

end CNC machine tools and accessories were imported from Japan and Germany; fewer than 20 Chinese companies can provide medium and high-end CNC machine tools. Local industry experts expect that the demand for metal cutting, forming machine tools, and accessories will face challenges of continued growth in 2019.¹⁴³²

8.7.11 Military technology

8.7.11.1 Developments and Trends in China's Defense Industry

China's defense-industrial complex continues to adapt and reorganize to improve weapon system research, development, acquisition, test, evaluation, and production.

China has realigned its S&T decision making apparatus by establishing two advisory groups that promote a strategic approach to military modernization and enhance collaboration.

Defense Sector Reform: China's defense industrial complex continues to adapt and reorganize to improve weapon system research, development, acquisition, test, evaluation, and production (RDATE&P). Inherent to this effort is a realignment of China's S&T decision making apparatus and the establishment of two advisory groups at the highest levels of government. One group is focused on promoting a strategic approach to military modernization, and the other encourages innovation through a doctrine of increased collaboration between China's military- and state-owned (defense) industrial sector and its private and commercial industrial enterprises. During the past four years, the CMC and the State Council implemented organizational and policy changes to advance the PLA's defense research and increase its capacity for innovation through market sector cooperation.

One of the most influential reforms to help improve RDATE&P occurred in 2015 with the establishment of the Strategic Committee of Science, Technology, and Industry Development for National Defense, a high-level advisory group chaired by the State Administration for Science, Technology, and Industry for National Defense. The committee, comprising military and civilian industrial, government, and technical leaders and experts, advises China's military and defense-industrial leaders on military modernization issues and on opportunities to develop emerging technologies.

The CMC, in 2016, established the S&T Commission, a high-level defense research body, as an independent organization under the high command. It also emphasized Civil-Military Integration (CMI), a phrase used in part to refer to the defense and commercial industrial sectors sharing or combining resources to develop dual-use technologies, policies, and organizations for mutual benefit but with a particular emphasis on assimilating private sector innovation into the defense industrial base. The 2017 establishment of a Central Commission for Integrated Military and Civilian Development, responsible for overseeing CMI efforts, underscores the importance China assigns to this initiative.

¹⁴³² Excerpts from a report "China - Machinery" of Ministry of Commerce, USA, last published on July 30, 2019, available online at URL: <https://www.export.gov/apex/article2?id=China-Machinery>

In early 2017, the PLA set up a Scientific Research Steering Committee, which falls directly under the CMC, consisting of scientists and engineers that have experience with cutting-edge technologies. Along with the CMC S&T Commission, the committee will spearhead S&T innovation by advising the CMC on early stage research projects.

In July 2017, China reorganized the three top PLA academic institutes the PLA Academy of Military Science (AMS), the National Defense University, and the National University of Defense Technology as part of its PLA reform initiative. With the new structure, the AMS will focus on scientific research related to military affairs, facilitating closer ties between military theory and S&T development. In 2016, China adopted its 13th Five-Year Plan (2016–2020) which, among other things, sets focus areas for R&D and innovation. Many of the focus areas featured have defense implications, such as aerospace engines including turbofan technology and gas turbines; quantum communications and computing; innovative electronics and software; automation and robotics; special materials and applications; nanotechnology; neuroscience, neural research, and AI; and deep space exploration and on-orbit servicing and maintenance systems. China also is concentrating substantial R&D resources on nuclear fusion, hypersonic technology, and the deployment and hardening of an expanding constellation of multipurpose satellites.

Two of the most influential proponents in promoting and enforcing China's RDATE&P, S&T, and CMI initiatives are the State Administration for Science, Technology and Industry for National Defense and the CMC's Equipment Development Department (EDD), which work together to monitor and guide the state and military sides of China's defense industrial apparatus, respectively. The EDD and its military service counterparts cooperate with China's 10 state-owned defense industrial corporations through a network of military representative bureaus and offices to supervise quality control and defense contract compliance. In 2018, the United States announced sanctions against the EDD related to purchases of military equipment from Russia and imposed pursuant to the Countering America's Adversaries Through Sanctions Act (CAATSA).

The National Science Foundation of China (NSFC), the China Academy of Sciences (CAS), and the Ministry of Science and Technology (MOST) are key to S&T decision-making, funding and promoting basic and applied research, scientific innovation, and high-tech integration throughout China's scientific, engineering, and civil-military industrial complex. CAS, working closely with NSFC, is the highest academic institution for comprehensive R&D in the natural and applied sciences in China and reports directly to the State Council in an advisory capacity, with much of its work contributing to products for military use. The NSFC and CMC S&T Commission, key advisors on emerging and disruptive technologies, signed a five-year strategic cooperation agreement in August 2016 to collaborate on civil-military co-innovation and basic research for national defense.

