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# The Defence Industry in the Visegrád Countries – Current State and Perspectives

Edited by  
Jakub Bornio

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# **The Defence Industry in the Visegrád Countries – Current State and Perspectives**

Edited by  
Jakub Bornio

Lublin 2024

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## List of abbreviations

AFRF	The Armed Forces of the Russian Federation
AFV	Armoured Fighting Vehicles
AMV	Armoured Modular Vehicle
APC	Armoured Personnel Carrier
APV	Armoured Personnel Vehicle
ARV	Advanced Reconnaissance Vehicle
C4ISR	Command, Control, Communications, Computers [C4] Intelligence, Surveillance and Reconnaissance [ISR]
CSG	The Czechoslovak Group
DIANA	Defence Innovation Accelerator for the North Atlantic
DIS	Defence Industrial Strategy
EU	The European Union
FGA	Fighter Ground Attack
GCI	Ground-Controlled Interception
GUS	Główny Urząd Statystyczny / The Central Statistical Office
HAF	Hungarian Air Force
HDF	The Hungarian Defence Forces
IFV	Infantry Fighting Vehicle
ITBM	Intermediate-range Ballistic Missile



## List of abbreviations

LM	Loitering Munition
MANPAD	Man-portable Anti-aircraft Missile System
MFA	Ministry of Foreign Affairs
MLRS	Multiple Launch Rocket System
MOD	Ministry of Defence
MRAD	Medium Range Air Defense
MRL	Multiple Rocket Launcher
NATO	North Atlantic Treaty Organisation
NSPA	NATO Support and Procurement Agency
PDI	The Polish Defence Industry
PGZ	Polska Grupa Zbrojeniowa
SAM	Surface-to-air Missile
SIPRI	The Stockholm International Peace Research Institute
UAV	Unmanned Aerial Vehicles
US/USA	The United States of America
USSR	The Union of Soviet Socialist Republics
V4	Visegrád Group
WP	The Warsaw Pact



## Executive summary

- The outbreak of the full-scale Russian-Ukrainian war has emphasised the significance of the arms industry as a resource provider for states' foreign and defence policies. From a Western perspective, it impacts the policy of continued military support for Ukraine, the policy of militarising NATO's eastern flank, and the policy of building the Alliance's overall defence capabilities, which are expected to translate into an effective deterrence of Russia.
- The countries of Central and Eastern Europe and their military capabilities are crucial to the regional resilience system due to their proximity to the Ukrainian theatre of war and these states' high vulnerability to Russian interference. The industry of the Visegrád countries (V4), with its central position on NATO's eastern flank and relatively large economic potential, has the capacity to play a significant role in the defence of this part of Europe. A well-developed arms industry is also a necessary factor for the V4 countries

to be able to pursue a foreign and security policy that is as sovereign as possible.

- Globally, the Visegrád countries' arms industry accounts for a small fraction of exports and production. However, the Russian-Ukrainian war is changing this dynamic.
- The arms industries of the Visegrád countries are not well integrated, with limited cooperation and infrequent trade between them. The Czechoslovak Group is an exception due to its historical background. In recent years, there have been some changes in this area, mainly through the purchase of licenses, company acquisitions, and joint projects.

## **Czech Republic**

- The Czech defence industry, although significantly reduced in size compared to the communist era, excels in the development of various types of modern weaponry including self-propelled howitzers, as well as passive tracking devices and electronic jammers. However, it has long struggled with low demand for its products, which has kept production at a minimum.
- The war in Ukraine has given an impetus for the expansion of ammunition production capacity, as well as for the refurbishment and modernisation of Soviet-era platforms. However, it has not yet had the same impact on the production of newly developed equipment.

## Hungary

- Hungary is taking fast strides to create a defence industrial base, partly on grounds of sovereignty (for the sake of securing adequate military defence capabilities), and partly to advance its overall economic development strategy.
- The defence (re)industrialisation that is currently unfolding builds on a mix of approaches, including support for start-ups and some already established national firms, foreign acquisitions, and attracting investment from major foreign firms (such as Rheinmetall and Airbus).
- This strategy is showing results thanks to a clear commitment to investing resources into its implementation. It does, however, leave some questions as to prospective human resources needs of the industry on the one hand, and a lack of a clear and transparent consensual rationale for the resource-demanding industry-building and military modernisation it entails.

## Poland

- The Polish defence industry is currently faced with the challenge of modernising the Polish armed forces while at the same time expanding its presence in the export market.
- The strength of the Polish defence sector lies in its diversification, with companies operating in land, sea, air, and cyberspace domains.
- The expansion and modernisation of the Polish Armed Forces offer a window of opportunity for the domestic arms industry. This could eventually lead to

an elevated status of domestic suppliers of armaments and military equipment.

- The Polish arms industry has been underinvested in over the years, with a minimum quantity of orders, barely keeping it alive (and even then, not in every case). For example, the production of ammunition is currently insufficient for the war conditions in Europe.
- The arms industry in Poland faces competition from foreign producers, who receive a large number of arms orders but do not necessarily invest in Poland, which may ultimately limit the Polish industry to the role of subcontractor, with only a minority of orders going to them.

## **Slovakia**

- The Slovak defence industry is relatively well-established and has used existing capacities and capabilities to adapt to a new security and market reality in Europe. It has resulted in a surge in demand, particularly for weapons such as self-propelled howitzers and 155 mm artillery shells produced in Slovakia.
- Slovakia also continues to maintain solid maintenance capabilities for various weapon systems (mainly older Soviet-era technology), which will prove critical especially after the Russian invasion of Ukraine in 2022.
- Cooperation between state-controlled companies and private firms is proving essential in the delivery of products such as howitzers or ammunition on time and in the desired quantity and quality. At the same time, smaller private defence companies focusing

on niche technologies such as sensors, communications, information, command and control systems or cybersecurity continue to operate in Slovakia, relying mainly on exports to third countries.

- Political will and priorities shape the industry. At present, the Slovak defence industry aims to export to markets including Southeast Asia and South America, while the future of closer defence industrial cooperation with Ukraine remains uncertain.





Jakub Bornio

## **Visegrád Group defence industry: global outlook, regional needs, intra-V4 cooperation**

The outbreak of a full-scale war in Ukraine has dramatically increased the demand for arms and ammunition. It has reinforced the global trend towards militarisation associated with the erosion of the liberal international system<sup>1</sup> that emerged after the collapse of the Soviet Union and the end of the Cold War. Although the Western academic debate has been dominated by the phenomenon of new-generation wars, including asymmetric conflicts, it is evident that classical weapons systems such as tanks, artillery, or aviation remain a crucial resource of force. This is demonstrated by

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<sup>1</sup> "Why the global arms trade is booming", *The Economist*, 7 May 2017, <https://www.economist.com/the-economist-explains/2017/03/07/why-the-global-arms-trade-is-booming> [22.03.2024]; P. Wezeman (et al.), "Trends in International Arms Transfers, 2023", *Stockholm International Peace Research Institute*, March 2024, p. 1, [https://www.sipri.org/sites/default/files/2024-03/fs\\_2403\\_at\\_2023.pdf](https://www.sipri.org/sites/default/files/2024-03/fs_2403_at_2023.pdf) [22.03.2024].



their extensive use in the Ukrainian theatre of war<sup>2</sup>. The specifics of the Russo-Ukrainian war have also highlighted the importance of the extensive arms industry and the logistics it provides for the conduct of a classic conflict between two traditional actors in international relations. This applies both to the production, modernisation and repair of weapons systems and to the capacity to produce ammunition. With regard to the latter, the so-called “ammunition hunger”, which has become a major problem for the Ukrainian Armed Forces two years after the start of the full-scale Russian offensive, is a striking example. Moreover, the scale of the Russian-Ukrainian war means that it is no longer just the quality of the weapons that is important in assessing production capacity, but also the speed at which they are produced and delivered<sup>3</sup>. This has led to the peculiar phenomenon of a “quantity to quality transition”, which at this stage allows Russia to gain operational advantages. This is also due to the specificity of its strategic culture.

From a Western perspective, the manufacturing and service capabilities of the arms industry are an essential element of security policy in two dimensions. Firstly, the arms industry is an essential tool for the policy of deterrence against Russia, which NATO countries have been pursuing

<sup>2</sup> M.F. Cancian, J. Anderson, “Expanding Equipment Options for Ukraine: The Case of Artillery”, *Center for Strategic & International Studies*, 23 January 2023, <https://www.csis.org/analysis/expanding-equipment-options-ukraine-case-artillery> [22.03.2024]; S. Cranny-Evans, “Russia’s Artillery War in Ukraine: Challenges and Innovations”, *Royal United Services Institute*, 9 August 2023, <https://www.rusi.org/explore-our-research/publications/commentary/russias-artillery-war-ukraine-challenges-and-innovations> [22.03.2024].

<sup>3</sup> D. Wartenberg, “The Relevance of Quantity in Modern Conflict. What Does Russia’s Approach in the Russo-Ukrainian War Reveal?”, *Joint Air Power Competence Centre*, September 2023, pp. 71-81, [https://www.japcc.org/wp-content/uploads/JAPCC\\_Conf\\_RA\\_2023.pdf](https://www.japcc.org/wp-content/uploads/JAPCC_Conf_RA_2023.pdf).

since 2014 and which has significantly intensified after February 2022. Secondly, manufacturing capacity is essential to the policy of military support to a war-torn Ukraine. The conflict between Russia and Ukraine has revealed the structural weaknesses of some states and emphasised the significance of the United States in Europe's security architecture as well as the continued support of Ukraine.

Since 2014, the US has been urging the European members of NATO to take on more responsibility with regard to security. This is due to the economic potential, know-how, technology, and capabilities possessed by the European members, which can be translated into hard power. From a US perspective, the aim is not only to stabilise the situation in Europe but also to focus on competition in the Pacific, given the growing power of the People's Republic of China and its increasingly assertive international policy. The US requires relief in securing its various theatres of operations, including Europe.

Russia's geographical proximity, resilience, and strategic objectives make it a significant threat to the countries of Central and Eastern Europe. Therefore, the arms industry in the region is a crucial component of the security system of the eastern flank. Moreover, the condition of the arms industry largely determines the autonomy of the region's states' security policy actions. This policy paper analyses the potential of the arms industry in the Visegrád Group countries, which are located in the geographical centre of the security processes on NATO's eastern flank and represent

one of the largest economic potentials among the Central and Eastern European countries<sup>4</sup>.

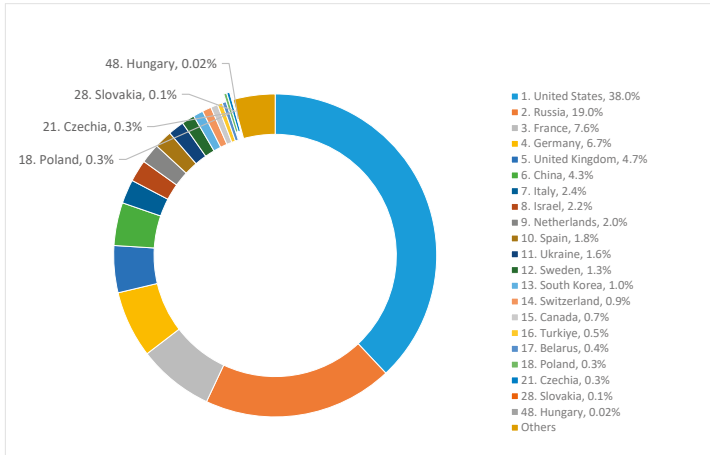
The security industry in the V4 countries has been significantly influenced by historical processes. Specifically, the post-war membership of the Eastern Bloc, followed by the transformation of the political and economic system in the late 1980s and early 1990s<sup>5</sup>, as well as the neglect of the arms industry during the 'peace dividend' period have had a substantial impact. Between 1992 and 2023, the armaments industry of the V4 countries accounted for only about 0.7% of total global exports (see Figure 1). Moreover, there is a clear imbalance favouring the more developed Polish and Czech industries compared to the other V4 countries. The distribution of the individual V4 countries' share in the global arms trade was uneven, with Poland and the Czech Republic accounting for almost its entirety. Hungary played an almost imperceptible role in this, as shown in Figure 1 and Figure 2. It is worth noting that Hungary's arms industry has been only recently undergoing reconstruction<sup>6</sup>. Nevertheless, following the outbreak of the full-scale war in Ukraine (see Figure 3), the V4 countries have experienced a significant increase in their status in the global arms trade. It is important to note, however, that this did not necessarily translate into an increase in the importance of local industries.

<sup>4</sup> The V4 countries, together with Romania, are the largest economies in Central and Eastern Europe, excluding war-torn Ukraine.

<sup>5</sup> This is a move away from a centrally planned economy towards a market economy.

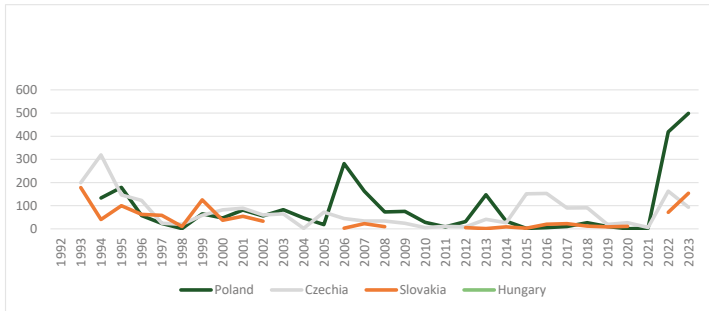
<sup>6</sup> J. Bornio, "Inwestycje niemieckiego sektora zbrojeniowego na Węgrzech (cz. 1)", *Komentarze IES*, no. 1002 (200/2023), <https://ies.lublin.pl/komentarze/inwestycje-niemieckiego-sektora-zbrojeniowego-na-wegrzech-cz-1/> [23.03.2024].

Figure 1. Position in and share of global arms exports by country (1992-2023)



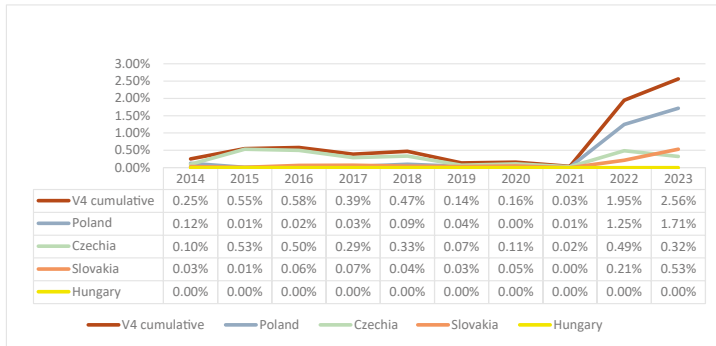
Source: Own elaboration on the basis of SIPRI Arms Transfers Database, <https://doi.org/10.55163/SAFC1241>.

Figure 2. Volume of exports of major arms 1992-2023 in millions of SIPRI trend-indicator values (TIVs)



Source: Own elaboration on the basis of SIPRI Arms Transfers Database, <https://doi.org/10.55163/SAFC1241>.

Figure 3. Change in V4 share in global arms exports (2014-2023)



Source: Own elaboration on the basis of SIPRI Arms Transfers Database, <https://doi.org/10.55163/SAFC1241>.

In fact, some of the exported armaments were second-hand equipment of various origins, mainly post-Soviet.

The armaments industries of the V4 countries differ with regard to the final destination of their products. In Poland, for example, the main recipient of products is the domestic armed forces, while in the Czech Republic, the majority of goods are destined for export, accounting for as much as 90% of Czech production in 2020<sup>7</sup>. The structure of arms exports from the V4 countries is not wide in the area of large-scale contracts. Between 1992 and 2023, the Czech Republic mainly exported light transport and training aircraft, engines, radar systems, and rocket launchers. Hungary made only a symbolic contribution to the total V4 export by re-exporting new Mi-8 helicopters. Poland's exports mainly

<sup>7</sup> J. Bornio, "Przemysł zbrojeniowy i wsparcie militarne Republiki Czeskiej wobec Ukrainy", *Komentarze IES*, no. 981 (229/2023), <https://ies.lublin.pl/komentarze/przemysl-zbrojeniowy-i-wsparcie-militarne-republiki-czeskiej-wobec-ukrainy/> [23.03.2024].

consisted of helicopters, light transport aircraft, reconnaissance vehicles, post-Soviet tanks, armoured personnel carriers, and, in recent years, self-propelled howitzers or man-portable anti-aircraft missile systems (MANPAD). Slovakia mainly exported engines, tanks, and reconnaissance vehicles of post-Soviet origin, as well as self-propelled howitzers or mortars (see more in Appendix 1).

The security situation has had a significant impact on the arms industries of the Visegrád countries. These industries are currently undergoing intensive reconstruction, strengthening, or rapid development with the assistance of foreign capital, as is the case in Hungary. The armaments industries of the Czech Republic, Poland, and Slovakia have strong capabilities in servicing and modernising post-Soviet equipment, particularly tanks and infantry vehicles. The V4 countries' industries have well-developed production capacities for land forces, including self-propelled howitzers, armoured personnel carriers, various types of chassis, and mortars. Although tank servicing and modernisation capabilities are developed (with the exception of Hungary), the domestic industry has not yet developed the capacity to produce third-generation tanks on its own. Similarly, in the aviation sector, the Czech and Polish industries mainly produce training or transport machines with low combat capability. The industries of the V4 countries, however, have satisfactory capabilities in the production of small arms or radio-electronic reconnaissance equipment and, to a lesser extent, unmanned ground vehicles and unmanned aerial vehicles (UAVs). The Visegrád arms industry also lacks the capacity to produce large-calibre ammunition on a scale

Table 1. Transfers of major conventional arms among V4 countries

Recipient	Supplier	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
Poland	Czech Republic	1991	48	aircraft engine	aircraft engine	1993 – 1996	Walter M-601D (750hp) turboprop for 48 PZL-130TB trainer aircraft produced in Poland; ordered from Czechoslovakia and delivered from Czech Republic after 1992 break-up of Czechoslovakia
Hungary	Czech Republic	1994	2	BMP-1	IFV	1995	Second-hand
Czech Republic	Poland	1995	11	W-3 Sokol	helicopter	1996; 1997	Exchanged for 10 second-hand MiG-29 combat aircraft; W-3A version
Poland	Czech Republic	1995	10	MiG-29	fighter aircraft	1995; 1996	Second-hand; exchanged for 11 W-3 helicopters; incl. 1 MiG-29UB version
Slovakia	Czech Republic	2008	2	L-410 Turbolet	light transport aircraft	2009; 2010	L-410UVP-E20 version
Poland	Czech Republic	2012	1	Z-142/Z-242L	trainer aircraft	2013	Z-242L version
Poland	Czech Republic	2012	2	Z-143L	light aircraft	2013	For training; Z-143L is version
Slovakia	Czech Republic	2012	2	L-410 Turbolet	light transport aircraft	2013	EUR 9.8 m deal; L-410UVP-20 version

Recipient	Supplier	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
Hungary	Czech Republic	2016	2	Z-142/Z-242L	trainer aircraft	2017	Part of HUF 343 m (USD 1.8 m) deal; Z-242L version
Hungary	Czech Republic	2016	2	Z-143L	light aircraft	2018	Part of HUF 343 m (USD 1.8 m) deal; Z-143LSi version
Slovakia	Czech Republic	2019	25	vehicle engine	vehicle engine	2021; 2022	Tatra T-3D-928-70 (436hp) diesel engine for 25 Zuzana-2 self-propelled guns produced in Slovakia
Hungary	Czech Republic	2020	4	Z-142/Z-242L	trainer aircraft	2020	Z-242L version
Hungary	Czech Republic	2022	12	L-39NG	trainer/combat aircraft		Incl. 4 for reconnaissance role; delivery planned from 2024
Slovakia	Poland	2023	180	Piorun	portable SAM		Selected but not yet ordered by end-2023; delivery planned 2024-2027

Source: Own elaboration on the basis of SIPRI Arms Transfers Database. <https://doi.org/10.55163/SACr241>.



required during wartime. Recent significant investments have been made in all these countries to increase this capacity.

