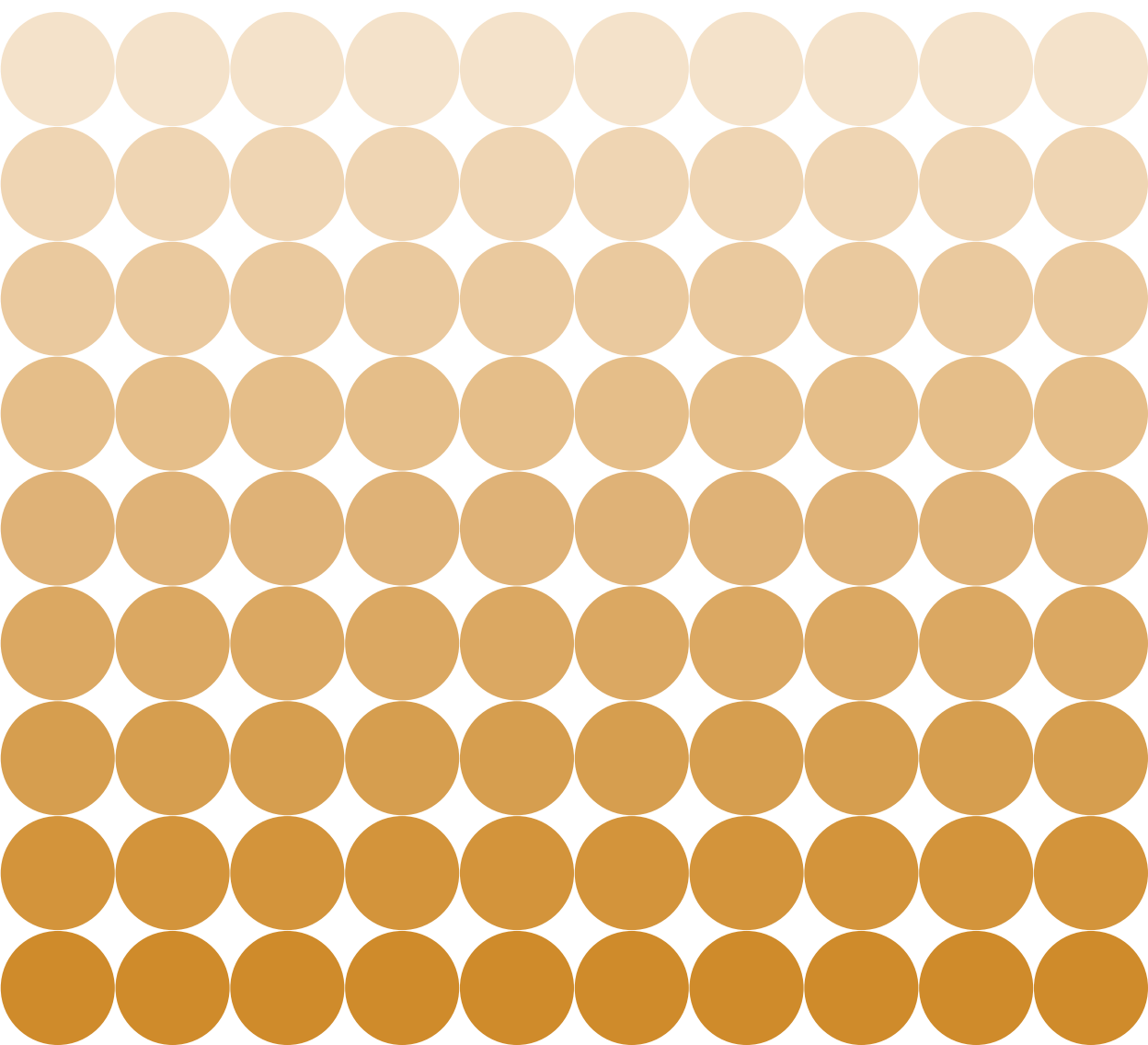


WESTERN ARMS EXPORTS TO CHINA

**OLIVER BRÄUNER, MARK BROMLEY
AND MATHIEU DUCHÂTEL**



STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

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SIPRI Policy Paper No. 43

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Preface

Over the past decade China has made significant progress in its ongoing efforts to modernize the People's Liberation Army (PLA), including its air and naval capabilities. This development is being closely watched by states in the region and around the world, especially in the light of growing tensions over unresolved maritime territorial disputes and fears of a potential arms race in East Asia. One under-researched aspect of the PLA's modernization has been the extent to which it has been supported by transfers of military-relevant technologies from Western countries—transfers which have continued despite the arms embargoes that were introduced after the tragic events of June 1989.

This Policy Paper details the policies of four Western states—France, Germany, the United Kingdom and the United States—on transfers of military-related technologies to China, including military goods, dual-use items and other non-controlled items that have played a role in the development of China's military capabilities. It also documents the nature and extent of transfers of military-related technologies from Western states to China and the impact of these transfers on China's defence industrial and technological modernization.

This Policy Paper, therefore, represents an important contribution to increased understanding of Western contributions to the PLA modernization process. It provides detailed insights into the key commonalities and differences regarding Western states' policies on controlling transfers of military-relevant technologies to China, and lays out recommendations aimed at building more harmonized and transparent practices in this area. The authors, Oliver Bräuner, Mark Bromley and Dr Mathieu Duchâtel, have combined their expertise on the international arms trade, export controls and China's foreign and security policy to provide an analysis of the historical background, recent political developments and actual defence-related transfers from the major Western arms exporters to China. Their work will provide a solid reference for academics and policymakers in both China and the West.

This research project has been made possible by a generous grant from the Norwegian Ministry of Foreign Affairs and SIPRI is tremendously grateful for this continued support. I would also like to express my personal gratitude to the three authors for this highly valuable contribution to the European debate on the security relationship with China, a topic that will certainly become even more salient in the coming years.

Dr Ian Anthony
Director, SIPRI
Stockholm, January 2015

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As with all SIPRI publications, the research was conducted independently and the views expressed in this Policy Paper are those of the authors.

Oliver Bräuner, Mark Bromley and Mathieu Duchâtel
Stockholm and Beijing, January 2015

Summary

Despite Western states' imposition of arms embargoes on China following the 1989 Tiananmen Square incident, China's efforts to modernize its defence forces' industrial and technological capabilities have continued to benefit from the transfer of military-relevant Western goods and technologies, including military goods, dual-use items—goods and technologies that have the potential to be used in both civilian and military products—and other non-controlled items that have been integrated into Chinese weapon systems or used in the production of weapon systems in China. These transfers complement domestic reforms of the Chinese arms industry that have been supported by a rising defence budget and a dramatic increase in spending on research and development (R&D). Western transfers also remain a crucial source of high technology for the modernization of the Chinese People's Liberation Army.

Apart from a brief period in the 1980s, the United States has imposed strict controls on exports of defence and dual-use goods and technologies to China. The USA also makes use of its expansive controls on the re-export of US-manufactured goods, and uses political and diplomatic pressure to convince other states to restrict supplies of military goods and dual-use items to China. Despite the USA's imposition of an arms embargo in 1989, a number of Chinese weapon systems use US-built components, either because the systems were supplied prior to 1990 or because the items concerned are not subject to US export controls. A number of commentators have warned that the USA's Export Control Reform (ECR) process will erode US controls on transfers to China and the USA's ability to convince other states to follow its lead. While there is a clear intention to ensure that the ECR does not dilute controls on transfers on China, the process may have unintended side-effects on US controls and may be used by other states as a justification for reducing their restrictions on transfers to China.

The US arms embargo restricts all transfers of military equipment and related components. In contrast, the 1989 European Union (EU) arms embargo lacks a clear legal basis and works more as a strong political constraint preventing EU member states from selling complete weapon systems to China. In this context, transfers by member states of dual-use goods, components and sub-systems have continued since 1989. While France and Germany strongly advocated lifting the arms embargo in the period 2003–2005, the three largest EU member states (France, Germany and the United Kingdom) are all currently opposed to such a move. Key considerations for maintaining the arms embargo include the need to preserve transatlantic partnerships; the European defence industry's desire to maintain access to US defence spending; and concerns on the part of the media, parliaments and civil society groups about the human rights situation in China. The risks of military conflict in East Asia and the views of regional partner states—particularly Japan—have also emerged as a major determinant explaining the reluctance of the three largest EU member states to lift the arms embargo.

The French, German and British approaches to transfers of military-relevant products to China continue to differ in minor but noticeable ways, based on their respective national export control systems, their interpretation of the EU embargo, and foreign policy and domestic politics considerations. France is generally seen as more liberal than the United Kingdom when it comes to authorizing transfers, while Germany is viewed as more cautious. In practice, European transfers have played a key role in the development of a number of key Chinese military capabilities, particularly with regard to helicopters and naval propulsion. Nonetheless, export restrictions have prevented China from gaining access to a number of key European technologies since 1989. In response, China has adapted its strategies for acquiring military technologies from Europe. Until 2012 China unsuccessfully lobbied EU member states to lift the arms embargo, seeing it as both an impediment to accessing technology and a diplomatic affront. Under the new Chinese President, Xi Jinping, Chinese diplomacy no longer publicly pushes for the embargo's removal. At the same time, China continues its pragmatic approach of trying to gain access to European military-relevant technology within the framework of the European export control system.

This shift in China's approach to the EU arms embargo has occurred at a specific point of the development of the Chinese defence industry. The goal of building a self-reliant arms industry now appears increasingly within reach and this, in turn, shapes China's acquisition strategy. Today, the Chinese defence industry consistently posts record annual profits. It develops and produces new advanced generations of weapon systems and has created more dynamic R&D institutions with a younger and better-trained workforce. As a result, China has gained independence in building air and sea platforms and aims now to reduce its dependence on imported engines and electronics systems. While China still seems willing to import complete weapon systems from Russia, its main objective now is to overcome bottlenecks in naval propulsion, aircraft engines and new materials that prevent the independent construction of fully indigenous systems. China's priority is to acquire foreign dual-use technologies or components through international trade and investments, scientific cooperation and, allegedly, espionage while building an advanced 'dual-use economy' that allows the defence industry to gain access to advanced and globalized civilian industries. This means that, even if Western states were to ease restrictions on arms exports to China, this would not necessarily result in a large increase in arms transfers.

European states appear to agree on the need to maintain both the EU arms embargo and strict national controls on the export to China of military goods and dual-use items. However, in order to strengthen their influence, EU member states need to develop a shared understanding of the exact purpose of current restrictions on exports to China as well as the steps China would need to take for them to be lifted. EU member states also need to communicate their positions more effectively, as the precise implications of the EU arms embargo and EU export controls are still not fully understood in the USA, Europe or China. Western states (and especially EU member states) also need to develop a better understanding of China's ongoing process of military modernization and the multitude

of actors involved, particularly with regard to China's defence needs and its civil-military integration strategy. In order to support this process, EU member states should develop better information-sharing mechanisms within the EU and the Wassenaar Arrangement and improve transparency about what individual member states license and export to China. Finally, EU member states should intensify and better coordinate the existing transatlantic dialogue on transfers of sensitive goods to China—a dialogue that provides an opportunity to identify the factors driving national decision-making processes and avoid past misunderstandings.

Abbreviations

AECA	Arms Export Control Act (USA)
AEW	Airborne early warning
ASW	Anti-submarine warfare
BAFA	German Office for Economic Affairs and Export Control
BMWi	German Ministry for Economic Affairs and Energy
CAEC	Committees on Arms Export Controls (UK)
CCL	Commerce Control List (USA)
CHINCOM	Coordinating Committee for Multilateral Export Controls, China
CFSP	Common Foreign and Security Policy (of the EU)
COCOM	Coordinating Committee for Multilateral Export Controls
DOD	Department of Defense (USA)
EAA	Export Administration Act (USA)
EU	European Union
ECR	Export control reform initiative (USA)
FCO	Foreign and Commonwealth Office (UK)
FMS	Foreign Military Sales Programme (USA)
ITAR	International Traffic in Arms Regulations
MFA	Ministry of Foreign Affairs
MOD	Ministry of Defence
MOST	Chinese Ministry of Science and Technology
PLA	People's Liberation Army
PLAAF	People's Liberation Army Air Force
PLAN	People's Liberation Army Navy
PRC	People's Republic of China
R&D	Research and development
ROC	Republic of China (Taiwan)
SAR	Search and rescue
SMEs	Small and medium-sized enterprises
USML	United States Munitions List
VEU	Validated End User

1. Introduction

The Chinese People's Liberation Army (PLA) is currently engaged in an accelerated process of modernization. This process is fuelled by unresolved territorial claims and China's perception of its emerging role as a global power, and sustained by a still rapidly growing economy. The modernization of the PLA has benefited enormously from products purchased off-the-shelf from Russia and (to a lesser extent) Israel and Ukraine but is increasingly driven by significant improvements in the capacities of the Chinese defence industry. Since the mid-1990s accelerations in the PLA's modernization push have benefited from considerable domestic research and development (R&D) efforts, although the total value of China's military-related R&D spending has never been accurately established. SIPRI estimates that, while China's official military budget for 2013 was \$132 billion, its total military spending in that year—including on R&D, the paramilitary People's Armed Police, military construction, pensions and demobilization payments, and arms exports—amounted to \$188 billion.¹ Through the process of military modernization, China has also integrated transfers of technology from abroad as well as unauthorized reverse-engineering of foreign weaponry.

Major Western arms exporters' contributions to China's defence industrial and technological modernization have never been examined thoroughly. From the end of World War II until the 1970s, most Western states recognized the Nationalist Republic of China (ROC, Taiwan) as the sole legitimate Chinese Government and had no relations with the Communist People's Republic of China (PRC, China). Even the Western states that recognized the PRC did not transfer military equipment to China. With the outbreak of the 1950–53 Korean War, transfers of military equipment to China and other Communist states were severely restricted by the Coordinating Committee for Multilateral Export Controls (COCOM).² In 1952 the United States established a separate COCOM subcommittee (CHINCOM) in order to prevent transfers of military technology to China. CHINCOM, which was run from the COCOM premises in Paris and continued its operations until 1957, controlled transfers based on lists of military-relevant items. These lists contained around two hundred items that were not embargoed to the Soviet Union and Eastern Europe, in what became known as the 'China Differential'.³ After CHINCOM was disbanded, controls on trade with China were coordinated from within COCOM.⁴ Restrictions on trade with China

¹ Perlo-Freeman, S., 'Deciphering China's latest defence budget figures', SIPRI Update: Global Security and Arms Control, Mar. 2014, <<http://www.sipri.org/newsletter/march14>>; and Perlo-Freeman, S. and Solmirano, C., 'Military spending and regional security in the Asia-Pacific', *SIPRI Yearbook 2014: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2014), pp. 189–92.

² Cain, F., 'The US-led trade embargo on China, the origins of CHINCOM, 1947–1952', *Journal of Strategic Studies*, vol. 18, no. 4 (1995), pp. 33–54.

³ Bräuner, O., 'Beyond the arms embargo, EU transfers of defence and dual-use technologies to China', *Journal of East Asian Studies*, vol. 13 (2013), p. 459.

⁴ Meijer, H., 'Balancing conflicting security interests: US defense exports to China in the last decade of the Cold War', *Journal of Cold War Studies*, vol. 16, no. 4 (fall 2014).

were slightly relaxed after US President Richard Nixon's groundbreaking 1972 visit to China. The China Differential was abolished and COCOM conducted a policy of 'even-handedness', which meant that the PRC would be treated in the same way as the Soviet Union and the Communist states of Eastern Europe.⁵

Chinese experts sometimes argue that there is a long history of Western hostility to the modernization of the PLA, from CHINCOM and COCOM through to the post-1989 embargoes.⁶ However, after the establishment of diplomatic ties between the PRC and the USA in 1979, the West gradually relaxed controls on exports to China and supported the PLA's modernization effort. This support occurred within the strategic context of cooperation against the Soviet Union after its 1979 invasion of Afghanistan and the decade-long conflict that followed.⁷ In 1984 the administration of US President Ronald Reagan made China eligible for the government-to-government Foreign Military Sales (FMS) programme.⁸ Furthermore, throughout the 1980s a number of Western states—including France, Germany, Italy, the Netherlands, the United Kingdom and the USA—transferred large volumes of defence-related items to China.⁹

The European Union (EU) and the USA both imposed arms embargoes on China after the 1989 Tiananmen Square incident. Other Western states, including Australia, Canada and Norway, also imposed restrictive policies on arms transfers to China.¹⁰ Therefore, it is often assumed that, since 1989, no transfers of military-related technologies from Western states to China have taken place. However, while the US embargo restricts all transfers of military equipment and related components, the EU embargo lacks clear guidelines and has been interpreted differently by individual EU member states. As a result, while sales of complete weapons and weapon systems have not occurred, both components and sub-systems have been supplied. Many Chinese submarines are powered by German engines or equipped with French sonar systems. China has also acquired French military helicopters and now produces its own using French technology.

The Chinese defence industry has also benefited from an influx of civilian technologies and foreign investment in China. In fact, Western companies, faced with fierce competition in what is still perceived as a fast-growing emerging market, are increasingly willing to transfer a broad range of high-end technologies in order to do business in China. At the same time, the dividing line between 'civilian' and 'military' technologies has become increasingly blurred. Technologies developed by the Chinese civilian aviation sector in joint ventures with

⁵ Meijer (note 4).

⁶ Du, W., '欧盟解禁，第18次真实的谎言' [The lifting of the EU arms embargo: the 18th lie], *Bingqi Zhishi—Ordinance Knowledge*, no. 4A (2010), pp. 20–23.

⁷ Harding, H., *A Fragile Relationship: The United States and China Since 1972* (The Brookings Institution: Washington, DC, 1992), pp. 91–93.

⁸ Meijer (note 4).

⁹ See Wezeman, S. T., 'Table 43.A. Transfers of equipment that meet the SIPRI definition of major weapons from states belonging to the North Atlantic Treaty Organization (NATO) to China, 1970–2013', SIPRI, Jan. 2015, <<http://www.sipri.org/research/security/china/western-arms-exports-to-china>>.

¹⁰ On Canada see Bromley, M., 'Canada's controls on arms exports to China', SIPRI Background Paper, Jan. 2015. On Norway see Bromley, M., 'Norway's controls on arms exports to China', SIPRI Background Paper, Jan. 2015.

Western companies, for example, have led to advances in Chinese defence avionics and the management of aircraft production lines.

China is keen to gain greater access to key military and civilian technologies in order to accelerate its process of military modernization. It remains heavily dependent on foreign acquisitions to fill the remaining technology gaps in its domestic arms industry, including engines, transmissions, avionics and electronics. China is eager to tap new, non-Russian, sources of equipment. Technology cooperation between China and the West through trade, investment and scientific collaboration has increased dramatically in the past 30 years but there is little precise knowledge of how Western civilian technology transfers benefit the Chinese defence sector in key (non-lethal) areas such as command and control, communications, surveillance and reconnaissance.

The debate about lifting the EU arms embargo on China led to frictions between the USA and its EU partners in 2003–2005, with the USA even threatening to impose sanctions against European defence companies doing business with China. Today, the EU embargo is no longer a contentious issue in transatlantic relations, due to insufficient political support in key EU member states for lifting the ban on arms sales. Nonetheless, the debate on lifting the arms embargo ignores two important issues: the impact of exports of dual-use items (goods and technologies that have the potential to be used in both civilian and military products) on China's military capabilities; and the fact that the embargo is of largely political and symbolic value and allows states flexibility at the national level. Moreover, while the adoption of the embargo was motivated by human rights concerns, the major obstacle to its removal now appears to be the risk of military conflict between states in East Asia over territorial disputes.

China has continually adapted its approach to acquiring military and dual-use technologies from the West. For instance, the lifting of the EU arms embargo is not a diplomatic priority for the new Chinese President, Xi Jinping. Influential Chinese experts have advocated moving beyond the arms embargo to focus on technology cooperation in priority sectors, including aerospace and aeronautics.¹¹ Although China's latest White Paper on its policy towards the EU still formally lists lifting the embargo as a goal, China is expected to continue to operate its acquisition strategy within the current EU export control framework.¹² On the one hand, this policy reflects a Chinese assessment that the lifting of the EU embargo is currently not a realistic objective. On the other hand, it confirms the fact that the modernization of China's defence industries is reaching a turning point, after which a self-sufficient procurement strategy seems increasingly attainable. This evolution also fits with China's strong promotion of civil–military integration and its support for the creation of a dual-use economy. The

¹¹ Wang, Z., '專家稱需升級中歐關係 對歐債危機不落井下石'[Experts calls for upgrading EU–China relations and not throwing stones in a well in the context of the European debt crisis], *Zhongguo Xinwenwang*, 26 Nov. 2013, <<http://dailynews.sina.com/bg/news/int/chinanews/20131126/22305211404.html>>.

¹² 'Full text of China's Policy Paper on the European Union', *Xinhua*, 2 Apr. 2014, <http://news.xinhuanet.com/english/china/2014-04/02/c_133230788.htm>.

integration of Western civilian and dual-use technologies in the development of Chinese defence systems is carried out within this strategic framework.

This Policy Paper fills an important gap in the literature by examining the policies and practices of the four largest Western arms exporters—the USA, France, Germany and the UK—with respect to controls on the transfers of military-related goods and technologies to China, as well as the key motivating factors behind the formulation and implementation of those policies.¹³ In particular, it maps the different restrictions that Western states have imposed on the transfer of military items and dual-use goods to China since 1989, and in the respective arms embargoes imposed by the EU and the USA.

Based on open source material and interviews with experts and officials in China, Europe and North America, this Policy Paper documents known transfers of military-related technologies to China from Western states to China since 1989, including military goods, dual-use items and other non-controlled items that have played a role in the development of China's military capabilities. Military-relevant technology includes complete weapon systems as well as parts and components that have either been directly integrated into Chinese weapon systems or else used in the production of weapon systems in China and include military items, dual-use goods and technologies, as well as other non-controlled items. In order to put this impact in perspective, the paper maps the more significant role that transfers from other states have played in the development of the Chinese military, particularly those from Russia, Israel and Ukraine.