8.7.11.2 Military Equipment Modernization Trends

Many of China's missile programs are comparable to other top-tier producers, and China can use aspects of the S-400 SAM system it began receiving from Russia in 2018 to reverse-engineer capabilities it lacks.

China is the top ship-producing nation in the world by tonnage, with the capability to domestically produce naval gas turbine and diesel engines as well as shipboard weapons and electronic systems, making it nearly self-sufficient for all shipbuilding components.

Missile and Space Industry: Most of China's missile programs, including its ballistic and cruise missile systems, are comparable in quality to other international top-tier producers. China produces a wide range of ballistic, cruise, air-to-air, and surface-to-air missiles (SAMs) for the PLA and for export, which has enhanced its primary assembly and solid propellant rocket motor production facilities.

China received the first S-400 SAM system it purchased from Russia in April 2018. China can use aspects of the S-400 to reverse engineer capabilities it lacks. China's space industry is rapidly expanding its ISR, navigation, and communication satellite constellations and making substantial strides in its space lift capabilities, human spaceflight, and lunar exploration programs. China is looking to expand its space launch vehicle industry to support commercial launches and make rapid satellite launch services available to foreign customers. China is planning to launch, assemble in-orbit, and operate a crewed Chinese space station before 2025.

Naval and Shipbuilding Industry: China is the top ship-producing nation in the world by tonnage, increasing its shipbuilding capacity and capability for all naval classes, including submarines and surface combatants as well as lift and amphibious ships. China's two largest state-owned shipbuilders the China State Shipbuilding Corporation and the China Shipbuilding Industry Corporation collaborate on ship designs and construction to increase shipbuilding efficiency. China produces its naval gas turbine and diesel engines domestically as well as almost all shipboard weapons and electronic systems making it nearly self-sufficient for all shipbuilding components.

Armaments Industry: China's production capacity is advancing in nearly every category of PLA ground systems, including armored personnel carriers, assault vehicles, air defense artillery systems, artillery systems and pieces, and main and light battle tanks. Notably, China began testing unmanned Type-59 tanks in November 2018. China can produce ground weapon systems at or near world-class standards; however, quality deficiencies persist with some exported equipment, which is limiting China's ability to broadly expand export markets.

Aviation Industry: China's aviation industry has produced large transport aircraft, modern fourth and fifth generation fighters incorporating low-observable technologies, modern reconnaissance and attack UAVs, and attack helicopters. China's commercial aircraft industry has invested in high-tech machine tooling and production processes to develop avionics and other components needed to produce military aircraft. However, even with heavy investment in its aero-engine industry, China's military and commercial aircraft industry remains reliant on foreign-sourced components for dependable, proven, and high performance aircraft engines as exemplified in China's decision in May 2018 to build its commercial C919 airliner with France's CFM International Leap 1C engine. China is developing the CJ-1000AX high-bypass turbofan to power the C919 and aims to have it enter service in 2021. China's ability to produce commercial and military aircraft is improving because of China's ongoing investment in the domestic ARJ21, C919, and CRJ929 wide-body commercial airliners and the Y-20 large transport program.

8.7.11.3 Science and Technology Goals in Support of Military Modernization

China's 13th Five-Year Plan calls for accelerating research on "majorly influential disruptive technologies" and the pursuit of "leapfrog" S&T developments in order to win "a competitive advantage in the new round of industry transformation."

China has mobilized vast resources to fund research and subsidize companies involved in strategic S&T fields while pressing private firms, universities, and provincial governments to cooperate with the military in developing advanced technologies.

China is pursuing a number of advanced military capabilities with disruptive potential such as hypersonic weapons, electromagnetic railguns, directed energy weapons, and counter space capabilities.

State Plans. China has issued an array of major national plans over the last decade that stress indigenous innovation and the rapid development of strategic S&T sectors, such as information and communications technology, high-end manufacturing, alternative energy, and biotechnology. China's 13th Five-Year Plan calls for accelerating research on "majorly influential disruptive technologies" and the pursuit of "leapfrog" S&T developments in order to win "a competitive advantage in the new round of industry transformation." China has increasingly funded basic research and made comprehensive efforts to grow the country's inventive capabilities over the last decade.

