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PROSPECTS FOR THE DEVELOPMENT OF THE DEFENCE INDUSTRY IN POLAND

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Abstract *This article presents considerations regarding the prospects of the Polish defence industry. It discusses, among other things, the state of the domestic defence industry, indicates opportunities and threats to its development, as well as the general assumptions of the Technical Modernisation Plan of the Armed Forces of the Republic of Poland. In addition, it defines the essence of agreements concluded with entities of the domestic defence industry, namely offset, framework and implementation agreements. It also analyses the sources of financing of agreements concluded for the purpose of modernisation and re-equipping not only the Armed Forces of the Republic of Poland but also other formations guarding public security and order, such as the Border Guard. The entire considerations end with conclusions, the implementation of which may contribute to the optimisation of the condition of the domestic defence industry, as well as to improving the security of the state and the effectiveness of the Polish army. One of the factors affecting the state of security of the country is its economic potential and industrial base. This applies in particular to the defense industry, which has been highlighted by the ongoing aggressive war of Russia against Ukraine. After only half a year of military operations, both sides began to experience shortages of equipment and supplies, and in particular large-caliber artillery ammunition. Currently, records are being broken in Poland in terms of defense spending - next year, funds at the disposal of the Ministry of National Defense (state budget, Armed Forces Support Fund) are to be 10% higher than in 2024. They will amount to PLN 169 billion, or 4.2% of GDP. Of this amount, PLN 53 billion, or $ 13.25 billion in 2025 alone, is to be allocated directly to the purchase of arms and military equipment. The purpose of this article is to define and indicate the prospects of the Polish defense industry. The work uses the literature studies method as the leading method, and the historical and dogmatic methods as auxiliary methods. A research limitation is access to classified information and information constituting a company's trade secret.*

Keywords defence industry, technical modernisation of the Polish Armed Forces, financing the defence industry in Poland, state security.

1. INTRODUCTION

The defence industry is one of the pillars of each country's security. In the case of Poland, the departure from the centrally controlled socialist economy model in the 1990s in favour of a free market economy resulted in a number of structural changes that had a negative impact on the condition of the Polish defence

industry. Many arms factories were closed or their production profile was completely changed to civilian production. A number of capabilities in the production of arms and ammunition were lost, in particular cluster or thermobaric munitions. Over the past thirty years, new technologies have emerged, unknown in the 20th century, which have now become standard equipment in modern armies. Here, the Polish defence industry also shows certain deficits.

The source of the "rolling up" of the defence industry was primarily the lack of significant orders from the Ministry of National Defence carried out by the domestic defence industry sector. Arms exports have also decreased significantly, which inevitably affected the condition of entrepreneurs in the defence industry. This situation began to change under the influence of external factors, namely Poland's accession to NATO, as well as growing political and military pressure from Russia on neighboring countries. The alarm signal that caused the intensification of Poland's defense effort was Russia's aggression against Ukraine, which began on February 24, 2022. The amount of equipment, weapons and ammunition ordered increased, both domestically and abroad. This opened up new opportunities, whether as part of the so-called offset or joint ventures, to acquire technologies to which the Polish defense industry had no access so far.

Poland's economic development and the growth of its GDP also have a positive impact on the level of orders in the domestic defense industry. Constant and long-term financing of purchases for the army and other formations serving the security of the state is also a factor positively influencing its development prospects.

2. ANALYSIS OF THE LATEST RESEARCH, LEGAL ACTS AND LITERATURĘ ON THE SUBJECT, WHICH DISCUSSES THE ANALYSED ISSUES

The issue of the Polish defense industry's ability to produce modern weapons in quantities that would meet the needs of the Polish army has been the subject of many considerations by both doctrine and practitioners, including the highest commanders of the Polish Armed Forces.