Chapter 2 details the US export control system, including the application of national export controls on transfers to China. Chapter 3 details the EU arms embargo, and the export control systems of France, Germany and the UK, respectively, as well as their policies on transfers to China, and known transfers of military-relevant goods and technologies to China. Chapter 4 assesses the impact of Western transfers on China's military-industrial and technological development, and China's cooperation with other exporting countries. Chapter 5 presents conclusions and proposes recommendations for states seeking to improve international coordination on transfers of military and dual-use items to China.

¹³ The world's 6 largest arms exporters in the period 2009–13 were the USA, Russia, Germany, China, France and the UK, accounting for 78 per cent of all transfers. SIPRI Arms Transfers Database, <<http://www.sipri.org/databases/armstransfers>>; and Wezeman, S. T. and Wezeman, P. D., 'Trends in international arms transfers, 2013', SIPRI Fact Sheet, Mar. 2014.

2. The United States' export controls on transfers to China

This chapter details the USA's policies on transfers of military-related technologies to China, including transfers of military goods, dual-use items and other non-controlled items relevant to the development of China's military capabilities. Separate sections outline the US export control system; the application of national export controls on transfers to China; and details of what is being licensed and exported to China.

The US national export control system

US national export controls are governed by multiple acts and regulations, and administered by several US Government departments. The central piece of legislation for US controls on exports of military goods is the 1976 Arms Export Control Act (AECA).¹⁴ The International Traffic in Arms Regulations (ITAR) sets out licensing policy and includes the US Munitions List (USML), which defines controlled items.¹⁵ The 1979 Export Administration Act (EAA) governs US controls on exports of dual-use items.¹⁶

The Export Administration Regulations (EAR) sets out licensing policy and the Commerce Control List (CCL) defines controlled items.¹⁷ The Directorate of Defense Trade Controls (DDTC) within the US Department of State is responsible for issuing and refusing licenses for the export of military goods. The Bureau of Industry and Security (BIS) within the US Department of Commerce is responsible for dual-use items.¹⁸ The US Department of Commerce administers trade prohibitions under the 1917 Trading with the Enemy Act and the 1977 International Emergency Economic Powers Act.¹⁹ Other US Government agencies have licensing authority for certain types of exports. For example, the Departments of Energy and Commerce administer certain nuclear-related exports and the Department of the Treasury administers certain aspects of trade embargoes and sanctions.²⁰

¹⁴ Arms Export Control Act of 1976, US Public Law 94-329, signed into law on 30 June 1976, <https://www.pmdtc.state.gov/regulations_laws/aeca.html>.

¹⁵ On ITAR and the USML see US Department of State, [n.d.], <https://www.pmdtc.state.gov/regulations_laws/itar.html>.

¹⁶ Export Administration Act of 1979, US Public Law 96-72, signed into law on 29 Sep. 1979, <<http://www.house.gov/legcoun/Comps/ea79.pdf>>.

¹⁷ US Bureau of Industry and Security (BIS), 'Export Administration Regulations', [n.d.], <<http://www.bis.doc.gov/index.php/regulations/export-administration-regulations-ear>>; and BIS, 'Commerce Control List', [n.d.], <<http://www.bis.doc.gov/index.php/regulations/commerce-control-list-ccl>>.

¹⁸ US Department of State, 'Overview of US Export Control System', [n.d.], <<http://www.state.gov/strategictrade/overview/>>.

¹⁹ Trading with the Enemy Act of 1917 (40 Stat. 411) enacted 6 Oct. 1917; and International Emergency Economic Powers Act of 1977, US Public Law 95-223, enacted 28 Oct. 1977.

²⁰ US Department of State (note 18).

The USA is currently engaged in a process of simplifying its controls on exports of military goods and dual-use items via the Export Control Reform (ECR) process, which aims to reduce the regulatory burden on US industry and focus controls on sensitive technologies and destinations.²¹ Launched in 2009, the ECR is based on achieving four ‘singularities’: (a) a single agency for administering all export controls on military goods and dual-use items; (b) a unified control list; (c) a single enforcement coordination agency; and (d) a single integrated information technology system.²² To date, the main focus of the ECR has been moving tens of thousands of items from the USML—which will become more focussed on items deemed particularly sensitive to US security interests—to the CCL, where they will be subject to less stringent licensing controls for exports to trusted destinations.²³ By the end of this process, the majority of items on the USML will have been either moved to the CCL or decontrolled. For example, it is anticipated that 90 per cent of the items under USML Category VII (Tanks and Military Vehicles) will be moved to the CCL or decontrolled.²⁴

A number of former US officials and commentators have warned that moving items from the USML to the CCL and decontrolling others will increase the range of goods that can be shipped to companies acting as fronts for the Chinese military, thereby generating new proliferation risks.²⁵ However, US officials argue that the reforms will have no impact on exports to China and that controls that were in place prior to 2009 will remain in force. According to one Department of Commerce official, ‘we have bent over backwards in all our training materials and preamble material to say we are maintaining the same embargo on China’.²⁶ In particular, officials note that most of the items moving to the CCL will be subject to additional controls—such as a presumption of denial—that will prevent their export to China.

²¹ On the ECR initiative see <<http://export.gov/ecr/>>; Currier, C., ‘In big win for defense industry, Obama rolls back limits on arms exports’, *ProPublica*, 14 Oct. 2013, <<http://www.propublica.org/article/in-big-win-for-defense-industry-obama-rolls-back-limits-on-arms-export>>; and Benowitz, B. and Kellman, B., ‘Rethink plans to loosen US controls on arms exports’, *Arms Control Today*, vol. 43 (Apr. 2013), <http://www.armscontrol.org/act/2013_04/Rethink-Plans-to-Loosen-US-Controls-on-Arms-Exports>.

²² Fergusson, I. F. and Kerr, P. K., *The US Export Control System and the President’s Reform Initiative*, Congressional Research Service (CRS) Report for Congress R41916 (US Congress, CRS: Washington, DC, 13 Jan. 2014), Summary.

²³ US Department of State, ‘Export control reform: first final rules go into effect’, 15 Oct. 2013, <<http://www.state.gov/r/pa/prs/ps/2013/10/215428.htm>>; and Fergusson and Kerr (note 22).

²⁴ White House, Office of the Press Secretary, ‘White House Chief of Staff Daley highlights priority for the President’s Export Control Reform Initiative’, 19 Jul. 2011, <<http://www.whitehouse.gov/the-press-office/2011/07/19/white-house-chief-staff-daley-highlights-priority-presidents-export-cont>>.

²⁵ Lowell, W. J., ‘Category VII Revision and USML—Positive List’, Letter to US Department of State, 7 Feb. 2011, <http://www.armscontrol.org/system/files/Lowell_Comments_ExportReform_Feb7_2011.pdf>; Kimes, M., ‘America’s hottest export: weapons’, *CNN Money*, 24 Feb. 2011, <http://archive.fortune.com/2011/02/10/news/international/america_exports_weapons_full.fortune/index.htm>; and Goodman, C., ‘Growing concerns over deregulation of arms export controls’, *Project on Government Oversight Blog*, 7 Apr. 2014, <<http://www.pogo.org/blog/2014/04/20140407-growing-concerns-over-deregulation-of-arms-export-controls.html>>.

²⁶ Shiffman, J. and Wilson, D., ‘Turf battles hinder US efforts to thwart smugglers’, *Reuters*, 17 Dec. 2013.

US national controls on exports to China

After the establishment of diplomatic ties between the PRC and the USA in 1979, the administration of US President Jimmy Carter gradually lifted some of the restrictions that had made controls of exports to China even stricter than controls on exports to the Soviet bloc. In 1984 US President Ronald Reagan made China eligible for the government-to-government FMS programme.²⁷ After the 1989 Tiananmen Square incident, however, the USA suspended military-to-military contacts with and arms sales to China.²⁸ US President George H. Bush passed a set of sanctions, including the suspension of arms sales. The US Congress then passed legislation that enshrined the embargo in law.²⁹

The US embargo covers the export to China and import from China of all items on the USML.³⁰ As a result, unlike the EU embargo (see chapter 3), the US arms embargo on China is codified and linked to a control list. The President may waive the embargo if doing so is deemed in the US national interest. A total of 13 waivers for transfers related to satellite projects were issued between 1989 and 1998, and additional waivers have since been issued for items including a bomb-disposal unit, equipment to help clean up chemical weapons, and sensors for commercial aircraft.³¹

Since the collapse of the Soviet Union and the 1995–96 Taiwan Strait crisis, the maintenance of US restrictions on exports to China has been driven by a broader set of considerations related to the potential threat posed by China's military modernization and its implications for the USA's power-projection capabilities, particularly in the western Pacific Ocean.³² These concerns are shared by all security-related branches of the US Government and remain prominent in US thinking. A recent report by the US Department of Defense (DOD) and the US Department of State argued that China's military 'could be put to use in ways that increase China's ability to gain diplomatic advantage or resolve disputes in its favour, and possibly against US national security interests'.³³

According to the US DOD, China's sustained process of military modernization is supported by ongoing efforts to gain access to military-relevant technologies from the USA, including through civilian front companies and economic espionage.³⁴ Seeking to limit China's access to these technologies is a key rationale for the USA's continued application of export control restrictions on China. Key

²⁷ Meijer (note 4).

²⁸ Archick, K., Grimmett, R. F. and Kan, S., *European Union's Arms Embargo on China: Implications and Options for US Policy*, Congressional Research Service (CRS) Report for Congress RL32870 (CRS: Washington, DC, 27 May 2005), p. 4.

²⁹ Meijer, H., *Trading with the Enemy: The Making of US Export Control Policy Toward the People's Republic of China*, PhD Dissertation, Institut d'Etudes Politiques (Sciences Po), Paris, 2013, p. 116.

³⁰ Archick, Grimmett and Kan (note 28).

³¹ Archick, Grimmett and Kan (note 28).

³² US Department of Defense (DOD) and US Department of State, *Risk Assessment of United States Space Export Control Policy*, Report to Congress (US DOD: Washington, DC, 15 Mar. 2012), Appendix 4, p. 1; Meijer (note 29); and Dyer, G., 'US v China: is this the new cold war?', *Financial Times*, 20 Feb. 2014.

³³ US DOD and US Department of State (note 32), Appendix 4, p. 5.

³⁴ US DOD, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (US DOD: Washington, DC, 2013), pp. 11–12.

concerns for the USA include China's improving capabilities in access denial—including 'short- and medium-range conventional ballistic missiles, land-attack and anti-ship cruise missiles, counter-space weapons, and military cyberspace capabilities'—as well as long-range strike and power projection.³⁵ In recent years, China's development of weapons capable of targeting space-based assets has been a particular concern for the USA. A 2012 US intelligence assessment mapped the vulnerability of the US military's space-based assets to disruption by Chinese military satellites, missiles and ground-based jamming techniques.³⁶

While exports of dual-use items on the CCL are not covered by the US arms embargo, additional controls apply to certain exports of CCL items. For example, since the late 1990s the USA has maintained strict controls on exports of satellite-related technologies to China. In 1998 a US Congressional Committee report on China's attempts to acquire military technology from the USA (the so-called Cox Report) concluded that unauthorized transfers of satellite-related technologies had allegedly helped Chinese missile programmes (although many of the report's findings, including on the extent to which the Chinese military benefitted from any transfers of technology, have since been challenged).³⁷ In response, the USA banned both the export of satellite technologies to China and the launch of US satellites in China.³⁸ In 2007 the USA also introduced a set of stricter controls on exports of CCL items to China under the so-called China Rule.³⁹ In particular, exports of 20 categories of CCL items became subject to additional licensing requirements if they are, or may be intended for, 'military end-use' in China.⁴⁰ Requirements for end-user certificates (EUCs) were also expanded.⁴¹ In particular, exporters of most CCL items to China must obtain an EUC issued by China's Ministry of Commerce (MOFCOM), regardless of the end-user.⁴²

Total trade between China and the USA has increased massively in recent years, rising from \$63 billion in 1996 to \$562 billion in 2013.⁴³ The growing interdependence of the Chinese and US economies has created a complex set of policy choices for the USA as it seeks to balance national security and trade interests.⁴⁴

³⁵ US DOD (note 34), p. i; and Nakashima, E., 'Confidential report lists US weapons system designs compromised by Chinese cyberspies', *Washington Post*, 27 May 2013.

³⁶ Shalal-Esa, A., 'China's space activities raising US satellite security concerns', Reuters, 14 Jan. 2013; and Shalal-Esa, A., 'Pentagon cites new drive to develop anti-satellite weapons', Reuters, 7 May 2013.

³⁷ US House of Representatives, Select Committee on US National Security and Military/Commercial Concerns with the People's Republic of China, *Final Report*, 3 Jan. 1999, <<http://www.house.gov/coxreport/>>; and M. M. May (ed.), *The Cox Committee Report: An Assessment* (Stanford University Centre for International Security and Cooperation: Stanford, CA, Dec. 1999), <http://cisac.stanford.edu/publications/cox_committee_report_the_an_assessment/>.

³⁸ 'Congress returns export control over satellites to State Department', *Arms Control Today*, Oct. 1998, <http://www.armscontrol.org/act/1998_10/satoc98>; and Lague, D., 'In satellite tech race, China hitched a ride from Europe', Reuters, 22 Dec. 2013.

³⁹ Fergusson, I. F., *The Export Administration Act: Evolution, Provisions, and Debate*, Congressional Research Service (CRS) Report for Congress RL31832 (US Congress, CRS: Washington, DC, 15 Jul. 2009), pp. 24–26.

⁴⁰ Fergusson (note 39).

⁴¹ Fergusson (note 39).

⁴² BIS, 'Export Administration Regulations' (note 17), Part 748.10.

⁴³ United States International Trade Commission, Interactive Tariff and Trade Data Web, 'US merchandise trade balance, by partner country 2013', <<http://dataweb.usitc.gov>>.

⁴⁴ Meijer (note 29).

In particular, while seeking to control transfers that may benefit the Chinese military, the USA has also sought to facilitate the export of certain dual-use items to the Chinese commercial sector. In 2007 the USA launched the Validated End User (VEU) programme as the third component of the China Rule.⁴⁵ The VEU programme is aimed at facilitating exports to trusted companies in China but exposes US exporters—and Chinese importers—to greater scrutiny by the US Government. Under the programme, pre-screened companies in China can receive certain dual-use items without the US-based exporter applying for an export licence.⁴⁶ In 2009 the programme was extended to include Indian importers.⁴⁷ However, doubts among Chinese and US companies about the benefits of the programme and delays in setting up an agreement with China for on-site inspections of Chinese companies have limited the programme's impact.⁴⁸ The programme has also been criticized for alleged flaws in the assessment applications from Chinese companies for VEU status.⁴⁹ As of November 2013, only 13 Chinese companies had been authorized as VEU's.⁵⁰

One analyst has characterized the development of US policy on exports controls to China as ongoing competition between two schools of thought in US policymaking: the so-called 'Control Hawks' and the 'Run Faster' coalition. Both groups emphasize the potential threat posed by China's military modernization and the need to limit China's access to key technologies but differ on their preferred policy response. The 'Control Hawks' advocate strict US export controls and restrictions on transfers of a wide range of goods and technologies to China, fearing these transfers would damage US national security interests. The 'Run Faster' camp advocates a more streamlined US export control system that targets the most sensitive items (or 'crown jewels'), supports the US defence industry and allows the US to run faster than its competitors. The China Rule is the outcome of the competition between these two rival coalitions, while the ECR initiative reflects the growing ascendancy of the 'Run Faster' viewpoint during the administration of US President Barack Obama.⁵¹

Application of national export controls on transfers to China

One indication of the extent to which the USA prioritizes enforcing controls on exports of military goods and dual-use items to China is the close attention paid to potential end users of exported goods in China. The US Department of State

⁴⁵ Fergusson (note 39), p. 24; and BIS, 'Validated End-User Program', [n.d.], <<http://www.bis.doc.gov/index.php/licensing/validated-end-user-program>>.

⁴⁶ BIS (note 45).

⁴⁷ Corr, C. F., and Hungerford, J. T., 'The struggles of shipping dual-use goods to China', *China Business Review* (Jan.–Feb. 2010), pp. 44–46.

⁴⁸ US Government Accountability Office (GAO), *Challenges with Commerce's Validated End-User Program May Limit Its Ability to Ensure that Semiconductor Equipment Exported to China Is Used As Intended*, GAO-08-1095 (GAO: Washington, DC, 25 Sep. 2008); and Corr and Hungerford (note 47).

⁴⁹ 'Newest designation reinforces concerns about Validated End-User Program', Wisconsin Project on Nuclear Arms Control, 10 June 2009, <<http://www.wisconsinproject.org/export-control/documents/avizareport-061009.pdf>>.

⁵⁰ BIS (note 45).

⁵¹ Meijer (note 29), p. 49.

and the US Department of Commerce both maintain global watch lists of ‘entities of concern’ to guide licensing and inform companies. China is the primary location for such entities on both lists.⁵² Another indication is the efforts to prosecute companies and individuals involved in unlicensed exports. Preventing ‘exports to China for military end-uses and military end-users’ is one of the main priorities of US export control enforcement.⁵³ Between 2011 and 2013 the US Government prosecuted 25 export control-related cases involving the shipment of controlled items to China.⁵⁴ In the most recent case, Pratt & Whitney Canada (P&WC) was fined for exporting US-made components used in China’s combat helicopter programme (see box 2.1).

The USA also seeks to influence other states’ policies on exports of military goods and dual-use items to China. In 2003 the Wassenaar Arrangement—a voluntary, consensus-based export control regime, covering transfers of both military items and dual-use goods, of which the USA is a member—agreed on a ‘statement of understanding’ in which participating governments agreed that an authorization would be required for exports of non-listed, dual-use items for military end uses in destinations subject to a United Nations arms embargo or any relevant regional or national arms embargo.⁵⁵ In 2007, under the China Rule, and as part of its implementation of the terms of the statement of understanding, the USA enacted stricter controls on exports to China and tried to convince other states to do the same.⁵⁶ However, these attempts appear to have been largely unsuccessful.⁵⁷

⁵² US GAO, *US Agencies Need to Assess Control List Reform’s Impact on Compliance Activities*, GAO-12-613 (GAO: Washington, DC, Apr. 2012), p. 36.

⁵³ Helder, J., et al., ‘Lessons learned from export controls and sanctions enforcement’, Presentation at Baker & McKenzie International Trade and Compliance Conference, Amsterdam, 8 Nov. 2013, <http://www.bakermckenzie.com/files/Uploads/Documents/International%20Trade%20&%20Compliance%20Event/Panel_Lessons%20Learned%20from%20Export%20Controls%20&%20Sanctions%20Enforcement%20Cases.pdf>.

⁵⁴ US Department of Justice (DOJ), ‘Summary of major US export enforcement, economic espionage, trade secret and embargo-related criminal cases (January 2008 to the present: updated March 26, 2014)’, Mar. 2014, <<https://www.pmdtc.state.gov/compliance/documents/OngoingExportCaseFactSheet.pdf>>.

⁵⁵ Wassenaar Arrangement, ‘Statement of understanding on control of non-listed dual-use items’, 2003, <http://www.wassenaar.org/guidelines/docs/Non-listed_Dual_Use_Items.pdf>. Established in 1996, the Wassenaar Arrangement encourages responsible behaviour aimed at preventing ‘destabilising accumulations’ through the agreement of best practices, shared control lists and exchanges of information. Wassenaar Arrangement, ‘Introduction’, <<http://www.wassenaar.org/introduction/index.html>>.

⁵⁶ Bromley, M., Duchâtél, M. and Holtom, P., *China’s Exports of Small Arms and Light Weapons*, SIPRI Policy Paper no. 38 (SIPRI: Stockholm, Oct. 2013), p. 18.

⁵⁷ US Embassy in Paris, ‘Export control bilats between France and DOC Assistant Secretary Christopher Padilla’, Cable to US Department of Commerce no. 06PARIS7705_a, 7 Dec. 2006, <https://www.wikileaks.org/plusd/cables/06PARIS7705_a.html>; US Embassy in Berlin, ‘Export control bilateral talks between Germany and DOC Assistant Secretary Padilla’, Cable to US Secretary of State no. 07BERLIN219_a, 2 Feb. 2007, <https://www.wikileaks.org/plusd/cables/07BERLIN219_a.html>; US Embassy in Stockholm, ‘Export control bilats between Sweden and DOC Assistant Secretary Christopher Padilla’, Cable to US Department of Commerce no. 07STOCKHOLM77_a, 23 Jan. 2007, <https://www.wikileaks.org/plusd/cables/07STOCKHOLM77_a.html>; and Meijer (note 29).

Box 2.1. Pratt & Whitney Canada and the Z-10 helicopter

In 2012 Pratt & Whitney Canada (P&WC), a Canadian subsidiary of the US-based company United Technologies Corporation (UTC), admitted to supplying components procured in the USA for use in the development of China's Z-10 combat helicopter, and to violations of US export controls.^a

In the 1990s P&WC had agreed to take part in a joint project with Eurocopter Southern Africa (Eurocopter SA) to assist the China Aviation Industry Corporation (AVIC II) with its helicopter programme. P&WC's involvement included the transfer of PT6C-67C turbo shaft engines containing the electric-engine control (EEC) system produced by the US-based company Hamilton Sundstrand Cooperation (HSC), another subsidiary of UTC.^b

Unlike HSC, P&WC appears to have been aware that the PT6C-67C engines would be used in the development of a military helicopter and that this might contravene US export control laws. One P&WC marketing manager wrote in an August 2000 email that 'discussions on [the PWC engine] for [the] Chinese Z-10 attack helicopter are progressing smoothly'.^c Nevertheless, the prospect of gaining access to the Chinese helicopter market appears to have convinced P&WC that it was worth taking the risk.