The 2017 National Artificial Intelligence Plan describes steps for China to become the "world's major AI innovation center" by 2030 and calls for the country to accelerate the integration of AI with the economy, society, and national defense. The plan foresees a great expansion in the "breadth and depth of AI applications in... national defense construction."

Other plans address the development of various sectors of China's robust Internet ecosystem to include cloud computing, the big data industry, e-commerce, and next generation broadband wireless communications networks, including fifth generation (5G) wireless networks. Due to information-sharing requirements with Chinese security services as stipulated in Chinese laws, worldwide expansion of Chinese-made equipment in 5G networks will challenge the security and resiliency of other countries' networks.

China continues to execute "Made in China 2025," an ambitious industrial masterplan centered around "smart manufacturing," that aims to create a vanguard of Chinese corporations that are global leaders in these 10 strategic industries: new generation information technology, high-grade machine tooling and robotics; aerospace equipment; marine engineering equipment and high-tech ships; advanced rail transportation equipment; new-energy automobiles; electric power equipment; agricultural equipment; new materials; and biomedicine and high-tech medical devices. The plan stresses the need to replace imported technology with domestically produced technology, a goal that corresponds with China's desire to reduce its reliance on other nations and develop a fully indigenous defense sector. In addition to presenting an economic challenge to nations that export high-tech products, the plan directly supports China's military modernization goals by stressing proprietary mastery of advanced dualuse technologies.

China's leaders have softened their rhetoric regarding "Made in China 2025" in response to concerns that advanced industrial countries have regarding Chinese licit and illicit acquisition of sensitive intellectual property pursuant to that policy.

Heavy Government and Corporate Sector Investment:

China has mobilized vast resources to fund research and subsidize companies involved in strategic S&T fields while pressing private firms, universities, and provincial governments to cooperate with the military in developing advanced technologies. Although China remains reliant on certain types of foreign technology, the country's decades-long execution of a strategy of advancing domestic S&T R&D through largescale technology transfer has deepened the expertise of Chinese scientists and engineers and placed them at, or near, the forefront of many scientific fields.

Chinese state investment funds established to support priority industries have marshalled an estimated hundreds of billions of dollars in capital.

China expects to field an exascale computer based on domestically produced technology by 2020, ahead of the United States, the European Union, and Japan.

China conducted the first quantum secured intercontinental videoconference in September 2017 and plans to have a satellite-enabled, global quantum encrypted communications capability operational by 2030. China is also reportedly building the world's largest quantum research facility slated to open in the city of Hefei in 2020.

In January 2018, scientists from CAS reported they had broken a technological barrier by successfully cloning primates.

China's private sector, led by Internet companies Baidu, Alibaba, and Tencent (BATs) and telecommunications equipment manufacturers Huawei and ZTE, is driving the development of emerging technologies, such as facial recognition and 5G, by establishing innovation centers and funding technology startups, or in the case of 5G, competing to build the world's next-generation networks. Chinese technology companies are also expanding into overseas markets, in some cases, by offering smart-city technologies, a development that could increase their access to foreign talent and data.

In 2018, Tencent and Alibaba made intensive investments in the Chinese robotics startup UB Tech and the AI startup Sense time, respectively.

In November 2017, the Chinese start-up Yitu won a U.S. government-sponsored competition involving facial recognition technology. Yitu, along with other Chinese AI and facial recognition firms like SenseTime, Megvii, and Deepglint, reportedly received hundreds of millions of dollars in investments in 2017. China is the world's largest market for video surveillance technologies.

The 2017 National Intelligence Law requires Chinese companies, such as Huawei and ZTE, to support, provide assistance, and cooperate in China's national intelligence work, wherever they operate.

Potential Military Applications:

China is pursuing a number of advanced military capabilities with disruptive potential such as hypersonic weapons, electromagnetic railguns, directed energy weapons, and counterspace capabilities. The country's effort to build national corporate champions that achieve rapid market dominance across a range of frontier technologies directly complements the PLA's modernization efforts and carries serious military implications. Given China's willingness to deploy emerging technologies rapidly and at massive scale as well as China's focus on CMI, the PLA would likely quickly benefit from any Chinese scientific breakthroughs with military utility. Potential military applications of some emerging technologies include:

AI and Advanced Robotics: enhanced forecasting, manufacturing, C4ISR, and surveillance technology, unmanned systems, human-machine teaming, swarming technology, and lethal autonomous weapons.