It is important to note that the defence industries of the V4 countries cooperate only to a limited extent, despite their geographical proximity and high degree of political cooperation. The only exception is the cooperation between the Czech and Slovak industries within the Czechoslovak Group (CSG) holding, which is historically conditioned. The individual companies of the V4 arms industries largely compete with each other and can only offer unique products to their Visegrád partners to a limited extent. This has resulted in a relatively low number of arms purchase contracts being concluded (see Table 1). The proposal for a joint Polish-Slovak production of a SCIPIO wheeled armoured personnel carrier, based on the Polish Rosomak Wheeled Armoured Vehicle (KTO Rosomak) and the Slovak Turra 30 turret, was unsuccessful. Nevertheless, in 2021, Huta Stalowa Wola, a Polish company, and Tatra, a Czech company, presented a 4x4 tactical multipurpose vehicle. The chassis was supplied by Tatra. In 2018, Česká zbrojovka granted Hungary's HM Arzenál a ten-year licence to produce small arms. The production is taking place at a newly opened factory in Kiskunfélegyháza. The contract requires the production of approximately 200,000 weapons, half of which will be used by the Hungarian Armed Forces<sup>8</sup>. One should also emphasise a relatively new trend in the Visegrád countries which

<sup>8</sup> J. Bornio, "Inwestycje niemieckiego sektora zbrojeniowego na Węgrzech (cz. 2)", *Komentarze IES*, no. 1003 (201/2023), <https://ies.lublin.pl/komentarze/inwestycje-niemieckiego-sektora-zbrojeniowego-na-wegrzech-cz-2/> [23.03.2024].

is the integration of industries through capital flows and acquisitions. In 2021, HSC Aerojet Zrt, a Hungarian company, purchased Aero Vodochody, a Czech company. The policy of militarisation on NATO's eastern flank and the demand for modern armaments and munitions in the V4 countries may drive more joint contracts and integration of the arms industries of the Visegrád countries.

Although the arms industry of the Visegrád countries does not have a significant global impact, it serves as a crucial logistical and manufacturing base for their domestic armed forces and for war-torn Ukraine, particularly in the context of the involvement of the Czech Republic and Poland. The industry's products are rarely innovative and have only limited market appeal<sup>9</sup>, partly due to strong global competition, technological backwardness and limited scale of production. It is worth noting, however, that the defence sector of the V4 countries has attracted significant foreign investments from various countries, including the United States, Germany, South Korea, Sweden, and France. This is mainly due to the high demand for modern armaments in the region and the Visegrád Group's strong logistical integration with both the countries of the eastern flank and the economic core of Europe. In the near future, one can expect a steady rise in the production capacity of local arms industries. This is primarily due to the weakening of the regional security architecture.

<sup>9</sup> For example, the Polish Piorun MANPADS, the UAV manufactured by WB Electronics, the Krab and Zuzana-2 self-propelled howitzers, BREN 2 rifles.

Appendix 1. Transfers of selected major new conventional arms from Poland, Czech Republic, Hungary, Slovakia (1992-2023)

Recipient	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
<b>CZECH REPUBLIC</b>						
Egypt	1991	48	L-59	trainer/combat aircraft	1993; 1994	USD 204 m deal; L-59E version
Poland	1991	48	aircraft engine	aircraft engine	1993 - 1996	Walter M-601D (750hp) turboprop for 48 PZL-130TB trainer aircraft produced in Poland; ordered from Czechoslovakia and delivered from Czech Republic after 1992 break-up of Czechoslovakia
Thailand	1992	36	L-39Z Albatros	trainer/combat aircraft	1993; 1994	USD 200 m deal; L-39ZE version
Tunisia	1994	12	L-59	trainer/combat aircraft	1995 - 1997	Part of USD 70 m deal; L-59T version
Algeria	1995	7	L-39C Albatros	trainer aircraft	1996	
Bangladesh	1995	8	L-39Z Albatros	trainer/combat aircraft	1995	Deal incl. barter trade (jute); L-39ZA version
Thailand	1996	4	L-39Z Albatros	trainer/combat aircraft	1996; 1997	L-39ZE version
Ethiopia	1997	4	L-39C Albatros	trainer aircraft	1997; 1998	
India	1998	396	vehicle engine	vehicle engine	2000 - 2022	Tatra T-930 (±260hp) diesel engine; for Pinaka MRL produced in India (on T-815 truck chassis from Czech Republic produced under licence in India)

Recipient	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
Yemen	1999	12	L-39C Albatros	trainer aircraft	1999	
Algeria	2001	17	L-39Z Albatros	trainer/combat aircraft	2002; 2003	Probably USD 30 m deal; L-39ZA version; originally produced for Nigeria but never delivered for financial reasons
Estonia	2005	1	VERA-E	air search system	2005	CZK 100 m (USD 4 m) deal
Russia	2010	4	L-410 Turbolet	light transport aircraft	2011	
Vietnam	2011	4	VERA-E	air search system	2014 – 2016	
Russia	2012	4	L-410 Turbolet	light transport aircraft	2013; 2014	L-410NG version; for training
Russia	2012	17	L-410 Turbolet	light transport aircraft	2015 – 2017	L-410JVP-E20 version
Iraq	2014	9	L-159A ALCA	FGA aircraft	2015; 2016	Part of USD 200 m deal; originally produced for Czech Republic but declared surplus and not used
Iraq	2014	1	L-159B	trainer/combat aircraft	2018	Part of USD 200 m deal; L-159T1 version
NATO	2014	2	VERA-E	air search system	2016; 2017	EUR 16 m deal; VERA-NG version
Indonesia	2017	1	VERA-E	air search system	2019	VERA-NG version
Indonesia	2021	28	RM-70 Vampire 122mm	self-propelled MRL	2022; 2023	Assembled or produced under license in Indonesia
Vietnam	2021	12	L-39NG	trainer/combat aircraft		Delivery planned 2024

Recipient	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
Hungary	2022	12	L-39NG	trainer/combat aircraft		Incl. 4 for reconnaissance role; delivery planned from 2024
Ukraine	2023	4	VERA-E	air search system		EUR 150 m deal; financed by Netherlands as aid after 2022 Russian invasion of Ukraine; VERA-NG version
<b>HUNGARY</b>						
Peru	1992	4	Mi-8T	transport helicopter	1993; 1995	Second-hand
Ethiopia	1997	4	Mi-8T	transport helicopter	1997	
<b>POLAND</b>						
Russia	1980	1	Project-775	landing ship	1992	Originally ordered by Soviet Union and delivered to Russia after end of Soviet Union
Myanmar	1990	22	Mi-2	light helicopter	1992	
Myanmar	1990	13	W-3 Sokol	helicopter	1992	Incl. 2 for VIP transport
Iran	1993	104	T-72M1	tank	1994; 1995	
Czech Republic	1995	11	W-3 Sokol	helicopter	1996; 1997	Exchanged for 10 second-hand MiG-29 combat aircraft; W-3A version
Venezuela	1995	6	M28 Skytruck	light transport aircraft	1996; 1997	For National Guard
Venezuela	1997	12	M28 Skytruck	light transport aircraft	1999 – 2001	USD 20 m deal; for National Guard

Recipient	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
India	1999	44	WZT-3M	ARV	2000; 2001	USD 31-32 m deal; Indian designation ARV-3
Venezuela	1999	6	M28 Skytruck	light transport aircraft	2000	
Yemen	1999	3	Deba	landing craft	2001	Part of USD 50 m deal; Yemeni designation Dhaffar
Yemen	1999	1	Project-771	landing ship	2002	Part of USD 50 m deal; NS-722 version; Yemeni designation Bilquis
India	2002	80	WZT-3M	ARV	2002 - 2004	USD 60-75 m deal; 40 assembled from kits in India; Indian designation ARV-3
Nigeria	2002	67	MT-LB	APC	2003	USD 6.5 m deal (financed by UN and/or USA); for use by Nigerian peacekeeping forces in Sierra Leone; incl. 6 ARV; 1 ambulance and 6 CP version
Malaysia	2003	48	PT-91M	tank	2007 - 2010	Part of USD 368-400 m deal (offsets USD 111 m); PT-91M version; Malaysian designation Pendekar
Vietnam	2003	2	M28B Bryza-1R	maritime patrol aircraft	2005	For coast guard; delivered without MP system (still to be ordered); option on 8 more
India	2004	228	WZT-3M	ARV	2006; 2007	USD 202 m deal (18-40% of components produced in India)

Recipient	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
Iraq	2005	600	Dzik	APV	2005 – 2007	USD 80 m or USD 180 m deal; Dzik-3 version
United States	2009	9	M28 Skytruck	light transport aircraft	2009 – 2011	US designation C-145A
Algeria	2011	8	W-3 Sokol	helicopter	2014	W-3A version
Philippines	2011	8	W-3 Sokol	helicopter	2012 – 2013	PHP 2.8 b (USD 64 m) deal
United States	2011	6	M28 Skytruck	light transport aircraft	2012	US designation C-145A
India	2012	8	WZT-3M	ARV	2013	
Sweden	2017	1	Artemis	support ship	2023	For modification in Sweden to SINGINT ship
Estonia	2022	300	Piorun	portable SAM	2023	EUR 103 m deal (incl. 100 launchers); delivery planned 2023-2025
Norway	2022	150	Piorun	portable SAM	2023	NOK 350 m (USD 35 m) deal; delivery planned from 2023
Ukraine	2022	54	Krab 155mm	self-propelled gun		EUR 650 m deal (partly financed by EU aid); delivery planned 2024
Ukraine	2022	1000	Piorun	portable SAM	2022	Aid after 2022 Russian invasion of Ukraine
Slovakia	2023	180	Piorun	portable SAM		Selected but not yet ordered by the end of 2023; delivery planned 2024-2027

Recipient	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
Ukraine	2023	200	AMV	IFV	2023	Financed by EU and USA aid after 2022 Russian invasion of Ukraine; Rosomak version
<b>SLOVAKIA</b>						
Egypt	1991	49	DV-2	turbofan	1993 – 1995	For 49 L-59E trainer/combat aircraft from Czech Republic
Syria	1992	58	T-72M1	tank	1993	Part of USD 200-350 m deal (for 252 T-72 tanks ordered from Czechoslovakia; incl. 194 delivered before 1993 from Czechoslovakia)
India	1993	35	VT-72B	ARV	1995	USD 32 m deal; probably incl. 25 assembled from kits in India
Algeria	1994	54	BMP-2	IFV	1995; 1996	BVP-2 version; incl. BVP-2K CP version
India	1994	78	VT-72B	ARV	1996; 1997	Ordered after planned Indian production given up due to problems with producing T-72M chassis
Tunisia	1994	12	DV-2	turbofan	1995 – 1997	For 12 L-59T trainer/combat aircraft from Czech Republic
India	1999	42	VT-72B	ARV	2001; 2002	USD 30 m deal
Cyprus	2001	12	Zuzana 155mm	self-propelled gun	2007	Ordered and delivered via Greece



Recipient	Year of order	Number ordered	Weapon designation	Weapon description	Year(s) of delivery	Comments
Saudi Arabia	2015	42	M12 120mm	mortar	2019; 2020	M12-1535 version
Ukraine	2022	8	Zuzana-2	self-propelled gun	2022; 2023	
Ukraine	2022	16	Zuzana-2	self-propelled gun	2023	EUR 93 m deal; financed by Denmark; Germany and Norway as aid after 2022 Russian invasion of Ukraine; delivery planned 2023-2024

Source: Own elaboration on the basis of <https://doi.org/10.55169/SAFCr241>



Petr Svatoň

## **Will the war in Ukraine revive the Czech Republic's once great arms industry?**

### **Historical context – a former arms industry powerhouse**

The Czech arms industry has a very long and far-reaching history. The post-1989 era is rather an exception in the country's economic history and the only period when the defence industry *has not* played a crucial role in the overall national economy.

The territory of today's Czech Republic was among the first areas in Continental Europe to industrialize in the mid-19th Century, and quickly rose to become the industrial heartland of the Austro-Hungarian Empire<sup>1</sup>. Therefore, after gaining independence in 1918, Czechoslovakia inherited

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<sup>1</sup> O. Stratilík, "Vrchol za perestrojky. Zbrojní produkce v roce 1987 činila 29 miliard", *Euro.cz*, 2 September 2018, <https://www.euro.cz/clanky/vrchol-za-perestrojky-1418632/> [26.03.2024].

an outsized defence industrial capacity<sup>2</sup>, which was disproportionate in relation to the needs of the much smaller nation. At the same time, the volatile security situation forced Czechoslovakia to become self-sufficient in both the development and production of all necessary weapon systems<sup>3</sup>. During WWII, the Czech defence industrial base was heavily utilized by the Nazis.

After the Communist takeover in 1948 and the country's incorporation into the Soviet-led Warsaw Pact, Czechoslovakia became an important cog in the war machine of the Communist Bloc, producing both domestically developed weapons as well as licensed Soviet weapon systems, churning out tanks and infantry fighting vehicles by the thousands<sup>4</sup>. The country routinely spent around 8% of its gross national product on the military<sup>5</sup>, and in some years, was the third largest exporter of armoured vehicles in the world, after the USSR and US<sup>6</sup>.

## Demilitarization after 1989

After the fall of Communism in Czechoslovakia in 1989, and continuing after its division in 1993, the Czech arms industry was drastically hit by the twin processes of:

<sup>2</sup> D. Khol, "(Staro)Nové příležitosti pro český zbrojní průmysl", *CZ Defense*, 5 October 2020, <https://www.czdefence.cz/clanek/staronove-prilezitosti-pro-cesky-zbrojni-prumysl> [26.03.2024].

<sup>3</sup> D. Sářka, "Zbrojní průmysl v ČR – historie a perspektivy", *Bakalářská práce. Vysoká škola ekonomická v Praze*, Praha 2010, <https://theses.cz/id/y5nlu8/> [26.03.2024].

<sup>4</sup> "Československo v minulosti vyvezlo 35 000 tanků a obrněnců, vyplývá z knihy o čs. tankových silách", *Vojenský historický ústav*, 6 September 2012, <https://www.vhu.cz/ceskoslovensko-v-minulosti-vyvezlo-35-000-tanku-a-obrnenecu-vyplyva-z-knihy-o-cs-tankovych-silach/> [26.03.2024].

<sup>5</sup> D. Khol, "Zbrojní průmysl posilovat, ale pragmaticky", *CZ Defense*, 23 April 2023, <https://www.czdefence.cz/clanek/zbrojni-prumysl-posilovat-ale-pragmaticky> [26.03.2024].

<sup>6</sup> D. Khol, "(Staro)Nové příležitosti", op. cit.

- 1) a complex transformation of its economy towards a free-market model;
- 2) a dramatic reduction in the size of the country's armed forces.

The far-reaching and dramatic neoliberal reforms carried out across the economy and centred around privatization were applied even to arms-producing corporations, which suddenly found themselves de-nationalized and operating in an open market. As we shall later see, there are still some state-owned players in the Czech arms industry. Nevertheless, the country's defence sector can be, generally speaking, considered unique because of the extent to which it operates in a market-based, capitalist model. The liberal model of the arms industry embraced by the Czech Republic has meant that since the 1990s, defence corporations have had to fend for themselves, with comparatively little support in the form of government guarantees or subsidies<sup>7</sup>.

At the same time, the post-Cold War nosedive in Czech military spending and corresponding downsizing of the military has led to an equivalent fall in demand for arms and other equipment. The Czech armed forces went from being a conscript-based military of circa 200,000 servicemen in the late 1980s<sup>8</sup> to having merely 28,000 active-duty soldiers in 2021<sup>9</sup>, while military expenditures declined from circa

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<sup>7</sup> Ibid.

<sup>8</sup> V. Bureš, "Vývoj počtů vojáků v armádě od konce druhé světové války", *Armáda České republiky*, 10 November 2004, <https://acr.army.cz/scripts/detail.php?id=3894> [26.03.2024].

<sup>9</sup> "Vývoj skutečných počtů osob v resortu MO ČR v letech 1992 – 2022", *Ministerstvo obrany České republiky*, 11 January 2023, <https://mocr.army.cz/scripts/detail.php?id=129653> [26.03.2024].

8% of GDP<sup>10</sup> to around only 1% in the early 2010s, and are only expected to reach the NATO threshold of 2% in 2024<sup>11</sup>.

There has also been a comparable decrease in the amount of equipment. In 1993, the newly independent Czech Republic inherited 957 tanks and 954 infantry fighting vehicles from the former Czechoslovakia<sup>12</sup>, which was already a substantial reduction from some 4,000 tanks and 4,700 IFVs in the arsenals of the pre-1989 period, even taking into account the fact that some of the equipment was passed onto Slovakia<sup>13</sup>. In the following years, the number was further reduced, while the production of new equipment for domestic forces grinded to a halt.

Until the first deliveries of Leopard 2A4 tanks in 2022, 14 of which (plus 1 recovery vehicle) were so far handed over to the Czech Republic as a part of the German *Ringtausch* program of supporting Ukraine<sup>14</sup> (with further deliveries being negotiated), the Czech Republic still operated a remainder of its Soviet-era fleet of tanks, without purchasing any new ones, which stands in contrast to the over 900 T-72 tanks

<sup>10</sup> D. Khol, "Zbrojní průmysl posilovat", op. cit.

<sup>11</sup> M. Janko, "Česko nedává na obranu tolik, co slíbilo. Závazek vůči NATO splní až příští rok", *Deník.cz*, 26 January 2023, <https://www.denik.cz/cesi-v-cislech/cesko-cr-nato-rozpocet-vydaje-obrana-hdp-srovnani-procenta-20230126.html> [26.03.2024].

<sup>12</sup> "Tank T-72 ve službě ČSLA", *Vojenský historický ústav*, <https://www.vhu.cz/exhibit/tank-t-72-ve-sluzbe-csla> [26.03.2024].

<sup>13</sup> "Československo v minulosti vyvezlo 35 000 tanků a obrněnců, vyplývá z knihy o čs. tankových silách", *Vojenský historický ústav*, 6 September 2012, <https://www.vhu.cz/ceskoslovensko-v-minulosti-vyvezlo-35-000-tanku-a-obrnencu-vyplyva-z-knihy-o-cs-tankovych-silach/> [26.03.2024].

<sup>14</sup> K. Čapek, "Německo nabídlo ČR další bojové tanky Leopard 2A4", *Armáda České Republiky*, 21 February 2024, <https://acr.army.cz/informacni-servis/zpravodajstvi/nemecko-nabidlo-cr-dalsi-bojove-tanky-leopard-2a4-249441/> [26.03.2024].

delivered by the domestic industry to the armed forces during the 1980s<sup>15</sup>.

It is true that there was a modernization program for the Czech Republic's T-72s carried out during the 1990s and 2000s by Czech defence corporations, but the gradual decrease of its scope itself tells the story of declining domestic demand for armaments – out of the 300-400 tanks originally planned to be modernized in 1994, only 30 ended up actually being upgraded to the T-72M4CZ standard<sup>16</sup>. In consequence, it also inevitably reduced the demand for maintenance services. Similarly, the Czech Republic also stopped acquiring new artillery pieces and still operates 1980s-made DANA vz. 77 howitzers<sup>17</sup>, which are only to be replaced by French CAESARs starting in 2024. Meanwhile, rocket artillery, formerly based around domestically produced RM-70 MLRSs, was completely abolished in 2010.

Export opportunities also dried up, as other former Warsaw Pact countries similarly decreased their arms purchases, and relations with Cold War-era Third World customers such as India, Egypt or Syria were given less priority. Overall, arms exports declined from EUR 602 million<sup>18</sup> in 1987 (as Czechoslovakia) to EUR 82.9 million in 2003<sup>19</sup>.

<sup>15</sup> "Tank T-72 ve službě", op. cit.

<sup>16</sup> D. Khol, "(Staro)Nové příležitosti", op. cit.

<sup>17</sup> J. Grohmann, "Armáda ČR obnovuje dělostřelectvo: Houfnice DANA zůstává", *Armádní Noviny*, 1 February 2017, <https://www.armadinoviny.cz/armada-cr-obnovuje-delostrelectvo-ceska-houfnice-dana-zustava.html> [26.03.2024].