In order to facilitate the granting of an export licence, AVIC II provided P&WC with a briefing paper outlining plans for the development of a civil helicopter. P&WC managers were sceptical but did not share their doubts with the Canadian authorities, informing the Canadian Department of Foreign Affairs, Trade and Development (DFATD) only that AVIC II had provided them with the basic elements of a civil helicopter programme. On the basis of this information, DFATD issued a license for the export for 10 67C engines for the programme.

In June 2012, following a lengthy investigation by the US authorities UTC, HSC and P&WC agreed to pay fines to the US Government totalling \$75 million.^d

^a US Department of Justice (DOJ), Office of Public Affairs, 'United Technologies subsidiary pleads guilty to criminal charges for helping China develop new attack helicopter', Press release, 28 June 2012, <<http://www.justice.gov/opa/pr/united-technologies-subsi-dary-pleads-guilty-criminal-charges-helping-china-develop-new>>; and Schmidt, M. S., 'Military contractors are fined over aid to China', *New York Times*, 28 June 2012.

^b Reynolds, S. B., 'The United Technologies case: investigating and prosecuting a major defense contractor following a voluntary disclosure of unlawful exports to an embargoed nation', *Export Control Laws*, vol. 61, no. 6 (Nov. 2013), p. 11.

^c US Attorney's Office, District of Connecticut, 'Deferred Prosecution Agreement', <http://lib.law.virginia.edu/Garrett/prosecution_agreements/sites/default/files/pdf/United_Technologies.pdf>, p. 2.

^d US DOJ, 'Re: United States v. United Technologies Corporation, Hamilton Sundstrand Corporation and Pratt & Whitney Canada Corp', Letter dated 28 June 2012, <<http://www.ice.gov/doclib/news/releases/2012/120628bridgeport3.pdf>>.

More directly, the USA seeks to prevent particular transfers to China via the implementation of controls on the re-export of US technologies. All exports of ITAR-controlled USML goods from the USA restrict use to specified end-users and place controls on onward re-exports.⁵⁸ These 're-export controls' are used by the USA to block transfers to China by other states. For example, in 2012 the US Government reported that it was able to block China's attempt to acquire an 'imaging satellite constellation' from a European company because it contained US technology.⁵⁹ These re-export restrictions have led foreign companies to try and minimize the presence of US components in their systems in order to avoid

⁵⁸ Gustavus, J. D., 'What US and Chinese companies need to know about US export control laws applicable to China', *WorldECR*, no. 26 (Oct. 2013).

⁵⁹ US DOD and US Department of State (note 32), Appendix 4, p. 2.

US restrictions on which actors they can supply.⁶⁰ Under the ECR initiative, aspects of US re-export controls to some countries are being relaxed. However, controls on re-exports to China and other countries subject to US arms embargoes will remain in place.⁶¹

The USA has also used diplomatic and economic pressure to persuade other states to block exports to China that were not subject to US re-export controls. In 2003, for example, the USA persuaded the Czech Government to block the sale of 10 Vera radars to China.⁶² In addition, in the mid-to-late 2000s US diplomats lobbied European officials to block the transfer to China of satellite technology under the Galileo programme.⁶³

The supply of Israeli military equipment to China has been a source of tension between the USA and Israel for many years (see chapter 4). In July 2000 Israel cancelled a \$250 million deal to supply China with the Phalcon Airborne Early Warning and Control system because of US pressure.⁶⁴ In 2005 the US DOD stated that Israel and Russia were China's 'primary foreign sources of weapon systems and military technology'.⁶⁵ Also in 2005, the USA suspended several arms deals with Israel, including the export of night vision goggles, and blocked Israel's participation in the Joint Strike Fighter (JSF) combat aircraft programme.⁶⁶ The measures were aimed at persuading Israel to cancel a deal to modernize Harpy anti-radar unmanned aerial vehicles (UAVs, or drones) that China had acquired from Israel in the late 1990s.⁶⁷ In addition to halting the deal, Israel agreed to: (a) consult with the US Government on future arms sales to China; (b) tighten restrictions on defence-related technology transfers; (c) downgrade military relations to a minimum; and (d) submit exports to China to a stricter export control regime.⁶⁸ Reports from late 2013 indicate that Israel's arms industry is lobbying the Israeli Government to ease restrictions on exports to China.⁶⁹ However, the Israeli Ministry of Defense (MOD) is keen to avoid

⁶⁰ US Embassy in Paris, 'Airbus: fears of defense trade controls hurt US exports', Cable to US Secretary of State no. 08PARIS1078, 5 June 2008, <<http://wikileaks.org/cable/2008/06/08PARIS1078.html>>.

⁶¹ BIS, 'Remarks of Under Secretary of Commerce Eric L. Hirschhorn at the Practicing Law Institute', 10 Dec. 2012, <<http://www.bis.doc.gov/index.php/2011-09-12-15-56-29/2012-06-26-19-35-02/newsroom-archives/97-about-bis/newsroom/speeches/speeches-2012/476-remarks-of-under-secretary-of-commerce-eric-l-hirschhorn-at-the-practicing-law-institute>>.

⁶² Saalman, L. and Yuan, J., 'The European Union and the arms ban on China', Nuclear Threat Initiative, 1 Jul. 2004, <<http://www.nti.org/analysis/articles/european-union-and-arms-ban-china/>>.

⁶³ US Embassy in Berlin, 'Message delivered: Chinese attempt to procure illicit satellite components', Cable to US Secretary of State no. 08BERLIN618, 9 May 2008, <<http://wikileaks.org/cable/2008/05/08BERLIN618.html>>; and Lague, D., 'In satellite tech race, China hitched a ride from Europe', Reuters, 22 Dec. 2013.

⁶⁴ 'Israel scraps China radar deal', BBC News, 12 July 2000.

⁶⁵ US DOD, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (US DOD: Washington, DC, 2005), p. 23.

⁶⁶ Ben-David, A., 'US pressure threatens Israel-China trade', *Jane's Defence Weekly*, 12 Jan. 2005, p. 22.

⁶⁷ Ben-David (note 66).

⁶⁸ US DOD, 'US Department of Defense-Israeli Ministry of Defense joint press statement', Press Release no. 846-05, 16 Aug. 2005, <<http://www.defense.gov/releases/release.aspx?releaseid=8795>>; Gertz, B., 'US to restart arms technology transfers to Israel', *Washington Times*, 17 Aug. 2005; and Evron, Y., 'Between Beijing and Washington: Israel's technology transfers to China', *Journal of East Asian Studies*, vol. 13, no. 3 (2013), pp. 503-28.

⁶⁹ Coren, O., 'Israel's defense industry lobbying to ease exports to China', *Haaretz*, 31 Dec. 2013, <<http://www.haaretz.com/news/diplomacy-defense/premium-1.566277>>.

taking steps that might threaten security cooperation with the USA. In December 2013 the head of the Israeli MOD's Defense Export Control Agency resigned following reports that an Israeli subsystem sold to a French company had been supplied to China.⁷⁰

What has the USA licensed and exported to China?

Prior to 1989, the USA supplied a number of key technologies to the Chinese military and throughout the 1980s signed several major arms deals with China.⁷¹ The largest of these was the \$550 million Peace Pearl programme for the modernization of China's F-8 combat aircraft. Other transfers included: (a) the modernization of a production facility for 155mm artillery shells; (b) the sale of 24 Sikorsky S-70 helicopters; (c) the sale of Mark-46 anti-submarine torpedoes; and (d) the sale of AN/TPQ-37 artillery-locating radars.⁷² In 1990, with the application of the US arms embargo, China cancelled the Peace Pearl programme and in 1992 the USA cancelled its remaining arms deals with China.⁷³ Despite the existence of the embargo, a number of Chinese weapon systems use US-built components, either because the systems were supplied prior to 1990 or because the items concerned are not subject to US export controls. For example, the Chinese K-8 trainer aircraft uses a flight instrumentation system built by US company Rockwell Collins and Chinese Dong Feng military trucks use diesel engines built by the US company Cummins.⁷⁴

The Chinese military also continues to deploy a number of weapon systems imported from the USA before the US arms embargo was imposed. For example, the PLA continues to use 24 Sikorsky-built S-70 transport helicopters, originally delivered in 1984. According to the Chinese military the helicopters are maintained using spare parts that were stockpiled before the US arms embargo. However, in 2005 a South Korean was convicted of trying to obtain engines for S-70 helicopters in order to supply them to the Chinese military.⁷⁵ Supplies of spare parts for these helicopters are blocked by the US arms embargo on China. Nevertheless, Sikorsky has been able to sell the civilian version of the S-70 to China continuously since 1984 and the civilian version of the S-92 transport helicopter

⁷⁰ Opall-Rome, B., 'Israel replaces export control chief after tech transfer to China', *Defense News*, 3 Jan. 2014, <<http://www.defensenews.com/article/20140103/DEFREG04/301030014/Israel-Replaces-Export-Control-Chief-After-Tech-Transfer-China>>.

⁷¹ Archick, Grimmett and Kan (note 28), p. 4; and Meijer (note 4).

⁷² Archick, Grimmett and Kan (note 28).

⁷³ Mann, J., 'China cancels US deal for modernizing F-8 jet', *Los Angeles Times*, 15 May 1990.

⁷⁴ 'K8/JL8 Trainer Jet: PLAAF', *Air Force World*, [n.d.], <<http://airforceworld.com/pla/english/k-8-JL-8-JL-11-trainer-china-pakistan.html>>; 'Rockwell Collins establishing joint venture with China Electronics Technology Avionics Co. Ltd. to support COMAC C919 program', *Business Wire*, 24 Oct. 2012, <<http://www.businesswire.com/news/home/20121024006576/en/Rockwell-Collins-Establishing-Joint-Venture-China-Electronics#UwdqiHmqB28>>; and Amnesty International, 'China: Sustaining conflict and human rights abuses—the flow of arms accelerates', 10 June 2006, <<http://www.amnesty.org/en/library/info/ASA17/030/2006/en>>.

⁷⁵ Tran, P., 'China extends military reach', *Defense News*, 24 May 2010, pp. 1, 8; and 'Sikorsky engine trader sentenced', *Connecticut Post*, 31 Aug. 2005.

since 2005.⁷⁶ In 2013 Sikorsky and the Chinese company Changhe Aircraft Industries Corporation signed a co-production deal for the civilian version of the S-76 in China.⁷⁷ This kind of deal is likely to have provided Chinese industry with technologies and production methods that can be applied in the production of military systems.⁷⁸ In late 2013 the PLA unveiled a new indigenous-built helicopter—the Z20—that appears to share some of the design and technology aspects of the S-70.⁷⁹

⁷⁶ 'USA lifts barriers to sale of S-92 to China', Flight International, 23 Aug. 2005, <<http://www.flightglobal.com/news/articles/usa-lifts-barriers-to-sale-of-s-92-to-china-201146/>>.

⁷⁷ Sikorsky, 'Sikorsky and Changhe sign agreement for S-76DCabin production in China', Press release, 5 Sep. 2013, <<http://www.sikorsky.com/About+Sikorsky/News/Press+Details?pressvcid=8c88d90f24fe0410VgnVCM1000004f62529fRCRD>>.

⁷⁸ US DOD (note 34).

⁷⁹ Waldron, G., 'Pictures: China pushes ahead with military helicopter programmes', Flight Global, 9 Jan. 2014, <<http://www.flightglobal.com/news/articles/pictures-china-pushes-ahead-with-military-helicopter-394676/>>.

3. European export controls on transfers to China: France, Germany and the United Kingdom

This chapter details the policies of the EU's three largest arms exporters—France, Germany and the UK—on transfers of military-related technologies to China, including transfers of military goods, dual-use items and other non-controlled items relevant to the development of China's military capabilities. It begins with a discussion of the EU arms embargo on China, which all three states are politically obliged to apply. Separate sections then outline the French, German and British export control systems, including their interpretations of and positions on the EU arms embargo, their application of national export controls on transfers to China, and details of what is being licensed and exported to China.

The European Union arms embargo on China

In June 1989 the European Council adopted a number of punitive measures against China, including a halt to 'military cooperation' and 'an embargo on trade in arms with China'.⁸⁰ The imposition of the embargo predates the creation of the EU's Common Foreign and Security Policy (CFSP) with the Maastricht Treaty in 1993 and is, consequently, not legally binding on member states.⁸¹ Furthermore, there has been no agreement on a list of items to be covered by the term 'arms'. The question of how the embargo should be applied is left to individual EU member states, whose interpretations continue to differ in terms of both policy and practice. In addition, the embargo is not covered by the 2009 EU Dual-use Regulation's so-called 'catch-all' provision that requires EU member states to control exports of unlisted goods to military end-users in embargoed destinations.⁸²

Each of the 12 EU member states that were members of the Union in 1989 is obliged to implement the EU arms embargo on China. While the 16 states that have joined the EU since 1989 have accepted as binding all EU decisions made prior to their membership, this does not apply to the European Community's political declarations.⁸³ However, the EU Common Position defining common rules governing control of exports of military technology and equipment covers

⁸⁰ European Council, 'Council of Ministers Declaration on China', 27 June 1989, <http://www.sipri.org/databases/embargoes/eu_arms_embargoes/china/eu-council-of-minister-declaration-on-china>.

⁸¹ European Union External Action Service (EEAS), 'Common Foreign and Security Policy (CFSP) of the European Union', [n.d.], <http://eeas.europa.eu/cfsp/index_en.htm>.

⁸² Council of the European Union, Council Regulation (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items, *Official Journal of the European Union*, L 134, 5 May 2009, Article 4(2).

⁸³ European Commission, 'Conditions for membership', [n.d.], <http://ec.europa.eu/enlargement/policy/conditions-membership/chapters-of-the-acquis/index_en.htm>.

the EU arms embargo.⁸⁴ The EU Common Position commits member states to deny arms export licences inconsistent with ‘the international obligations of Member States and their commitments to enforce United Nations, European Union and Organization for Security and Co-operation in Europe (OSCE) arms embargoes’.⁸⁵ This means that EU member states which joined the EU after 1989 are obliged to take the EU arms embargo on China into account when assessing export licence applications.⁸⁶

Disputes about the lifting of the embargo

The EU embargo on China was the source of an intense transatlantic and intra-European dispute in 2003–2005, when both France and Germany indicated that they were in favour of its removal.⁸⁷ At the December 2004 meeting of the Council of the European Union, EU member states ‘reaffirmed the political will to continue to work towards lifting the arms embargo’.⁸⁸ At the same time, member states recalled ‘the importance of the EU Code of Conduct on Arms Exports in particular criteria regarding human rights, stability and security in the region and the national security of friendly and allied countries in preventing an increase in arms sales to China from EU Member States’.⁸⁹

However, the proposal raised strong objections in the USA, with both the US Congress and US President George W. Bush warning that such a move would be a significant obstacle to US defence cooperation with EU member states.⁹⁰ In an attempt to allay US concerns, the EU made it clear that the embargo on China would not be lifted until a strengthened EU Code of Conduct was agreed.⁹¹ However, US opposition to lifting the embargo remained strong. The passing of an anti-secession law by China’s National People’s Congress in March 2005—which threatened military force if Taiwan formally declared its independence—also influenced EU member states’ thinking, serving to further dampen support for lifting the embargo.⁹² Some commentators have argued that the passing of the anti-secession law provided convenient cover for EU member states to drop the plan, which they were now keen to abandon in the face of concerted US

⁸⁴ The EU Common Position supersedes the 1998 Code of Conduct on Arms Exports, and is a legally binding agreement aimed at setting ‘high common standards’ in EU member states’ arms export policies. Council of the European Union, ‘Council Common Position 2008/944/CFSP of 8 Dec. 2008 defining common rules governing control of exports of military technology and equipment’ (EU Common Position), *Official Journal of the European Union*, L335, 8 Dec. 2008; and Council of the European Union, ‘European Union Code of Conduct on Arms Exports’, 8675/2/98 Rev. 2, 5 June 1998.

⁸⁵ Council of the European Union, ‘EU Common Position’ (note 84), p. 2.

⁸⁶ British Government official, Interview with authors, 11 Feb. 2014.

⁸⁷ ‘Schroeder backs sales to China of EU weapons’, *Wall Street Journal*, 2 Dec. 2003; and ‘Chirac renews call for end of EU arms embargo on China’, Agence France-Presse, 27 Jan. 2004.

⁸⁸ European Council, ‘Presidency Conclusions’, 16–17 Dec. 2004, Brussels, <<http://www.european-council.europa.eu/council-meetings/conclusions/>>.

⁸⁹ ‘European Union Code of Conduct on Arms Exports’ (note 84); and European Council (note 88).

⁹⁰ Alden, E., ‘US threat to restrict arms sales to Europe’, *Financial Times*, 13 May 2004.

⁹¹ Anthony, I. and Bauer, S., ‘Transfer controls’, *SIPRI Yearbook 2005: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2005), pp. 699–719.

⁹² US Embassy in Dublin, ‘Subject: Ireland still opaque on China arms embargo’, Cable no. 05DUBLIN512, 29 Apr. 2005, <<http://www.wikileaks.ch/cable/2005/04/05DUBLIN512.html>>.

pressure.⁹³ In addition, there was strong opposition to lifting the embargo within Europe, from both the media and the European and member-state parliaments, mostly based on concerns relating to the human-rights situation in China.

Since 2005 the idea of lifting the arms embargo on China has been raised occasionally by EU member states and EU officials but failed to gain the kind of support needed to make it a serious proposition. In January 2010 the Spanish Government—which had just assumed the rotating Presidency of the Council of the European Union—indicated its desire to discuss lifting the embargo.⁹⁴ In December 2010 the High Representative of the European Union for Foreign Affairs and Security Policy, Catherine Ashton, described the EU arms embargo on China as ‘a major impediment for developing stronger EU–China cooperation’.⁹⁵ However, these moves appear to have had limited support among EU member states, a number of which—particularly Germany and the UK—remain opposed to lifting the embargo.⁹⁶ Indeed, it appears that the real ambition of the two declarations was not to restart a serious debate about lifting the embargo but, instead, to send a friendly signal to China.

Under President Obama, the USA has maintained its staunch opposition to the lifting of the EU arms embargo, despite the apparent lack of credible support for a policy change within Europe. In 2010 the US Department of State issued an action request ‘for all Embassies in EU countries to reiterate our position that the EU should retain its arms embargo on China’.⁹⁷ US pressure is still widely seen as the key factor blocking any move towards an eventual lifting of the EU arms embargo.⁹⁸ It has been argued that the USA’s position on the embargo on China is illogical, since the embargo is not legally binding and provides no real constraint on EU member states’ transfers of military goods to China.⁹⁹ One argument is that the USA is actually more concerned about denying the Chinese Government the symbolic victory that a decision to lift the embargo would represent.¹⁰⁰

Japan has also consistently voiced its strong opposition to any attempt to lift the EU arms embargo on China.¹⁰¹ In addition, a majority of members in the

⁹³ ‘The EU and arms for China’, *The Economist*, 1 Feb. 2010, <http://www.economist.com/blogs/charlemagne/2010/02/eu_china_arms_embargo>.

⁹⁴ US Secretary of State, ‘Supporting the EU arms embargo on China’, Cable to US Embassy in Beijing and US Mission to the European Union no. 10STATE13969, 17 Feb. 2010, <https://wikileaks.org/plusd/cables/10STATE13969_a.html>; and Cowan, G., ‘Spain looks to end EU arms embargo on China’, *Jane’s Defence Weekly*, 3 Feb. 2010, p. 14.

⁹⁵ Hale, J., ‘EU arms embargo called “bargaining chip” in wider China talks’, *Defense News*, 13 Jan. 2011, <<https://groups.yahoo.com/neo/groups/ENAAAT/conversations/topics/984>>.

⁹⁶ Kirkup, J., ‘Britain prepared to block Eurozone move to relax arms embargo on China’, *Daily Telegraph*, 4 Nov. 2011; and German Parliament, ‘Antwort der Bundesregierung, Zur Sicherheitspolitischen Lage in Ost- und Südostasien’ [Reply by the Federal Government on the security situation in East and Southeast Asia], Drucksache 17/8561, 8 Feb. 2012, <<http://dipbt.bundestag.de/dip21/btd/17/085/1708561.pdf>>.

⁹⁷ US Secretary of State (note 94).

⁹⁸ ‘The EU and arms for China’ (note 93).

⁹⁹ Lewis, J., ‘EU arms embargo on China’, Arms Control Wonk, 24 Mar. 2005, <<http://lewis.armscontrolwonk.com/archive/496/eu-arms-embargo-on-china>>.

¹⁰⁰ British Parliament, Select Committee on International Development, ‘Examination of Witnesses (Questions 100–119)’, 12 Jan. 2005, <<http://www.publications.parliament.uk/pa/cm200405/cmselect/cmintdev/145/5011203.htm>>.

¹⁰¹ Willis, A., ‘Japan: Ashton was wrong to suggest lifting China arms ban’, *EU Observer*, 19 May 2011, <<http://euobserver.com/news/32360>>.