Semiconductors and Advanced Computing: enhanced cyber operations and weapons design, and shortened R&D cycles.

Quantum Technologies: secure global communications, enhanced computing and decryption capabilities, detection of stealth platforms, and enhanced submarine navigation.

Hypersonic and Directed Energy Weapons: global strike and defeat of missile defense systems, and anti-satellite, anti-missile, and anti-unmanned aircraft system capabilities.

Advanced Materials and Alternative Energy: improved military equipment and weapon systems.

8.7.11.4 Foreign Technology Acquisition

China is investing in the critical technologies that will be foundational for future innovations, both for commercial and military applications.

In 2018, Chinese espionage efforts to acquire sensitive, dual-use, or military grade equipment included dynamic random access memory, aviation technologies, and anti-submarine warfare technologies.

In 2018, China continued to supplement indigenous military modernization efforts through the acquisition of foreign technologies and know-how. China is actively pursuing an intensive campaign to obtain foreign technology through imports, foreign direct investment, industrial and cyber espionage, and establishment of foreign R&D centers. China is investing in the critical technologies that will be foundational for future innovations both for commercial and military applications: AI, robotics, autonomous vehicles, quantum information sciences, augmented and virtual reality, financial technology, and gene editing. The line demarcating products designed for commercial versus military purposes is blurring with these new technologies. China's legal acquisition efforts supplement its military industrial base through methods and practices, which include:

Imports: China acquires dual-use, export controlled technology by applying for licenses through the U.S. Department of Commerce. The majority of China's imports have traditionally been electronic and materials processing and test, inspection, and production equipment.

Foreign Direct Investment: China actively invests in or outright purchases foreign companies that have technology, facilities, and people working in key technology areas.

Talent Recruitment: China uses various incentive strategies to attract foreign personnel to work on and manage strategic programs and fill technical knowledge gaps, including the "Thousand Talents Program," which prioritizes recruiting people of Chinese descent or recent Chinese emigrants whose recruitment the Chinese government views as necessary to Chinese scientific and technical modernization, especially with regard to defense technology.

Research and Development Centers: China actively seeks partnerships with private, government, and academic research labs to gain exposure to cutting-edge technology and researchers. These partnerships also provide the technical know-how to run, manage, and organize such facilities.¹⁴³³

DIA Report

Defense-Industrial Base

China's defense-industrial complex comprises both a military and a state sector governed by the CMC and State Council, respectively, under oversight of the Chinese Communist Party Central Committee. The CMC's Equipment Development Department oversees weapons planning, research, development, and acquisition (RDA) in conjunction with the military service armament organizations for China's Army, Navy, Air Force, Rocket Force, Strategic Support Force, Armed Police, and Coast Guard.

The State Council's State Administration for Science, Technology, and Industry for National Defense (SASTIND) is the key organ responsible for overseeing China's state-owned defense-industrial corporations and enterprises. Twelve SASTIND-subordinate defense-industrial enterprises conduct RDA and production in six distinct scientific, engineering, and technological domains:

- Aerospace/missile
- Naval/maritime
- Aviation
- Ground systems/ordnance
- Electronics
- Nuclear

¹⁴³³ Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2019, issued in May 2, 2019, RefID: E-1F4B924, Pg 96-103 available online at URL: https://media.defense.gov/2019/May/02/2002127082/-1/-1/1/2019_CHINA_MILITARY_POWER_REPORT.pdf

During a speech at an equipment-quality work conference in 2015, CMC Vice Chairman General Xu Qiliang stressed the need to build a strong defense-industrial base to support military development. Xu emphasized themes of quality, innovation, technology, and improving combat readiness, but also said it would be necessary to strengthen laws, regulations, and accountability within the defense industry to increase quality standards.

The PLA initiated defense-industrial reforms in 2016 that aimed to reduce bureaucracy, develop a more structured RDA and production decision making apparatus, streamline developmental timelines, promote innovation, and institutionalize civil-military integration. Within an industrial context, the latter entails establishing a formal relationship between China's defense and civilian industrial bases to develop a technologically advanced, domestically reliant, and internationally relevant defense-industrial complex. Key components of the initiative include the establishment of widely distributed "science cities," industrial parks, and high-tech zones most near China's defense-industrial corporations and commercial industrial centers, large cities, and provincial capitals harboring significant RDA and manufacturing capabilities to facilitate efficient logistics and supply. These reforms are expected to be implemented by 2020.