Examples include*: P. L. Wilczyńskiego, Sektor zbrojeniowy jako czynnik rozwoju gospodarki opartej na wiedzy*, *„Studies of the Industrial Geography Commission of the Polish Geographical Society", 2013 Vol. 21; W. Skrzypczaka, P. Luzak, Miejsce, rola i zadania polskiego przemysłu zbrojeniowego w systemie bezpieczeństwa państwa, „Przegląd Strategiczny" 2014, nr 7; B. Packa, Konsolidacja przemysłowego potencjału obronnego w Polsce. Uwarunkowania, dylematy i szanse, „Zeszyty Naukowe AON" 2014 nr 1(94); Andrzeja Żebrowskiego, Zagrożenia i bezpieczeństwo przemysłu zbrojeniowego u progu XXI wieku (wybrane aspekty), [w:] Przemysł zbrojeniowy. Tendencje, perspektywy, uwarunkowania, innowacje, pod red. R. Kopeć, Kraków 2016, Wydawnictwo Naukowe Uniwersytetu Pedagogicznego; P. Sorokę, P. L. Wilczyńskiego, Potencjał polskiego przemysłu zbrojeniowego, „Przegląd Geopolityczny" 2018, Tom 23; P. L. Wilczyński, Geografia przemysłu zbrojeniowego Europy, Kraków 2019; W. Lewandowskiego, P. Fonroberta, Polski przemysł obronny – ambicje i perspektywy, „Problemy Techniki i Uzbrojenia" 2021, Tom 158, Nr 3-4; K. Chochowskiego, Plan Modernizacji Technicznej Sił Zbrojnych Rzeczypospolitej Polskiej na lata 2021 - 2035 jako przejaw polityki publicznej państwa polskiego, [w:] Oblicza polityk publicznych, pod red. S. Falińskiego, D. Strus, Wydawnictwo UPH w Siedlcach, Siedlce 2022; P. Zemelek, Budowanie odporności sektora obronnego w perspektywie Komisji Europejskiej, „Wiedza Obronna" 2024, Vol. 286 No. 1.*

Nevertheless, the dynamics of changes in the discussed area force us to revisit the analyzed issue. This will enable us to update the development prospects of the defense industry in Poland.

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3. RESEARCH OBJECTIVES AND METHODS UNDERTAKEN IN THE ANALYSIS OF THE TOPIC

The purpose of this article is to define and indicate the prospects of the Polish defense industry. The work uses the literature studies method as the leading method, and the historical and dogmatic methods as auxiliary methods. A research limitation is access to classified information and information constituting a company's trade secret.

4. DISCUSSION

I. The State of the Polish Defense Industry

Currently, the Polish defence industry includes both companies associated within the Polskiej Grupy Zbrojeniowej (hereinafter referred to as PGZ), the Grupy WB, as well as those that operate fully autonomously and independently, such as Advanced Protection Systems S.A., Hertz Systems Ltd Sp. z o. o., Creotech Instruments S.A., Lubawa S.A., PZL Mielec Sp. z o.o., Protector S.A., AMZ – Kutno S.A., or Scanway S.A.

PGZ is one of the largest defense concerns in Europe. It brings together over 50 companies in five domains (areas), namely land, weapons and ammunition, C4ISR (electronics, information technology, cyber technology), aviation, and naval.

The land domain includes the following companies: Huta Stalowa Wola; Stomil – Poznań S.A.; Zakłady Mechaniczne „Bumar – Łabędy" S.A.; Ośrodek Badawczo – Rozwojowy Urządzeń Mechanicznych OBRUM; Rosomak S.A.; Wojskowe Zakłady Motoryzacyjne S.A.; Jelcz Sp. z o.o.; Ośrodek Badawczo – Rozwojowy Przemysłu Oponiarskiego "Stomil"; Zakład Mechaniczny "BUMAR-MIKULCZYCE" S.A.; H. Cegielski-Poznań S.A.