European Parliament are strongly opposed to ending the ban.¹⁰² A 2008 resolution in the Parliament stating that the EU ‘must maintain its arms embargo on China, as long as China continues to export arms to armed forces and armed groups in countries, many of them in Africa, that fuel conflicts and perpetrate gross violations of human rights’ was passed with 618 members in favour and 16 against.¹⁰³ While the European Parliament has no formal say in whether or not the embargo is lifted, any attempt to lift it while opposition remains strong could pose significant political problems.¹⁰⁴ Some EU think tank experts have voiced support for lifting the embargo if it can be used as leverage for gaining Chinese concessions in other areas (e.g. cooperation against the Iranian nuclear programme), but the issue is not currently a policy research priority.¹⁰⁵

China’s view of the embargo

The EU arms embargo has been a source of intense irritation to China since its imposition and the Chinese Government has constantly called for it to be lifted. These calls grew louder following the publication in 2003 of China’s first EU Policy Paper, which stated that ‘the EU should lift its ban on arms sales to China at an early date so as to remove barriers to greater bilateral cooperation on defence industry and technologies’.¹⁰⁶ The Chinese Government considers the embargo degrading as it puts China in the same category as other countries that are under EU sanctions, such as Belarus, Myanmar, Sudan and Zimbabwe.¹⁰⁷ During a September 2012 visit to Brussels, Chinese Prime Minister Wen Jiabao reiterated China’s unhappiness that the embargo remained in place.¹⁰⁸ A characteristic of Wen’s policy towards the EU was to link the lifting of the arms embargo to other bilateral issues—especially the EU’s trade deficit with China and international security cooperation.

Although the arms embargo is still framed in China as an obstacle to greater China–EU cooperation on international security matters, there are also clear signs that China is becoming less focused on lifting the EU arms embargo.¹⁰⁹ The 2014 update to China’s EU Policy Paper still calls on the EU to ‘lift its arms embargo on China at an early date’ but Chinese officials are not pushing the issue with the same frequency or intensity of previous years.¹¹⁰ This position is likely to

¹⁰² Cendrowicz, L., ‘Should Europe lift its arms embargo on China?’, *Time*, 10 Feb. 2010.

¹⁰³ European Parliament, ‘Chinese policy and its effects on Africa’, Procedure File no. 2007/2255(INI), 23 Apr. 2008, <<http://www.europarl.europa.eu/oeil/popups/ficheprocedure.do?id=556476>>.

¹⁰⁴ ‘The EU and arms for China’ (note 93).

¹⁰⁵ Godement, F. and Fox, J., *A Power Audit of EU–China Relations* (European Council on Foreign Relations: London, 2008).

¹⁰⁶ Chinese State Council, *China’s European Union Policy Paper* (Information Office of the State Council: Beijing, Oct. 2003).

¹⁰⁷ Weitz, R., ‘EU should keep China arms embargo’, *The Diplomat*, 18 Apr. 2012, <<http://thediplomat.com/2012/04/eu-should-keep-china-arms-embargo/>>.

¹⁰⁸ Kanter, J., ‘Wen chides Europe on arms sale embargo’, *New York Times*, 20 Sep. 2012.

¹⁰⁹ Banks, M., ‘EU arms embargo against China dismissed as “unimportant”’, *TheParliament.com*, 2 Aug. 2011, <<http://www.china-defense-mashup.com/eu-arms-embargo-against-china-dismissed-as-unimportant.html>>.

¹¹⁰ Chinese State Council, ‘China’s policy paper on the EU: deepen the China–EU comprehensive strategic partnership for mutual benefit and win-win cooperation’, Apr. 2014, <http://www.fmprc.gov.cn/mfa_eng/wjdt_665385/wjzcs/t1143406.shtml>.

reflect China's recognition of EU member states' lack of interest in lifting the embargo, the limited scope for movement on this issue in the near future and China's ability to acquire key technologies within the current framework of European export controls. Some Chinese experts openly advocate moving beyond the arms embargo. For example, Wang Zaibang, Vice-President of the China Institutes of Contemporary International Relations (CICIR), argues that, in light of the rapid progress of China's defence industries, it is now 'in China's best interest to prioritize cooperation against non-traditional threats instead of focusing on lifting the arms embargo'. Specifically, China should prioritize 'technological education cooperation' (科技教育合作, *keji jiaoyu hezuo*) in key industries such as aeronautics.¹¹¹

The French export control system

France's arms export legislation is based on a 'prohibition principle', which posits that arms exports are prohibited until an authorization is issued.¹¹² The legislation for France's controls on exports of military goods and dual-use items consolidated in the *Code de la défense* (Defence Code) is complemented by numerous administrative regulations.¹¹³ A June 2012 administrative decree sets out licensing policy for military goods and dual-use items, while the EU Common Military List and EU Control List define controlled military goods and dual-use items, respectively.¹¹⁴

The French Prime Minister's office is responsible for issuing and denying licenses for the export of military goods. In practice, an inter-ministerial commission, the *Commission interministérielle pour l'étude des exportations de matériels de guerre* (Interministerial Commission for the Study of War Material Exports, CIEEMG) examines license applications. The French Ministry of Foreign Affairs (MFA), the French MOD and the Ministry of Economy, Finances and Industry hold 'deliberative powers' within the commission—that is, they can provide advice to the Prime Minister after consulting with other government agencies including the Cabinet, the Ministry of the Interior and the Ministry of Education, intelligence agencies and representatives from the Presidential Office's Military

¹¹¹ Wang, Z., '—專家稱需升級中歐關係 對歐債危機不落井下石' [Expert calls for upgrading EU-China relations and not worsening the European debt crisis], *Zhongguo Xinwenwang*, 26 Nov. 2013, <<http://dailynews.sina.com/bg/news/int/chinanews/20131126/22305211404.html>>.

¹¹² French Government, *Code de la Défense* [Defence Code], 30 May 2014, <<http://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006071307>>, Article L2335-1.

¹¹³ French Government (note 112), Book III, titles III and IV.

¹¹⁴ French Government, 'Arrêté du 27 juin 2012 relatif à la liste des matériels de guerre et matériels assimilés soumis à une autorisation préalable d'exportation et des produits liés à la défense soumis à une autorisation préalable de transfert' [Decree on war materials and other similar materials requiring a preliminary export licence and on defence products requiring a preliminary export licence], 27 June 2012, <<http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000026088164>>; Council of the European Union, 'Common Military List of the European Union', adopted by the Council on 11 Mar. 2013, *Official Journal of the European Union*, C90/1, 27 Mar. 2013; Council of the European Union (note 82); and French MOD, *Rapport au Parlement 2013 sur les exportations d'armement de la France* [2013 Report to Parliament on French arms exports], July 2013, p. 28.

Staff. In cases where a consensus is not reached, the Prime Minister's office has the ultimate decision-making power.

The *Service des biens à double usage* (Dual-Use Goods Services Administration, SBDU) within the Ministry of Economy, Finances and Industry is responsible for issuing and refusing licenses for the export of dual-use goods. Another inter-ministerial commission, chaired by the MFA, examines sensitive cases. Transfers of dual-use items are examined against the EU Council Regulation and additional national criteria in certain cases.¹¹⁵ Export applications are examined against the eight criteria of the EU Common Position.¹¹⁶ France's general policy framework underlines the 'political nature' of arms transfers and the ultimate 'responsibility' of the sovereign state to 'authorize or deny an export'.¹¹⁷ In its annual report to Parliament, the French MOD points to the importance of considering risks of diversion and compliance with the 2008 EU Common Position criteria, especially with regards to human rights and the domestic situation of the recipient state.¹¹⁸

France's interpretation of the European Union arms embargo

France has never provided a public statement detailing how it interprets the EU arms embargo on China. France was a leading proponent of lifting the embargo during the second mandate of President Jacques Chirac. In the context of his opposition to the 2003 Iraq War and in the Gaullist tradition of a foreign policy seeking independence from the USA, Chirac perceived the rise of China as a welcome counterweight to US unilateralism and a key element of a multipolar world order.¹¹⁹ Furthermore, Chirac argued that the embargo did not 'correspond to the political reality of the contemporary world'.¹²⁰ He presented lifting the arms embargo as an act of political 'normalization' with China that would not result in an increase in European arms exports to China, and was therefore predominantly a symbolic gesture.¹²¹ In contrast, French Defence Minister Michèle Alliot-Marie argued that lifting the arms embargo would in fact delay the emergence of China as a competitor on export markets, since it could slow the modernization of China's defence industries.¹²² While French Government officials have never

¹¹⁵ French Ministry of Foreign Affairs (MFA), 'Contrôle des biens et technologies sensibles à double usage' [Control of dual-use goods and technologies], Feb. 2013, <<http://www.diplomatie.gouv.fr/fr/politique-etrangere-de-la-france/desarmement-et-non-proliferation/la-france-et-le-controle-des/article/biens-et-technologies-a-double>>.

¹¹⁶ Matelli, S., 'Un Code de conduite européen pour sécuriser les exportations ? Le cas des exportations d'armes en Europe' [A European code of conduct to secure exports? The case of arms exports in Europe], *Les Cahiers Identité, relations internationales et civilisationnelles de l'Europe*, vol. 6, no. 2 (2010), pp. 93–110.

¹¹⁷ French MOD (note 114), p. 28.

¹¹⁸ French MOD (note 114), p. 29.

¹¹⁹ Barluet, A., 'Jacques Chirac courtise la Chine de Hu Jintao' [Jacques Chirac courts Hu Jintao's China], *Le Figaro*, 25 Oct. 2006.

¹²⁰ 'Chine : Chirac juge dépassé l'embargo sur les armes' [China: Chirac argues that the arms embargo is outdated], *Le Nouvel Observateur*, 28 Jan. 2004, <<http://tempsreel.nouvelobs.com/monde/20040127.OBS3171/chine-chirac-juge-depasse-l-embargo-sur-les-armes.html>>.

¹²¹ 'Jacques Chirac : interview du Président de la République au Quotidien Asahi Shimbun' [Jacques Chirac: interview with the President by Asahi Shimbun], 21 Mar. 2005, <http://www.jacqueschirac-asso.fr/archives-elysee.fr/elysee/elysee.fr/francais/interventions/interviews_articles_de_presse_et_interventions_televisees/2005/mars/fi001142.html>.

¹²² Spiegel, P. and Thornhill J., 'France urges end to China arms embargo', *Financial Times*, 15 Feb. 2005.

publicly spoken about French trade interests, there has been speculation that the embargo discussion took place in the context of major arms deals being considered in relation to China.

Since the debate over the European embargo came to an end, France's approach has dramatically evolved from being a staunch advocate of lifting the embargo to becoming a supporter of the status quo. This evolution reflects an important shift in France's views of policy on Asia and transatlantic ties, with risks of armed confrontation in the region taking precedence over commercial interests. During the final years of Chirac's presidency, diplomatic language stressed that France was actively 'working toward lifting the embargo' but stopped short of calling for it to be lifted.¹²³ Similar language was employed during the presidency of Nicolas Sarkozy.¹²⁴ Unlike Spain, and contrary to China's expectations, France did not reinstate the arms embargo debate during its own term as EU President in 2008. Since President François Hollande came to office in May 2012, diplomatic language has stressed France's EU and international obligations. This evolution reflects the perception that the key political question for France, in the context of rapid modernization of Chinese defence industries seeking autonomy and global expansion, is no longer whether the embargo should be lifted but how to address technology transfers within the current export control framework.

France's application of national export controls on transfers to China

France takes a political approach to decision making on transfers to China, with deliberations in light of the consolidated criteria of the EU Common Position and its relations with China, Japan and the USA. In particular, France's view on exports of defence products to China is shaped by regional security dynamics in East Asia. Instead of advocating greater defence cooperation with China, the French Government seems to have prioritized support for domestic arms companies seeking market access in Asian countries other than China. In recent years, the French arms industry has sold major weapon systems to countries that have unresolved territorial disputes with China, such as Vietnam and Malaysia, and may also benefit from defence modernization in the Philippines.¹²⁵

The Indian arms market also features prominently in the current French arms export policy in Asia, especially in the context of exports seen as crucial to sustaining key French defence industries that cannot be supported by domestic procurement alone. In June 2013 a bilateral dialogue was initiated with Japan on arms industry cooperation. During the negotiations, Japan raised the risk of re-exports via France of Japanese components to Chinese military end-users as an obstacle to the conclusion of an agreement.¹²⁶ These efforts by the French defence industry to further ties with Asian countries—whose defence modernization efforts are partly driven by China's rapidly growing military spending and

¹²³ French Government official, Interview with authors, Paris, Dec. 2013.

¹²⁴ 'France calls for lifting of arms sales ban on China', *Xinhua*, 5 Dec. 2007.

¹²⁵ French defence industry experts and officials, Interviews with author, Paris, Dec. 2013.

¹²⁶ Senior Japanese Government officials, Interview with authors, Tokyo, Feb. 2014.

increasingly assertive foreign policy in the region—have been carried out with the support of the French Government, and can be seen as a pragmatic adaptation to the constraints preventing more transfers to the PLA.

French policy on technology transfers to China is also increasingly shaped by ‘economic intelligence’ concerns. The Prime Minister’s office established an inter-ministerial commission for economic intelligence in 2009 to elaborate and implement a policy on economic intelligence risks. Preventing immaterial transfers through joint research and development and scientific cooperation has been identified as a priority.¹²⁷

What has France licensed and exported to China?

The French MOD ranks China 17th in the list of recipients of French arms sales between 2003 and 2012. Under the former three-stages export control framework, French public statistics distinguished between negotiated contracts and actual deliveries. According to MOD statistics, the value of export authorizations granted for transfers or licensed production was around €160–180 million (\$200–225 million) per year between 2008 and 2012. In the same period, the annual value of actual deliveries was in the range of €76–115 million (\$95–145 million).¹²⁸ Between 2003 and 2012, transfers to China were dominated by imaging and countermeasures equipment (42 per cent) and aircraft equipment (37 per cent), but also included electronic equipment (6 per cent) and ‘other’ (13 per cent).¹²⁹ Similar to many other states, France doesn’t communicate publicly on specific license denials but shares information with its EU partners.

France provided key military systems to China prior to 1989, including Crotale surface-to-air missiles, attack and transport helicopters (SA-365 Dauphin/Panther, SA-321 Super Frelon and SA-342 Gazelle) and 100 mm naval guns. In particular, the French contribution to the construction of China’s civilian and military helicopter fleet and industrial capacity has been decisive, and is currently expanding through Eurocopter’s consolidated strategic partnership with Harbin Aircraft Manufacturing Corporation (HAMC) for the co-production of the EC-175 heavy transport helicopter (Chinese version Z-15). A contract for the co-production of 1000 helicopters, for a total value of €15 billion (\$18.6 billion), was announced in Paris in March 2014.¹³⁰

In 1978 China acquired a license to build 13 Super Frelon helicopters in anti-submarine warfare (ASW) and search-and-rescue (SAR) versions. They are still in service in the PLA Navy (PLAN), and China has produced several modified versions (Z-8) that equip both the PLAN and the PLA Air Force (PLAAF), including an early-warning version photographed in 2009, and an improved Z-18 ASW system reportedly already operational on the aircraft carrier *Liaoning*.¹³¹

¹²⁷ French government official, Interviews with author, Paris, Dec. 2013.

¹²⁸ French MOD (note 114), p. 82.

¹²⁹ French MOD (note 114), p. 82.

¹³⁰ ‘Airbus Hélicoptères signe un contrat historique de 1000 hélicoptères avec la Chine’ [Airbus Helicopters signs historic contract for 1000 helicopters with China], *L’usine nouvelle*, 26 Mar. 2014.

¹³¹ ‘Z-8 AEW Helicopter unveiled’, China Defense Blog, 19 Oct. 2009, <<http://china-defense.blogspot.com/2009/10/z-8-aw-helicopter-unveiled.html>>; Minnick, W., ‘Chinese carrier’s purported air

France's contribution to these new versions remains undocumented. In the early 1980s Aerospatiale signed a contract for the production under license of 50 Dauphin/Panther helicopters. In the early 1990s HAMC began to mass-produce various versions of the Z-9 including some with a range of anti-tank, anti-surface and air-to-air armament. Some versions of the Z-9 are heavier than the Dauphin and the Panther and have a larger cabin; and hence the Chinese argue that it is an indigenous system. China also acquired eight Gazelle anti-tank and anti-helicopter attack helicopters in 1987–88.¹³² Contracts signed prior to 1989 include maintenance and replacement of spare parts, both of which are included in the statistics made public by the French MOD in its annual report on arms sales. However, transferred helicopters are not included when the Chinese end-user is civilian, in which case they do not need to pass through the export licence procedure.¹³³

While no major weapon system has been transferred since 1989, the French arms industry has transferred optronic systems, radars, propulsion systems and spare parts. Products include maritime surveillance and air-traffic monitoring radar systems (both produced by Thalès) and maritime surveillance software. The French Safran Group, an important actor in the aviation sector, established joint ventures for production of Turbomeca turboshafts in 2006 (JV Beijing Turbomeca Changkong Aero-Engine Control Equipment Co. Ltd) and 2008 (Turbomeca Beijing Helicopter Engines Trading Co.).¹³⁴ In 2013 Turbomeca's engines equipped more than 300 Chinese helicopters, including export versions.¹³⁵ Sagem (a subsidiary of the Safran Group) provides avionics equipment (flight control suites) to Chinese helicopters through exports and licensed production. Through its French subsidiary, MAN Diesel Pielstick has transferred diesel engines for PLAN Jiangkai-2 frigates.¹³⁶

Law enforcement cooperation is an important channel for transfers of military-relevant equipment. Transfers of dual-use material have included signal and image recognition software, textiles for law enforcement agencies' uniforms and night-vision equipment.¹³⁷ Eurocopter claims that the Z-15/EC-175 transport helicopter has law enforcement applications but some observers have warned that the Chinese version might ultimately enter into service in the PLAN.¹³⁸ Japan

wing seems plausible but limited', Defense News, 7 Sep. 2014, <<http://www.defensenews.com/article/20140907/DEFREG03/309070015/Chinese-Carrier-s-Purported-Air-Wing-Deemed-Plausible-Limited>>.

¹³² Crawford, S., *Twenty First Century Military Helicopters, Today's Fighting Gunships* (MBI Publishing: St. Paul, MN, 2003), p. 13.

¹³³ Senior French Government official, Interview with authors, Paris, May 2014.

¹³⁴ Safran Group, 'Safran in China', [n.d.], <<http://www.safran.cn/spip.php?rubrique7&lang=en>>.

¹³⁵ Turbomeca, 'Turbomeca China renouvelle la certification de Citic Offshore Helicopter Co Ltd comme Centre de Maintenance pour le marché chinois' [Turbomeca China renews the certification of Citic Offshore Helicopter Co Ltd as a repair centre for the Chinese market], Press release, 18 June 2013, <<http://www.turbomeca.com/francais/media-evenements/communiques-de-presse/turbomeca-china-renouvelle-la-certification-de-citic-offshore-helicopter-co-ltd-comme-centre-de-maintenance-pour-le-marche-chinois.html>>.

¹³⁶ Jacobs, K., 'PLAN: rapid frigate growth', *Asia-Pacific Defence Report*, Apr. 2007, pp. 42–44; and '13+7 Jiangkai II (Type 054A) Class (FFGHM)', Commodore S. Saunders RN (ed.), *IHS Jane's Fighting Ships 2013–2014* (Jane's Information Group: London, 2013), p. 144.

¹³⁷ French law enforcement expert, Interview with authors, Paris, Dec. 2013.

¹³⁸ Western defence attaché, Interview with authors, Beijing, Jan. 2014.

protested against DCNS's sale of helicopter landing grids—high-quality steel grids that enable helicopters to land safely on ships under severe weather conditions—to Chinese maritime law enforcement agencies.¹³⁹ A small number of transfers included in the MOD's statistics concern equipment assembled in China with Chinese components and sold to third parties, such as the Panhard 4x4 trucks delivered to Saudi Arabia between 2008 and 2011 for use with PLZ-45 guns from China.¹⁴⁰

Concerns regarding illegal copies of French systems in China are thought to have been raised by the French side, although they are rarely made public. One exception is Eurocopter's objection to HAMC's continuous production of Z-9 helicopters 'despite the expiry of the license production agreement'.¹⁴¹ However, French companies, including Eurocopter, continued cooperating with China on the Z-9 after 2002. China has sold Z-9 helicopters to Bolivia, Cambodia, Kenya, Mali, Pakistan and Zambia. Staying in the race for the future opening of the private civilian helicopter market seems to have been an important incentive for French accommodation of China's demands. China appears to have reverse-engineered Crotale-type surface-to-air missiles and their supporting radar system (the Sea Tiger, also sold by Thomson in the late 1970s), under the designation HQ-7, although Crotale has never publicly criticized China for doing so. Other copies include the QBZ-95/97 assault rifle, based on the French Famas, and the Type 92 (WMZ-551) heavy armoured personnel carrier, which is modelled on Nexter's *véhicule de l'avant blindé* (VAB). Again, the French companies involved have never publicly criticized China for doing this. The Z-11 attack helicopter, manufactured by Changhe (HAMC's main competitor within the domestic helicopter market) and used by China's ground forces, is a copy of Eurocopter's Ecureuil. Some experts have suggested that Microturbo engine technology might have been copied in the propulsion system of H-10 cruise missiles.¹⁴² It seems clear that China also copied 100-mm naval guns but the French Government never issued a public protest regarding their serial production. French-designed naval guns also equip 051-C Luzhou-class and 052 Luyang-class destroyers.

China is also increasingly interested in military-relevant scientific cooperation with France. One recent example is the efforts of the Chinese Ministry of Science and Technology (MOST) to support joint research on advanced materials—materials that have superior performances in areas such as resistance, hardness and elasticity, and have a wide range of applications, including military. In 2001 MOST identified advanced materials as a priority for the development of China's industries.¹⁴³ In 2011 it proposed a research consortium between France and the

¹³⁹ 'Tokyo préoccupé par la vente de matériel français à la marine chinoise' [Tokyo worried by sales of French material to the Chinese Navy], *Le Monde*, 18 Mar. 2013.

¹⁴⁰ 'Panhard TC54, General Utility Truck', *Military Today*, [n.d.], <http://www.military-today.com/trucks/panhard_tc54.htm>.

¹⁴¹ 'China approves re-engined Z-9 Twin', *Flight International*, 22–29 July 2002, p. 49, <<http://www.flightglobal.com/pdfarchive/view/2002/2002%20-%202243.html>>.