A key emphasis of defense-industrial reforms is developing an innovative military industrial complex capable of delivering cutting-edge technologies to meet future PLA requirements. China's research and development apparatus is designed to both identify and maximize the utility of emerging and potentially disruptive science and technology for military use. Scientific and technological disciplines with military applications targeted for development include hyper sonics; nanotechnology; high-performance computing; quantum communications; space systems; autonomous systems; artificial intelligence; robotics; high-performance turbofan engine design; new, more efficient and powerful forms of propulsion; advanced manufacturing processes (including additive manufacturing/3-D printing); and advanced aerospace quality materials, just to name a few.¹⁴³⁴

White Paper

The Chinese government published the tenth White Paper **China's Military Strategy (May 2015)** specialized in China's military strategy. The white paper systematically expounded on the Chinese military's missions and strategic tasks in the new era for the first time, pointed out that the basic point in making preparation for military struggle (PMS) shall be focused on winning local wars in conditions of modern technology.

The white paper also highlighted the importance of science **and technology and**

I. National Security Situation: Profound changes are taking place in the international situation, as manifested in the historic changes in the balance of power, global governance structure, Asia-Pacific geostrategic landscape, and international competition in the economic, **scientific and technological, and military fields.**

¹⁴³⁴ Excerpts from Defence Intelligence Agency (DIA) Report titled "China's Military Power: Modernizing a Force to Fight and Win" Published in 2019, Pg 48-49, available online at URL: https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/China_Military_Power_FINAL_5MB_20190103.pdf

China has an arduous task to safeguard its national unification, territorial integrity and development interests.

As the world economic and strategic center of gravity is shifting ever more rapidly to the Asia-Pacific region, the US carries on its "rebalancing" strategy and enhances its military presence and its military alliances in this region. Japan is sparing no effort to dodge the post-war mechanism, overhauling its military and security policies. Such development has caused grave concerns among other countries in the region. On the issues concerning China's territorial sovereignty and maritime rights and interests, some of its offshore neighbors take provocative actions and reinforce their military presence on China's reefs and islands that they have illegally occupied. Some external countries are also busy meddling in South China Sea affairs; a tiny few maintain constant close-in air and sea surveillance and reconnaissance against China. It is thus a long-standing task for China to safeguard its maritime rights and interests. Certain disputes over land territory are still smoldering. The Korean Peninsula and Northeast Asia are shrouded in instability and uncertainty. Regional terrorism, separatism and extremism are rampant. All these have a negative impact on the security and stability along China's periphery.

The Taiwan issue bears on China's reunification and long-term development, and reunification are an inevitable trend in the course of national rejuvenation. In recent years, cross-Taiwan Straits relations have sustained a sound momentum of peaceful development, but the root cause of instability has not yet been removed, and the "Taiwan independence" separatist forces and their activities are still the biggest threat to the peaceful development of cross-Straits relations. Further, China faces a formidable task to maintain political security and social stability. Separatist forces for "East Turkistan independence" and "Tibet independence" have inflicted serious damage, particularly with escalating violent terrorist activities by "East Turkistan independence" forces. Besides, anti-China forces have never given up their attempt to instigate a "color revolution" in this country. Consequently, China faces more challenges in terms of national security and social stability. With the growth of China's national interests, its national security is more vulnerable to international and regional turmoil, terrorism, piracy, serious natural disasters and epidemics, and the security of overseas interests concerning energy and resources, strategic sea lines of communication (SLOCs), as well as institutions, personnel and assets abroad, has become an imminent issue.

The world revolution in military affairs (RMA) is proceeding to a new stage. Long-range, precise, smart, stealthy and unmanned weapons and equipment are becoming increasingly sophisticated. Outer space and cyber space have become new commanding heights in strategic competition among all parties. The form of war is accelerating its evolution to informationization. World major powers are actively adjusting their national security strategies and defense policies, and speeding up their military transformation and force restructuring. The aforementioned revolutionary changes in **military technologies** and the form of war have not only had a significant impact on the international political and military landscapes, but also posed new and severe challenges to China's military security.

III. Strategic Guideline of Active Defense:

Shortly after the founding of the PRC in 1949, the Central Military Commission (CMC) established the military strategic guideline of active defense, and later, in line with the developments and changes in the national security situation, had made a number of major revisions of it. In 1993 the military strategic guideline of the new era was formulated, which **took winning local wars in conditions of modern technology, particularly high technology**, as the basic point in making preparation for military struggle (PMS). In 2004, the guideline was further substantiated, and the basic point for PMS was modified to winning local wars under conditions of informationization.