<sup>18</sup> Using 2003 constant prices, conversions provided by the Czech Ministry of Foreign Affairs. In: M. Tůma, "Relics of Cold War: Defence Transformation in the Czech Republic", *Stockholm International Peace Research Institute*, 2006, <https://www.sipri.org/publications/2006/sipri-policy-papers/relics-cold-war-defence-transformation-czech-republic> [26.03.2024].

<sup>19</sup> Ibid.

When democratic Czech Republic did in fact make large-scale arms purchases, they typically involved foreign suppliers. Most notably, the country's air force was modernized by a long-term lease of Swedish-made JAS-39 Gripen fighter jets in 2005, while in the present era, the greatest acquisition concerns US F-35 fighter jets.

In general, we can conclude that the Czech arms industry after 1989 had to adjust to a severe lack of purchases by the Czech military. Meanwhile, when attempting to export on the global market, it was forced to compete with the technological advantage, much greater capital endowment, and established global maintenance and logistic networks of Western defence firms. This compelled Czech defence firms to seek out smaller niches within which they remain competitive.

### **Types of activities**

There are, in principle, five such niches listed here in ascending order in terms of their technological sophistication, the amount of added value, as well as respective distance from Soviet-era technologies:

#### *Maintenance of domestic military equipment*

The Czech armed forces continue to rely on a substantial amount of Warsaw Pact-era equipment, which is only now being phased out in connection with Russia's invasion of Ukraine, which has served as a crucial impetus for long-delayed acquisitions of modern replacements, and has simultaneously created a one-off opportunity to get rid of obsolete equipment that has been handed over to Ukraine.

The Czech Army, therefore, still uses, for example, 120 1980s BVP-2 infantry fighting vehicles, a Czechoslovak version of the Soviet BMP-2<sup>20</sup>. Their servicing is handled by the STV Group<sup>21</sup> (mainly an ammunition producer, further discussed in part IV), which also provides maintenance for DANA vz. 77 self-propelled howitzers<sup>22</sup>.

The Czech Army also still operates the 30 aforementioned modernized T-72M4 CZ tanks, as well a small number of highly obsolete T72M1s, whose maintenance is handled by the VOP CZ state-owned enterprise<sup>23</sup>, until they are replaced by a yet-to-be-realized purchase of Leopard 2A8 tanks, likely in the quantity of 77 pieces.

#### *Modernization and potential export of Warsaw*

##### *Pact-era military equipment*

The VOP CZ, who handled the original modernization of the Czech Republic's T-72s in the 1990s and 2000s to the T-72M4 CZ standard, is currently working on further updates<sup>24</sup>.

On the commercial and export-oriented side of the Czech arms industry, the modernization and sale of outdated Soviet-era equipment are at the heart of the business model of the Excalibur Army corporation, arguably the most important producer of heavy military equipment in the Czech

<sup>20</sup> The BVP-2s are to be replaced by 246 newly purchased Swedish CV-90 infantry fighting vehicles, which shall be delivered between 2026 and 2030.

<sup>21</sup> "STV Group opravila BVP-2 pro zahraničního zákazníka", *STV Group*, <https://www.stvgroup.cz/novinky/stv-group-opravila-bvp-2-pro-zahranicniho-zakaznika> [26.03.2024].

<sup>22</sup> "STV Group opravi pro AČR houfnice DANA", *STV Group*, 4 March 2019, <https://www.stvtechnology.cz/novinky/stv-group-opravi-pro-acr-houfnice-dana> [26.03.2024].

<sup>23</sup> "Pásová technika", *VOP.cz*, <https://vop.cz/pasova-technika/> [26.03.2024].

<sup>24</sup> *Ibid.*



Republic, and indeed in many cases the only one, mainly for artillery pieces.

Since its foundation in the mid-1990s, the company has found success refurbishing and re-selling discarded Czech military equipment, and later by importing, overhauling and re-exporting Warsaw Pact-origin equipment from third countries, which include either fellow post-Communist states or developing countries, with destination primarily in the Global South. Building on this success, the company has grown to become the heart of the Czechoslovak Group (CSG), a holding company that includes multiple other firms, mainly in the defence sector, and can be seen as the most important player in the Czech arms industry, besides the state itself.

Among the equipment in its portfolio, the Excalibur Army currently offers the RM-70 VAMPIRE 122 mm multiple-launch rocket system, a modernized version of the Czechoslovak RM-70 (“rocket-launcher, model 1970”), itself a mutation of the famous Soviet GRAD BM-21 system, whose modernized version, called BM-21 MT, the company also produces<sup>25</sup>. Both MLRS systems have kept the original 122 mm rockets and have added digitized features such as a computerized aiming system or a fire control system. Both weapon systems have been exported to Indonesia, which was the original customer, and since 2022, also to Ukraine<sup>26</sup>.

The firm has also reworked the original DANA vz. 77 self-propelled howitzer into the modernized DANA

<sup>25</sup> D. Khol, “(Staro)Nové příležitosti”, op. cit.

<sup>26</sup> J. Janovský, “Bohemian Brotherhood: List Of Czech Military Supplies To Ukraine”, *Oryx*, 10 July 2022, <https://www.oryxspioenkop.com/2022/07/bohemian-brotherhood-list-of-czech.html> [26.03.2024].

M1 and DANA M2 versions<sup>27</sup>. Both have kept the original gun, but have added a more powerful engine, as well as digitized features which should increase the speed of firing and thus increase the weapon's survivability on the modern battlefield. (It should be added that the individual DANA M1 and M2s are new pieces produced from scratch, not old refurbished ones)<sup>28</sup>.

Last but not least, the Excalibur Army also produces two modernized versions of the T-72 tank, called T-72 Scarab and T-72 Avenger, both of which feature digitized interfaces for the crew, as well as enhanced night vision and greater protection, including explosive reactive armour<sup>29</sup>. The former is a modular product, capable of being amended based on the customer's needs, while the latter has been tailor-made specifically for Ukraine in 2022<sup>30</sup>.

### *Production of domestically-developed military equipment*

While this article keeps this category and the former one separate, it should be kept in mind that while the Czech arms industry is capable of independent research and development of new products and systems, this is done in

<sup>27</sup> "DANA M2 – nejnovější verze osvědčené houfnice se představuje", *Armádní Noviny*, 16 August 2018, <https://www.armadinoviny.cz/dana-m2-nejnovejsi-verze-osvedcene-houfnice-se-predstavuje.html> [26.03.2024].

<sup>28</sup> J. Grohmann, "Houfnice DANA M2: Nasazení na Ukrajině do deseti hodin", *Armádní Noviny*, 9 December 2020, <https://www.armadinoviny.cz/houfnice-dana-m2-nasazeni-na-ukrajine-do-deseti-hodin.html> [26.03.2024].

<sup>29</sup> "T-72 Scarab – česká modernizace osvědčeného bojového tanku", *Armádní Noviny*, 13 February 2019, <https://www.armadinoviny.cz/t-72-scarab-ceska-modernizace-osvedceneho-bojoveho-tanku.html> [26.03.2024].

<sup>30</sup> T. Kolářik, "Čechy darovaný tank Tomáš je zmodernizovaná T-72 na míru ukrajinské armády", *iDnes.cz*, 21 October 2022, [https://www.idnes.cz/technet/vojenstvi/tank-tomas-ukrajina-t-72m1-darek-pro-putina.A221020\\_112534\\_vojenstvi\\_alv](https://www.idnes.cz/technet/vojenstvi/tank-tomas-ukrajina-t-72m1-darek-pro-putina.A221020_112534_vojenstvi_alv) [26.03.2024].

a path-dependent model, where new products are often still being built on earlier, Soviet-era technologies.

Among the best examples are the Excalibur Army's two new self-propelled howitzers, the DITA and MORANA, introduced in 2021 and 2022, respectively. While the DITA still shares visible similarities with the DANA, the MORANA is a completely distinct and novel weapon system. Both of these new Czech artillery pieces use the NATO standard 155 mm calibre ammunition, instead of the 152 mm Warsaw Pact calibre, and both also boast an extended range of fire. The original DANA, as well as its M1 and M2 versions, have a relatively short range of 18.7 kilometres, which is the result of the relatively short 37-calibre lengths of the barrel<sup>31</sup>. DITA's barrel length is 45 calibres, while MORANA's stands at the NATO-standard of 52 calibres.

This has resulted in an extended range, though the precise range has never been shared with the public. The producer states a range of 39 kilometres for the DITA and 41.5 kilometres for MORANA, but this is measured while using extended-range base bleed shells. The range with ordinary shells has not yet been published and is almost certainly more limited, while also undoubtedly longer than the one offered by the original DANA vz. 77 because of the different barrel lengths.

The MORANA remains a prototype while the DITA is already being produced for Ukraine based on a contract for

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<sup>31</sup> The range of the firearm is extended with a longer barrel, as the projectile is accelerated by expanding gas inside the barrel for a longer period of time.

9 pieces funded by the Netherlands, the first-ever purchase of the new weapon system<sup>32</sup>.

CSG's Excalibur Army has also developed its own armoured combat vehicle, not based on a Soviet-era predecessor – the PATRIOT 4x4, which is also available in its larger PATRIOT II 4x4 version. Both are modular vehicles and can be outfitted with an array of weapons ranging from anti-tank missile launchers and machine guns to a remote-controlled autocannon, depending on customer specifications. The Czech Army has, up to this point, not purchased the vehicle, which has been so far most notably utilized by the Polish army in a domestically-manufactured version called “Waran”, which has also been modified into the Ottokar Brzoza tank destroyer<sup>33</sup>.

The Czech company SVOS, which normally specialises in converting commercial vehicles into specialist military or police vehicles, also offers two armoured vehicles developed entirely in-house: the mine-resistant, ambush-protected Vega, available in various configurations on either a 4x4 or 6x6 chassis, and the modular, open-top 4x4 Perun. Unlike the converted vehicles, with which the company has found commercial success, the Perun and Vega have so far failed to find customers, and neither have been purchased even by the Czech military – Vega was spurned in favour of

<sup>32</sup> “Netherlands acquires Czech Dita self-propelled howitzer for Ukraine”, *Army Recognition*, 28 February 2024, [https://armyrecognition.com/defense\\_news\\_february\\_2024\\_global\\_security\\_army\\_industry/netherlands\\_acquires\\_czech\\_dita\\_self-propelled\\_howitzer\\_for\\_ukraine.html](https://armyrecognition.com/defense_news_february_2024_global_security_army_industry/netherlands_acquires_czech_dita_self-propelled_howitzer_for_ukraine.html) [26.03.2024].

<sup>33</sup> “Patriot – obrněné vozidlo (nejen) pro střední Evropu”, *CZ Defense*, 15 October 2022, <https://www.czdefence.cz/clanek/patriot-obrne-vozidlo-nejen-pro-stredni-evropu> [26.03.2024].

Nexter's Titus, while Perun entirely failed to fulfil the army's requirements<sup>34</sup>.

The Czech arms industry is also capable of producing electronic equipment, mainly radars and, in particular, passive tracking devices, as well as jammers for electronic warfare purposes. This area was one of the specialties of Communist Czechoslovakia's arms industry during the Cold War, where the country even made novel technological and scientific advances – most notably the invention of passive radiolocation in the late 1950s<sup>35</sup>. Indeed, two contemporary leading Czech firms in this area, RETIA and ELDIS (both controlled by the CSG holding), are successors of the defunct Communist state-owned enterprise Tesla Pardubice. ELDIS mainly produces radars for civilian air control, while RETIA manufactures short-range radars for air defence purposes (to be integrated with MANPADS and other SHORAD and VSHORAD systems) as well as detection devices for security purposes.

Meanwhile, the company ERA<sup>36</sup> specializes in passive tracking devices, with its most notable product arguably being the Vera-NG ("next generation") passive enhanced surveillance measure tracker, capable of detecting and monitoring targets without being detected itself, which separates it from normal radars. The new version of the passive

<sup>34</sup> "Komentář: Perun a Vega od SVOSu: Nespěšn projekty, kter nekoupila ani česk armáda. Bude posledním dějstvím soud?", *SecurityMagazin*, 2019, <https://www.securitymagazin.cz/defence/komentar-perun-a-vega-od-svosu-neuspesne-projekty-ktere-nekoupila-anic-ceska-armada-bude-poslednim-dejstvím-soud-1404064267>.html. [6.05.2024].

<sup>35</sup> J. Vávra, "Závody ve zbrojení. Jak Československo zasáhlo do studené války", *Lidovky.cz*, 13 September 2018, [https://www.lidovky.cz/byznys/zavody-ve-zbrojeni-jak-ceskoslovensko-zasahlo-do-studene-valky.A180913\\_123809\\_firmy-trhy\\_ele](https://www.lidovky.cz/byznys/zavody-ve-zbrojeni-jak-ceskoslovensko-zasahlo-do-studene-valky.A180913_123809_firmy-trhy_ele) [26.03.2024].

<sup>36</sup> Itself founded by former Tesla Pardubice employees and currently owned by OMNIPOL, formerly a Communist SOE with monopoly rights on the import and export of aircraft.

tracker builds on the 1990s Vera, which was itself based on the Communist-era radio-locator "Tamara", developed in Tesla during the 1980s<sup>37</sup>. Vera-NG has already been supplied to the Czech Army (2 complexes) and Ukraine (4 complexes, purchased by the Netherlands)<sup>38</sup>, while an export version of the original Vera ("Vera-E") has been exported to multiple countries, including, Vietnam, Malaysia and Indonesia<sup>39</sup>.

In the area of jammers, the Czech Republic's newest addition is the STARKOM system, introduced in 2022 and already delivered to the Armed Forces of the Czech Republic last year in the quantity of 8 systems. The jammer was developed by the state-controlled Military Research Institute in cooperation with the private JIST Institute and URC Systems, and is deployed on a Tatra 8x8 chassis. STARKOM is a follow-up on the earlier Moruš system and should be able to jam telecommunications, including mobile signals, as well as GPS or WiFi, or to disable enemy drones<sup>40</sup>.

An interesting success of the Czech defence industry in the last few years is its sale of a Medium Range Air Defense ("MRAD"), a Ground-Controlled Interception ("GCI") system, and a tactical ballistic missile system (ITBM KHAN) to

<sup>37</sup> J. Podpěra, P. Vrabec, "Radaru Tamara se spojenci báli, tak přišel dopis z Bílého domu", *Ekonomický Magazín*, 25 May 2018, <https://e-news.cz/rozhovory/radaru-tamara-se-spojenci-bali-tak-prisel-dopis-z-bileho-domu-i/> [26.03.2024].

<sup>38</sup> "The Netherlands announced the transfer of VERA-NG radar to Ukraine", *Militarnyj*, 24 February 2024, <https://mil.in.ua/en/news/the-netherlands-announced-the-transfer-of-vera-ng-radar-to-ukraine/> [26.03.2024].

<sup>39</sup> T. Svoboda, "Ukrajina obdrží 4 nejmodernější české pasivní radary VERA-NG", *Armyweb*, 16 June 2023, <https://www.armyweb.cz/clanek/ukrajina-obdrzi-4-nejmodernejsi-ceske-pasivni-radary-vera-ng> [26.03.2024].

<sup>40</sup> M. Šiška, "Nové rusičky STARKOM jsou unikátní. Armáda využívá možností domácího obranného průmyslu", *CZ Defense*, 11 February 2023, <https://www.czdefence.cz/clanek/nove-rusicky-starkom-jsou-unikatni-i-v-alianci-armada-vyuziva-moznosti-domaciho-obranneho-prumyslu> [26.03.2024].

Indonesia in late 2022, with a price tag of over EUR 500 million. The development and production of both systems are managed by the Czechoslovak Group (CSG), which directly produces some parts and subcontracts other activities while acting as a system architect and integrator. Radar production is being handled by RETIA for MRAD and by ELDIS for CGI, while both the surface-to-air missiles for MRAD and surface-to-surface ITBM KHAN missiles are being delivered by the Turkish company Rocketsan. What makes this project outstanding is the ability of the CSG to place itself at the centre of the development and production of a sophisticated weapon system that is not based on earlier Czechoslovak or Soviet technology<sup>41</sup>.

On the publicly-owned side of the Czech defence industry, the VOP enterprise has long been active in the development and production of light unmanned ground vehicles, used for reconnaissance and transport<sup>42</sup>. In 2023, the VOP introduced its 4th generation of the TAROS 6x6 robot, whose previous version has also been modified into the specialized UGV Pz reconnaissance vehicle by the Military technical institute<sup>43</sup>.

In the area of military aircraft, the Czech Republic's most important domestic producer is the OMNIPOL-owned Aero Vodochody. Its 1990s attempt to produce a light fighter jet in the form of the L-159 has mostly failed, as only the Czech

<sup>41</sup> "Excalibur International implements new projects for Indonesia worth over EUR 500 million", *Defense Industry Europe*, 16 December 2022, <https://defence-industry.eu/excalibur-international-implements-new-projects-for-indonesia-worth-over-e500-million/> [26.03.2024].

<sup>42</sup> P. Vitásek, "Robot na kolech. Jedinečný český výrobek chrání životy vojáků", *Deník.cz*, 25 April 2023, <https://www.denik.cz/podnikani/robot-pro-vojaky.html> [26.03.2024].

<sup>43</sup> J. Grohmann, "UGV-Pz: Český průzkumný robot pro Armádu ČR", *Armádní Noviny*, 16 July 2020, <https://www.armadinoviny.cz/ugv-pz-cesky-pruzkumny-robot-pro-armadu-cr.html> [26.03.2024].

Air Force and the post-2003 Iraqi Air Force were willing to buy the platform. Since then, the firm has developed the L-39 NG, a reworked jet trainer based on the original L-39 from the late 1960s. The NG model has already been successfully sold to the LOM Praha SOE<sup>44</sup>, which handles the training of Czech combat pilots, as well as exported to numerous countries, including the United States, France, Hungary, Vietnam and Senegal, and its manufacturer hopes that further sales will follow. In order to keep up with demand, the manufacturer decided to hire new workers and even introduce second shifts in September 2023, when the firm had orders for 34 planes in total.

Finally, the Czech Republic is a relatively successful manufacturer of small arms for military, police and civilian purposes. The largest company in this sector is Česká zbrojovka, which manufactures a wide range of man-held firearms, ranging from pistols to submachine guns and assault rifles, as well as sniper rifles and grenade launchers is a well-established supplier in many countries, particularly in sub-Saharan Africa. Perhaps the best-known known product is the assault rifle BREN-2, available in multiple modifications, including as a sniper rifle. The weapon is used by the Czech Army as well as the armies of Portugal and Rwanda, along with the police forces of multiple states such as Romania and France. Small quantities are used by Ukrainian forces.

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<sup>44</sup> "Significant milestones of the Czech L-39NG: five years since the first flight", *Aero*, 19 January 2024, <https://www.aero.cz/en/significant-milestones-of-the-czech-l-39ng-five-years-since-the-first-flight/> [26.03.2024].



*Production of components for foreign-made equipment*

Czech defence companies can also serve as subcontractors for foreign firms, the most notable example of that arguably being the use of Tatra trucks as chasses for various foreign weapon systems. Importantly, this includes French CAESAR 8x8 self-propelled howitzers, originally placed on a 6x6 Renault Sherpa 5/Arquus Armis chassis, but replaced by a Tatra 815-7 for deliveries to the Czech Republic (52 units) and Denmark (19 units, all donated to Ukraine in 2023)<sup>45</sup>.

A Tatra 815-7 chassis is also used by the Ukrainian Neptune anti-ship missile system (both for missile-launching and radar vehicles). Other foreign applications of the Tatra 185-7 chasses for military purposes include the Ukrainian self-propelled howitzer Bogdana 2S22, the Slovak Zuzana 2 self-propelled howitzer, the Israeli air defence system SPYDER, the multiple launch rocket system PULS, and the self-propelled howitzer ATMOS.