¹⁴² Defence industry expert, Interview with authors, Paris, Dec. 2013.

¹⁴³ Chinese Ministry of Science and Technology, 'National High-tech R&D Program (863 Program)', Apr. 2001, <<http://www.most.gov.cn/eng/programmes1/>>.

Beijing University of Aeronautics and Astronautics under the State Administration for Science, Technology and Industry for National Defense (SASTIND).¹⁴⁴

The view of the French arms industry

Some firms in the French arms industry increasingly perceive Chinese arms companies as competitors and are less willing to transfer technologies. This is particularly true of companies operating in Chinese areas of excellence, such as missiles and satellites, the key products of Astrium and MBDA.¹⁴⁵ Producers of electronic components, such as Thalès, have stronger incentives to be part of China's military modernization. Eurocopter, like Italia's Agusta, has developed a strategic partnership with a Chinese firm in anticipation of what may be a major boom in the civilian helicopter market when the PLAAF relaxes control over China's air traffic. Military-relevant transfers may be seen as serving long-term objectives in the civilian market.

The German national export control system

Germany's export control system is rooted in Article 26(2) of the German Constitution, which states that 'weapons designed for warfare may be manufactured, transported, or marketed only with the permission of the Federal Government'.¹⁴⁶ This requirement is implemented through federal laws, namely the 1990 *Kriegswaffenkontrollgesetz* (War Weapons Control Act) and the 2013 *Außenwirtschaftsgesetz* (Foreign Trade and Payments Act), in combination with the 2013 *Außenwirtschaftsverordnung* (Foreign Trade and Payments Ordinance).¹⁴⁷

The War Weapons Control Act requires a German Government licence for all aspects of weapons of war, including production, acquisition, licencing, trafficking and brokering. It includes a *Kriegswaffenliste* (Weapons of War List) containing 62 items.¹⁴⁸ This list is also included in the *Ausfuhrliste* (Export List), which is drafted according to the munitions list of the Wassenaar Arrangement. Part I of the Export List details weapons, ammunition and other defence materials (section A), and nationally registered dual-use goods (section B).¹⁴⁹ These nationally registered dual-use goods are controlled in addition to those

¹⁴⁴ French academics and officials, Interviews with authors, Paris, Dec. 2013.

¹⁴⁵ Senior French arms company representative, Interview with authors, Paris, Dec. 2013.

¹⁴⁶ German Ministry of Economics and Technology (BMW), 'Bericht der Bundesregierung über ihre Exportpolitik für konventionelle Rüstungsgüter im Jahre 2013: Rüstungsexportbericht 2013' [German National Arms Exports Report 2013], May 2014, p. 8. For non-official translations of German export control legislation see the website of the German Office for Economic Affairs and Export Control (BAFA), <http://www.bafa.de/bafa/en/export_control/legislation/index.html>. In Dec. 2013 the Ministry of Economics and Technology was renamed the Ministry for Economic Affairs and Energy.

¹⁴⁷ *Kriegswaffenkontrollgesetz* [War Weapons Control Act], 22 Nov. 1990, as amended on 11 Oct. 2002, <http://www.bafa.de/bafa/en/export_control/legislation/export_control_cwc_p_war_weapons_control_act.pdf>; *Außenwirtschaftsgesetz* [Foreign Trade and Payments Act], 28 Apr. 1961, as amended on 6 June 2013, <http://www.bafa.de/bafa/en/export_control/legislation/export_controlLawg_en.pdf>; and *Außenwirtschaftsverordnung* [Foreign Trade and Payments Ordinance], 2 Aug. 2013, <http://www.bafa.de/bafa/en/export_control/legislation/export_controlLawv_en.pdf>.

¹⁴⁸ BMW (note 146), p. 8.

¹⁴⁹ BAFA, 'Ausfuhrliste' [Export list], [n.d.], <<http://www.ausfuhrkontrolle.info/ausfuhrkontrolle/de/gueterlisten/ausfuhrliste/>>.

listed on the EU control list.¹⁵⁰ While weapons of war require an export licence in line with both the War Weapons Control Act and the Foreign Trade and Payments Act, other defence materials and dual-use goods only require an export licence according to the Foreign Trade and Payments Act.

Export licences for weapons of war are issued or denied by the Federal Ministry for Economic Affairs and Energy (BMWi), while one of its sub-branches, the Federal Office for Economic Affairs and Export Control (BAFA), is responsible for licences for the export and transfer of dual-use items and other armaments that are not included on the Weapons of War List.¹⁵¹ BAFA receives advice from the BMWi, the German Foreign Office and the intelligence services, and cooperates with customs through the German Ministry of Finance. All licences are assessed against a set of legally non-binding political principles—including consideration of German ‘national interests’, internal repression in the recipient country, regional conflicts and stability, and terrorism—as well as the eight criteria stipulated in the EU Common Position and, since April 2014, Articles 6 and 7 of the Arms Trade Treaty (ATT).¹⁵² Sensitive applications are decided on by the *Bundessicherheitsrat* (Federal Security Council), which is chaired by the German Chancellor.¹⁵³

Germany’s interpretation of the European Union arms embargo

The German Government follows a strict interpretation of the EU arms embargo on China that covers all items contained in Part I of the Export List—that is, weapons, ammunition and other defence materials (e.g. telescopes and military trucks).¹⁵⁴ German officials therefore see Germany as being at the restrictive end of the spectrum compared to other EU member states.¹⁵⁵ Germany does not interpret the EU arms embargo on China as being covered by the catch-all provision of the EU Dual-use Regulation.¹⁵⁶ However, in the case of sensitive exports the government would use the instruments stipulated in the Foreign Trade and Payments Act.¹⁵⁷ This includes the so-called *Einzeleingriff* (individual intervention clause), whereby the transfer of an unlisted item can in principle be refused if there is an agreement between the Economic, Foreign Affairs and Finance Ministries.¹⁵⁸

During the 2003–2005 debate on the lifting of the EU arms embargo the German Chancellor, Gerhard Schröder, was one of the main proponents of lifting

¹⁵⁰ Council of the European Union (note 82), Article 4(2).

¹⁵¹ BMWi (note 146), p. 9.

¹⁵² BMWi (note 146), pp. 9–11, Appendix 1.

¹⁵³ The Federal Security Council is a committee of the German Cabinet consisting of the Chancellor, the Chief of the Chancellery and the ministers of Foreign Affairs, Interior, Finance, Justice, Defence, Economics and Technology, and Economic Cooperation and Development. BMWi (note 146), p. 9.

¹⁵⁴ BMWi and BAFA officials, Interviews with authors, Berlin and Eschborn, 13–14 Feb. 2014.

¹⁵⁵ German Government officials, Interviews with author, Beijing and Berlin, Sep. 2013 and Feb. 2014.

¹⁵⁶ BAFA, ‘Übersicht über die länderbezogenen Embargos’ [Overview of country-specific embargoes], 17 Apr. 2014, <http://www.ausfuhrkontrolle.info/ausfuhrkontrolle/de/embargos/uebersicht/uebersicht_laender_bezogene_embargos.pdf>.

¹⁵⁷ BMWi official, Interview with author, Berlin, 13 Feb. 2014.

¹⁵⁸ Individual intervention orders expire after six months ‘unless the restriction or obligation to act is imposed by an ordinance’. [Foreign Trade and Payments Act] (note 147), Article 6.

it, calling the embargo a ‘political-symbolic instrument’ that was both outdated and ‘expendable’.¹⁵⁹ The Chancellor’s initiative was cautiously supported by some German industry associations and, in private, by a union representing workers from the shipbuilding and aerospace industries.¹⁶⁰ However, other industry representatives were concerned about the potential negative impact on their business interests in the USA.¹⁶¹ Schröder’s stance was also opposed by the main opposition parties and by many members of his own governing coalition. Critics at the time mostly referred to China’s threat to use force if Taiwan officially declared independence, as well as to China’s poor human rights record.¹⁶² Since opposition in the public and the media was overwhelming, US pressure only played a marginal role, unlike in other EU member states.

Schröder’s successor, Angela Merkel, took a much more cautious approach and has not advocated lifting the embargo since coming to power in 2005. In February 2012 the coalition government of Christian Democrats and Liberals listed two conditions for lifting the embargo: (a) a sustainable easing of tensions in the Taiwan Strait, including China giving up its threat of force against Taiwan; and (b) further improvements in China’s human rights record, including the release of persons detained during the 1989 Tiananmen Square incident.¹⁶³ These conditions are unlikely to change under the current ‘grand coalition’ between the Christian Democrats and the Social Democrats. The German Government has recently announced a more transparent and restrictive approach to German arms exports in general and some measures have already been implemented.¹⁶⁴

Germany’s application of national export controls to transfers to China

German officials believe that lifting the EU arms embargo would have little impact on the granting and denying of licences for exports of defence goods to China from a legal perspective, both with regard to quantity and quality of exports. However, officials assume that lifting the embargo might perhaps lead to an increase in export license applications for certain dual-use goods and tech-

¹⁵⁹ German Chancellor, ‘Bundesregierung, Rede von Bundeskanzler Gerhard Schröder zur Aufhebung des EU-Waffenembargos gegenüber China vor dem Deutschen Bundestag am 14. April 2005 in Berlin’ [Speech by Chancellor Gerhard Schröder on the lifting of the EU arms embargo on China], Berlin, 14 Apr. 2005, <<http://www.bundesregierung.de/Content/DE/Bulletin/20012007/2005/04/2005-04-14-rede-von-bundeskanzler-gerhard-schroeder-zur-aufhebung-des-eu-waffenembargos-gegenueber-chin.html>>.

¹⁶⁰ German member of parliament, Interview with author, Berlin, 11 Feb. 2014; and Meyer-Wellmann, J., ‘Waffen für China: Hamburgs SPD gegen Schröder [Arms for China: Hamburg’s SPD vs. Schröder]’, *Hamburger Abendblatt*, 7 Apr. 2005, <<http://www.abendblatt.de/hamburg/article735283/Waffen-fuer-China-Hamburgs-SPD-gegen-Schroeder.html>>.

¹⁶¹ ‘Keine klare Aussage im China-Streit’ [No clear statements on China dispute], *Handelsblatt*, 4 Apr. 2005, <<http://www.handelsblatt.com/politik/international/mitnahmeeffekt-durch-ende-des-waffenembargos-keine-klare-aussage-im-china-streit/2490730.html>>.

¹⁶² Vestring, B., ‘Kanzler will sich dem Bundestag nicht beugen’ [Chancellor does not want to give in to Parliament], *Berliner Zeitung*, 31 Mar. 2005, <<http://www.berliner-zeitung.de/archiv/im-streit-um-das-china-embargo-stellt-sich-schroeder-auch-gegen-die-regierungsfractionen-kanzler-will-sich-dem-bundes-tag-nicht-beugen,10810590,10271244.html>>.

¹⁶³ German Parliament, ‘Antwort der Bundesregierung, Zur Sicherheitspolitischen Lage in Ost- und Südostasien’ [Reply by the Federal Government on the security situation in East and South East Asia], Drucksache 17/8561, 8 Feb. 2012, <<http://dipbt.bundestag.de/dip21/btd/17/085/1708561.pdf>>.

¹⁶⁴ BMWi, ‘Transparenz’ [Transparency], [n.d.], <<http://www.bmw.de/DE/Themen/Aussenwirtschaft/Ruestungsexportkontrolle/transparenz.html>>.

nologies to China.¹⁶⁵ There is also an impression on the German side that China has shifted its focus from calling for a lifting of the arms embargo and is instead focusing on acquiring German dual-use high-end technologies that could theoretically be integrated into Chinese systems.¹⁶⁶ Technological progress in China might also affect future licensing decisions for dual-use items for which China has developed its own production capabilities.¹⁶⁷

The main challenge for the licencing authorities is to identify so-called *Mischempfänger* (mixed recipients) in China that cater to both civilian and military end-users and to determine whether there is a significant risk of the goods or technology being diverted to the PLA. These risks are judged by BAFA and the relevant German Government ministries according to reports from the intelligence services and embassies, previous experiences with the recipient, previous export licence denials issued by other EU member states, evaluations by in-house technical experts and information provided by the German supplier and the Chinese recipient.¹⁶⁸ Although the volume of licence rejections remains low, a BMWi official has noted a growing tendency on the part of China to systematically request and collect information on these rejections, possibly in order to prepare a World Trade Organisation (WTO) complaint against alleged 'EU protectionism' in the guise of the arms embargo.¹⁶⁹

German goods and technologies that reportedly ended up in Chinese weapon systems (including diesel engines and truck chassis—see below) are not covered by German or EU export control regulations or the arms embargo. The German licencing and customs authorities would only have very limited legal powers to stop such transfers.¹⁷⁰ An alternative that has been used in the past is for the BMWi to approach a company and 'discourage' it from proceeding with a sensitive export by pointing to potential reputational damage. This approach can be especially difficult when other EU member states are already providing the same items to China.¹⁷¹ German officials also refer to the possibility of adding the items in question to the respective control lists of the EU's export-control mechanisms and the Wassenaar Arrangement. However, such a step would take a considerable amount of time and neither Germany nor other states seem to be willing to present such a proposal in the foreseeable future.¹⁷²

What has Germany licenced and exported to China?

Unlike France or the UK, Germany has never been a significant provider of weapon systems to the PLA. In a 2012 statement to the German Bundestag the German Government stated that it was 'not aware of any technology transfers

¹⁶⁵ BAFA official, Interview with author, Eschborn, 14 Feb. 2014.

¹⁶⁶ BAFA official, Interview with author, Eschborn, 14 Feb. 2014.

¹⁶⁷ BMWi official, Interview with author, Berlin, 13 Feb. 2014.

¹⁶⁸ BAFA official, interview with author, Eschborn, 14 Feb. 2014.

¹⁶⁹ BMWi official, Interview with author, Berlin, 13 Feb. 2014.

¹⁷⁰ Since the legal requirements for individual interventions are very strict, the authorities rarely use this tool. BMWi official, Interview with author, Berlin, 13 Feb. 2014.

¹⁷¹ BMWi official, Interview with author, Berlin, 13 Feb. 2014.

¹⁷² BMWi official, Interview with author, Berlin, 13 Feb. 2014.

from Germany to the Chinese defence industry'.¹⁷³ At the same time, German industry has generally kept a low profile on the arms embargo issue.

Nevertheless, Germany has been a constant supplier of diesel engines that have ended up in Chinese land and maritime systems. Between 1966 and 1981, Deutz AG (formerly Klöckner-Humboldt-Deutz) delivered a total of 1200 Type-6150L diesel engines for use in Chinese-produced YW-531/Type-63 APCs and WZ302/Type-70 self-propelled guns.¹⁷⁴ Other diesel engines for land systems delivered before and after 1989 include Deutz Type BF8L engines, which have been delivered to the China North Industries Group Corporation (NORINCO) since 1982.¹⁷⁵ The number of vehicles produced by NORINCO for the PLA is unclear but different sources suggest that, by 1995, at least 3100 YW-531 type armoured personnel carriers (APC) were in service and that more and newer APCs (including some with Type-6150L engines) have been produced since. The BF8L was the first modern diesel engine for APCs and infantry fighting vehicles acquired by China and it is still believed to be in production for the main types used by the PLA. The BF8L remains an important asset and there are no indications of a Chinese-developed or imported alternative being used before 2014.¹⁷⁶ Since 1996, Deutz has also delivered Type BF12L engines, which are used in a limited number of PLZ-45 self-propelled 155mm guns and the PCZ-45 armoured ammunition supply vehicle.¹⁷⁷ The PLZ-45 was one of the first modern self-propelled guns developed by China, although it has never been widely used. However, some of the contracts predate the arms embargo and, since the engines are produced under license in China, it is questionable whether there are any legal possibilities to pressure either the German company or the Chinese licensees. In 1988 Mercedes-Benz and NORINCO signed a licensing agreement allowing the Chinese company to manufacture heavy-duty trucks. Since 1990, Beiben (North Benz) trucks based on German technology have been produced for a number of civilian and military purposes, including radar trucks and missile launchers.¹⁷⁸

Motoren- und Turbinen-Union Friedrichshafen GmbH (MTU) has supplied diesel engines for Chinese naval systems since 1994, including Type 396 engines used in Type-039G (Song) submarines (2001-6) and Type 1163 engines used in Type-052 and Type-051 (Luyang, Luhai and Luhai) destroyers (1994-2005).¹⁷⁹ The majority of these engines were most likely produced under license in China

¹⁷³ German Parliament (note 163), p. 15.

¹⁷⁴ SIPRI Arms Transfers Database (note 13).

¹⁷⁵ Nassauer, O. and Steinmetz, C., *“Made in Germany” Inside: Komponenten—Die vergessenen Rüstungsexporte* [“Made in Germany” Inside: Components—the forgotten arms exports] (Berlin Information Centre for Transatlantic Security/Oxfam Germany: Berlin, Feb. 2005), <<http://www.bits.de/public/pdf/komponentenstudie.pdf>>, p. 37.

¹⁷⁶ SIPRI Arms Transfers Database (note 13).

¹⁷⁷ SIPRI Arms Transfers Database (note 13).

¹⁷⁸ Beiben Truck, ‘History’, [n.d.], <<http://www.beiben-truck.com/history.html>>.

¹⁷⁹ According to German officials, because of the ‘One China policy’, the German interpretation of the arms embargo means that it also covers Taiwan. Nevertheless, between 2009 and 2010, MTU also delivered 42 MTU-4000 diesel engines for the Taiwanese navy’s new stealthy 170-ton Kuang HuaVI (KH-6) guided-missile patrol boats. Bräuner, O., ‘How Europe shies from Taiwan’, *The Diplomat*, 20 Mar. 2012, <<http://thediplomat.com/2012/03/how-europe-shies-from-taiwan/>>.

by Shaanxi Diesel Engine Heavy Industry Co Ltd.¹⁸⁰ While a recent Reuters report described the submarine engines as ‘state-of-the-art diesel engines’ that turn China’s diesel-electric submarines into ‘potentially the PLA’s most serious threat to its American and Japanese rivals’, German officials have expressed doubts about the impact of these transfers on PLAN modernization.¹⁸¹ German Government officials describe the MTU diesel engines in Chinese submarines as ‘regular civilian engines of a lower quality standard than similar items for military end-use’ and point to the lack of an international consensus on their status as a military item.¹⁸² The engines are not included on the Wassenaar control list, since they are not specifically designed or modified for military use, and therefore do not require an export license. A ‘national exception’ for this type of engine or a ‘military end-use catch all clause’, similar to the ones used in Norway, is not applied.¹⁸³

MTU’s main German competitor for transfers of maritime systems to China is MAN Diesel & Turbo. The company announced in 2012 that it would supply engines built under license in China for two new transport vessels for the China Satellite Maritime Tracking and Controlling Department, part of the PLA’s General Armament Department (GAD). The deal would also see the company’s Danish subsidiary, MAN B&W Diesel A/S, supply gearboxes, propellers and propulsion control systems for the ships.¹⁸⁴ According to a company spokesperson, about 250 engines had been made under license in China and supplied to the PLAN, while MAN Diesel & Turbo also provided services and spare parts including fuel equipment.¹⁸⁵ For example, MAN B&W was awarded the contract to supply a twin-engine/single-propeller propulsion plant for a 1000 DWT Type II Patrol Vessel under construction for the Chinese Coast Guard in 2004.¹⁸⁶ However, it should be noted that transfers by MAN’s Danish and French subsidiaries, B&W and SEMT Pielstick, do not fall under German export control jurisdiction. In addition, the German company Rohde & Schwarz delivered military communications technology to the PLAN in the early to mid-2000s, although the details of this transfer are unclear.¹⁸⁷

Although there is no official data available, BAFA officials have stated that China has constantly been among the top applicants for export licenses for dual-use items over the past decade, with regard to both the number and value of applications. Most of the applications were for machine tools and industrial

¹⁸⁰ Lague, D., ‘Chinese military’s secret to success: European engineering’, Reuters, 19 Dec. 2013.

¹⁸¹ Lague (note 180).

¹⁸² BMWi official, Interview with author, Berlin, 13 Feb. 2014.

¹⁸³ Bromley ‘Norway’s controls on arms exports to China’ (note 10).

¹⁸⁴ MAN Diesel & Turbo, ‘China endorses complete propulsion concept’, Press release, 10 Jan. 2012, <<http://www.entry.man.eu/gr/en/press-and-media/man-diesel-and-turbo/China-Endorses-Complete-P propulsion-Concept-7496.html>>.

¹⁸⁵ The majority of these engines are most likely PA-6 engines from MAN’s French subsidiary, SEMT-Pielstick. Lague (note 180).

¹⁸⁶ MAN Diesel & Turbo, ‘New MAN B&W Diesel Powered 1000 DWT Patrol Vessel for Chinese State Oceanic Administration’, Press release, 29 Jan. 2004, <<http://www.mandieselturbo.com/files/news/files0f3248/patrol.pdf>>.