To implement the military strategic guideline of active defense in the new situation, China's armed forces will uphold the following principles:

-to give full play to the overall power of the concept of people's war, persist in employing it as an ace weapon to triumph over the enemy, enrich the contents, ways and means of the concept of people's war, and press forward with the shift of the focus of war mobilization from human resources to **science and technology**;

IV. Building and Development of China's Armed Forces:

In line with the strategic requirement of being lean and effective and possessing both nuclear and conventional missiles, the PLA Second Artillery Force (PLASAF) will strive to transform itself in the direction of informationization, press forward with independent innovations in weaponry and equipment by reliance on **science and technology**, enhance the safety, reliability and effectiveness of missile systems, and improve the force structure featuring a combination of both nuclear and conventional capabilities. The PLASAF will strengthen its capabilities for strategic deterrence and nuclear counterattack, and medium- and long-range precision strikes.

China will devote more efforts to **science and technology** in national defense mobilization, be more readily prepared for the requisition of information resources, and build specialized support forces. China aims to build a national defense mobilization system that can meet the requirements of winning informationized wars and responding to both emergencies and wars.

In-depth Development of Civil-Military Integration (CMI)

Following the guiding principle of integrating military with civilian purposes and combining military efforts with civilian support, China will forge further ahead with CMI by constantly bettering the mechanisms, diversifying the forms, expanding the scope and elevating the level of the integration, so as to endeavor to bring into place an all-element, multi-domain and cost-efficient pattern of CMI.

Accelerating CMI in key sectors. With stronger policy support, China will work to establish uniform military and civilian standards for infrastructure, key technological areas and major industries, explore the ways and means for training military personnel in civilian educational institutions, developing weaponry and equipment by national defense industries, and outsourcing logistics support to civilian support systems. China encourages joint building and utilization of military and civilian infrastructure, joint exploration of the sea, outer space and air, and shared use of such resources as surveying and mapping, navigation, meteorology and frequency spectra. Accordingly, military and civilian resources can be more compatible, complementary and mutually accessible.

Improving the systems and mechanisms of national defense mobilization. China will enhance education in national defense and boost the awareness of the general public in relation to national defense. It will continue to strengthen the building of the reserve force, optimize its structure, and increase its proportion in the PLAN, PLAAF and PLASAF as well as in combat support forces. The ways to organize and employ reserve forces will be more diversified. China will devote more efforts to **science and technology** in national defense mobilization, be more readily prepared for the requisition of information resources, and build specialized support forces. China aims to build a national defense mobilization system that can meet the requirements of winning informationized wars and responding to both emergencies and wars.

V. Preparation for Military Struggle

China's armed forces will persist in unified organization and command, **scientific** employment of forces, rapid and efficient actions, and strict observation of related policies and regulations.

VI. Military and Security Cooperation

The Chinese military will also strengthen cooperation with related countries in personnel training, material assistance, equipment and **technology**, so as to strengthen mutual support and enhance respective defensive capabilities.¹⁴³⁵

8.7.12 Mining and Rare Earth Industry

On 20 June 2012, the Chinese government published its first whitepaper on rare earth elements.

The IIT Madras the Chennai Centre for China Studies brought out an article **IITM CSC Article #31 dated 19 July 2012 captioned "Situation and Policies: China's Whitepaper on Rare Earths"**. It mentions that on June 2012, the Chinese government published its first whitepaper on rare earth elements. China is the world's largest depositor, producer, consumer and exporter of rare earths, controlling 97 per cent of the global supplies. Commenting on this White Paper, it says that the document justifies the Chinese export restrictions of these critical elements and defends China against the WTO case filed by the European Union, United States, and Japan. Users of the minerals in industrialized countries now face tighter supplies and higher prices. China has cut its export quotas for rare earths by 35 per cent in 2011, threatening to extend a global shortage of the minerals needed for smart phones, hybrid cars and guided missiles.

The whitepaper reveals a number of policy measures of the Chinese government with regard to this industry. The recent controversy about the rare-earth industry in China and the future global supply of these critical raw materials is heightened in the document. The paper states that China has just 23 percent of the world's rare-earth minerals, not 36 percent as the U.S. estimated.

¹⁴³⁵ The Information Office of the State Council White Paper on "China's military strategy at Beijing" in May 26, 2015 (Xinhua) available online at URL: http://eng.mod.gov.cn/Press/2015-05/26/content_4586805_6.htm