The arms and ammunition domain includes the following enterprises: MESKO S.A.; PCO S.A.; CENZIN Sp. z o.o.; Fabryka Broni „Łucznik" – Radom sp. z o.o.; Wojskowe Zakłady Uzbrojenia S.A.; Bydgoskie Zakłady Elektromechaniczne „BELMA" S.A.; Zakład Produkcji Specjalnej „GAMRAT" Sp. z o.o.; Zakłady Chemiczne „NITRO-CHEM" S.A.; Zakłady Metalowe „DEZAMET" S.A.; Przedsiębiorstwo Sprzętu Ochronnego „Maskpol" S.A.; Zakłady Mechaniczne „Tarnów" S.A.

The C4ISR (Electronics, Information Technology, Cyber Technology) domain includes the following companies: PIT-Radwar S.A.; Ośrodek Badawczo – Rozwojowy Centrum Techniki Morskiej S.A.; Wojskowe Zakłady Elektroniczne S.A.; Wojskowe Zakłady Łączności nr 1 S.A.; Wojskowe Zakłady Łączności nr 2 S.A.; ZURAD Sp. z o.o.

The Aviation domain includes the following companies: Wojskowe Zakłady Lotnicze Nr 1 S.A.; Wojskowe Zakłady Lotnicze Nr 2 S.A.; Wojskowe Centralne Biuro Konstrukcyjno-Technologiczne S.A.; Wytwórnia Sprzętu Komunikacyjnego „PZL-Kalisz" S.A.; Narzędziownia-Mechanik Sp. z o.o.

The Maritime domain includes the following companies: PGZ Stocznia Wojenna Sp. z o.o.; Stocznia Remontowa Nauta S.A.

Noticeably, for several years now, PGZ has been systematically developing its potential, taking over and incorporating new companies into the group, as well as modernizing and expanding its machinery and production lines, as well as the production volume. Moreover, its products meet the requirements of the 21st century battlefield, and therefore the thesis that PGZ significantly contributes to the generational leap of the domestic defense industry seems justified. Cooperation with foreign partners who transfer technologies that were previously beyond the reach of Polish entrepreneurs is helpful in this respect. Offset agreements also play a positive role. (Chochowski K., 2020, p. 181 – 195).

The second most serious domestic player on the Polish arms market is the Grupa WB. It comprises 12 entities, namely: Zakład Automatyki i Urządzeń Pomiarowych AREX Sp. z o.o.; Flytronic S.A.; Mindmade

Sp. z o.o.; Polcam Systems Sp. z o.o.; Radmor S.A.; WB America LLC; WB Electronics S.A.; WB India; WB Middle East LLC; WBE Technologies Sbn Sdh; WB UKRAINE LLC; PNS Sp. z o.o.

They offer communication and command technologies, as well as advanced solutions for the armed forces in areas such as: observation and reconnaissance systems; battlefield command, communication and management systems; fire control systems; strike systems; IT and cybersecurity systems; equipment and modernization of military equipment.

It is neither possible nor advisable to present here a larger number of entities involved in armaments production in Poland. However, it should be emphasized that practically all of them have recorded a significant increase in sales of products and services in recent years, which has translated into the profit achieved.

II. General Assumptions of the Technical Modernization Plan of the Polish Armed Forces

There is no army in the world that could be said to be 100% modern. "Technical modernization is one of the key elements of the functioning of the armed forces of every country. Due to the fact that efficiently and properly carried out, it improves the capabilities, effectiveness and safety of soldiers and the armed forces as a whole, almost every country in the world with its own armed forces, constantly subject them to technical modernization." (Jasiński D., 2018, p. 165).

The ongoing technological progress means that the process of modernization of the armed forces is by its nature endless. It is no different in the case of the Polish Army, for which the Technical Modernization Plan of the Polish Armed Forces, hereinafter referred to as the PMT, has been implemented. This plan was approved on October 10, 2019 by the Minister of National Defense for the years 2021-2035, taking into account the year 2020. The legal basis for the Technical Modernization Plan for the years 2021-2035 is the Act of May 25, 2001 on the reconstruction and technical modernization and financing of the Armed Forces of the Republic of Poland. The amount of planned expenditure is PLN 524 billion, i.e. approximately USD 133 billion, and in the context of the ongoing war in Ukraine, it is highly probable that it will increase further.