¹⁸⁷ Nassauer and Steinmetz (note 175), p. 7.

equipment, one of Germany's main exports to China.¹⁸⁸ In 2012 Germany exported a number of military items to China. However, all of those licences were for the export of goods to non-military end-users in China and included decontamination and detection equipment for the Chinese Ministry of Environmental Protection (MEP) and the Chinese Center for Disease Control and Prevention (China CDC), as well as airbag gas and airbag-gas generators.¹⁸⁹ A total of 28 licenses, with an approximate total value of €5.76 million [\$7.4 million] were issued in 2012, while 3 licenses valued at a total of €1.38 million [\$1.77 million] were rejected, including machine tools and software for defence production.¹⁹⁰ In 2013 the value of German exports (again, mostly decontamination and detection equipment) almost tripled to €16.98 million [\$22.6 million], while one license with a value of €370 000 [\$491 348 million] for electronic equipment and imaging and countermeasure equipment was rejected.¹⁹¹

The view of the German arms industry

German companies and business associations generally kept a low profile both during and after the 2003–2005 debate on the arms embargo. Some business associations cautiously supported lifting the embargo, as they thought it could improve the overall business climate between China and Germany. Although it would not automatically open the door for German defence exports to China, it was anticipated that it would create a *Mitnahmeeffekt* (windfall gains) for other business sectors in Germany.¹⁹² However, this cautious support was rarely displayed in public and German business representatives instead stressed the traditional division between business and politics in Germany.¹⁹³ This approach is the result of: (a) concern about a potential negative impact on German business interests in the USA; (b) continued public, parliamentary and media opposition to lifting the embargo; and (c) the fact that Germany is one of the few Western industrialized nations that has a trade surplus with China, which reduces the macroeconomic urge to open up new business areas, such as defence.

Nevertheless, there are indications that China continues to be an attractive market for German small and medium-sized companies (SMEs) that produce defence-related products. German SMEs seem to be particularly interested in the Chinese market for protection equipment, including mine-clearing equipment and protective suits for Chinese participation in UN peacekeeping operations, for which it might be easier to gain export licenses.

¹⁸⁸ BAFA official, Interview with author, Eschborn, 14 Feb. 2014.

¹⁸⁹ German Government official, interview with author, Feb. 2014.

¹⁹⁰ BMWi, 'Bericht der Bundesregierung über ihre Exportpolitik für konventionelle Rüstungsgüter im Jahre 2012: Rüstungsexportbericht 2012' [German National Arms Exports Report 2012], Oct. 2013, p. 97; and BAFA official, Interview with author, Eschborn, 14 Feb. 2014.

¹⁹¹ BMWi (note 146), p. 102.

¹⁹² [No clear statements on China dispute] (note 161).

¹⁹³ Stumbaum, M., *The European Union and China: Decision-making in EU Foreign and Security Policy towards the People's Republic of China* (Nomos: Baden-Baden, 2009), p. 191.

The British national export control system

The central piece of legislation for the UK's controls on exports of military goods and dual-use items is the 2002 Export Control Act.¹⁹⁴ A number of individual orders made under the Act have now been consolidated into one order, the Export Control Order 2008, which came into force on 6 April 2009 and is now the main piece of legislation in this area. The Export Control Order sets out licensing policy for military goods and dual-use items, while the UK's Military List and Dual-Use List define controlled items. Both lists incorporate all items in the Wassenaar Arrangement and EU control lists.¹⁹⁵ The Export Control Organisation (ECO) within the British Department for Business Innovation and Skills (BIS) is responsible for issuing and refusing licenses for the export of military goods and dual-use items. All licences are assessed against the Consolidated EU and National Arms Export Licensing Criteria (Consolidated Criteria). The Foreign and Commonwealth Office (FCO), the British Ministry of Defence (MOD) and the Department for International Development (DFID) provide the ECO with advice on the assessment of export licence applications. Particularly delicate or sensitive applications are referred to government ministers in the FCO for a final recommendation.¹⁹⁶

The United Kingdom's interpretation of the European Union arms embargo

The EU arms embargo on China is implemented in the UK via broader controls on arms exports and is not subject to separate legislation. The British Government has stated that it interprets the EU embargo as covering

lethal weapons such as machine guns, large calibre weapons, bombs, torpedoes, rockets and missiles; specially designed components of the above, and ammunition; military aircraft and helicopters, vessels of war, armoured fighting vehicles and other such weapons platforms; [and] any equipment which is likely to be used for internal repression.¹⁹⁷

The British Government has also stated that 'components of complete military platforms such as helicopters and aircraft are not covered by the Embargo'.¹⁹⁸ All applications for the export of military goods and dual-use items that are not covered by the EU arms embargo are assessed against the Consolidated Criteria.¹⁹⁹

In 2005 the British Foreign Secretary, Jack Straw, stated that the UK supported the French and German proposal to review the EU arms embargo on China

¹⁹⁴ British Government, *United Kingdom Strategic Export Controls Annual Report 2012* (The Stationary Office: London, July 2013), <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/212251/Strategic_Exports_AR_2012_NO_SIG.pdf>, p. 39.

¹⁹⁵ British Government (note 194), p. 39.

¹⁹⁶ British Government (note 194), p. 42.

¹⁹⁷ Baroness Chalker of Wallasey, Minister of State, British Foreign and Commonwealth Office, 'China: arms sales embargo', Answer to the House of Lords, 4 Apr. 1995, <http://hansard.millbanksystems.com/written_answers/1995/apr/04/china-arms-sales-embargo>.

¹⁹⁸ British Parliament, House of Commons, Committees on Arms Export Controls (CAEC), 'First Joint Report', 22 Mar. 2011, <<http://www.publications.parliament.uk/pa/cm201011/cmselect/cmquad/686/68602.htm>>, para. 263.

¹⁹⁹ CAEC (note 198), para 484.

because the embargo ‘had run its course’.²⁰⁰ However, the British Government’s enthusiasm for the move shrank rapidly, particularly once the strength of US opposition became clear.²⁰¹ Since 2005, the British Government has strongly opposed lifting the embargo.²⁰² In 2011 the British Foreign Secretary, William Hague, was reported to have assured colleagues that he ‘would not countenance’ any dilution of the embargo.²⁰³ In order for any discussion on lifting the EU arms embargo to take place, the British Government would want to see ‘clear progress on the issue that necessitated the Embargo in the first place, namely civil and political rights’.²⁰⁴ The British Government hopes that China will make progress in this area in the near future, but until then sees little prospect of the embargo being lifted at the EU level. The UK is also of the view that there appears to be broad consensus in the EU that the time is not right to lift the arms embargo.²⁰⁵

Application of national export controls to transfers to China

Decision making with regard to British arms export licensing is based on the criteria of the EU Common Position and National Consolidated Criteria. Licenses for exports to China are assessed against Criterion 1 (international commitments) in order to determine whether the goods should be subject to the EU arms embargo. In addition, all licences are assessed on a case-by-case basis against the remaining seven criteria, including risks with respect to internal repression (Criterion 2), regional stability (Criterion 4) and diversion (Criterion 7).²⁰⁶ Concerns about the risk of diversion appear to be particularly important for the British Government when assessing licences for exports to China. In 2011 the UK rejected 16 of 24 requests for export licences for China, partly because of concerns about the risk of diversion.²⁰⁷ These concerns relate either to the risk that the items will be re-transferred within China or that they will be re-exported to another state.²⁰⁸ Nonetheless, according to one British Government official, China is not seen as a ‘special case’ with regards to the risks of diversion and no specific controls are in place for assessing export licence applications to China. Regional tensions have made relations with Japan and other regional powers an important

²⁰⁰ British Parliament, House of Commons, Select Committee on International Development, ‘Examination of witnesses’, 12 Jan. 2005, <<http://www.publications.parliament.uk/pa/cm200405/cmselect/cmintdev/145/5011203.htm>>.

²⁰¹ Rath, K., ‘The challenge of China: testing times for New Labour’s “ethical” dimension—a case study of the EU arms embargo on China’, *International Public Policy Review*, vol. 2, no. 1 (May 2006), pp. 26–63.

²⁰² Weitz, R., ‘EU should keep China arms embargo’, *The Diplomat*, 18 Apr. 2012, <<http://thediplomat.com/2012/04/eu-should-keep-china-arms-embargo/>>.

²⁰³ Kirkup, J., ‘Britain prepared to block Eurozone move to relax arms embargo on China’, *Daily Telegraph*, 4 Nov. 2011.

²⁰⁴ British Parliament, House of Commons, Business, Innovation and Skills, Defence, Foreign Affairs and International Development Committees, ‘Government response to First Joint Report’, July 2011, <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/238253/8079.pdf>, p. 16.

²⁰⁵ British Government official, Interview with author, London, 11 Feb. 2014.

²⁰⁶ British Government official, Interview with author, London, 11 Feb. 2014.

²⁰⁷ CAEC (note 198), Annex 2.

²⁰⁸ British Government official, Interview with author, London, UK, 11 Feb. 2014. In 2011 the UK refused two licences for the export of ‘computer analogue to digital equipment’ because there was ‘a clear risk of diversion to the military’. CAEC, ‘Scrutiny of arms exports, 2012’, 13 July 2012, <<http://www.publications.parliament.uk/pa/cm201213/cmselect/cmquad/419/41915.htm>>.

consideration when applying export controls to China. The risk of reverse engineering is also a factor in the British Government's assessment of exports to China, but only if it might result in a significant boost to the capabilities of the Chinese military.²⁰⁹

The British Government's sense is that France grants somewhat more arms export licences for transfers to China than the UK and Germany, but that overall differences in policy are not significant.²¹⁰ The Government has seen little or no evidence of the application of export controls affecting wider China-UK business ties.²¹¹ China regularly raises the issue of unnecessary restrictions on transfers of technology in different forums but always on a very general level and has never raised specific complaints with regards to an export licence denial issued by the British Government.²¹²

What has the United Kingdom licensed and exported to China?

Prior to 1989, the UK supplied a number of key military technologies to the Chinese military. The most significant was the sale and licensed production in China of Spey Mark 202 turbo-fan engines, under a deal signed with Rolls-Royce in 1975.²¹³ The engines—and China's domestically produced copy, the WS-9—are used to power China's JH-7 combat aircraft.²¹⁴ The engine was a modern system at the time of the original order and the WS-9 was the first turbofan engine produced in China. However, by the time the JH-7 entered operational service in the early 2000s the engine was no longer state-of-the-art technology. In 2006 the UK was still issuing licences for the export of Spey engines to China.²¹⁵ At the time, the British Government's position was that exports were allowed because engines and radar for combat aircraft 'are not caught by our interpretation of the embargo' and because 'a spare engine or any other part of an aircraft allows them to maintain that capability' but 'does not extend that capability'.²¹⁶

However, all such transfers have since ended. Rolls-Royce confirmed there are now no supplies of Spey engines or associated spare parts to China and that it has no involvement in the production of the WS-9 engine in China.²¹⁷ Another example is the transfer of turrets for Type-59 tanks, under a deal signed with Vickers in 1981.²¹⁸ The turret had a computerized fire control system developed

²⁰⁹ British Government official, Interview with author, London, 11 Feb. 2014.

²¹⁰ British Government official, Interview with author, London, 11 Feb. 2014.

²¹¹ British Government official, Interview with author, London, 11 Feb. 2014.

²¹² British Government official, Interview with author, London, 11 Feb. 2014.

²¹³ 'Military Speys for China', *Flight International*, 25 Dec. 1975, <<http://www.flightglobal.com/pdfarchive/view/1975/1975%20-%202884.html>>; and British Parliament, House of Commons, Foreign Affairs Committee, 'Examination of witnesses', 4 July 2000, <<http://www.publications.parliament.uk/pa/cm199900/cmselect/cmaff/574/0070416.htm>>, para 150.

²¹⁴ 'Xian JH-7 fighter bomber aircraft, China', *Airforcetechnology.com*, [n.d.], <<http://www.airforcetechnology.com/projects/xianjh7fighterbomber/>>.

²¹⁵ British Parliament, House of Commons, Quadripartite Select Committee, 'Examination of witnesses', 25 Apr. 2006, <<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmquad/873/6042505.htm>>.

²¹⁶ Quadripartite Select Committee (note 215).

²¹⁷ Rolls-Royce representative, Correspondence with author, 28 Apr. 2014.

²¹⁸ SIPRI Arms Transfers Database (note 13).

specifically for retrofitting Chinese Type-59 tanks. Other pre-1989 orders included head-up displays (HUDs) and navigation/attack systems and other avionics for F-6 and F-7 combat aircraft and the development of an air refuelling tanker version of the H-6 bomber aircraft.²¹⁹ The most significant order of British-produced equipment by the Chinese military after 1989 was the 1996 acquisition of at least six Searchwater airborne early warning (AEW) aircraft radars from Racal-Thorn. These radars are used on the Y-8 AEW and maritime patrol aircraft that began entering service with the PLA Navy in 1999.²²⁰

In recent years, the value of strategic goods licensed for export to China has increased, particularly for dual-use items. The British Government maintains that the majority of export licences issued are for non-military end-users in the industrial or scientific research sectors.²²¹ According to official UK data, the only licences issued by the British Government in 2011 and 2012 for the export of items to a military end-user in China related to exports of 'propeller shafts and seals' for naval vessels.²²² Despite these assurances, the British Parliamentary Committees on Arms Export Controls (CAEC) continue to raise questions about British exports to China. Recently, the CAEC have raised questions about export of 'equipment employing cryptography' and 'cryptographic software' to China due to the potential uses of such technology in violations of human rights.²²³ The British Government claims that the majority of licences issued for the export of these goods relate to transfers to the private sector in China and that it assesses the risk of diversion to the Chinese security forces and the potential use of any items in violations of human rights.²²⁴

Many British exports of controlled goods to China are for items that will be returned to the UK or re-exported to another country. These exports include transfers of technical data to a sub-contractor that is producing items in China as well as transfers of items that will be worked on in China and then sent back to the UK.²²⁵ According to one representative of UK industry, in many cases the final end-user of these products will be the British MOD. Indeed, the MOD's emphasis on ensuring value for money in procurement decision making has led to the greater involvement of Chinese companies in its supply chains. However, the

²¹⁹ Bussert, J. C., 'China forges ahead with indigenous avionics base', Signal Online, Feb. 2009, <<http://www.afcea.org/content/?q=node/941>>; and Kopp, C., 'The PLAAF's aerial refuelling programs', Air Power Australia, Apr. 2012, <<http://ausairpower.net/APA-PLA-Tanker-Programs.html>>.

²²⁰ 'China converts Y-8 for AEW role', *Flight International*, 14 Mar. 2000, <<http://www.flightglobal.com/news/articles/china-converts-y-8-for-aew-role-63288/>>.

²²¹ CAEC, 'Scrutiny of arms exports, 2012', 13 July 2012, <<http://www.publications.parliament.uk/pa/cm201213/cmselect/cmquad/419/41913.htm>>, para. 263.

²²² The British Government judged that these items did not fall under the arms embargo since they were 'standard components originally designed for commercial cruise liners 40 years ago and had not been designed or modified for military use' and that they 'would not provide any enhancement of combat capabilities'. CAEC (note 198), Annex A.

²²³ CAEC, 'Oral evidence: scrutiny of arms export controls', HC 695, 8 Jan. 2014, <<http://data.parliament.uk/writtenevidence/WrittenEvidence.svc/EvidencePdf/5169>>. Licences for the export of 'equipment employing cryptography' and 'cryptographic software' accounted for £389 million of the £967 million in licences granted for the export of dual-use items to China in 2012. See Campaign Against Arms Trade, 'Database on UK arms exports', <<http://www.caat.org.uk/resources/export-licences/>>.

²²⁴ CAEC (note 221).

²²⁵ CAEC (note 198).

British Government has been accused of having a ‘schizophrenic attitude’ in this field. In one recent case a British company was seeking to supply body armour to the British MOD but was denied permission to transfer relevant technical details to a potential Chinese sub-contractor as part of the process of assembling a bid. There is also a significant and growing trade in the supply of security equipment to China, such as airport scanners and other related items. In 2005 the British Government assisted in organizing an outward trade mission to promote the export of security technologies from the UK to China in the run-up to the 2008 Beijing Olympics. The UK has placed a strong emphasis on supporting exports of security technologies, and companies can expect to receive a licence for exports to China, after careful scrutiny and assessment by British Government officials, if there are clear legitimate uses for the exported goods.²²⁶

The view of the British arms industry

British exports to the Chinese military are also constrained by a concern, particularly amongst larger British companies, of losing access to the US defence market. In the period 2009–2013 the USA accounted for 18 per cent of British arms exports and 65 per cent of British arms imports.²²⁷ In addition, most major British defence companies—including BAE Systems, Cobham, Qiniteq and Rolls-Royce—have purchased defence companies in the USA.²²⁸ BAE Systems has stated that its close integration with the US defence market meant that it would be unlikely to seek defence contracts with China, even if the EU arms embargo were lifted.²²⁹ There is no evidence that these positions will shift in the years to come. US concerns about transfers of strategic technologies to China are as strong as ever and although the US procurement budget has fallen, it remains a key source of revenue for many British companies.

Any British company doing business in China also has to contend with concerns relating to reverse engineering and the protection of intellectual property rights.²³⁰ Another disincentive for companies wanting to do business in China is the fear of violating the 2010 Bribery Act.²³¹ The dangers posed by the Chinese market in this area can be seen in the ongoing British Serious Fraud Office (SFO) investigation into Rolls-Royce’s marketing of civil nuclear reactors to China and Indonesia.²³² However, a number of SMEs in the defence sector are keen to do more business in China, particularly with non-military end-users. This

²²⁶ Brinley Salzmänn, ADS Group, Interview with author, London, 11 Feb. 2014.

²²⁷ SIPRI Arms Transfers Database (note 13).

²²⁸ ‘BAE Systems completes acquisition of Armor Holdings Inc.’, Business Wire, 31 July 2007, <<http://www.businesswire.com/news/home/20070731006088/en/BAE-Systems-Completes-Acquisition-Armor-Holdings#.U3oKH16Ufgs>>; Cobham, ‘Cobham completes purchase of US intelligence and missile defence company’, Press release, 4 June 2008, <<http://www.cobham.com/media/2223/243%20sparta%20completion%20final.pdf>>; ‘QinetiQ to buy U.S. firm Analox for \$173 million’, Reuters, 21 Jan. 2007; and Rolls-Royce, ‘Rolls-Royce in the US’, [n.d.], <<http://www.rolls-royce.com/northamerica/na/about/us/>>.

²²⁹ Evans, M., Browne, A. and Rozenberg, G., ‘British arms firm will spurn China if embargo ends’, *The Times*, 22 Feb. 2005; and O’Connell, D., ‘BAE demands immunity on US sanctions’, *London Sunday Times*, 27 Feb. 2005.

²³⁰ Brinley Salzmänn, ADS Group, Interview with author, London, 11 Feb. 2014

²³¹ Brinley Salzmänn, ADS Group, Interview with author, London, 11 Feb. 2014

²³² ‘Rolls-Royce: Serious Fraud Office launches probe’, BBC News, 23 Dec. 2013.

group includes companies that have not generated significant business in the USA.²³³ In certain cases, companies have expressed frustration at what they view as overly restrictive British Government policies with regards to exports to China. In 2005 the British company Pyser SGI claimed that it was being denied permission to export night-vision goggles to the Shanghai Police at a time when French and Dutch manufacturers were being granted permission for sales of the same type of equipment to the same type of end-user. It was claimed that French and Dutch manufacturers had also been granted permission to agree on deals for the production of items under licence in China.²³⁴

²³³ Brinley Salzmann, ADS Group, Interview with author, London, 11 Feb. 2014

²³⁴ Churcher, J., 'Minister defends ban on night vision sales to China', *Press Association*, 3 Feb. 2005, <<http://www.stopwapenhandel.org/publicaties/2005/nachtzichtapp>>.

4. China's adaptation to Western export controls

This chapter outlines the strategies that China has adopted in response to the imposition of arms embargoes by Western states in 1989. It begins with an examination of China's acquisitions of military technology from the West, both before and after 1989. It then explores cooperation between China and other exporting countries, in particular Russia, Ukraine and Israel. The final section reflects on China's military modernization and self-reliance.

The main obstacle to an accurate assessment of the impact of arms transfers by Western states on China's defence industrial and technological modernization is the fact that states do not release detailed information on export licences and exports of dual-use goods and technologies. However, it is possible to evaluate qualitatively the impact of known licensed sales of military products and major deals in technology categorized as civilian but with military end-use, such as some helicopters and engines. During the golden decade of Western military cooperation with China in the 1980s, Europe and the USA played a significant role in helping the PLA and the Chinese arms industry overcome equipment bottlenecks that emerged after the 1960 Sino-Soviet split. Technologies and systems transferred from Western states in the 1980s helped parts of the Chinese arms industry upgrade from the basis laid, with Soviet assistance, in the 1950s.

While no complete systems have been sold since the implementation of the US and EU arms embargoes in 1989, China has cooperated with European states on 'non-lethal' areas of PLA modernization, such as propulsion, helicopters, radars and other electronic products. In 2012 the total value of military licenses for the export of military items to China approved by EU member states and reported to Brussels was \$173.4 million, a negligible proportion of both China's official military budget and estimates of its acquisition expenses.²³⁵ While this amount is a product of national and EU-level export control restrictions, it reflects in parallel the considerable progress made by the Chinese arms industry in the past two decades, driven by sizeable domestic R&D efforts, accumulation of Russian technology and unauthorized reverse engineering of foreign weaponry.

As a result of this progress, since 2000 China has gradually adapted its military technology acquisition strategy in three major ways. First, China's focus has shifted from acquiring foreign military technologies (especially complete weapon systems) to transfers of dual-use technologies that can fill gaps by being integrated into Chinese 'indigenous' systems. Domestically, this trend is mirrored in the continued promotion of civil-military integration (军民融合, *junmin ronghe*). Second, there has been a shift in acquisition methods, from trade in physical goods to intangible technology transfers (e.g. scientific exchanges, overseas investments and industrial espionage). Third, efforts to strengthen China's own defence technological and industrial capacity are being intensified as the Chinese Government emphasizes the development of 'indigenous innovation'

²³⁵ Wezeman (note 9).

(自主创新, *zizhu chuangxin*) capabilities, for example through higher R&D expenditures, subsidies to Chinese state-owned enterprises (SOEs), and 'forced technology transfers' from foreign companies seeking to invest in China.

