products, but also to try to purchase as many tungsten resources as possible in the international market to supplement its war consumption and enhance the reserve of such strategic materials, which will produce a certain degree of tungsten product demand depression and absorb corresponding tungsten resources to a certain extent; (4) Of course, at the same time, we must also be aware that if the conflict between Russia and Ukraine continues to expand, it will inevitably affect the process of global

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传真/FAX：0086 592 512 9797
邮箱/Emailsales@chinatungsten.com

economic recovery, weaken the market demand and consumption prospect of tungsten products industry, and the price of tungsten products will inevitably fall.

For more information about the history, current situation and future development trend of China's tungsten industry, news, products, prices and market dynamics, please visit our website www.ctia.com.cn

SUMMARY

Based on the experience of tungsten products market in the past decades and the current situation of the conflict between Russia and Ukraine, the author believes that the price of tungsten products will continue to rise in 2022, but the main factor is not traditional market factors; Therefore, in the first part, we focus on the conflict between Russia and Ukraine and the military use and importance of tungsten products. In this part, we introduce the global resource distribution of tungsten products, especially the overview of Russian tungsten resources and the relationship between China's tungsten products industry and Russia. In the later part, we will start from the intensification of tungsten market cost pressure under the background of resource struggle under the conflict between Russia and Ukraine from the perspective of currency and finance, analyze the market trend of tungsten industry under the background of war and sanctions, and comprehensively analyze the main factors and possibilities of the rise and fall of tungsten product prices in 2022. At the same time, we will also discuss the feasibility and risks of China's Tungsten product futures.

(THE REMAINING PART III TO X WILL BE CONTINUED)

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