*Production of licensed foreign-developed or jointly developed military equipment*

Since the late 2000s, Czech arms companies have proven their capability to take over the production of foreign weapon systems, to nearly always produce them primarily for the Czech military. The first major instance of this was the original purchase of 107 PANDUR II 8x8 modular armoured vehicles, which were purchased from the Austrian Company Steyr, but produced by the VOP CZ enterprise,

<sup>45</sup> "Houfnice Caesar 8x8 – budoucnost českých dělostřelců", *Armádní Noviny*, 8 June 2021, <https://www.armadninoviny.cz/houfnice-caesar-8x8-budoucnost-ceskych-delostrelcu.html> [26.03.2024].

with the exception of an initial batch of 17 vehicles<sup>46</sup>. Afterward, the production of PANDUR IIs was licensed by Steyr's owner, General Dynamics European Land Systems, to the CSG-owned Tatra Defence Vehicle, which has since then produced them in small series for the domestic army (20 pieces)<sup>47</sup> as well as for Indonesia and the Philippines.

A more ambitious version of a similar arrangement is currently taking place with the Czech Republic's ongoing acquisition of 246 Swedish CV-90 Mark IV Infantry fighting vehicles. According to the contract with the vehicle's manufacturer, BAE Systems, the Czech industry will deliver at least 40% of the value of the contract, with 5 Czech companies already having signed contracts guaranteeing their participation and the total amount of participating Czech companies likely to exceed 30. A crucial role is being played by the VOP CZ enterprise, which will assemble the vehicles and verify their functionality. Following delivery, the Czech Republic will have a full license for the maintenance of the CV-90s, as well as their upgrading and connected research, and future production<sup>48</sup>.

Finally, the Czech industry, namely the Tatra Defence Vehicle company (CSG), also produces the Titus 6x6 multirole armoured vehicle, developed jointly with the French

<sup>46</sup> L. Světnička, "Vojáci se dočkali, začali přebírat první obrněné transportéry Pandur", *IDnes*, 30 September 2009, [https://www.idnes.cz/zpravy/domaci/vojaci-se-dockali-zacali-prebirat-prvni-obrne-transportery-pandur.A090930\\_104910\\_domaci\\_jw](https://www.idnes.cz/zpravy/domaci/vojaci-se-dockali-zacali-prebirat-prvni-obrne-transportery-pandur.A090930_104910_domaci_jw) [26.03.2024].

<sup>47</sup> "Ministerstvo obrany podepsalo nákup obrněnců Pandur. Cena stoupla na více než dvě miliardy", *ČT24*, 30 January 2017, <https://ct24.ceskatelevize.cz/clanek/domaci/ministerstvo-obrany-podepsalo-nakup-obrnencu-pandur-cena-stoupla-na-vice-nez-dve-milardy-103298> [26.03.2024].

<sup>48</sup> "CV90 – otázky a odpovědi (průběžně aktualizováno)", *Ministerstvo obrany České Republiky*, 12 July 2023, <https://mocr.army.cz/informacni-servis/zpravodajstvi/cv90---otazky-a-odpovedi-244249/> [26.03.2024].

Nexter company, 62 of which are being produced for the Czech army<sup>49</sup>, while deliveries for Albanian, United Arab Emirates and Saudi Arabian armies, as well as French police, are also underway.

### **The Czech arms industry's current state**

In general, we can say that the Czech arms industry has managed to preserve Soviet-era know-how and to build on it to develop new products. Nevertheless, it faces problems regarding demand, which is tied to the fact that its products are either:

- a) very niche (for example passive trackers and electronic warfare equipment);
- b) not particularly new or groundbreaking (e.g., RM-70 Vampire, DANA M2, DITA, PANDUR II);
- c) lacking in established maintenance infrastructure and availability of spare parts (e.g., MORANA).

The Czech state seeks to support its arms industry by purchasing domestic-made military equipment when possible, but these orders are inevitably relatively small, which reflects the size of the Czech armed forces. These orders are probably enough to keep the producers on the market, but they are hardly a sufficient incentive to increase production to a level where more regular and cost-effective production could be established. There are export opportunities, but those are relatively few and far between and often one-off,

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<sup>49</sup> P. Otto, "Armáda koupí desítky transportérů Pandur a Titus. Za miliardy je dodá Strnadova CSG", *e15.cz*, 19 April 2022, <https://www.e15.cz/byznys/prumysl-a-energetika/armada-koupi-desitky-transporteru-pandur-a-titus-za-miliardy-je-doda-strnadova-csg-1389371> [26.03.2024].

a perfect example being the deliveries to Indonesia, which is frequently the only customer for a given weapon system.

Consequently, the Czech arms industry currently exists on a relatively small scale. Even one of the largest companies, Excalibur Army, only employs “over 700” people<sup>50</sup>, which is nothing to be scoffed at, but hardly makes it seem like an industrial powerhouse. The Czechoslovak Group as a whole (which does business outside the defence sector as well) had some 8,200 employees as of 2019<sup>51</sup>. Another major firm, the predominantly munitions-making STV Group, also has about 700 employees as of May 2023<sup>52</sup>. Probably the largest single employer in the area of the Czech arms industry is the small-arms making Česká zbrojovka, which employed some 2,000 people as of 2019<sup>53</sup>. It should be kept in mind, however, that its products are not strictly military-grade and are frequently sold on the civilian market or to police forces.

The production capacity of the Czech arms industry is overall difficult to estimate, largely due to the ad-hoc and inconsistent nature of production, which is based on individual, one-off contracts, rather than sustained manufacturing at a given level. Most of the products described in this report only have several users and are not produced continually. Production is also largely not mechanized and automated, as is typical, for example, for the commercial automobile industry,

<sup>50</sup> “Company”, *Excalibur Army*, <https://www.excaliburarmy.cz/company> [26.03.2024].

<sup>51</sup> P. Beran, “Klíčové firmy českého obranného a bezpečnostního průmyslu na Dnech NATO”, *CZ Defense*, 17 September 2019, <https://www.czdefence.cz/clanek/klicove-firmy-ceskeho-obranneho-a-bezpecnostniho-prumyslu-na-dnech-nato> [26.03.2024].

<sup>52</sup> M. Knížek, “Hlad po zbraních neodezní. Očekáváme poptávku dalších 10 až 15 let, říká šéf STV Group”, *Hospodářské Noviny*, 22 May 2023, <https://archiv.hn.cz/c1-67204820-hlad-po-zbranich-neodezni-ocekavame-poptavku-dalsich-10-az-15-let-rika-sef-stv-group>, [26.03.2024].

<sup>53</sup> P. Beran, “Klíčové firmy českého”, op. cit.

but instead relies on a skilled workforce – workers with years or decades of hands-on experience, who repair old pieces or build new ones with hand-held drills, welders, rivet guns, etc.

This has two important implications. Firstly, production can be expanded somewhat, but not exponentially, as workers pose a significant bottleneck. At the same time, there are trade-offs, as activities can be prioritized at the expense of others, and therefore, the production of one type of equipment by a company may limit the production of another, given the shifting of workers. (Another bottleneck is material, in particular the availability of older pieces of heavy equipment to be refurbished). Secondly, a hypothetical very large acquisition of new equipment (as opposed to the modernization of old ones) could provide the Czech defence companies with both the funds and the certainty of future income necessary to make substantial capital investments into mechanizing production, which would, in turn enable them to hire less experienced workers and to re-train them more quickly. When combined, these factors make it difficult to estimate production levels, which are simultaneously constrained by bottlenecks, but could be permanently expanded in response to a sufficiently large contract.

Another possibility would be a loan or equity infusion. Unfortunately, as in other EU countries, Czech arms companies face insurmountable obstacles in applying for bank loans due to the financial industry's practice of Environmental, Social and Governance reporting, which disincentivizes banks and investment funds from providing capital to defence companies.

Currently, the Czech industry is able to refurbish at most circa 10 pieces of Soviet-era equipment in every given

category (tanks, howitzers, MLRS) per month, if provided with the old pieces to be modernized. The production capacity for brand new equipment (such as PANDUR II, DITA) is much lower, at the level of lower tens of pieces per year, even though it is at least not constrained by the necessity to purchase existing pieces. For aircraft, the limit is probably on the order of 10-15 pieces a year, either in complex upgrades (for example, helicopters of Soviet origin), or the production of entirely new planes, such as the L-39 NG. The situation is better in military-grade trucks and in large-calibre ammunition, which is discussed in the next section.

### **Cooperation and aid to Ukraine as an opportunity to enhance the Czech arms industry's production capacity**

The war in Ukraine is undoubtedly a once-in-a-generation opportunity for the Czech arms industry, which has for the first time since 1990 been presented with an opportunity to produce at a significant scale. This is enabled by Ukraine's obvious and desperate need for armaments, combined with the willingness (so far) of its Western allies to fund its war effort, among other routes also by financing the production of arms and ammunition in the Czech Republic.

On top of the general opportunity, which applies to the entire European arms industry, the Czech defence industry possesses several specific strengths with respect to Ukraine. Among the most important is its established familiarity and mutual trust with the Ukrainian arms industry and government, which was already established in the years between 2014 and 2022, when Ukraine started to purchase Czech weapon systems and components, such as Tatra

815-7 chasses. Another advantage is that heavy weapons produced or refurbished by Czech companies are typically either upgrades of Warsaw Pact-era designs or are at least based on earlier Eastern Bloc designs, which makes it easier and quicker for the Ukrainians to learn how to use the new equipment or to find spare parts for it. The relatively low price is another advantage when compared to more sophisticated products of Western European or American arms manufacturers. At the same time, the performance of Czech armaments, such as DANA M2 or RM-70 Vampire, is still very much competitive on the Ukrainian battlefield where much older platforms are commonly used by both sides. For all these reasons, Czech defence companies have often been the go-to option for purchasing armaments, either for Ukraine itself or for its allies.

Arguably the most notable case of this trend has been the delivery of a total of 117 T-72 Avenger tanks, whose modernization has been financed by the United States, the Netherlands, Denmark and Ukraine<sup>54</sup>, while one tank was symbolically fundraised by the Czech public in a show of national goodwill and solidarity<sup>55</sup>. In order to accelerate their production, the Excalibur Army company hired additional workers, including Ukrainian refugees, as well as trained Ukrainian professionals selected for the task by their own government<sup>56</sup>. Moreover, it is, in principle, able to pro-

<sup>54</sup> J. Janovský, "Bohemian Brotherhood", op. cit.

<sup>55</sup> T. Kolářik, "Tank Tomáš odjel na ukrajinskou frontu", *CZ Defense*, 21 October 2022, <https://www.czdefence.cz/clanek/tank-tomas-odjel-na-ukrajinskou-frontu> [26.03.2024].

<sup>56</sup> "Sovětský šrot po faceliftu. Češi na Ukrajinu posílají k nepoznání vylepšené T-72", *Aktuálně*, 7 December 2022, <https://zpravy.aktualne.cz/domaci/pomahame-ukoncit-valku-driv-up-rhlici-opravuji-v-cesku-tanky/r~b73615ec760f11edbe29ac1f6b220ee8/> [26.03.2024].

duce one modernized tank every 4 days<sup>57</sup>, but this critically depends on the availability of old T-72 tanks, whose post-Soviet stocks in Europe are already running thin<sup>58</sup>.

This currently makes the Czech Republic (both the government and industry) incapable of sustaining the extraordinary rate of deliveries to Ukraine from 2022, when the state played a surprisingly important and even pioneering role, which however relied on the ability to pull military equipment from storage (as happened with the government's donation of BVP-1/BMP-1s, or original T-72s), or to purchase it on the market. In other words, while the deliveries of refurbished Soviet-era armaments are certainly helpful for the Ukrainian war effort, they cannot be seen as a sustainable business model.

The aforementioned Dutch purchase of 9 DITA self-propelled howitzers for Ukraine can be more plausibly seen as an opportunity for a possible path forward for the whole industry, or at least for its owner, the Excalibur Army, as these are brand-new weapon systems whose production can, in principle, be upscaled.

If more and larger purchases are made of modern Czech-developed products, such as MORANA, this could provide the “big push” needed to start their serial production – in other words, to move from the current mode of

<sup>57</sup> M. Pivoňka, “Ukrajíně v boji proti Rusku pomáhají a budou pomáhat české modernizované tanky a další systémy”, *CZ Defense*, 6 December 2022, <https://www.czdefence.cz/clanek/ukrajine-pomahaji-a-i-nadale-budou-pomahat-v-boji-proti-rusku-ceske-modernizovane-tanky-a-houfnice> [26.03.2024].

<sup>58</sup> M. Balabán, “Úspěšný rok českých zbrojařů s novými výzvami na obzoru”, *CZ Defense*, 25 December 2022, <https://www.czdefence.cz/clanek/uspesny-rok-ceskych-zbrojaru-s-novymi-vyzvami-na-obzoru> [26.03.2024].



quasi-artisan work, which relies on individual experienced engineers, to more capital-intensive and mechanized production. This could, in turn, not only lessen the reliance on precious human capital but also make the products cheaper and more competitive through economies of scale. Meanwhile, the modern technologies used and the development and ownership by domestic capital would ensure high Czech value added that “stays at home”, which could restore some of the overall economic importance the defence industry used to have, which would be extremely helpful in a time when the Czech economy has gone through protracted stagflation and has been hard-hit by the rise of energy prices. However, it remains very much an open question whether any such large-scale acquisitions will ever materialize, as the current acquisitions by the Czech government, Ukraine, or allies have not been on the required scale, with the exception of the T-72 Avengers, which are not a new product.

The one area where demand has truly skyrocketed and production is already significantly increasing in a way that seems sustainable in the long run is ammunition production, especially large-calibre ammunition, which is concentrated in the hands of the STV Group. The company produces everything from small-calibre ammunition for assault rifles to auto-cannon ammo, rocket-launched grenades and large-calibre artillery ammunition, including 155 mm NATO-standard shells, which can also be produced in an extended-range modification. The production of 155 mm shells started in early 2024 on a brand-new production line, utilizing an imported SA-15 filling machine. The shells are currently solely produced for Ukraine, even though later this year, at least some outputs will be re-directed to the Czech

Army, which needs to stock up on 155 mm shells in connection with the purchase of the French CAESAR howitzers. The stated production capacity is 56,000 – 150,000 artillery shells per year, depending on type<sup>59</sup>. Presumably, the capacity is lower for the 155 mm calibre and larger for smaller calibre, such as 122 mm or 81 mm.

According to the STV Group's chairman of the board of directors, the firm's production of large calibre ammunition has increased tenfold since the 24th of February 2022, while the output in repair and modernization of vehicles has increased fivefold<sup>60</sup>. Recently, the STV Group, along with the company Explosia, which produces propellant cartridges for artillery shells, succeeded in their application to join the EU's ASAP ("Act on Supporting Ammunition Production") program, which will lead to further purchases of their output for Ukraine<sup>61</sup>.

Another area where the Czech arms industry is already on a substantial upswing is the production of Tatra Trucks, whose sales have risen from 1,186 in 2020 to 1,451 in 2023<sup>62</sup>, thanks to contracts from both the Czech Army and foreign

<sup>59</sup> "The launch of a new line for filling (not only) artillery shells is the beginning of a new era for STV Group", *STV Group*, <https://www.stvgroup.cz/en/news/the-launch-of-a-new-era-for-stv-group>, <https://www.stvgroup.cz/en/news/the-launch-of-a-new-era-for-stv-group> [26.03.2024].

<sup>60</sup> J. Klímová, "Přepočítali jsme se. Stále je tu reálná hrozba obyčejné konvenční války, říká zbrojař Hác", *iRozhlas.cz*, 12 March 2024, [https://www.irozhlas.cz/ekonomika/zbrojni-prumysl-stv-group-david-hac-zbrane-munice-valka-ukrajina-nato\\_2403121540\\_jud](https://www.irozhlas.cz/ekonomika/zbrojni-prumysl-stv-group-david-hac-zbrane-munice-valka-ukrajina-nato_2403121540_jud) [26.03.2024].

<sup>61</sup> "České společnosti uspěly v rámci programu ASAP", *Ministerstvo obrany České Republiky*, 15 March 2024, <https://mocr.army.cz/informacni-servis/zpravodajstvi/ceske-spolecnosti-uspely-v-ramci-programu-asap-249998/> [26.03.2024].

<sup>62</sup> "Automobilka Tatra Trucks v roce 2023 opět navýšila výrobu a chystá další novinky", *TATRA*, 2 February 2024, <https://www.tatra.cz/o-spolecnosti/tisk-a-media/novinky-a-clanky/automobilka-tatra-trucks-v-roce-2023-opet-navysila-vyrobu-a-chysta-dalsi-novinky-2/> [26.03.2024].

militaries, including those of India, Austria, Belgium, or Persian Gulf countries<sup>63</sup>. Some trucks are also being exported to Ukraine, but the war has had a less dramatic impact on them than on ammunition production or tanks and howitzers, as Tatra's sales had already been rising before the full-scale Russian invasion.

## Conclusions

In sum, we can say that the Czech arms industry continues to possess significant and in many cases unique know-how, but has overall suffered from low demand for a long time, which has prevented it from becoming truly successful on the international stage in competitive markets such as the one for howitzers, and forced it to survive with low-level of production for the domestic military, supplemented by occasional export opportunities. While the current war in Ukraine presents an opportunity to make investments into upscaling production, the contracts given to the Czech industry so far cannot be seen as sufficient for a major transformation of the industry, with the exception of large-calibre ammunition.

Therefore, in order to make the leap necessary to once again become a major player in the international arms markets, the arms industry of the Czech Republic would need much larger contracts, preferably for brand-new products. However, neither Ukraine nor even the Czech Republic itself currently possesses the necessary purchasing power, while individual foreign governments have so far not made purchases on a sufficient scale and have mostly preferred

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<sup>63</sup> Ibid.

relatively cheaper modernization of old products, rather than the acquisition of modern and state-of-the-art ones. Given the traditional tendency of governments, including Czech ones, to prioritize the domestic arms industry, it is difficult to imagine a scenario where foreign states such as the United States or France decide to make a monumental purchase of Czech armaments for Ukraine, when they can purchase their own equipment, and hence make sure that the money spent will “stay at home” and create jobs, which will in turn make it easier to politically justify such spending. It is telling that among the largest buyers of Czech armaments for Ukraine, we can find the Netherlands and Denmark – this is presumably due to the fact that they do not possess their own domestic industrial capacity in the given area. Unfortunately, these countries are, to put it bluntly, too small to be expected to make significant purchases in the future.

One somewhat plausible hope lies in EU fiscal programs or loans dedicated to supporting Ukraine, which can, in principle, provide the required sums of money needed to kickstart Czech arms production and enable the usage of such funds for the purchase of Czech armaments. Whether such a program will materialize, however, remains an open question.





Péter Marton

## **The Hungarian defence industry: between the past and plans**

### **Introduction and historical context**

The Hungarian defence industry, similarly to other post-socialist defence sectors, entered an era of struggle in the 1990s<sup>1</sup>. The old Eastern Bloc markets have been largely lost, other markets have become unavailable due to sanctions regimes, while state subsidies and domestic demand also decreased drastically. Security perceptions have fed a tendency in decision-makers to ignore defence modernisation right up to the post-2014 situation, in the wake of Russia's unlawful annexation of Crimea, which eventually led to a reassessment of security and defence needs and the consequent consideration of the need for a defence industrial base.

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<sup>1</sup> K. Budavári, *A magyar védelmi ipar helyzete és fejlődési lehetőségei*, Magyar Hadtudományi Társaság – Hungarian Association of Military Science, Budapest 2021, pp. 37–43, <https://m2.mtmt.hu/api/publication/31598449> [24.03.2024].

Accordingly, the Hungarian defence budget began to grow not only in absolute terms but relative to GDP. By 2022, defence expenditure reached 1.44% of GDP, with a high rate of modernisation-related spending for the acquisition of new assets and equipment – a positive development overall, but one to be assessed in parallel to relative underinvestment in the military’s human resources and having only reached defence spending of above 2% of GDP by 2023. The latter fact is particularly remarkable at a time when Russia, NATO’s main adversary, has essentially shifted to a war-economy footing.

In line with the Zrínyi 2026 Homeland Defence and Military Modernisation Program<sup>2</sup> announced in 2016 and the Irinyi Plan of industrial strategy<sup>3</sup> of the same year, the Hungarian government adopted a Defence Industrial Strategy (DIS) in 2021 (the document is not publicly available). The key institutional stakeholder behind it was the Ministry of Innovation and Technology, the ministry that oversaw higher education at the time – with the understanding that the need to provide skilled labour for the industry is dependent to a great extent on an adequate higher education strategy that is conducive to training the required specialists in appropriate numbers, especially in the STEM (Science, Technology, Engineering and Mathematics) fields.