China's acquisitions of military technology from the West

Acquisitions prior to 1989

During the 1960s and 1970s the contribution of Western states to China's military modernization was almost non-existent. An important exception was the UK's 1975 decision to authorize a contract for the licenced production in China of Rolls-Royce Spey Mk-202 turboprop engines to equip JH-7 long-range fighter-bombers (see chapter 4). Overall, the modernization of China's conventional forces stagnated during these two decades. The lack of foreign input was aggravated by Mao's strategic decision to prioritize R&D funding for nuclear technologies, including nuclear-powered submarines.²³⁶

While the 1980s are regarded as the golden decade of China's military cooperation with the West, exports to China were, at that time, still controlled and coordinated among Western allies through COCOM, and only took place in the form of exemptions. Nevertheless, the 1980s was also a period of strategic convergence between the West and China against the Soviet Union, and Western states' hopes that Deng Xiaoping would bring political reform in Beijing. The USA's sales of major conventional arms to China peaked at \$98 million in 1985, out of a total of \$188 million between 1984 and 1996.²³⁷ These transfers had a significant impact on the modernization of the PLAAF and PLAN in a decade during which China's budget for foreign acquisitions amounted to less than 25 billion yuan (\$4 billion).²³⁸

Western transfers helped China develop attack and assault helicopters now in use in the PLAAF, the PLAN and PLA ground forces in a variety of versions (including ASW, anti-tank and SAR). The USA authorized the sale of 24 S-70/UH-60A Sikorsky Black Hawk helicopters, the only assault helicopter in service in the PLA capable of operating in high-altitude environments, while Boeing sold 6 Chinook heavy-lift helicopters. France also had fruitful cooperation with China in the 1980s in the area of military helicopters. Transfers from France enabled the PLA to add anti-tank (AS-565 Panther and SA-342 Gazelle) and ASW helicopters (SA-321 Super Frelon) to its arsenal. In 1987 France also authorized the transfer of an unknown number of high subsonic optical remote-guided, tube-launched (HOT) anti-tank missiles for use on Gazelle helicopters.

European transfers in the 1980s also had a significant impact on the modernization of the PLAN, which upgraded or retrofitted a dozen platforms (Luhu-

²³⁶ Godwin, P., 'China's defense establishment, the hard lessons of incomplete modernization', L. Burkitt et al. (eds), *The Lessons of History: the Chinese People's Liberation Army at 75* (Strategic Studies Institute, US Army War College: Carlisle, 2003), pp. 15–58.

²³⁷ SIPRI Arms Transfers Database (note 13).

²³⁸ Wang, S. G., 'The military expenditure of China, 1989–98', *SIPRI Yearbook 1999: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1999), pp. 334–49.

class destroyers, Jiangwei I/II-class frigates and some old Luda-class destroyers) with better defensive capabilities as a result of transfers of naval combat systems, 100 mm guns, anti-submarine sensors, air defence radars and anti-air missiles.²³⁹ French, German and US companies also played a key role in the propulsion of the PLAN's new surface and underwater platforms with the transfer of MTU and Pielstick diesel engines and General Electric's LM 2500 gas turbines for a Luhu (Type 052) destroyer. Finally, Western countries transferred sea-based armaments to equip Chinese surface ships and submarines.

The USA authorized the transfer of Mark-46 Mod 2 torpedoes, a standard ASW weapon for navies operating across the world. Although the USA's FMS programme was interrupted in 1989, the bilateral cooperation that had already taken place allowed China to mass-produce its own domestic version of the Mark-46 Mod 2 torpedo, the Yu-7. France exported the PLAN's first short-range, air-defence missile, the Crotale, a state-of-the art technology when the contract was signed in the first half of the 1980s. The Crotale and the retro-engineered Chinese version (the HQ-7) are now used by the majority of China's surface combatant ships as short-range air defence systems. China also developed land versions on wheeled vehicles to protect ground forces and bases. In 1988 France authorized the transfer of the compact 100 mm naval gun, the first modern heavy naval gun to equip the PLAN destroyers and frigates, which formed the basis for the construction of a similar canon by the Chinese arms industry.

Western transfers also had an impact on the modernization of the PLAAF, especially in the area of avionics. The largest FMS item authorized by the USA was avionics for the F-8 interceptor in 1986, for a total value of \$501 million. Air and naval systems were the majority of items licensed by US export control authorities, for a total value of \$501 million in 1982–86, although China reportedly purchased only 17 per cent of the authorized items.²⁴⁰ Between 1979 and 1989, China and the UK cooperated on an avionics suite for the J-7 fighter, China's version of the Mig-21.

Finally, in the area of land systems, France, the UK and the USA provided assistance to the Chinese main battle tank and light infantry armoured vehicle programmes by transferring main guns and assisting in upgrading turrets.

Acquisitions since 1989

After 1989, Western governments interrupted the majority of contracted defence programmes. The four FMS programmes were cancelled, and in 1992 the US Department of State decided to reimburse unused funds to China and return equipment present on US soil to implement the contracts.²⁴¹ However, there were exceptions. In particular, a number of European states allowed companies to continue to honour some contracts signed during the 1980s. China also managed to

²³⁹ Duchâtel, M. and Sheldon-Duplaix, A., 'The European Union and the modernisation of the People's Liberation Army Navy: the limits of Europe's strategic irrelevance', *China Perspectives*, vol. no. 4 (2011), p. 37.

²⁴⁰ Kenny, H., 'Underlying patterns of US arms sales to China', *World Military Expenditures and Arms Transfers 1986* (US Arms Control and Disarmament Agency: Washington DC, 1987), pp. 39–47.

²⁴¹ Gill, B. and Kim, T., *China's Arms Acquisitions from Abroad: A Quest for 'Superb and Secret Weapons'*, SIPRI Research Report No. 11 (Oxford University Press: Oxford, 1995), p. 74.

identify loopholes in Western export control systems to acquire military-relevant technology after 1989. In addition, European governments granted licences for the export of certain technologies that were of benefit to the Chinese military, particularly in the fields of propulsion, helicopters, and certain radars and electronic equipment. Some of these exports related to military items and others to dual-use goods, while others were civilian technologies not covered by either set of controls. As such, the transfers illustrate the thin line between civilian and military equipment in some areas of defence modernization.

Transfers after 1989 had an important role in the development of the PLAN fleet through the sale of diesel engines, albeit not state-of-the-art military versions. The German company MTU signed at least two new contracts to equip Song-class diesel submarines and continued deliveries of pre-1989 contracts for propulsion of PLAN surface ships. In terms of surface-ship combatants, the 1988 French contract to sell DUBV 23 ASW sonars to equip PLAN frigates and destroyers was honoured and deliveries took place between 1991 and 1999, helping the PLAN to develop an embryonic ASW capability.

A major feature of the West's military cooperation with China since 1989 has been its continued and expanded support in building China's fleet of combat helicopters. Although most contracts have been with civilian end-users, there is no doubting their constructive impact on Chinese military capabilities. In addition, engines are provided to helicopters in service in the PLA, and sometimes for export versions too. In 1996 China placed an order to acquire at least six Search-water radar systems from the UK, for use on aircraft with AEW and maritime patrol roles. The order was officially placed for civilian purposes, including anti-smuggling operations in maritime law enforcement. However, the radar system is now operating on Y-8 maritime patrol aircraft in the PLAN, and might have assisted the development of China's AEW capabilities.

China's cooperation with other exporting countries

The Soviet Union and Russia

Soviet aid was decisive in the initial development of the Chinese arms industry and the PLA. Soviet transfers of machine guns, artillery pieces, mortars, tanks, naval vessels and aircraft in the mid- and late-1940s had already helped the Communist Party of China (CPC) achieve final victory in its civil war against the Nationalist Kuomintang (KMT).²⁴² Under the 1950 Treaty on Friendship and Mutual Assistance, the Soviet Union provided assistance to the development of Chinese defence enterprises in all areas of military modernization, including upstream heavy industry for the production of aluminium, cables and electrical appliances.²⁴³ The PRC's first industrial complexes in the areas of land systems, aviation, electronics, space and shipbuilding were all started with Soviet support.

²⁴² Goncharenko, S., 'Sino-Soviet military cooperation', O. A. Westadt (ed.), *Brothers in Arms: The Rise and Fall of the Sino-Soviet Alliance* (Woodrow Wilson Center Press: Washington, DC, 1998), pp. 141-64.

²⁴³ Goncharenko (note 242), p. 153.

In the context of the 1950–53 Korean War, the PLA also acquired Soviet arms and weapon systems in order to equip 60 army divisions, 12 air force divisions and 36 naval vessels. The PLAAF and PLAN were established on the basis of Soviet military assistance with Russian systems, so that the PLA was able to ‘leap over a generation of weaponry’ during the early 1950s.²⁴⁴ Soviet engineers and advisers also played a key role in the early development of China’s nuclear programme and missile industry. Mao’s main foreign policy guideline, to ‘lean on one side’ (一边倒, *yibiandao*)—that is, to rely exclusively on relations with the Soviet Union—also applied to acquisition of military equipment. However, following the break in relations between China and the Soviet Union in 1960, Soviet experts in China were recalled.

The interruption in acquisitions of military technology from the West in 1989 coincided with a revival in relations between China and the Soviet Union. The visit to Beijing of the Soviet leader Mikhail Gorbachev during the May 1989 protests leading up to the Tiananmen Square incident paved the way for a major new turning point in China’s quest for advanced military technology. In addition, China developed a robust military relationship with Ukraine and was also able to purchase military technology and weapon systems from Israel before US opposition put an end to that cooperation. As a result, the 1990s and the 2000s were a period of enormous foreign input in China’s military modernization. After the 1995–96 Taiwan Strait crisis, the Chinese Government decided to accelerate military modernization in order to deter Taiwan’s declaration of independence and create a strategic environment conducive to unification.

After the collapse of the Soviet Union, Russia became the main source of advanced defence technologies for China in a context of double-digit growth of the Chinese military budget. According to SIPRI estimates, between 1991 and 2013, more than 80 per cent of China’s imported major conventional weapons were supplied by Russia, while China accounted for nearly 30 per cent of Russian arms exports.²⁴⁵ During this period, Russia supplied China with Su-27/Su-30 combat aircraft, transport aircraft, Mi-17 military transport helicopters, Tor-M1 mobile air defence systems, S-300PMU1/2 air defence systems, Type 636E and Type 877E submarines, Sovremenny destroyers and a wide range of missiles. In addition, China secured agreement for the licensed production of Su-27 combat aircraft, Mi-17 helicopters and anti-tank and anti-ship missiles.²⁴⁶ The acquisition of complete weapon systems from Russia tremendously increased the combat capabilities of the PLA, especially in the areas of air and sea superiority in China’s periphery. It also laid the basis for the development of the PLA’s long-range deployment capabilities.

Since the mid-2000s, Chinese imports of Russian arms have fallen significantly.²⁴⁷ After peaking in 2005, they fell by over 50 per cent in just two years and

²⁴⁴ You, J., ‘The Soviet model and the breakdown of the military alliance’, T. Bernstein and Y. Hua (eds), *China Learns from the Soviet Union, 1949–Present* (Lexington Books: Plymouth, 2010), pp. 131–52.

²⁴⁵ SIPRI Arms Transfers Database (note 13).

²⁴⁶ SIPRI Arms Transfers Database (note 13).

²⁴⁷ Jakobson, L. et al., *China’s Energy and Security Relations with Russia: Hopes, Frustrations and Uncertainties*, SIPRI Policy Paper no. 29 (SIPRI: Stockholm, Oct. 2011), pp. 17–22.

have remained on a much lower level ever since (see figure 4.1). Russia's ability and willingness to deliver arms desired by China continues to be affected by six factors: (a) Russian technology levels; (b) competition (or lack thereof) from other suppliers; (c) the quality of Russian arms exports; (d) Russian arms transfers relations with India and other countries; (e) concerns about unauthorized Chinese copying (reverse-engineering) of Russian systems; and (f) Chinese competition with Russia in the global arms market.²⁴⁸ Alleged unauthorized Chinese copies of Russian weapon systems include the J-11B combat aircraft (Russian SU-27SK). According to media reports, Russian concerns about Chinese reverse-engineering are one of the major reasons behind the stalling of negotiations on the sale of advanced Sukhoi SU-35 multirole combat aircraft to the Chinese military.²⁴⁹

Ukraine

After the breakup of the Soviet Union, Ukraine became another major supplier of arms to China. Reported Ukrainian supplies to China include four Il-78 aerial refuelling tankers, AI-222K-25 engines for the Chinese L-15 combat trainer programme, a Russian T-10K-7 fighter plane (a prototype of the Su-33) and 6TD-2 engines and transmission blocks used in VT1A export versions of the MBT-2000 main battle tank.²⁵⁰ Ukraine has also made an essential contribution to the Chinese aircraft carrier programme: in 2002 China purchased the half-finished Soviet Project 11436 aircraft-carrying cruiser *Varyag* from Ukraine. The cruiser was towed from Nikolayev in Ukraine to Dalian in China and, starting in 2005, it was refitted at the China Shipbuilding Industry Corporation's (CSIC) Dalian shipyards. In August 2011 the aircraft carrier, now named the *Liaoning*, started a sea-trials programme. China also acquired the prototype of a Russian-made Sukhoi-33 from Ukraine in 2001, which it used as a basis to develop its own carrier-based fighter-bomber, the J-15.²⁵¹

²⁴⁸ Jakobson et al. (note 247).

²⁴⁹ Wood, P., 'How China plans to use the Su-35', *The Diplomat*, 27 Nov. 2013, <<http://thediplomat.com/2013/11/how-china-plans-to-use-the-su-35/>>.

²⁵⁰ Barabanov, M., Kashin, V. and Makienko, K., *Shooting Star: China's Military Machine in the 21st Century* (East View Information Services: Minneapolis, 2012), pp. 52, 84, 100, 106, 109, 125.

²⁵¹ Minnick, W., 'Chinese media take aim at J-15 fighter', *Defense News*, 28 Sep. 2013, <<http://www.defensenews.com/article/20130928/DEFREG/309280009/Chinese-Media-Takes-Aim-J-15-Fighter>>.

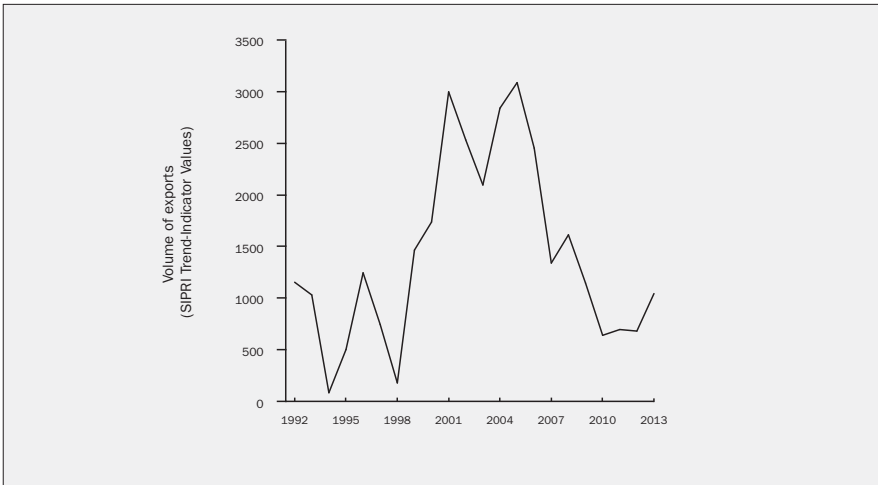


Figure 4.1. Russian exports of major conventional weapons to China, 1992–2013

Source: SIPRI Arms Transfers Database, <<http://www.sipri.org/databases/armstransfers>>.

The emergence of a pro-Western interim government in Ukraine in 2013, the annexation of the Crimean peninsula by Russia in 2014 and the ongoing conflict in Ukraine could lead to interruptions in joint Chinese–Ukrainian programmes. Most Ukrainian arms industry assets are located in the crisis-hit areas of southern and eastern Ukraine, and in Crimea.²⁵² Plans for cooperation between China and Ukraine on the development of an upgraded version of the Antonov An-70 transport plane and the PLAN’s purchase of four Zubr-class landing-craft air cushions (LCACs) for \$315 million may both be affected.²⁵³ Two of the LCACS are produced under licence in China, while a third was delivered in April 2013, and the fourth hovercraft was hurriedly shipped out of the Crimean port of Feodosiya in March 2014 despite not having finished its safety-trials programme.²⁵⁴

Israel

With its traditionally export-oriented arms industry, Israel was another source of military-relevant technology transfers to China both before and after the implementation of the US and EU arms embargoes in 1989. Between the late 1970s and 2000 China and Israel struck more than 60 arms deals worth an estimated \$1–2 billion. Transfers included technology to upgrade Chinese T- 59-

²⁵² Choursina, K. and Gomez, J. M., ‘Ukraine’s arms industry is both prize and problem for Putin’, *Bloomberg*, 7 May 2014, <<http://www.bloomberg.com/news/2014-05-07/putin-eyes-ukrainian-arms-prize-as-troops-build-up-along-border.html>>.

²⁵³ Gordon, Y. and Komissarov, D., *Chinese Air Power: Current Organisation and aircraft of all Chinese air forces* (Midland Publishing: Surrey, 2010), pp. 393–94.

²⁵⁴ Rahmat, R., ‘Ukraine crisis prompts hurried delivery of second Zubr LCAC to China’, *IHS Jane’s Navy International*, 6 Mar. 2014, <<http://www.janes.com/article/35030/ukraine-crisis-prompts-hurried-delivery-of-second-zubr-lcac-to-china>>.

type tanks, night vision systems, radio systems, electronic warfare systems, air-to-air missiles, antiradar assault unmanned aerial vehicles (Harpy) and others.²⁵⁵ The supply of Israeli military equipment to China has been a source of tension between the USA and Israel for many years, with the USA pressuring Israel to cancel deals and restrict transfers (see chapter 2). Despite these developments, Chinese interest in Israeli technologies remains high. China blamed the USA for the disruption of defence ties and, mirroring the situation with Western countries, continued its science and technology cooperation by shifting to high-tech trade (e.g. integrated circuits and micro assemblies and electrical components for communications systems), investments and academic exchanges in dual-use areas. These developments are posing new challenges for Israeli export control mechanisms.²⁵⁶

China's military modernization and self-reliance

China's goal of building a self-reliant arms industry seems increasingly within reach, and this shapes China's acquisition strategy. Following the military reforms launched in the late 1970s, and especially the acceleration of military modernizations prompted by the 1995–96 Taiwan Strait Crisis, imports of weapon systems from Russia in the 1990s and early 2000s aimed to change the balance of military power in the Taiwan Strait: a goal that China achieved, largely without Western assistance. Overall, the contribution of Western states to the modernization of the PLA's equipment was decisive in only a limited number of weapon systems (mainly ship propulsion and helicopters). The key issue in the post-1989 era, however, is the extent to which Western transfers of dual technologies have fuelled Chinese progress in systems integration, and in the area of command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR).

The ultimate goal of self-reliance was always present in the Chinese Government's view of defence modernization. The break in relations between China and the Soviet Union in 1960, and China's subsequent isolation from sources of imports, only made this goal more urgent.²⁵⁷ The then Soviet leader Nikita Khrushchev's refusal to provide technological assistance for the construction of Chinese nuclear-powered attack- and ballistic-missile submarines was one of the factors that increased mutual mistrust and led to the split.²⁵⁸ In the 1980s, US defence analysts noted that China showed greater interest in acquiring technologies for integration in Chinese systems, such as computers, electronics, communications equipment, night-vision devices, fire-control systems and airborne-reconnaissance systems.²⁵⁹

Even at the height of the transatlantic debate on the arms embargo, Chinese

²⁵⁵ Evron, Y., 'Between Beijing and Washington: Israel's technology transfers to China', *Journal of East Asian Studies*, vol. 13, no. 3 (2013), pp. 509–10.

²⁵⁶ Evron (note 255), p. 505.

²⁵⁷ Gill and Kim (note 241), p. 32.

²⁵⁸ Chen, J., *Mao's China and the Cold War* (University of North Carolina Press: Chapel Hill, 2001), p. 74.

²⁵⁹ Kenny (note 240), pp. 61–71.

analysts were warning in specialized military publications that China should focus on integrating European technologies in Chinese systems rather than acquire complete weapon systems. The analysts invoked a number of reasons. First, the USA would be in position to block European decisions on arms sales to China, as the case of Israel exemplified. Second, acquiring complete systems from US allies would cause security concerns as they could be compromised or deliveries of spare parts or maintenance services could be cancelled during any future conflict with the USA. Third, importing complete European systems would generate a range of problems regarding their integration with the PLA's mostly Russian and domestic equipment.²⁶⁰ Other experts note that, even if the embargo were lifted, European export control legislation would still place considerable restraints on acquiring advanced weapon systems. The main concrete effects of the lifting of the arms embargo would have been increased leverage in negotiations with Russia and greater cooperation with Europe in other areas of international politics.²⁶¹

The tremendous progress of the Chinese arms industry in the past two decades has solidified China's quest for self-reliance. As advocated by Deng Xiaoping in the 1980s, China's military modernization has progressed through 'pockets of excellence' in areas such as missile technology and satellites. Today, the Chinese defence industry is consistently posting record annual profits. It develops and produces new advanced generations of weapon systems and has created more dynamic R&D institutions with a younger and better-trained workforce.²⁶² As a result, China has gained independence in building air and sea platforms and aims now at reducing its dependency on imports for engines and electronic systems. Although China is still considering imports of complete systems from Russia, the main objective of China's acquisition strategy has shifted to focus on overcoming the bottlenecks that prevent the independent construction of fully indigenous systems in naval propulsion, aircraft engines and new materials. As a result, China's priority is to acquire dual-use technologies through trade and investment, scientific cooperation and espionage.

China's efforts to acquire military technology are best understood in the broader context of Chinese efforts to build an advanced dual-use economy that allows the defence industry to gain access to more advanced and globalized civilian industries. Tai-Ming Cheung defines the goal as 'the establishment of a civilian apparatus that has the technological and industrial capabilities to meet the needs of the PLA and the defence economy.'²⁶³ Therefore, transfers of dual-use technology and know-how through China-EU trade and scientific cooperation might serve as a loophole that allows China to circumvent Western export control restrictions and acquire military-relevant technologies. Since the early 2000s,

²⁶⁰ Wang, Y., '飞鱼的诱惑，如何对待欧盟对华军售解禁' [Exocet attraction: How to handle the lifting of the EU arms embargo], *Shipborne Weapons*, no. 1 (Jan. 2005).

²⁶¹ Wang X. and Xu G., '欧盟对华军售解禁，主要的结症与影响' [The EU's lifting of the arms embargo on China, principal causes and impact], *Junshi jingji yanjiu* [Research on military economy], no. 8 (Aug. 2005).

²⁶² T. M. Cheung (ed.), *Forging China's Military Might: A New Framework for Assessing Innovation* (John Hopkins University Press: Baltimore, 2014), p. 9.

²⁶³ Cheung, T. M., *Fortifying China: The Struggle to Build a Modern Defense Economy* (Cornell University Press: Ithaca, 2009), p. 9.

the Chinese Government has strongly promoted civil-military integration and supported the creation of a dual-use economy based on four principles: (a) combining civilian and military needs (军民结合, *junmin jiehe*); (b) locating military potential in civilian capabilities (寓军于民, *yujun yumin*); (c) vigorously promoting coordination and cooperation [between military and civilian industries] (大力协同, *dali xietong*); and (d) conducting indigenous innovation (自主创新, *zizhu chuangxin*).²⁶⁴

The Chinese approach to civil-military integration is reflected in a broad range of industrial policies, most prominently in the CPC's five-year plans and the 'National Outline for Medium and Long Term Science and Technology Development Planning' (2006–2020, 国家中长期科学和技术发展规划纲要, MLP), which was published by the State Council in 2006.²⁶⁵ The plan aims to transform China into an 'innovation-oriented society' by 2020 and into a 'global science and technology leader' by 2050. In order to achieve these ambitious goals, China plans to increase its R&D expenditure to 2.5 per cent of GDP in 2020 (from c. 1.98 per cent in 2012).²⁶⁶ In addition, China wants to drastically increase the output of innovation patents and scientific publications, and develop world-class universities and research institutes.²⁶⁷ National defence plays a major role within the MLP and is one of its 11 key areas. At least 10 of the 16 'megaprojects' (国家科技重大专项项目, *Guojia keji zhongda zhuanxiang xiangmu*) and 6 of the 8 'frontier technologies' mentioned in the MLP are either directly military-relevant or of dual civilian and military use. In addition, the Chinese leadership has designated seven 'strategic emerging industries' (战略性新兴产业, *Zhanlüexing xinxingchanye*), all of which have dual-use applications.²⁶⁸ These projects and programmes are mostly led by civilian ministries and research institutions, but in several cases also involve defence procurement agencies (the State Administration for Science, Technology and Industry for National Defense [SASTIND] and the PLA General Armament Department) or defence conglomerates (e.g. AVIC).²⁶⁹ In recent years, efforts to adapt civilian technologies for military use and to provide civilian capital for military use have been increased, for example through a reform of the defence industry's shareholding system that allows for the creation of subsidiary enterprises that can attract civilian capital and other resources.²⁷⁰ These policies underline the central significance of the arms

²⁶⁴ Cheung (note 263), pp. 176–85.

²⁶⁵ Chinese State Council, '国家中长期科学和技术发展规划纲要' [The National Medium- and Long-Term Program for Science and Technology Development, 2006–20], 9 Feb. 2006, <http://sydney.edu.au/global-health/international-networks/National_Outline_for_Medium_and_Long_Term_ST_Development1.doc> [unofficial translation].

²⁶⁶ Yang, F., 'China's spending in R&D 1.98 per cent of GDP', *Xinhua*, 22 Oct. 2013.

²⁶⁷ Cong, C., Suttmeier, R. P. and Simon, D. F., 'China's 15-year science and technology plan', *Physics Today*, Dec. 2006, <<http://levin.suny.edu/pdf/physics%20Today-2006.pdf>>.

²⁶⁸ The 8 'frontier technologies' are advanced energy, advanced manufacturing, aerospace and aeronautics, biotechnology, information technology, lasers, new materials and ocean technologies. The 7 'strategic emerging industries' are information technology, energy-saving and environmental protection, biology, high-end equipment manufacturing, new energy, new materials and new energy automobiles.

²⁶⁹ T. M. Cheung (ed.), *The Chinese Defense Economy Takes Off: Sector-By-Sector Assessments and the Role of Military End-Users* (University of California: San Diego, 2013), pp. 12, 14.

²⁷⁰ Alderman, D. et al., 'The rise of Chinese civil-military integration' in Cheung (ed.) (note 262), p. 114.

industry and of civil-military integration for the Chinese leadership's overall science and technology strategy. As a result, China adopted a number of measures to adapt its strategy of acquiring military-relevant technologies from Western sources, including the following four examples.

First, as in the case of Israel described above, dual-use technology transfers to China now often take place in the form of trade and investment, as well as science and technology cooperation, sometimes through joint research in academia or industry. For example, commercial and scientific exchanges in dual-use areas between China and the EU and its member states occur in commercial aerospace, information and communications technologies, material science, mechanical engineering and nuclear physics.²⁷¹ Apart from the long-standing technology-trading ties, Chinese investments in Western dual-use sectors are also on the rise, with Chinese analysts identifying foreign technology firms as lucrative targets for Chinese investors.²⁷² According to research by the Rhodium Group, the period from 2000 to 2012 has seen significant Chinese foreign direct investment (FDI) in technology-intensive and sometimes also dual-use sensitive sectors in both the EU and the USA. Examples of Chinese FDI include aerospace equipment and components (€256 million, \$506 million) and information technology equipment (€1209 million; \$411 million).²⁷³ Chinese investments include the acquisition in 2009 of the Austrian aircraft supplier FACC by Xi'an Aircraft Industry Company Ltd (XAC), a subsidiary of the Aviation Industry Corporation of China (AVIC).²⁷⁴ FACC supplies components for many major aircraft producers (e.g. Airbus, Boeing and Eurocopter) and engine producers (e.g. Rolls-Royce). It also supplies winglets and spoilers for China's Comac C919 commercial airliner and outer bypass ducts for the Northrop Grumman RQ-4 Global Hawk unmanned aerial vehicle (UAV) surveillance aircraft.²⁷⁵ In addition to its production of civilian turboprop airliners, XAC is a major supplier of military aircraft for the PLAAF, and has designed bombers, trainer aircraft and transport aircraft (including the new Y-20) for the Chinese military.²⁷⁶

Second, Chinese 'indigenous innovation' policies have also been criticized by foreign analysts for containing regulations leading to 'forced technology' transfers, for example by forcing foreign companies into joint ventures with Chinese partners. These policies are based on China's MLP, a policy guideline that a 2010

²⁷¹ On the EU case see Bräuner (note 3).

²⁷² Chen, B., Peng C. and Chen Y., '利用跨国并购方式获取国际创新资源 [Using multinational mergers and acquisitions to gain international sources of innovation]', *S&T Daily*, 12 Aug. 2013, <http://digitalpaper.stdaily.com/http_www.kjrb.com/kjrb/html/2013-08/12/content_218320.htm?div=-1>.

²⁷³ Hanemann, T., 'Chinese investment: Europe vs. the United States', Rhodium Group, 25 Feb. 2013, <<http://rhg.com/notes/chinese-investment-europe-vs-the-united-states>>.

²⁷⁴ In May 2014 AVIC announced plans to list FACC on the Vienna Stock Exchange in order to raise money to expand and strengthen R&D. Weber, A., 'AVIC plans to list aerospace parts maker FACC on Vienna Exchange', *Bloomberg*, 13 May 2014, <<http://www.bloomberg.com/news/2014-05-13/avic-plans-to-list-aerospace-parts-maker-facc-on-vienna-exchange.html>>.

²⁷⁵ FACC company website, <<http://www.facc.com/en>>.

²⁷⁶ Barabanov, Kashin and Makienko (note 250), p. 111.

report by the US Chamber of Commerce in China called 'a blueprint for technology theft on a scale the world has never seen before.'²⁷⁷

Third, there have also been a growing number of reports about alleged Chinese industrial espionage and cybertheft of military-relevant technologies from Western arms companies and research institutions. In May 2013 it was reported that the US Defense Science Board had concluded that Chinese hackers had gained access to designs of more than two-dozen major US weapon systems, including the Patriot missile system, the Aegis ballistic missile defence system (PAC-3), the Terminal High Altitude Area Defence (THAAD) system, the F/A-18 fighter jet, the V-22 Osprey, the Black Hawk helicopter and the F-35 Joint Strike Fighter.²⁷⁸ Recent years have also seen a growing number of media reports about alleged Chinese cyberattacks on European defence conglomerates and security-related government institutions.²⁷⁹ The Chinese Government routinely denies its involvement in such attacks against foreign targets.

Fourth, China continues to expand its science and technology and open-source intelligence (科技情报, *keqi qingbao*) capacities, and attempts to collect publically available information on foreign civilian and dual-use technologies from as early as the 1950s. In 2005 an estimated 15 782 employees in China (many of them with an intelligence background) at 353 institutions were allegedly tasked with the collection of relevant information from scientific publications, conference partners and other open sources and to process them for use by Chinese recipients, including the Chinese arms industry. Examples of such institutions are the Institute of Scientific and Technical Information of China, the China Defence S&T Information Center and the National Library of Standards.²⁸⁰

²⁷⁷ McGregor, J., 'China's drive for "indigenous innovation": a web of industrial policies', US Chamber of Commerce, 28 July 2010, <http://www.uschamber.com/sites/default/files/reports/100728chinareport_0.pdf>, p. 4.

²⁷⁸ Nakashima (note 35).

²⁷⁹ 'EADS, ThyssenKrupp attacked by Chinese hackers: report', Reuters, 24 Feb. 2013.

²⁸⁰ Hannas, W. C., Mulvenon, J. and Puglisi, A. B., *Chinese Industrial Espionage: Technology Acquisition and Military Modernisation* (Routledge: London/New York, 2014), pp. 22–24.

5. Conclusions and recommendations

The Chinese military benefited enormously from transfers of military-relevant technologies from Western states in the 1980s, which marked a turning point for the development of China's defence technological capabilities. After China was largely cut off from Western transfers in the wake of the 1989 Tiananmen Square incident, it turned to Russia, Ukraine and Israel for transfers of advanced military technologies. The imposition of Western arms embargos, in combination with the 1995–96 Taiwan Strait crisis, constituted another turning point for the Chinese military. The Chinese Government responded with a greatly increased defence budget; a stronger focus on the development of the domestic arms industry and the promotion of civil–military integration; and the development of a dual-use economy, which now has the technological and industrial capabilities to meet most of the needs of the PLA and the arms industry.

Over the past two decades, China has made considerable progress in modernizing the PLA and in developing advanced indigenous defence technological capabilities. At the same time, arms imports from Russia, Ukraine and Israel have been reduced significantly, although they have not stopped altogether. Today, China is mostly interested in acquiring components or technologies that help remove specific remaining bottlenecks (e.g. in aircraft propulsion systems). As a result, China has become less interested in purchasing complete off-the-shelf weapon systems. Instead, it is focusing on dual-use technologies that can be acquired through 'civilian' channels, such as high-tech trade, investments and scientific cooperation or, allegedly, through clandestine methods such as industrial espionage or cybertheft.

Many of these efforts are supported by dramatic increases in China's spending on general R&D, which has received far less attention than its rising military budget. China has also introduced a number of other measures to foster 'indigenous innovation', such as subsidies to Chinese companies and 'forced technology transfers' (e.g. through multinational joint ventures). These measures are intended to strengthen China's domestic and independent technological capabilities that, as part of the civil-military integration strategy, also contribute to the strengthening of Chinese defence capabilities. These developments have enabled China to access technologies that are of benefit to its defence industry despite Western export control restrictions.

As a result, China's views on the EU arms embargo appear to have shifted. In particular, China appears less insistent today that the embargo should be lifted and does not raise the issue as forcibly as it did in previous years. This may be because China recognizes that the prospects of the EU arms embargo being lifted are limited for the time being or because it does not view the embargo as restricting its ability to access required technologies from Europe. Nonetheless, China sees the embargo as an expression of the West's continued refusal to treat it as an equal partner and as a continuation of a history of bullying directed at China by foreign powers. As a result, the Chinese Government continues to complain about

alleged restrictions on transfers on technology from Europe to China and has sought to pressure governments to loosen their controls, although individual states' experience of these pressures varies.

It seems unlikely that the EU arms embargo on China will be lifted in the near future. France, Germany and the UK have all stressed that the issue of lifting the embargo is unlikely to be discussed at the EU level in the near future. US opposition to any attempt to lift the EU arms embargo—which played such a decisive role in ending the debate on the issue in the mid-2000s—still appears to be a major influence on the thinking of EU member states. US opposition to lifting the embargo appears to be driven as much by the symbolic value of the instrument as by any rational assessment of its importance for restricting transfers of military-relevant technologies to China.

At the same time, France, Germany and the UK all underlined a range of other reasons—apart from US pressure—arguing against moving to lift the embargo, pointing particularly to the situation in China and in East Asia. Within Europe, governments acknowledge that the risk of war in the Taiwan Strait has considerably decreased since the 2008 election of Taiwanese President Ma Ying-jeou on a platform of cross-strait economic integration, even if it has not disappeared. However, Europeans are disappointed about a lack of political reforms and the deterioration of the human rights situation in China over the past six years.

Together with the rising tensions between China and its neighbours in the East and South China Seas, any move to lift the embargo would be highly controversial among parliamentarians, the media and the general public and could also damage relations with important EU trading partners in East Asia. In addition, the hope that the embargo provides leverage that could be used to gain concessions from China, particularly in relation to domestic political reforms, has not entirely disappeared. Although many analysts in Europe have become more sceptical of the idea of the leverage approach to the arms embargo, any decision to lift it would be tied to clear progress in this area.

These domestic and regional concerns are also seen to be of central importance to national decision making on export licences to China. France, Germany and the UK have all emphasized that the EU embargo does not, in and of itself, significantly influence national decision making on exports to China. Instead, the three states have highlighted concerns about diversion, human rights and regional stability as playing a primary role in determining which export licences are granted and denied. In particular, the risk that goods would be diverted from the industrial sector to the Chinese security forces was prominent in all states' decision making. Despite these shared concerns about the risks associated with exports of military items and dual-use goods to China, differences remain in terms of what technologies each state is willing to transfer, with France more liberal and Germany more restrictive in terms of which licences are approved and refused. However, this picture is complicated by the export of German engines for Chinese submarines and armoured vehicles that are not captured by German and international export control regulations.

The fact that there are differences in policy outcomes despite shared underlying concerns may be partly due to variations in the extent to which such concerns have an impact on government and industry thinking. For example, the fear of losing access to the US defence market influences government and industry thinking in all three countries, but particularly in the UK. Differences in policy outcomes may also be due to variations in access to information. While all states emphasized the risk of exported items being diverted from the civilian to the military sector in China as a key concern when assessing export licences, they also noted the difficulty in making accurate assessments of these risks. At the inter-governmental level, states share information on export licence denials within both the EU and the Wassenaar Arrangement, and discuss concerns about exports to particular destinations at the annual Wassenaar Arrangement plenary meetings and the monthly meetings of the EU Council Working Group on Arms Exports (COARM). States have emphasized the benefits of these information-sharing mechanisms but noted that improvements could be made to both systems to allow for the sharing of more accurate and timely data for assisting with national decision making.

Strict US controls on arms exports to China are likely to remain in place for the foreseeable future, as indicated by the fact that the USA is seeking to ensure that its ECR initiative does not affect controls on transfers to China. In addition, the USA shows continued willingness to use re-export controls and political pressure to convince other states to block particular exports to China. The USA's ability to exert such pressure is likely to be tested in the years to come, as indicated by the Israeli defence industry's apparent desire to increase exports to China. At the same time, moving large numbers of items from the USML to the CCL under the ECR process, and the importance of the Chinese market for US industry, will likely increase the amount of technology that can be shipped to the civilian sector in China. This, in turn, may lead to more cases where US technology and know-how indirectly assist developments in the Chinese military. Such cases will draw renewed accusations of double standards from US allies and may weaken the USA's ability to convince them to block particular transfers to China.

Attempts to assess the impact of Western technology transfers on developments in the Chinese military are hampered by a lack of transparency. Since 1989, it is clear that transfers from Russia, Ukraine and Israel have had a far greater impact on developments in the Chinese military than exports from Western states. However, ongoing transfers under deals signed prior to 1989 as well as new deals for exports of military goods, dual-use items and non-controlled civilian items have benefitted the Chinese military in a number of areas, particularly in the fields of propulsion, helicopters, radars and electronic equipment. Nevertheless, making an accurate assessment of the exact impact of these transfers is made difficult by the lack of open-source data. In particular, there is often limited information about whether systems being developed or deployed in China continue to benefit from active supplies of technology from Western manufacturers. The current status of many of the agreements signed before 1989 is unclear. Ongoing production in China under many of the deals may be a result of Chinese

violations of intellectual property but it is often unclear whether these issues have been raised with the Chinese Government or Chinese industry. This lack of information may be due to an unwillingness to offend China and jeopardize potential contracts in the commercial sphere. However, it makes an accurate assessment of national export control policies harder and may contribute to a false impression of the amount of technology that states are willing to export to China.

Recommendations

Reach agreement about the goals of export restrictions on China

European states appear to agree on the need to maintain the EU arms embargo and retain strict controls on the export of military goods and dual-use items to China. However, despite agreement on the broad purpose of these restrictions, there are differences in the precise details involved. As a result, member states' policy outcomes continue to differ, with some licensing the export of goods that others would deny, and disagreements about the steps that China would need to take for restrictions to be loosened. In order to strengthen the EU's influence, EU member states need to reach speak with one voice, and develop a shared understanding of the exact purpose of current restrictions on exports to China.

Become more transparent about the goals of export restrictions on China

EU member states also need to be more effective in communicating these issues to the outside world. All EU member states and states aligned with the EU Common Position should clearly state if, and how, they apply the EU arms embargo on China. It should also be made clear that any move to lift the embargo would only be taken in connection with concrete moves by EU member states to improve the harmonization and transparency of national controls on arms exports. While efforts were made in the mid-2000s to explain the fact that the EU arms embargo on China predates the creation of the CFSP, and is therefore not the same as other EU embargoes, this is not fully understood, either in the USA or in Europe.

Develop independent European strategic assessment capabilities

Western states, especially EU member states, need to develop a better understanding of the ongoing process of China's military modernization and the multitude of actors involved, particularly with regard to China's strategy of civil-military integration. Europeans lag behind their US counterparts in this field and urgently need to develop independent strategic assessment capabilities that can better inform European debates based on European interests. Gaining a better understanding of these issues would allow EU member states to more accurately assess the risks that items will be diverted from the civilian to the military sector when determining whether or not to grant licences for the export of military items and dual-use goods to China.

Increase intergovernmental information sharing on exports to China

Both EU and Wassenaar Arrangement member states need to develop better mechanisms for sharing information on what is being licensed and exported to China. This information would assist states in understanding how other states are implementing national policies controlling exports to China and provide valuable information that could help inform national decision making in this area. At the EU level—either at COARM meetings or via secure communication channels—states should also consider exchanging additional information that could assist others with their licensing decisions with regards to China and other sensitive destinations, including details of suspended or revoked export licences, concerns about particular end-users, and other intelligence.

Improve transparency about exports to China

Making an accurate assessment of the impact of Western transfers of military-relevant technologies on the development of the Chinese military is hampered by the lack of available data. Both exporting states and companies could release relevant data to allow for an accurate assessment of the impact of Western supplies. States should further increase the amount of public information about export licences approvals and denials and actual arms exports to China and other sensitive destinations via both the EU Annual Report and national reports on arms exports. At a minimum, states should provide descriptions of goods licensed for export and goods actually exported, as well as the number of items involved and a description of the end user. Companies should release information about the current status of deals signed prior to 1989, including whether they are aware of any ongoing production in China and whether issues relating to intellectual property theft have been raised with the Chinese Government or industry.

Assess the impact of the Export Control Reform process on relations with China

States should intensify and better coordinate the existing transatlantic dialogue on the issue of transfers of sensitive goods to China so that they can share views on the main points of concern and the key factors driving national decision making. The need for EU member states and the USA to clearly communicate and coordinate their positions and policies is likely to become more acute as a result of the USA's ECR process. Concerns are already being raised that the ECR will lead to a loosening of restrictions on US export controls and an increase in the sophistication of technologies that can be exported to sensitive destinations, particularly China. This, in turn, may lead companies in EU member states to pressure governments to relax controls on exports to China. EU member states and the USA should therefore use existing dialogue frameworks—such as the biannual political dialogues on export controls—to discuss the implications of the ECR process on their relations with China in the area of technology transfers.

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Western Arms Exports to China

In 1989 several Western states imposed arms embargoes on China. Nevertheless, China has continued to benefit from the transfer of military-relevant Western goods and technologies in its efforts to modernize its defence forces' industrial and technological capabilities.

This Policy Paper details the policies of four Western states—France, Germany, the United Kingdom and the United States—on transfers of military-related technologies to China, including military goods, dual-use items—goods and technologies that have the potential to be used in both civilian and military products—and other non-controlled items that have played a role in the development of China's military capabilities.

The authors conclude that, while Western transfers of militarily-relevant technology to China will remain limited for the foreseeable future, Western states need to develop more harmonized and transparent approaches to the issue that take relevant developments within China into account.

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