The latter consideration regarding skilled labour is both warranted and a sign of present-day weakness – the DIS can only deliver if investments and decisions made going

<sup>2</sup> “Zrínyi 2026”, *Honvedelem.hu*, 16 January 2017, <https://honvedelem.hu/hirek/hazai-hirek/zrinyi-2026-2026.html> [24.03.2024].

<sup>3</sup> “Irinyi Plan”, *Magyar Gazdaságfejlesztési Ügynökség*, <https://ifka.hu/hu/page/irinyi-2021> [24.03.2024].

forward will bring the kind of results that are expected. Otherwise, what remained of the Hungarian defence industry after the slim years (from 1990 to 2014) does not yet stand on solid ground, and some of the foundations will have to be built up on the go. Moreover, given the country's small size and limited resources to subsidise its domestic production, economical functioning would require producing at scale, which may, in turn, depend on exports – presenting a vicious circle of sorts, given the need to be competitive at least in the less demanding markets for the sake of having something to sell. As such, the DIS is currently a strategy of purposeful economic mobilisation, counting on domestic as well as foreign resources to achieve its aims over time.

### **Details of the defence industrial strategy**

An ultimate goal of the strategy, as summarised by Taksás and Hegedűs<sup>4</sup>, is the establishment of six distinct defence industrial clusters that will focus, respectively, on military aviation (centred on Békés county), the manufacture of small arms (centred on Bács-Kiskun county), armoured fighting and other vehicles (centred on Zala and Somogy counties), ammunition, explosives and live fire simulation systems (centred on Veszprém and Fejér counties), radio and satellite communication systems (centred on Budapest and its environs), and radar systems (centred on Szabolcs-Szatmár-Bereg county). Four “sub-strategies” serve overarching goals. One deals with overall industry design, supply chains,

<sup>4</sup> B. Taksás, E. Hegedűs, “A magyar védelmi ipar jövőképe”, *Köz-Gazdaság – Review of Economic Theory and Policy*, 17 (2022), no. 1, pp. 9-26, <https://unipub.lib.uni-corvinus.hu/7241/1/1405-Article%20Text-5247-1-10-20220309.pdf> [24.03.2024].



targeted subsidies to strengthen the latter, and knowledge imports (such as how to acquire the necessary know-how in the first place); the second deals with innovation; the third with issues of education to secure the necessary human resource base of the DIS; and the fourth with structures of command for the industry.

The first of the sub-strategies (knowledge imports and supply chains) is as important for a defence industry that is yet-to-be-created as is the third (human resources), and reflects the imperative of “cooking with what one has”. From support to start-ups in promising areas – that is, ones with competition that can be prospectively penetrated by newcomers – to reinforcing existing, already somewhat competitive firms in other areas, and incentivising investment by major foreign manufacturers, only a multi-pillared approach can be envisioned to work. With the objective of exploring opportunities for growth and knowledge acquisition, a Defence Innovation Research Institute has been established to help foster links between the NATO DIANA (Defence Innovation Accelerator for the North Atlantic) initiative and Hungarian firms that may be eligible for services and grant resources from DIANA and able to join international military research and development networks. For the first time in 2023, an Almanach of the Hungarian defence industry was published by the Defence Industry Association of Hungary<sup>5</sup>, highlighting the relevant companies that may have something to offer in this respect (with

<sup>5</sup> *Hungarian Defence Industry – 2023*, Defence Industrial Association of Hungary, [https://vedelmiipar.hu/downloads/tmp/MVSZ\\_Almanach\\_2023\\_web.pdf](https://vedelmiipar.hu/downloads/tmp/MVSZ_Almanach_2023_web.pdf) [24.03.2024].

38 member companies listed, and 34 out of those introduced in more detail).

## **Foreign investment meets local resources**

Recent news in the media reflect some of the major developments regarding the target of enticing leading-edge and “decent-edge” manufacturers to come to Hungary. With these, altogether, considerable progress is already being made.

## **Tanks and armoured vehicles**

### **– Rheinmetall makes a splash**

Most prominently, Rheinmetall AG’s factory, which opened in August 2023 in Zalaegerszeg to produce Lynx Armoured Fighting Vehicles (AFVs), as well as, prospectively, KF51 Panther tanks, has indicated how the implementation of both the Zrínyi 2026 program and the DIS has gained momentum. The Hungarian Defence Forces (HDF) plans to procure a total of 218 Lynx AFVs, out of which 172 stand to be manufactured in Zalaegerszeg, with a capacity of 45 pcs per annum<sup>6</sup>. Serial production was set to begin as early as 2023, but the first Hungarian-assembled Lynx AFV only became available at the very end of that year for testing, i.e., not yet operationally<sup>7</sup>.

The prospect of becoming involved in the manufacture of Panther tanks is clearly an example of engagement with

<sup>6</sup> F.D. Dajkó, “Térképen mutatjuk, hol nyílnak hadiüzemek Magyarországon”, *Novekedes.hu*, 5 September 2022, <https://novekedes.hu/elemezsek/terkepen-mutatjuk-hol-nyilnak-hadiuzemek-magyarorszagon> [24.03.2024].

<sup>7</sup> “Elkészült az első Zalaegerszegen gyártott Lynx harcjármű”, *hvg.hu*, 22 December 2023, [https://hvg.hu/kkv/20231222\\_Elkeszult\\_az\\_első\\_Zalaegerszegen\\_gyartott\\_Lynx\\_harckocsi](https://hvg.hu/kkv/20231222_Elkeszult_az_első_Zalaegerszegen_gyartott_Lynx_harckocsi) [24.03.2024].

the cutting-edge sector of the industry. The Panther, at the prototype stage, is a modularly built battle tank carrying a 130 mm gun served by an autoloading system. The latter allows for the exchange of one member of the crew for a drone operator or a platoon or company commander; that is, besides other options, given how experiences of the war in Ukraine may strongly underline the importance of electronic warfare, too, which may lead to the consideration of alternatives based on the lessons-learned process that is already underway.

Meanwhile, in nearby Győr, the Hungarian subsidiary of the Turkish Nurol Makina firm is setting out to produce Gidran armoured tactical vehicles – 50 of these have been ordered by the HDE, with the acquisition of 100 more planned per reports (the annual manufacturing capacity is also indicated at 100 pcs per year, planning for export needs as well). The Turkish company is already somewhat embedded in the Hungarian economy, with its supply chain including a Kaposvár-based Hungarian firm assembling radar and weapons systems for its vehicles (that is, BM Heros, whose capacities will be used and expanded by Rheinmetall Hungary Zrt.)<sup>8</sup>.

Notably, both the arrival of Rheinmetall and Nurol Makina concern the cluster focused on military vehicles in the West of Hungary – farthest from the eastern border of the country and best integrated into Central European logistics networks (including for railway, road and riverine transportation).

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<sup>8</sup> See F.D. Dajkó, "Térképen mutatjuk", op. cit.

Also located in this area is the ZalaZone vehicle test site, where reports indicate plans to set up drone research, too. This may logically complement vehicle development both with the prospect of developing drones operating with the vehicles manufactured and testing the Counter-Unmanned Aerial Systems (C-UAS) means to defeat enemy drones that may be a threat to them. The overlap of the Western Hungarian vehicles-focused defence cluster with the cluster of military aviation reflects Rheinmetall AG's plans and priorities. The German company came to Hungary as part of a complex investment scheme, which saw it acquire a minority stake in the major Hungarian ICT firm 4iG. It now looks ahead to setting up drone manufacturing, reportedly expressing interest in producing Israeli HERO loitering munitions (LMs) – which was publicly revealed by Hungarian Prime Minister Viktor Orbán<sup>9</sup>. HERO LMs have a double X-wing configuration commonly employed in this weapons category, including in the case of the ZALA Lancet drones known from Russia's war of aggression against Ukraine (with the name of the Russian manufacturer being identical to the name of Zala county in Hungary only by coincidence). In fact, even the presence of Turkish Nurol Makina is closely linked to Rheinmetall AG's interests and thus integrated with larger German defence industrial concepts, which may treat Hungary's Dunántúl (Transdanubian) area (areas to the west of the Danube) as both safe and sufficiently serviceable to weave into their production and development plans.

<sup>9</sup> "Orbán Viktor beszéde a Rheinmetall gyárátadó ünnepségén", *Kormany.hu*, 19 August 2023, <https://kormany.hu/beszede-k-interjuk/miniszterelnok/orban-viktor-beszede-a-rheinmetall-gyaratado-unnepsegen>.

Indigenous potential in the vehicles-focused cluster is constituted by the Rába Vehicle Industry Holding and Kvantex. Self-developed (or largely self-developed) military off-road trucks (such as the H14 type) and military buses (such as the E95 type) of Rába are used by the HDF. The company's capacities currently cover the ability to produce elements of the chassis for 500 trucks and 150 buses annually (albeit, apparently, with a tight bottleneck of capacity for the construction of only under 200 structures to be mounted on said chassis). Besides serving domestic demand, Rába also exports to Austria and Germany.

### **Ammunition, firearms**

With an investment of HUF 300 billion (over EUR 770 million), a major Defence Industrial Complex (DIC) has been unveiled in Várpalota, in Veszprém county, making ammunition, including high-calibre artillery ammunition, and employing prospectively up to 1,000 to 1,200 people. This cluster would clearly have to be developed in the future to reflect the needs of the vehicle and small arms clusters. The Várpalota DIC will host production of the recently Hungarian-acquired (by HDT Védelmi Ipari Kft.) Austrian firm Hirttenberger Defence Systems' 120 mm heavy mortars (of which a "double-digit" number is to be procured by the HDF, as indicated in: SuT, 2022). This is also where 30 mm ammunition will be made (by Rheinmetall Hungary Munitions Zrt.) for the Lynx AFVs' autocannon, along with 155 mm projectiles for PzH 2000 Self-Propelled Howitzers and 120 mm

munitions for the Leopard 2 tanks of the HDF<sup>10</sup>. As to 155 mm artillery munitions, reports cite plans that “Hungary will be one of the biggest sites of production for them in NATO” by 2027<sup>11</sup>; it may be worth noting that if Rheinmetall indeed, as envisaged<sup>12</sup>, manages to raise its overall global production by 700,000 pcs (of shells) by 2025, the production in Várpalota will come on top of that, i.e., only later (perhaps by 2026). The production of RDX explosives in Várpalota is also envisaged from 2027 only<sup>13</sup>.

As part of the small arms cluster, Kiskunfélegyháza, in Bács-Kiskun county, is home to HM Arzenál, an already well-established holding firm making a number of products, including contemporary Colt firearms under license (the original U.S. firm and brand is today a Czech acquisition). Other licenses acquired cover weapon products of Česka zbrojovka Uherský Brod (the Czech Republic) and Unique Alpine (from Germany; a maker of sniper rifles). The Czech firm’s products made in Kiskunfélegyháza include CZ BREN 2 assault rifles, Scorpion Evo 3 carbines and P-09 pistols (since 2018), with reportedly as much as 70% of the output going on to be exported. The local DIC received an initial

<sup>10</sup> G.P. Kovács, “Magyar lőszergyártó kapacitás: növekszik a várpalotai lőszergyár”, *Védelmi ipari blog*, 30 January 2024, <https://vedelmiiparblog.hu/blog/magyar-loszergyarto-kapacitas-novekszik-a-varpalotai-loszergyar/> [24.03.2024].

<sup>11</sup> “A politikai retorika ellenére Magyarország és Szlovákia is küld fegyvereket Ukrajnába”, *Szent Korona Rádió*, <https://szenkoronaradio.com/blog/2024/01/05/a-politikai-retorika-ellenere-magyarorszag-es-szlovakia-is-kuld-fegyvereket-ukrajnaba/> [24.03.2024].

<sup>12</sup> “Rheinmetall is expanding its ammunition production capacity”, *Europäische Sicherheit und Technik*, 31 January 2024, <https://esut.de/en/2024/01/meldung-de/47297/rheinmetall-baut-kapazitaeten-fuer-munitionsfertigung-aus/> [24.03.2024].

<sup>13</sup> “Rheinmetall wins triple-digit million-euro contract for explosives factory in Várpalota, Hungary”, 2023 (no precise date indicated), *Defence 21*, <https://www.defence21.com/en/rheinmetall-wins-triple-digit-million-euro-contract-explosives-factory-v96C3%41rpalota-hungary/> [24.03.2024].

investment of HUF 22 billion back in 2018 for the purpose of this licensed production. In line with the goals of self-sustenance and resilience, all main components of the CZ BREN 2 can be manufactured domestically<sup>14</sup>, with secondary components produced by certified domestic suppliers. Products of the German-Israeli firm Dynamit Nobel Defence (DND) also stand to be produced here, including RGW 110 HHT-T anti-tank weapons for the HDF's needs.

### **Military aviation, radars – taking off**

As for military aviation, results to report include the setting up of a joint venture between the Airbus company and the Hungarian government – 30% Hungarian-owned and 70% Airbus-owned, at a value of EUR 90 million. This concerns the manufacture of both civilian and military helicopters in Gyula. Airbus' entry has already brought further accompanying investment (of EUR 17 million) by the Satys Group, a specialist in aircraft painting and the sealing and manufacturing of aircraft interiors, which is also setting up production in the area.

Given the obvious difficulties of entering the military aviation market, and thus in line with the DIS, a foreign acquisition has made the biggest news in recent years in the field of military aviation, namely, the acquisition of an 80% stake in the Czech Aero Vodochody a.s., the maker of the L-39NG trainer aircraft, which is used by the Hungarian Air Force (HAF).

<sup>14</sup> "Hazai fegyvergyártás – beszélgetés a gyárigazgatóval", *Kaliber Info*, 22 September 2021, [https://www.kaliberinfo.hu/cikkek/hazai-fegyvergyartas-beszelgetes-a-gyarigazgatoval/\[24.03.2024\]](https://www.kaliberinfo.hu/cikkek/hazai-fegyvergyartas-beszelgetes-a-gyarigazgatoval/[24.03.2024]).

In the field of radar technology, an already up-and-running significant piece of indigenous industry is the Hungarian firm Pro Patria, established in the market of making mobile (including man-portable and vehicle-mounted) ground surveillance radars for considerable clientele, including the United Kingdom and Polish militaries within NATO, along with African and Central Asian countries. The company has about 1,500 employees and is based in Budapest. Its major product, the PGSR-3i Beagle, can be used to track both on-the-ground targets and objects flying close to the ground. Foreign know-how is also present in Hungary in the form of the assembly and maintenance in Nyírtelek (in Szabolcs-Szatmár-Bereg county) of Israeli ELM-2084 air control, air defence and artillery reconnaissance radars, of which the HDF has ordered 11 so far, with the aim of replacing its Soviet-era radar equipment. Used for the purposes of air control and air defence, the ELM-2084 should be able to track 1,100 aerial targets within a range of 470 km. Functioning in an artillery reconnaissance or counter-battery role, it is reportedly capable of locating points of fire and points of impact in a 120-degree span up to a range of 100 km.

### **Evaluation in light of the broader political context**

As may be apparent from this overview, the Hungarian defence industrial strategy is working effectively overall to create a more adequate production base for HDF needs as long as those can be resourced and are treated as a priority. It will take much more time and incremental progress to be achieved through “circularities of causation” to lay the foundations of a more independent and thus more resilient national defence industrial base with the DIS. For the time



being, this implies no major compromise of autonomy given that membership in the NATO Alliance creates permissive conditions for investment decisions requiring and reflecting trust by partners such as Airbus and Rheinmetall AG (and behind them by France and Germany).

Concerns may arise from what some perceive as political risk related to an assertive Hungarian leadership often entering into conflict with the European Union and key partner states, albeit so far it seems that the government has been able to either leverage such conflict to secure outcomes conducive to the maintenance of military capabilities, or has at least avoided any fallout from it. This may be exemplified by the agreement with Sweden regarding the supply of more Gripen multi-role aircraft for the HAF (also providing for the extension of the lease agreement for the rest of the already-existing fleet, for Hungary taking ownership of the aircraft after 2026, and for setting up joint research on the application of Artificial Intelligence between Saab and the Hungarian Defence Innovation Research Institute)<sup>15</sup>. The latter package deal came on the heels of long drawn-out bickering about Swedish politicians' criticism of the state of the rule-of-law and democracy in Hungary and Hungary's delayed support for Sweden's NATO accession. The conclusion of the agreement is all the more significant given that Hungary has so far avoided procuring major U.S. weapons systems for its needs, giving added importance to the relationship with European suppliers.

<sup>15</sup> G. Nyilas, J. Presinszky, "Orbán új Gripenről állapodott meg a svédekkel, és NATO-tagokként egymásért fognak küzdeni", *Telex*, 23 February 2024, <https://telex.hu/belfold/2024/02/23/orban-viktor-ulf-kristersson-sajtotajekoztato-svedorszag-csatlakozas-nato> [24.03.2024].

Another fundamental longer-term concern is whether there is, on the one hand, an ability to domestically train the engineers and scientists necessary for the defence industry, and, on the other hand, to keep them not only in Hungary but also away from the better-paying sectors of employment. Otherwise, knowledge acquisition, a key target of the DIS, may remain an elusive goal – should the people with acquired knowledge not remain in place to practice and disseminate what they know.

## **Conclusions**

The abovementioned issues (the state and prospects of alliance relationships, and the availability of skilled labour) are often highlighted by observers. Less often discussed is how the lack of a truly clear strategic vision may undermine sustained support for the kind of consistent spending that Hungary's military modernisation and the related economic mobilisation for the creation of a defence industrial base entail.

The Hungarian government's rhetoric offers a seemingly straightforward answer as to why rearmament and defence industrialisation are necessary: to be able to stand on one's own feet. However, the simplistically presented relationship of means, ways, and the ability to defend oneself as an end leaves out the issue of how to address trade-offs with other strategic endeavours.

Hungary avoids anchoring its official discourse around upgrading the country's defences to countering the threat of Russia's belligerent revisionism. Meanwhile, its domestic media output (through public and pro-government non-public media) does not consistently support either

Western values or the very idea of belonging with the West. This does not lead to any explicit interpretation of how important defending oneself may be, relative to other goals, including that of economic prosperity. In fact, it does not even make it clear if the integrity of relations with Hungary's key allies should be occasionally prioritized over asserting the Hungarian leadership's perspective on issues ranging from military and economic assistance for Ukraine to issues of migration. For now, whatever compass is available to the Hungarian government to guide it in the long term, it keeps to itself, behind a wall of tactical rhetoric.

In other words, the Hungarian government may rely too much on tactics to securely sustain its strategy over the long term – or for Hungary, under any future government to come, to sustain this strategy. Nevertheless, executing this strategy is actually imperative given the present-day strategic landscape.



Mariusz Marszałkowski

## **Polish arms industry: prospects, opportunities, and challenges**

### **Introduction: the conflict in Ukraine triggers changes in the European arms industry**

The defence industry is a significant contributor to the national economy in peacetime, yet as the example of Ukraine shows, it becomes even more important in times of armed conflict. The 24 February 2022 assault by Russia on Ukraine has accelerated processes related to this branch of industry and purchasing decisions in many NATO states. This intensification presents opportunities for the development of arms industries, including those located in the Republic of Poland. A country's strength is often determined by the organisation and resilience of its arms industry. It is considered a key strategic asset.

Based on the experience with the conflict in Ukraine<sup>1</sup>, this is particularly important in areas such as the production of ammunition and its components. According to a report by The Royal United Services Institute (RUSI), Ukraine fires between 60,000 and 200,000 rounds per month (2,000 to 6,500 rounds per day), depending on the intensity of the clashes, the types of fighting, and the logistical capacity for supply. The Armed Forces of the Russian Federation (AFRF), on the other hand, fire between 300,000 and 500,000 rounds per month (between 10,000 and 15,000 rounds per day)<sup>2</sup>, which is still well below the level of the first months of the full-scale invasion, when, according to Ukrainian staff, the AFRF was expected to fire up to 60,000 rounds per day<sup>3</sup>. Ukraine faces a significant challenge in meeting the needs of its own army with munitions, also due to regular air attacks from Russia on its energy infrastructure, defence industry, and transport infrastructure. The term ‘missile famine’ has been coined in expert circles to describe the situation where the Ukrainians possess artillery systems but are unable to use them effectively due to shortages of firepower.

To bolster Ukraine’s defence efforts, European Union (EU) member states have pledged to support the country

<sup>1</sup> The specificity of the conflict arises from the traditional rivalry between two international actors. Therefore, the war has taken on a classic character of clashes between large groupings, which necessitate appropriate logistical support. This is a far different situation from the asymmetric threats faced by NATO countries after 1991.

<sup>2</sup> J. Watling, N. Reynolds, “Russian Military Objectives and Capacity in Ukraine Through 2024”, *RUSI*, 13 February 2024, <https://www.rusi.org/explore-our-research/publications/commentary/russian-military-objectives-and-capacity-ukraine-through-2024> [24.02.2024].

<sup>3</sup> “Zaluzhnyi: Russia uses up to 60,000 rounds of ammunition daily”, *The Kyiv Independent*, 16 August 2022, <https://kyivindependent.com/zaluzhnyi-russia-uses-up-to-60-000-rounds-of-ammunition-daily/> [24.02.2024].

with, among other things, a steady supply of artillery ammunition. However, the EU may struggle to fulfil its own commitments mainly due to industrial backwardness, under-investment, delayed investments<sup>4</sup>, and the need to establish and develop supply chains for ammunition components, including nitrocellulose and other key parts<sup>5</sup>. The French EU internal market commissioner, Thierry Breton, predicts that the EU will produce 1.4 million munitions by the end of this year, increasing to 2 million by 2025<sup>6</sup>. Breton reports that EU ammunition production has grown by almost 50% since February 2023<sup>7</sup>. In contrast, the Russian arms industry is projected to produce 2.2 million units of artillery ammunition with calibres of 122 and 152 mm in 2024<sup>8</sup>, which are the standard calibres used by the artillery systems of the AFRF.

## The historical background and structure of the Polish arms industry

Poland has been assisting Ukraine since the beginning of the full-scale invasion by supplying ammunition, as well.

<sup>4</sup> "Rheinmetall building new ammo plant at Unterlüß in northern Germany", *Rheinmetall*, 12 February 2024, <https://www.rheinmetall.com/en/media/news-watch/news/2024/02/2024-02-12-rheinmetall-builds-new-ammunition-factory-in-unterluess-ground-breaking-ceremony-with-chancellor-scholz> [19.03.2024].

<sup>5</sup> K. Kjellström Elgin, T. Hycker, "NATO has a munitions problem, and Europe needs to step up", *Defense News*, 1 February 2024, <https://www.defensenews.com/opinion/2024/02/01/nato-has-a-munitions-problem-and-europe-needs-to-step-up/> [19.03.2024].

<sup>6</sup> L. Kayali, J. Posander, J. Barigazzi, "EU to Ukraine: You'll get half the ammo we promised by March", *Politico*, 31 January 2024, <https://www.politico.eu/article/eu-to-ukraine-half-is-better-than-nothing-when-it-comes-to-ammunition/> [19.03.2024].

<sup>7</sup> J. Posaner, "EU Commission declares victory on its 1M shells for Ukraine pledge", *Politico*, 31 January 2024, <https://www.politico.eu/article/commission-declares-victory-in-million-artillery-round-mission/> [19.03.2024].

<sup>8</sup> J. Watling, N. Reynolds, "Russian Military Objectives", op. cit.

This has been possible due to capabilities inherited from its position in the Eastern Bloc. After the dissolution of the Warsaw Pact (WP), Poland had an extensive and versatile defence industry. Equipment and armaments used by the Land Forces, Navy, and Air Force of the WP states were manufactured, overhauled, and modernised in Poland. Additionally, Poland remains a home to plants producing various types of artillery munitions<sup>9</sup>.

In Poland, one can distinguish three main types of representatives of the Polish defence industry (PDI). These are:

- 1) State-owned companies – mainly Polska Grupa Zbrojeniowa S.A.;
- 2) Private companies – leading examples: WB Group, Luba-wa;
- 3) Foreign companies – mainly:
  - PZL Mielec, owned by the American Lockheed Martin;
  - PZL Świdnik, owned by the Italian-British AgustaWestland;
  - Airbus Poland, which is a company with French capital.

Furthermore, there are numerous other companies operating in the defence sector in Poland, such as Protector or Advanced Protection Systems S.A. However, they do not have a significant position in the arms market.

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<sup>9</sup> Both 122 mm and 152 mm Soviet standard artillery ammunition, and 155 mm NATO standard artillery ammunition; tank ammunition 120 mm (NATO) and 125 mm (post-Soviet), and small calibre ammunition including 30 mm, 23mm and 12.7mm. However, production capacity is not impressive. By mid-2023, Polska Grupa Zbrojeniowa was only able to produce 30-40 thousand rounds of 155 mm artillery ammunition per year. K. Wilewski, "Pięć razy więcej amunicji z polskich zakładów", *Polska Zbrojna*, 17 May 2023, <https://polska-zbrojna.pl/home/ArticleShow/39608> [21.03.2024].

## State companies

Polska Grupa Zbrojeniowa (PGZ) is the primary entity in the domestic defence market and is responsible for the majority of its revenue. It is a capital group that comprises 50 defence sector entities and holds shares in 32 other companies, which operate to varying degrees in the defence industry<sup>10</sup>. In the 2022 international ranking of the 100 largest entities in the defence industry prepared by the Stockholm International Peace Research Institute (SIPRI), PGZ was ranked 71st, which is an upward improvement of 5 positions from the 2021 listing<sup>11</sup>. The company is owned by the State Treasury via three entities. The State Treasury (Skarb Państwa) directly holds 50% of the shares, while the Polish Defence Holding and the Industrial Development Agency hold 26% and 24% of the shares, respectively. The 2022 report 'Functioning of PGZ and Subsidiaries' (Funkcjonowanie PGZ i spółek zależnych) by the Supreme Audit Office (Najwyższa Izba Kontroli) states that the Group had 17,400 employees in 2020<sup>12</sup>.

PGZ encompasses a wide range of armaments activities, which are divided into five distinct segments: land, arms and munitions, C4ISR (Command, Control, Communications, Computers [C4] Intelligence, Surveillance and Reconnaissance [ISR]), aviation, and maritime. Each domain corresponds to the main business profile of a specific

<sup>10</sup> "Grupa Kapitałowa", PGZ, <https://grupapgz.pl/o-nas/grupa-kapitalowa/> [19.03.2024].

<sup>11</sup> X. Liang (et al.), "The SIPRI Top 100 Arms-producing and military services companies", *SIPRI 2022*, p. 10, [https://www.sipri.org/sites/default/files/2023-11/fs\\_2312\\_top\\_100\\_2022.pdf](https://www.sipri.org/sites/default/files/2023-11/fs_2312_top_100_2022.pdf) [19.03.2024].

<sup>12</sup> "Funkcjonowanie PGZ i spółek zależnych", *NIK*, 147/2021/P/21/015/KGP, <https://www.nik.gov.pl/plik/id,25444,vp,28206.pdf> [19.03.2024].



group of companies<sup>13</sup>. In the land domain, the leading companies include Huta Stalowa Wola, Zakłady Mechaniczne Bumar-Łabędy, Ośrodek-Badawczo Rozwojowy Urządzeń Mechanicznych OBRUM, ROSOMAK SA, and Wojskowe Zakłady Mechaniczne. The companies responsible for ammunition in PGZ include Fabryka Broni "Łucznik", Zakłady Metalowe Dezamet, MESKO SA, Zakłady Chemiczne Nitro-Chem S.A., and Zakłady Mechaniczne Tarnów. PIT-Radwar, OBR-CTM, and Wojskowe Zakłady Elektroniczne S.A. are among the companies responsible for the C4ISR domain in the group. Similarly, Wojskowe Zakłady Lotnicze No.1 and No.2 are among the companies responsible for the aeronautical domain. The PGZ Stocznia Wojenna company is responsible for the maritime domain in the PGZ. Each company is responsible for contracts related to specific projects or cooperation between PGZ companies. For instance, the Naval Shipyard is building three multi-purpose frigates as part of the Miecznik programme for the Polish Navy, jointly with PIT-Radwar. PIT-Radwar is responsible for the OSU-35 Ship Armament System project in the programme, which is being implemented together with MESKO SA<sup>14</sup>. As a result, complex projects that require the cooperation and involvement of multiple entities can be implemented within the group.

PGZ produces a diverse range of military equipment, including tanks, artillery, missile systems, communication and radar systems, as well as individual equipment such as assault carbines, optoelectronic equipment, and direct

<sup>13</sup> "Spółki", PGZ, <https://grupapgz.pl/spolki/> [19.03.2024].

<sup>14</sup> "Okrętowy System Uzbrojenia OSU-35", PIT-Radwar, <https://www.pitradwar.com/oferta/391,system-armaty-morskiej-kal-35-mm-am-35> [19.03.2024].

protection equipment. The company is involved in overhauling and modernising Soviet-origin equipment, such as T-72 tanks, BWP-1, OSA-AKM, Newa-S.C., and WEGA anti-aircraft systems. They also produce the latest models of equipment and armaments that meet the requirements of modern battlefields and NATO standards. PGZ is responsible for implementing the main modernization programmes of the Polish army, both independently and in partnership with national and international entities.

In the category of heavy products, the Krab self-propelled howitzers stand out as one of the most profound. These howitzers have been battle-tested in Ukraine and are highly valued by Ukrainian operators<sup>15</sup>. Since 2012, the Polish Armed Forces have ordered more than 144 Krab AHS. Another notable product from PGZ, specifically from Huta Stalowa Wola, is the self-propelled mortar on the Rak wheeled chassis. This 120 mm calibre mortar has a firing range of up to 12 km. To date, the Polish army has received over 100 RAK mortars<sup>16</sup>. Bumar-Łabędy, a branch of PGZ's Gliwice, specializes in upgrading the T-72, PT-91, and Leopard 2A4 tank families to the modernized PL versions. Since 2003, the PGZ plant in Siemianowice-Śląskie has been manufacturing ROSOMAK Wheeled Armoured Transporters, a licensed version of the Finnish AMV-360P transporter.

<sup>15</sup> "Не встигаю рахувати вбитих ворогів". Бійці з Донеччини розповіли про влучність та комфорт польських гаубиць "Краб", *Suspilne*, <https://suspilne.media/317986-ne-vstiga-gau-rahuvati-vbitih-vorogiv-bijci-z-doneccini-rozpovili-pro-vlucnist-ta-komfort-pol-skih-gaubic-krab/> [19.03.2024].

<sup>16</sup> *Raki dla podhalańczyków*, <https://www.polska-zbrojna.pl/Mobile/ArticleShow/24600> [19.03.2024].

The PGZ product that generates the highest foreign sales is the GROM MANPADs and its upgraded version PIORUN. These systems are in use by Poland, Indonesia, Ukraine, Georgia, Lithuania, Estonia, Latvia, Norway, and the US, among others. GROM was used in combat during the 2008 war in Georgia. PIORUN has also been used by Ukrainian soldiers since the beginning of Russia's full-scale invasion of Ukraine. No data exists on the effectiveness of this system. However, according to unofficial information, the weapon has a track record of shooting down both helicopters and Russian aircraft, including Mi-24s, Su-25s and unmanned aerial vehicles (UAVs), including Orlan<sup>17</sup>.

PGZ is responsible for the production of radars and anti-aircraft systems. PIT-Radwar offers TRS-15M Odra medium-range radars with a range of 240 km, BYSTRA radars with a range of over 50 km, and PILICA anti-aircraft systems<sup>18</sup>.

What is more, PGZ is responsible for implementing polonisation projects, such as the Wisła and Narew air defence systems. These contracts require PGZ to produce Jelcz chassis, communication systems, and missile parts, including the CAMM system<sup>19</sup>. Additionally, Poland will produce ammunition and components for the K239 Chunmoo missile

<sup>17</sup> А. Галасюк, "Від Оrlанів до Ка-52 і навіть Су-34: як польський ПЗРК нищить російську зброю в руках ЗСУ", *DefenseExpress*, 16 November 2022, [https://defence-ua.com/weapon\\_and\\_tech/vid\\_orlaniv\\_do\\_ka\\_52\\_i\\_navit\\_su\\_34\\_jak\\_polskij\\_pzrk\\_nisshit\\_rosijsku\\_zbroju\\_v\\_rukah\\_zsu-8349.html](https://defence-ua.com/weapon_and_tech/vid_orlaniv_do_ka_52_i_navit_su_34_jak_polskij_pzrk_nisshit_rosijsku_zbroju_v_rukah_zsu-8349.html) [19.03.2024].

<sup>18</sup> "Oferta PIT-Radwar", *PIT-Radwar*, <https://www.pitradwar.com/oferta> [19.03.2024].

<sup>19</sup> "MBDA z dużym kontraktem dla polskiego systemu obrony powietrznej", *MBDA*, <https://www.mbda-systems.com/polska/press-releases/mbda-z-duzym-kontraktem-dla-polskiego-systemu-obrony-powietrznej/> [19.03.2024].

system, known in Poland as HOMAR-K<sup>20</sup>. PGZ, through WZM in Poznań, has the competence to overhaul and service Leopard 2 tanks. In the future, they will also be able to service M1A1/2 Abrams and K2 tanks.

### Private companies

Several dozen private defence companies operate in the Polish market. However, most of them are small entities that specialise in a narrow range of activities. For example, APS focuses on producing anti-drone systems, and Protector produces protective equipment for uniformed services, including the army. Two large private companies operating in the defence market in Poland are WB Group and Lubawa Group.

The WB Group is a privately owned capital group that specializes in manufacturing communications, command, reconnaissance, and battlefield management systems. The company produces observation, reconnaissance, command, and strike systems. The group employs over 1,200 people worldwide<sup>21</sup> and is one of the most active in the export market. Its solutions are supplied to the armies of the US, Ukraine, India, Malaysia, Sweden, and Slovakia, among others. WB has acquired customers for its products in Middle Eastern countries, although these purchases are not officially reported. The company's headquarters are located in Ożarów Mazowiecki, and its best-known products are

<sup>20</sup> See more: J. Bornio, *South Korea grounds its position in the Central and East European defence market*, [in:] *South Korea and Central Europe: Geopolitics, Security, and Economy*, ed. T. Stępniewski, Instytut Europy Środkowej 2023, pp. 61-71, <https://ies.lublin.pl/ies-policy-papers/2023-007-2/> [19.03.2024].

<sup>21</sup> "O Grupie WB", *Grupa WB*, <https://www.wbgroup.pl/technologie-laczności-i-dowodzenia-grupa-wb/> [19.03.2024].

unmanned systems, including FlyEye<sup>22</sup>, a reconnaissance UAV, and Warmate, a strike UAV also referred to as a 'circling munition'<sup>23</sup>. Both systems have been successfully deployed in Ukraine since 2015. WB has opened an office in Kiev and established the WB-Ukraine company to sell and service systems to the Ukrainian army<sup>24</sup>. The WB Group is increasing production capacity for both Fly-Eye and Warmate. According to the company's CEO Piotr Wojciechowski, the group's plants will build a total of 6,000 unmanned platforms in 2024, including 4,000 Warmate and 200 sets (4 each) of FlyEye<sup>25</sup>. The majority of production, 90%, will be exported, primarily to Ukraine.

The Lubawa Group is another private entity operating in the domestic armaments industry. Its main business includes the production of ballistic shields, bulletproof vests, specialized fabrics, and individual soldier equipment. In 2022, the group employed over 1,000 people<sup>26</sup>, although some contracts are carried out by subcontractors. The group

<sup>22</sup> FlyEye is a reconnaissance platform that detects, tracks and directs artillery fire at targets. The Ukrainian Armed Forces have repeatedly demonstrated the effectiveness of these systems, for example in conjunction with the US HIMARS missile system. The FlyEye detects the target and HIMARS fires GMLRS missiles at it.

<sup>23</sup> Warmate is an UAV system that can remain airborne over the battlefield for several tens of minutes, waiting to locate a target. Once a target is located, it can be engaged by hitting it with a warhead weighing several hundred grams. Warmate has a proven track record of targeting radar and air-defence systems of the AFRF. "Warmate", *WB Group*, <https://www.wbgroup.pl/produkt/system-amunicji-krazacej-warmate/> [19.03.2024]; M. Marszałkowski, "Polski Warmate niszczy rosyjskie systemy przeciwlotnicze", *Polon.pl*, 8 January 2024, <https://www.polon.pl/news/polski-warmate-niszczyc-rosyjskie-systemy-przeciwlotnicze-wideo/> [19.03.2024].

<sup>24</sup> "WB Ukraine", *WB Group*, <https://www.wbgroup.pl/wb-ukraine/> [19.03.2024].

<sup>25</sup> M. Cielma, "Grupa WB o roku spełnionych obietnic", *Dziennik Zbrojny*, 20 August 2023, <https://dziennikzbrojny.pl/aktualnosci/news,1,11880,aktualnosci-z-polski,grupa-wb-o-roku-speelnionych-obietnic> [19.03.2024].

<sup>26</sup> "Dane spółki Lubawa", *Puls Biznesu*, <https://notowania.pb.pl/instrument/PLLUBAW00013/lubawa/informacje-spolka> [19.03.2024].

is active not only in Poland but also has branches in Ukraine. The company used to have a production facility in Armenia but left the market in 2018. According to Jerzy Marek Nowakowski, the former Polish ambassador to Yerevan, this was due to political reasons<sup>27</sup>. Lubawa is a manufacturer that supplies uniforms and individual equipment to Polish Armed Forces soldiers.

### Foreign companies

Foreign companies with subsidiaries in Poland also have a significant share of the Polish arms market. The two largest foreign entities are the American company Lockheed Martin, which owns PZL Mielec, and the British-Italian company AgustaWestland, which operates PZL Świdnik. Both companies are active in the aviation market, producing helicopters and aircraft parts. Both PZL Świdnik and PZL Mielec primarily produce helicopters, which are purchased by various institutions and armies in Poland as well as abroad. PZL Świdnik's main product is the AW 149 transport helicopter, while PZL Mielec's is the S-70i transport helicopter. Both companies also carry out orders for entities operating within their corporations abroad in Italy and the US, respectively. PZL Mielec employs 1,500 people<sup>28</sup>, while PZL Świdnik employs approximately 3,000 people<sup>29</sup>.

<sup>27</sup> "Poland's former ambassador to Armenia: 'Lubawa-Armenia', producing armors, left Armenia after meeting with Pashinyan", *News.am*, 30 May 2022, <https://news.am/eng/news/704659.html> [19.03.2024].

<sup>28</sup> "Polska wraca do produkcji odrzutowców. W PZL Mielec powstały pierwsze elementy do myśliwca F-16", *PolskieRadio.pl*, 4 April 2023, <https://www.polskieradio.pl/399/7976/Artykul/3145763,Polska-wraca-do-produkcji-odrzutowcow-W-PZL-Mielec-powstaly-pierwsze-elementy-do-mysliwca> [19.03.2024].

<sup>29</sup> "Home", *PLZ-Świdnik*, <https://www.pzlswidnik.pl/pl/home> [19.03.2024].

Europe's Airbus is a significant aviation market player in Poland, with operations located near Warsaw-Okecie airport. The company provides maintenance services for C295 CASA aircraft for the Polish, Czech, and Kazakh Air Forces. According to the manufacturer, the Warsaw subsidiary of Airbus produces 40% of the CASA aircraft components sold worldwide<sup>30</sup>. 70% of the electrical harnesses used in Airbus transport aircraft are produced in Warsaw. Engineers at Airbus Poland design aircraft and their structural parts. The company plans to build a new plant in Radom. Currently, the company employs 700 people, but after expanding production capacity, it is expected to employ a total of about 1,500 people across all subsidiary companies in Poland<sup>31</sup>.

Furthermore, Pratt & Whitney, one of the world's largest manufacturers of engines used in F-16 fighter jets, among others, has branches in Poland, specifically in Rzeszów, Niepołomice, and Kalisz. The Polish plant is responsible for manufacturing gears, seal modules, and static structures, as well as overhauling engine components<sup>32</sup>. The company employs over 3,700 people across its various locations<sup>33</sup>.

In recent years, foreign entities, mainly in the aviation industry, have accounted for a significant portion of PDI

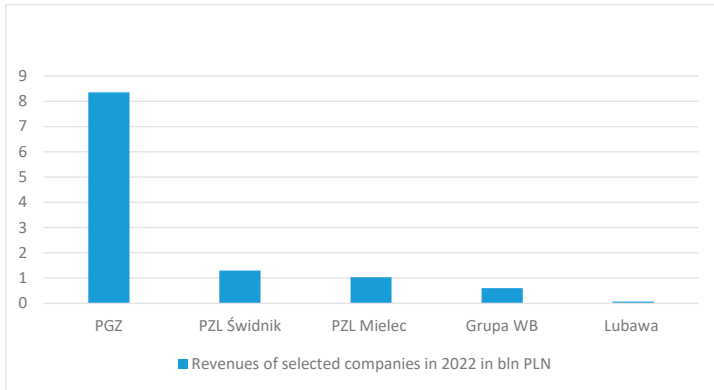
<sup>30</sup> "Airbus in Poland", *Airbus*, <https://www.airbus.com/en/our-worldwide-presence/airbus-in-europe/airbus-in-poland> [19.03.2024].

<sup>31</sup> W. Kaleta, "Spółka Airbusa od roku w Polsce. Wciąż rekrutuje w Gdańsku", *WNP.pl*, 30 October 2023, <https://www.wnp.pl/przemysl-obronny/spolka-airbusa-od-roku-w-polsce-wci-az-rekrutuje-w-gdansk,769034.html> [19.03.2024].

<sup>32</sup> "Obszary działalności", *Pratt & Whitney*, <https://pwrze.com/obszary-dzialalnosci> [19.03.2024].

<sup>33</sup> "Pratt & Whitney Rzeszów S.A.", *Pracuj.pl*, <https://pracodawcy.pracuj.pl/profile/pratt-whitney-rzeszow-s-a,02zvg1u,pl> [19.03.2024].

Figure 1. Revenues of selected companies in 2022 in bln PLN



Source: Own elaboration on the basis of Ministry of Justice, Wykaz sprawozdań finansowych, EKRS, <https://ekrs.ms.gov.pl>.

exports. Further details will be provided in the following sections of this paper.

### The significance of PDI for the Polish economy

From the perspective of the entire economy, both in terms of revenue generated and exports, PDI is not a significant industry. In the 2022 ranking of the 500 largest Polish companies compiled by the Rzeczpospolita daily based on annual revenue, only one company operating in the armaments industry was listed: state-owned PGZ, which was ranked 91st<sup>34</sup>. The group's revenue for 2022 amounted to PLN 8.351 billion<sup>35</sup>. PZL-Świdnik was ranked second among armaments companies with a revenue of PLN 1.293 billion, followed by

<sup>34</sup> "Ranking największych polskich firm 2023 roku dziennika Rzeczpospolita", *Rzeczpospolita.pl*, <https://rankingi.rp.pl/lista500/2023#four> [19.03.2024].

<sup>35</sup> "Sprawozdanie finansowe spółki PGZ S.A za 2022 r.", *Ministerstwo Finansów*, [https://ekrs.ms.gov.pl/rdf/pd/search\\_df](https://ekrs.ms.gov.pl/rdf/pd/search_df) [19.03.2024].



PZL Mielec in third place with a revenue of PLN 1.035 billion. WB Grup took fourth place with a revenue of PLN 0.6 billion, and Lubawa was ranked fifth with a revenue of PLN 0.07 billion. In 2022, the largest PDI companies generated a total revenue of PLN 11.345 billion<sup>36</sup> (see Figure 1).

In 2022, the Ministry of Foreign Affairs (MFA) prepared a report titled 'Exports of Arms and Military Equipment from Poland – Report for 2022', which stated that the MFA granted 1,237 licenses for arms exports outside of Poland, with a total value of EUR 5.686 billion. The actual exports, which were the realization of the obtained licenses, amounted to EUR 1.180 billion, compared to EUR 498 million in 2021<sup>37</sup>. In comparison, in 2022, Poland's total exports of goods in EUR amounted to EUR 346.2 billion, according to the Central Statistical Office (Główny Urząd Statystyczny – GUS)<sup>38</sup>. However, it should be noted that these figures do not necessarily fully reflect reality. The Ministry of Foreign Affairs has refrained from sharing some data on arms exports to Ukraine, which were carried out under donations from the Polish government, and not included it in the official GUS statistics. According to the GUS's data, in 2022, exports of arms to Ukraine, which in GUS statistics are included in

<sup>36</sup> The financial data is sourced from companies' financial statements available on the Ministry of Justice's eKRS system. "Wykaz sprawozdań finansowych: EKRS", *Ministerstwo Finansów*, <https://ekrs.ms.gov.pl/> [19.03.2024].

<sup>37</sup> Departament Polityki Bezpieczeństwa Ministerstwo Spraw Zagranicznych, *Ekspert uzbrojenia i sprzętu wojskowego z Polski. Raport za rok 2022*, Ministerstwo Spraw Zagranicznych, Warszawa 2023, <https://www.gov.pl/web/dyplomacja/eksport-uzbrojenia-i-sprzetu-wojskowego-z-polski-raport-za-rok-2022> [19.03.2024].

<sup>38</sup> "Obroty towarowe handlu zagranicznego ogółem w 2022 r.", *GUS*, <https://stat.gov.pl/obszary-tematyczne/ceny-handel/handel/obroty-towarowe-handlu-zagranicznego-ogolem-i-wedlug-krajow-dane-ostateczne-w-2022-r-,2,15.html> [19.03.2024].

category XIX – Arms and ammunition, amounted to PLN 3.91 billion<sup>39</sup>.

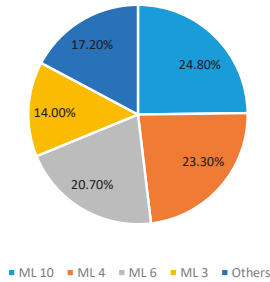
Arms exports are classified into categories according to the Common Military List, a legal framework for the export of arms and ammunition established by the Council of the European Union<sup>40</sup>. In 2022, in Poland, the main category for arms exports is ML 10, which includes aircraft, lighter-than-air aircraft, UAVs, engines and equipment for aircraft, and related equipment and components, specially designed or modified for military purposes. The MFA attributes this to the ownership structure of the subcontracting companies, such as PZL Mielec and PZL Świdnik. These companies operate globally under the umbrella of ‘parent companies’, fulfilling both independent export orders (e.g., PZL Mielec’s supply of S-70i helicopters to Turkey<sup>41</sup>) and subcontracting for the supply of individual structural elements of aircraft. In 2022, the ML 10 category accounted for EUR 293.4 million of exports from Poland, which represents 24.8% of the total military export in 2022. ML 4, which includes bombs, torpedoes, rockets, guided missiles, other explosive devices and charges, as well as related equipment, accessories, and specially designed components, was ranked second with an actual export value of EUR 275.3 million (23.3% of

<sup>39</sup> M. Marszałkowski, “Czym handluje Polska i Ukraina?”, *POLON.pl*, 22 February 2024, <https://www.polon.pl/gospodarka/czym-handluje-polska-z-ukraina-bilans-jest-rekordowo-korzystny-dla-polski/> [19.03.2024].

<sup>40</sup> “Common Military List of the European Union adopted by the Council on 26 February 2018 (2018/C 098/01)”, *Official Journal of the European Union*, C 98, 15 March 2018, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AC%3A2018%3A098%3AFULL> [19.03.2024].

<sup>41</sup> “PZL Mielec Completes 100th Polish Built Black Hawk”, *PZL Mielec*, 29 November 2023, <https://pzmielec.pl/en/media/newsroom/press-release/pzl-mielec-completes-100th-polish-built-black-hawk,828> [19.03.2024].

Figure 2. Share in Polish arms exports of the most significant categories of armaments in 2022



Source: Own elaboration on the basis of Departament Polityki Bezpieczeństwa Ministerstwo Spraw Zagranicznych, Eksport uzbrojenia i sprzętu wojskowego z Polski. Raport za rok 2022, Ministerstwo Spraw Zagranicznych, Warszawa 2023, <https://www.gov.pl/web/dyplomacja/eksport-uzbrojenia-i-sprzetu-wojskowego-z-polski-raport-za-rok-2022> [19.03.2024].

military exports). In third place, with a value of actual exports amounting to EUR 245 million (20.7% of military exports), was ML 6 – ground vehicles and their components. In fourth place, with an export value exceeding EUR 100 million, was ML 3, which includes ammunition, setting fuses, and specially designed components for them. This category accounted for EUR 166 million of actual military exports. This corresponds to 14% (see Figure 2).

The MFA report states that the rise in exports of ML 3, ML 4 and ML 6 items in comparison to 2021 is due to the outbreak of a full-scale war in Ukraine and the increased activity of Polish companies in this market. The report notes that in the previous years, it was difficult to identify regular patterns in the dynamics of Polish exports. However, the results for 2022 were dominated by deliveries of arms and military equipment to war-torn Ukraine. The Foreign

Ministry report states that this is particularly applicable to the categories of armaments ML 4, ML 6, and ML 3<sup>42</sup>.

Regarding the direction of arms exports from Poland in 2021, the markets of North America, Southeast Asia and the European Union were dominant. In that year, military equipment worth EUR 176 million was exported to North America, mainly in the ML 10 category. Additionally, equipment worth EUR 128.2 million was exported to Southeast Asia, also primarily in the ML 10 category. Military equipment worth EUR 123.3 million was exported to European Union countries. The main items exported were ML 10 and ML 2, which include smoothbore weapons of 20 mm calibre or more, other weapons and armaments of a calibre greater than 12.7mm (0.50 inches), blasters and equipment, and specially designed components for them. In 2022, arms exports were directed towards 'Other European Countries', with actual exports amounting to EUR 828 million. The main categories of exports were ML 4, ML 6, and ML 13, which include armoured or protective equipment, structures, and their components. Exports to North America totalled EUR 203.5 million, with the majority coming from the ML 10 and ML 16 categories. Southeast Asia received exports worth EUR 61.4 million, mainly from the ML 10 category. EU countries were the fourth largest export destination, with EUR 58.4 million worth of exports dominated by ML 10 and ML 2 items. In 2022, Ukraine was the primary recipient of products exported from Poland, with goods worth EUR 796.7 million from 11 categories of armaments. The United States followed in second place,

<sup>42</sup> Departament Polityki Bezpieczeństwa Ministerstwo Spraw Zagranicznych, op. cit.

importing armaments worth EUR 197.6 million across eight categories, while Thailand came in third place with exports worth EUR 36.2 million across two categories of armaments. Overall, Poland exported military goods to 60 countries in 2022<sup>43</sup>.

## Conclusions

The Polish Defence Industry plays a crucial role in ensuring the functionality of the Polish Armed Forces. It is responsible for supplying equipment, armaments, and ammunition, as well as servicing, modernizing, and maintaining previously supplied products. However, despite the numerous military procurements that have taken place in recent years in Poland, the Polish industry, particularly the state-owned sector, has not been the primary beneficiary. Tomasz Dmitruk's analysis of 120 major modernization contracts concluded between 2015 and 2023, with a gross value of PLN 234 billion, shows that only 24.8% of this amount, i.e., PLN 58.1 billion, will be allocated to PDI (state, private, and foreign)<sup>44</sup>. This is due, in part, to the low outlays allocated to R&D projects. In 2024, the Defence Ministry's budget allocated only PLN 1.32 billion for development work, accounting for only 1.12% of all defence spending that year<sup>45</sup>. The limited spending on research by PDI implies that it has

<sup>43</sup> Ibid.

<sup>44</sup> T. Dmitruk, "Finansowanie modernizacji technicznej Wojska Polskiego w latach 2023-2026", *Dziennik Zbrojny*, 22 August 2023, <https://dziennikzbrojny.pl/artykuly/art,2,4,11881,armie-swiata,wojsko-polskie,finansowanie-modernizacji-technicznej-wojska-polskiego-w-latach-2023-2026> [19.03.2024].

<sup>45</sup> T. Dmitruk, "Wydatki na obronność planowane na 2024 rok bez istotnych zmian", *Dziennik Zbrojny*, <https://dziennikzbrojny.pl/aktualnosci/news,1,11978,aktualnosci-z-polski,wydatki-na-obronosc-planowane-na-2024-rok-bez-istotnych-zamian> [19.03.2024].

restricted capabilities to compete with other players in the arms industry. This poses a significant challenge to PGZ's operations in the future as post-Soviet equipment will make up a decreasing proportion of the Polish Armed Forces. As a result, the amount of repair and modernisation work will decrease.

PDI does not significantly contribute to the Polish economy through exports. SIPRI reports that PDI's share of global arms exports between 2018 and 2022 was only 0.4%, representing a 168 %<sup>46</sup> increase from the 2013-2017 figure when PDI's share of global trade was 0.1%<sup>47</sup>. The increase in Poland's share of the global arms trade is also due to the fact that, according to the SIPRI report, the global arms trade fell by 5.1 % between 2013-2018 and 2018-2022<sup>48</sup>.

Predicting the dynamics of Polish exports is challenging, as is acknowledged by the Ministry of Foreign Affairs, due to their small scale. What is more, the volume of exports may depend on the geopolitical situation or the acquisition or loss of a particular customer<sup>49</sup>.

At present, due to the modernization process of the Polish Armed Forces and the domestic situation, exports are not a priority for PDI, particularly for the state-owned companies. However, in the coming years, the economic situation may require increased global engagement. This could pose a challenge not only for defence companies, but also

<sup>46</sup> The figures show the change in the volume of total arms exports per exporter between the two periods.

<sup>47</sup> P.D. Wezeman, J. Gadon, S.T. Wezeman, "Trends in International Arms Transfers, 2022", SIPRI, March 2023, [https://www.sipri.org/sites/default/files/2023-03/2303\\_at\\_fact\\_sheet\\_2022\\_v2.pdf](https://www.sipri.org/sites/default/files/2023-03/2303_at_fact_sheet_2022_v2.pdf) [19.03.2024].

<sup>48</sup> Ibid.

<sup>49</sup> Departament Polityki Bezpieczeństwa Ministerstwo Spraw Zagranicznych, op. cit.

for the Polish Armed Forces, which may become increasingly reliant on foreign suppliers for armaments and military equipment. One potential opportunity for the industry is the localization of equipment and increased service and maintenance capabilities of purchased equipment. However, this solution does not offer prospects for the development of the armaments branch of the Polish economy.



Viliam Ostatník

## **Answering the wake-up call or remaining on hold? The defence industry in Slovakia**

A new security reality brought about mainly as a consequence of the Russian invasion of Ukraine in 2022 is being directly reflected by the defence industry across Western countries, and the Slovak Republic is no exception. More weapons are needed in order to fill the depleted storages and build up enough force for effective deterrence against any potential enemy – and the industry also needs to export in order to survive and thrive. How is the Slovak defence industry prepared to deliver after decades of neglect, maintaining practically minimum capacities? This paper explores the current state of the industry, its main strengths, but also some challenges it faces in this new security (as well as political) environment<sup>1</sup>.

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<sup>1</sup> Parts of this analysis are based on the conclusions reached within a project run under the Adapt Institute of Bratislava, Slovakia, see V. Ostatník, A. Potočník, “Slovak Defence Industry Up to 2030: Navigating Through New Reality Towards Rebirth”, Adapt



## Industry gradually reborn

The defence industry in Slovakia has relatively deep roots, reaching the times of Austria-Hungary and the First Czechoslovak Republic (1918-1938). Soviet-era products of the industry such as tanks or infantry fighting vehicles were produced in Slovakia in tens of thousands<sup>2</sup> over the decades of communist rule, relying on politically aligned third countries as their market. Some domestic products of the industry from that era – mainly self-propelled howitzers, engineering logistical vehicles, or ammunition – survived the turbulent period of the 1990s to this day. When Slovakia joined NATO in 2004, it helped transform its defence industry, especially in products like ammunition (production switching from Warsaw Pact's 152 mm to NATO's 155 mm). Since then, competitive private companies focused on niche tech (such as sensorics, communication, detection systems, imaging, cybersecurity, or electronic warfare tech) were established, while servicing capacities focused mainly on Soviet-era tech remained strong.

Since 2018, the Slovak defence industry has been incentivized by overhauling modernization projects ordered by the Ministry of Defence for the Slovak Armed Forces, and was then massively triggered by the general increase in

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Institute, 2023, <https://www.adaptinstitute.org/sk/slovensky-obranny-priemysel-do-roku-2030-navigovanie-cez-novu-reality-ku-znovuzrozeniu/14/12/2023/> [16.02.2024].

<sup>2</sup> For example, at the height of its production in the 1980s, plant in the Slovak city of Martin produced more than 400 T-72 tanks a year, see "Potreboval som byt, fabrika pomohla. Aký bol príbeh ZŤS Martin, ktoré nezničil Havel", *Denník N*, 6 June 2021, <https://e.dennikn.sk/2412772/potreboval-som-byt-fabrika-pomohla-aky-bol-pribeh-zts-martin-kto-re-neznicil-havel/> [29.02.2024]; for more data on production capacities also see "ANALÝZA: Efektivita zbrojárskej výroby na Slovensku za čias budovania socializmu", *Armádní Noviny*, 30 July 2017, <https://www.armadinoviny.cz/efektivita-zbrojarskej-vyroby-na-slovensku-za-cias-socializmu.html> [29.02.2024].

demand for weapons and ammunition due to the Russian invasion of Ukraine and the ongoing war there. Two products stand out in this regard: the Zuzana 2 self-propelled howitzer made by the state-owned Konštrukta Defence and 155 mm artillery shells made by ZVS Holding, owned jointly by the state and the Czech-based private company CSG (through its Slovak subsidiary MSM Group)<sup>3</sup>.

In 2023, Slovakia surpassed the threshold of 2% of its GDP being allocated to defence for the first time, if only by a very slight margin (2.03%). For 2024, the new government of Robert Fico has also set a 2% of the GDP for defence benchmark, planning to allocate EUR 2.63 billion in total to the Defence Ministry, with EUR 2.61 billion planned for the Armed forces, including 877 million for the “development of defence” (which includes investments into infrastructure, communication and information systems, but also multiple ongoing or new modernization programs, namely the acquisitions of tactical aircraft, tracked armoured combat vehicles, or 8x8 armoured modular vehicles)<sup>4</sup>. Furthermore, in terms of strengthening NATO’s Eastern Flank, Slovakia’s contribution through such modernization programs and maintained funding above the 2% benchmark is coupled with a more enhanced and deepened cooperation within NATO. NATO leaders agreed to establish four new multinational battlegroups in Bulgaria, Hungary, Romania and Slovakia at the NATO Summit in Brussels in March 2022, with

<sup>3</sup> There is also a non-lethal military hardware, namely the de-mining system called Božena, already in service in multiple countries and with potential for further export.

<sup>4</sup> “Výdavky na obranu sú na rok 2024 rozpočtované na úrovni dvoch percent HDP”, *SITA*, 12 December 2023, <https://sita.sk/vydavky-na-obranu-su-na-rok-2024-rozpoctovane-na-urovni-dvoch-percent-hdp/> [16.02.2024].

the battlegroup in Slovakia led by Czechia as the framework nation and Germany and Slovenia as the contributing nations (along with the Slovak Armed Forces) as of February 2024<sup>5</sup>. Following the exercise “Strong Cohesion 2023” in September of last year, this battlegroup received the “Combat Ready” status from NATO<sup>6</sup>.

Since late 2022, a service hub has been in operation in Eastern Slovakia that provides support to Ukraine, set up by Krauss-Maffei Wegmann. Its main task is to conduct rapid maintenance and necessary repairs of combat vehicles of various types<sup>7</sup>. Slovak Konštrukta also participates and repairs Ukrainian combat fighting vehicles and tanks<sup>8</sup> in its facility in Moldava nad Bodvou, which was set up in 2019 originally for the needs of the Slovak Armed Forces (running multiple modernization projects as well as requiring more repair capacities for an older arsenal) and was used extensively, especially after the Russian invasion of Ukraine

<sup>5</sup> “NATO’s military presence in the east of the Alliance”, NATO, 8 December 2023, [https://www.nato.int/cps/en/natohq/topics\\_136388.htm](https://www.nato.int/cps/en/natohq/topics_136388.htm) [16.02.2024].

<sup>6</sup> “NATO’s multinational Slovakia battlegroup ‘combat ready’”, *UK Defence Journal*, 12 October 2023, <https://ukdefencejournal.org.uk/natos-multinational-slovakia-battlegroup-combat-ready/> [16.02.2024].

<sup>7</sup> Such as the self-propelled howitzer PzH 2000, Caesar wheeled howitzer, Gepard self-propelled anti-aircraft gun, Mars II artillery rocket system, or Dingo armoured transport vehicle, see “KMW establishes KNDS service base in Slovakia for Ukraine”, *KNDS*, 15 November 2022, <https://www.knds.com/newsroom/press-releases/detail/kmw-establishes-knds-service-base-in-slovakia-for-ukraine/> [16.02.2024].

<sup>8</sup> Moldava nad Bodvou facility specializes in the maintenance of various types of combat and engineering army vehicles and systems, such as older type of Zuzana 155 mm self-propelled howitzers (vz. 2000), new Zuzana 2 howitzers, BMP-2 IFVs, RM70/85 Modular rocket launchers, Alligator armoured 4x4 vehicles, or Tatrapan armoured vehicles, see “Defence minister rebuts claims that Slovakia is blocking repairs of Ukrainian weapons”, *The Slovak Spectator*, 17 February 2023, <https://spectator.sme.sk/c/23136324/defence-minister-rebuts-claims-that-slovakia-is-blocking-repairs-of-ukrainian-weapons.html> [16.02.2024] and “Opravy a údržba vozidiel a vojenského vybavenia”, *Konštrukta Defence*, 2024, <https://kotadef.sk/servis/> [29.02.2024].

(enlarging and modernizing the maintenance capacities)<sup>9</sup>, illustrating how servicing capacities maintained by several Slovak companies, mainly for the Slovak Armed Forces (and their old Soviet-era tech), but also some third states in Europe or Africa, could be quickly utilized in a real-life conflict in the region. However, the absence of a long-term national strategy for the defence industry also translates into insufficient long-time maintenance and servicing capacities (taking potential scenarios for direct conflict involving multiple states in the region into account) as well as insufficient storage capacities and strategic reserves in terms of volume and with regard to in-time deliverability.

### **The Slovak defence industry's heavyweights: Zuzana 2 and 155mm ammunition**

After the Russian invasion of Ukraine, the Slovak government decided to provide eight Zuzana 2s to Ukraine, which were originally ordered in 2018 and were being built for the Slovak Armed Forces. Seven were delivered to Kyiv over the course of 2022 and the 8th one in January 2023. Then, in August 2023, the first two of the second batch (16 ordered in total) were delivered to Ukraine. The second order, worth EUR 92 million, was being financed by Norway, Denmark and Germany and can serve as an example to illustrate how a ready-made product that was already in service with the national Armed Forces as well as tested in combat (in Ukraine for the first time), and a flexible, multilateral format

<sup>9</sup> See "Takzvanú delovú halu prevádzky servisno-opravárenských služieb štátnej akciovej spoločnosti Konštrukt-Defence zrekonštruovali za viac ako 580.000 eur", *TASR*, 11 April 2022, <https://www.teraz.sk/regiony/delova-hala-v-moldave-nad-bodvou-presl/625945-clanok.html> [29.02.2024].

with available resources can enable a relatively quick delivery of arms needed for a country's defence – in this case, Ukraine's<sup>10</sup>. Thanks to existing orders from the Slovak and later Ukrainian MODs, Konštrukta was able to steadily increase its production capacities since 2018, allowing them to react to the situation on the market after the Russian invasion of Ukraine more rapidly. Year-over-year profits in 2022 increased ten-fold and the number of workers rose by 36% to almost 200. As of 2023, the company has been able to produce around 20 howitzers a year. If new contracts were to be signed with immediately available capital, the production could jump to around 40, although no such plans have officially been announced so far. The order book under current capacities is filled until 2025.

The cooperation with the Ukrainian Armed Forces as well as its defence industry since 2022 has proved to be vital for products like Zuzana 2<sup>11</sup>. Having first-hand experience from the war, the howitzer could be gradually upgraded – reflecting, for instance, the use of older artillery shells in combat, which required adjustments of the firing system and the cannon itself.

Konštrukta's new product – the self-propelled 155 mm howitzer Bia, which is lighter and thus more mobile, yet retains its firing power – is also promising in terms of potential export, being designed primarily as a commercial product for foreign customers. Main potential export markets could

<sup>10</sup> "Adapt to Survive: Slovakia's Arms Industry Faces New Reality", *Center for European Policy Analysis (CEPA)*, 9 January 2024, <https://cepa.org/article/adapt-to-survive-slovakias-arms-industry-faces-new-reality/> [16.02.2024].

<sup>11</sup> *Ibid.*

include Ukraine, Azerbaijan<sup>12</sup>, and countries in Southeast and Central Asia, as well as South America. However, no details about production capacities have been revealed, nor have any contracts yet been signed<sup>13</sup>, and the current commercial prospects remain so far rather unclear under the new Slovak political leadership, which made several changes in the top management of the state-controlled company<sup>14</sup>.

Slovakia also enjoys a particularly strong position in the production of 155 mm artillery shells through a company called ZVS Holding. This product enjoys a rapidly rising demand not only due to lessons learned in Ukraine, but also in other localized conflicts around the globe, which all illustrate that standard, non-guided artillery ammunition still has its place on the battlefield. The production capacities in Slovakia were enlarged adequately, benefiting from existing capacities and continuous, preserved expertise in the field since the communist times (producing 152 mm, later transiting to NATO's 155 mm). Before the Russian invasion of Ukraine, ZVS was at around 60% of its production capacity – now the order book is full until at least next year. Over the course of 2024, the private co-owner of ZVS, MSM Group, under the Czech-based Czechoslovak Group (CSG), plans to invest around EUR 50 million into further enlarging production capacities, hiring new workers and, perhaps most importantly, increasing productivity through the adoption of

<sup>12</sup> After a renewed interest in exploring potential cooperation with Baku under Robert Fico's fourth government.

<sup>13</sup> Ibid.

<sup>14</sup> See "Slovakia's No Bullets for Ukraine Pledge\* (Conditions Apply)", *Center for European Policy Analysis (CEPA)*, 5 December 2023, <https://cepa.org/article/slovakias-no-bullets-for-ukraine-pledge-conditions-apply/> [16.02.2024].

new technologies, including robotization and automation. In January 2024, a contract to ZVS was also awarded from the Slovak government for a publicly unspecified number of shells, with an order value of EUR 145 million. The contract was allocated to ZVS “in the absence of a competition”<sup>15</sup>.

ZVS Holding (as part of MSM Group) integrates multiple companies that focus on all stages of a munition’s “life cycle”, meaning the development, production, as well as modernization, maintenance and disposal. They do both mechanical production of the shell bodies in the Snina plant in Eastern Slovakia, as well as very delicate production of pyrotechnical components, ignition systems, and fuses in Dubnica, where production of all shells is finalized. The unique market position enjoyed by ZVS in producing shells rests on their product being universal and practically usable by any 155 mm howitzer. They also produce and sell different kinds of artillery munition, including standard ones and with a longer range of over 40 km, as well as munition ranging from 81 mm to 120 mm. ZVS also maintains production capacities for munitions used in the former Warsaw Pact countries<sup>16</sup>.

<sup>15</sup> “Slovakia fills its artillery shell stocks with \$132 million order”, *Defense News*, 31 January 2024, <https://www.defensenews.com/global/europe/2024/01/31/slovakia-fills-its-artillery-shell-stocks-with-132-million-order/> [16.02.2024].

<sup>16</sup> Before 2022, ZVS produced around 25 thousand pieces of various sorts of artillery ammunition, with 2022 and 2023 seeing a ramp-up to 50 thousand pieces a year. Plans for 2024 and 2025 see a potential rise to 100 thousand and 150 thousand pieces a year, respectively, see “Slovensko má reálnu šancu oživiť zbrojársku výrobu, vojna na Ukrajine mu priniesla hneď dva rozvojové impulzy”, *SITA*, 5 April 2023, <https://sita.sk/vojna-na-ukrajine-priniesla-sancu-na-revitalizaciu-slovenskeho-obranneho-priemyslu-a-to-predovsetkym-vo-vyrobe-municie/> [29.02.2024], and “Šéf obrany potvrdil záujem Slovenska o výrobu municie pre Ukrajinu”, *Trend*, 1 June 2023, <https://www.trend.sk/spravy/sef-obrany-potvrdil-zaujem-slovenska-vyrobu-municie-pre-ukrajinu> [29.02.2024].

Moreover, being partly owned by a private company brings multiple benefits such as private capital, enabling more flexible investments and decision-making in both production as well as sales. CSG also owns the Spanish FMG company, which produces gunpowder used in the shells, making ZVS highly vertically integrated and almost self-reliant in terms of critical supply chains. ZVS mainly supplies the Slovak and Polish Armed Forces, and also the Baltic countries. Through the NATO Support and Procurement Agency (NSPA), it partly supplies multiple NATO member states, including the US<sup>17</sup>. Their order books are currently full.

### **Other key services, products and manufacturers**

It is also important to note the Slovak defence industry's contribution to the modernization projects of the Slovak Ministry of Defence, namely the Patria 8x8 armoured modular vehicle (AMV) and the CV90 MkIV combat vehicle. Slovak defence companies should contribute (at least) 40% to the overall production of 76 Patria AMVs for the Slovak Armed Forces, according to the intergovernmental agreement between Slovakia and Finland. Konštrukta is the main Slovak coordinator and integrator of this Slovak contribution with much of the production done by a company

<sup>17</sup> See "Pavol Čahoj, predseda predstavenstva ZVS holding: 'Muničný priemysel sa musí prispôbiť Green Dealu rovnako ako iné odvetvia", *Pravda*, 12 October 2023, <https://spravy.pravda.sk/rozne/clanok/684718-pavol-cahoj-predseda-predstavenstva-zvs-holding-municny-priemysel-sa-musi-prispobit-green-dealu-rovnako-ako-ine-odvetvia/> [12.02.2024], and "Technický riaditeľ ZVS holdingu Ušiak: Klasická delostrelecká munícia je vo svete veľmi žiadaná", *Pravda*, 22 November 2023, <https://spravy.pravda.sk/domace/clanok/689334-klasicka-delostrelecka-municia-je-vo-svete-velmi-ziadana/> [12.02.2024].



called CSM Industry, based in Central Slovakia. Similarly, according to an agreement between Slovakia and Sweden, Slovak companies should also contribute to the production of 152 CV90 vehicles, with the main manufacturer (BAE Systems Hägglunds) signing various agreements of cooperation with ZTS Špeciál, Koval Systems and Aliter Technologies, as well as EVPÚ, Ray Service, Virtual Reality Media, and Konštrukta.

There are also multiple other Slovak companies not mentioned yet that focus on repairs and maintenance (e.g., Levecké opravovne Trenčín, a.s., or Kerametal), production of various parts (e.g., Delta Defence), production of specific engineering equipment (e.g., UDS engineering vehicle produced by CSM Industry or the Božena unmanned mine-clearing vehicle produced by Way Industries), or on niche technologies, such as ALES (radar, communication, information, command and control systems) or SEC Technologies (long-range active stand-off chemical detection technology).

### **Slovak defence industry under the current government: realities and prospects**

As has already been mentioned, some changes impacting the Slovak defence industry were brought about by the new political leadership coming out of the September 2023 parliamentary elections, both on the political level as well as on the managerial level.

Robert Fico formed his fourth government with the Slovak National Party and Hlas-Social Democracy. Before the election, PM Fico also campaigned with a pledge not to deliver “a single [bullet] to Ukraine” in case of his victory. Since

he did win, the signals sent to Ukraine and other (Western) partners are a bit more mixed. More precisely, the political leadership seems to pragmatically reflect on the current state of the market (defined by high demand) and on Slovakia's (potential) contribution to it, especially regarding the production of ammunition and howitzers. PM Fico's "no bullet" pledge, in other words, seems to translate into a government policy that applies this pledge only to supplies from the Slovak Armed Forces stockpiles, and in no way<sup>18</sup> affects commercial, contractual deals<sup>19</sup>. Recently, at the end of January 2024, during his meeting with Ukrainian Prime Minister Denys Shmyhal, PM Fico announced a humanitarian aid package in addition to a delivery of Slovakian Božena

<sup>18</sup> However, there might be impacts of the personal changes on the high managerial level of relevant state-controlled companies such as Konštrukta, or the entire DMD Holding (which not only controls Konštrukta, but also 50% of ZVS Holding), that are currently unknown. More specifically, The Defence Minister dismissed Štefan Škultéty, CEO of DMD Group, and Alexander Gurský, head of Konštrukta–Defence. Gurský in particular was a strong advocate and key figure within the company for prioritizing the Ukrainian market, maintaining close relations (see "Slovakia's No Bullets for Ukraine Pledge\* (Conditions Apply)", *Center for European Policy Analysis (CEPA)*, 5 December 2023, <https://cepa.org/article/slovakias-no-bullets-for-ukraine-pledge-conditions-apply/> [16.02.2024]) and also "Skončil šéf zbrojovky, ktorá vyrába húfnice Zuzana. Mal spory s Kaliňákovým človekom, za kľúčový trh považoval Ukrajinu", *Denník N*, 16 November 2023, <https://e.dennikn.sk/3681068/skoncil-sef-zbrojovky-ktora-vyraba-hufnice-zuzana-mal-spory-s-kalinakovym-clovekom-za-klucovy-trh-povazoval-ukrajinu/> [16.02.2024]). During the time of the previous Slovak (interim) government, Konštrukta–Defence signed a memorandum of understanding with the PJSC Kramatorsk Heavy Duty Machine Tool Building Plant joint development of a new 155 mm howitzer and the modernization of the Ukrainian Bohdana artillery platform. Additionally, a trilateral agreement involving Ukraine, Slovakia, and the Czech Republic was reached for the joint procurement, maintenance, and operation of CV90. De-prioritization or outright derailing of such projects due to changed political priorities and interests or simply due to indifference is now a potential prospect ("Slovakia's No Bullets for Ukraine Pledge\* (Conditions Apply)", *Center for European Policy Analysis (CEPA)*, 5 December 2023, <https://cepa.org/article/slovakias-no-bullets-for-ukraine-pledge-conditions-apply/> [16.02.2024]).

<sup>19</sup> "Slovakia's No Bullets for Ukraine Pledge\* (Conditions Apply)", *Center for European Policy Analysis (CEPA)*, 5 December 2023, <https://cepa.org/article/slovakias-no-bullets-for-ukraine-pledge-conditions-apply/> [16.02.2024].

4+ unmanned mine-clearing vehicles (the logic behind this being, most likely, that these are not combat vehicles)<sup>20</sup>. Regarding other states for potential exports of Slovak-made products, current Defence Minister Robert Kaliňák seems to be eyeing Azerbaijan as one such destination, having visited the country very early in his office<sup>21</sup>.

Kaliňák also decided to allocate EUR 100 million for investing into (i.e., increasing the assets) state-owned and controlled stock companies such as DMD Holding<sup>22</sup>. The new minister is also said to be reviewing some previous, already prepared acquisitions, such as the purchase of 160 Oshkosh JLTV 4x4 vehicles, and some potential ones – namely the purchase of 12 Bell AH1-Z Viper helicopters, which the US government offered to the Slovak government with a significant discount in connection to past Slovak military aid to Ukraine<sup>23</sup>.

<sup>20</sup> See “Slovakia fills its artillery shell stocks with \$132 million order”, *Defense News*, 31 January 2024, <https://www.defensenews.com/global/europe/2024/01/31/slovakia-fills-its-artillery-shell-stocks-with-132-million-order/> [16.02.2024]. Also note that Slovakia has previously supplied 10 Božena vehicles to Ukraine in 2023, two of which were the latest 5+ versions. In 2023, the manufacturer (Way Industries) underwent a reorganization of the manufacturing programs in order to ramp up production, aiming at making eight Božena (4+ and 5+ versions) a month (see “Slovak defence industry’s products are in demand by and of valuable assistance to Ukraine”, *Ministry of Defence of the Slovak Republic*, 14 July 2023, <https://www.mosr.sk/53075-en/slovenske-produkty-obranneho-priemyslu-su-pre-ukrajinu-cennou-pomocou-aj-ziadanou-komoditou/> [16 February 2024]).

<sup>21</sup> “Kaliňák ponúka húfnice Azerbajdzanu, kam ešte slovenské zbrojovky legálne nevyvážali”, *Denník N*, 26 January 2024, <https://dennikn.sk/3792294/kalinak-ponuka-hufnice-azerbajdzanu-kam-este-slovenske-zbrojovky-legalne-nevyvazali/?ref=list> [16.02.2024].

<sup>22</sup> See “Vysoký post na obrane získal manažér zbrojára Strnada. Je to ako človek Penty na ministerstve zdravotníctva, tvrdí Kaliňák”, *Denník N*, 8 February 2024, <https://e.dennikn.sk/3815290/vysoky-post-na-obrane-ziskal-manazer-zbrojara-strnada-je-to-ako-clovek-penty-na-ministerstve-zdravotnictva-tvrdi-kalinak/?ref=list> [16.02.2024].

<sup>23</sup> “Ak Kaliňák odmietne americké bojové vrtuľníky, ich nákup zväžia Česi”, *Denník N*, 1 February 2024, <https://dennikn.sk/3805366/ak-kalinak-odmietne-americke-bojove-vrtulniky-ich-nakup-zvazia-cesi/?ref=list> [16.02.2024].

## Capturing wider trends: what next?

The Slovak defence industry, with its array of products, is shaped not only by the wider market trends, but also political will, priorities and interests. The cases of Zuzana 2 howitzers and 155 mm artillery shells illustrate the benefits of available (and maintained) competitive products in the world of surging defence spending and demand for weapons, as more countries or entire blocs, such as the EU, again feel the need to be prepared for defence (and doing so by deterring potential enemies, not by relying on subsequent punishments, such as with sanctions).

The necessity for longer-term orders enabling further investments into development, production and maintenance is evident for the industry to adapt and deliver. Effective public-private partnerships, or even ownerships of certain strategic assets (such as ammunition production) can also be viewed as a cornerstone for the industry to deliver products of good quality and within a realistic time frame, promptly enlarging capacities if needed<sup>24</sup>.

As for the factor of political will and interests, relations with Ukraine translated into cooperation and concrete projects serve as an example to illustrate how multiple Slovak companies can benefit from working closely with Ukraine. Exports of defence industry products from Slovak companies to Ukraine, but also elsewhere, are shaped by the political priorities set at the level of the government – more specifically, at the Ministry of Defence, granting necessary

<sup>24</sup> "Adapt to Survive: Slovakia's Arms Industry Faces New Reality", *Center for European Policy Analysis (CEPA)*, 9 January 2024, <https://cepa.org/article/adapt-to-survive-slovakias-arms-industry-faces-new-reality/> [16.02.2024].

permits. With the new political leadership in Slovakia, joint projects and opportunities mainly with Ukraine, as mentioned above, currently remain in limbo. Interest from other states has not yet materialized into signed contracts. This all shows how political will and commitment is essential in order for the industry to enlarge capacities, invest in development if needed, ramp up production – and deliver.



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The countries of Central and Eastern Europe and their military capabilities are crucial to the regional resilience system due to their proximity to the Ukrainian theatre of war and these states' high vulnerability to Russian interference. The industry of the Visegrád countries (V4), with its central position on NATO's eastern flank and relatively large economic potential, has the capacity to play a significant role in the defence of this part of Europe. A well-developed arms industry is also a necessary factor for the V4 countries to be able to pursue a foreign and security policy that is as sovereign as possible.

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