The PMT is closely related to the Development Program of the Polish Armed Forces, which is a classified document, and therefore the Authors cannot present it to the Reader.

Referring directly to the PMT, it should be stated that it includes several programs, the implementation of which in the Polish army will allow it to gain new capabilities and raise it to a higher level of combat effectiveness. Thus, it will increase the security of not only Poland but also other NATO countries.

These are the following programs: PATRIOT System; HIMARS Launchers; HOMAR-K Launchers; ABRAMS M1A2 SEP v.3 tanks; ABRAMS M1A1 tanks; K2 tanks; BORSUK infantry fighting vehicle; F-35 aircraft; FA-50 aircraft; M-346 aircraft; Saab 340 AEW aircraft; JASSM-ER; K9 gun-howitzers; KRAB gun-howitzers; RAK mortars; Naval Missile Unit; MIECZNIK program frigates; KORMORAN II class destroyers; ORP ŚLĄZAK patrol corvette; Carl Gustaf M4 grenade launchers; AW149 helicopters; APACHE helicopters; AW101 helicopters; Black Hawk helicopters; Rosomak ZSSW-30; ŻMIJA vehicles; PIORUN; BAYRAKTAR TB2 unmanned aerial vehicles; GLADIUS unmanned aerial vehicles; WIZJER drones; FLY EYE drones; ORLIK drones; Barbara aerostats; LMP-2017 mortars; VIS 100; EOD/IED robots; Tugboats; MSBS GROT.

"The Technical Modernization Plan of the Polish Armed Forces for 2021-2035 is very ambitious, and its implementation is to take the domestic army to a higher level of combat capabilities. It takes into account the ongoing technological progress, especially in the field of cybernetics and information technology, although the question remains whether it is sufficient. It includes new areas of armed struggle such as cyberspace or outer space" . (Chochowski K., 2022, p. 25).

PMT is therefore a lever that can raise to a new level not only the Polish army, but also the Polish defense industry. If we also take into account the East Shield program, the Szpej operation, or the needs of the reactivated Civil Defense, the prospects for this branch of industry in Poland look optimistic.

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III. Offset, Framework and Implementation Agreements

In the Polish media space, information about subsequent agreements concluded with both domestic and foreign entities, the subject of which are new types of military equipment and technology, appears every now and then. This gives the impression that the Polish army is being flooded with a huge amount of various types of weapons. However, this is not the case, because the media does not pay much attention to the distinction between agreements. Offset agreements are one thing, and framework or implementation agreements are another.

Offset agreements "These are agreements between the State Treasury of the Republic of Poland and a foreign supplier. As a result, there is forced cooperation between domestic entities and a foreign supplier. According to the Offset Act, the offset agreement is to ensure the participation of foreign suppliers in the process of restructuring and development of our country's economy, and in particular the arms sector" . (Banasiński C., Piontek E., 2019, art. 119). Therefore, in the case of what is popularly referred to as offset, we are dealing with compensation agreements.

The legal definition of offset is provided by the legislator in art. 2 point 14 of the Act of 26 June 2014 on certain agreements concluded in connection with the implementation of orders of fundamental importance to the security of the state (consolidated text Journal of Laws of 2017, item 2031). According to the above provision, offset means cooperation between the State Treasury and the offset recipient and a foreign supplier necessary to maintain or establish in the territory of the Republic of Poland the potential in the scope of production, service and maintenance and repair capabilities, as well as other, necessary from the point of view of protecting the fundamental interests of the security of the state, consisting in particular in the transfer of technology, know-how together with the transfer of copyrights or use of the work on the basis of a granted license in order to ensure the independence from the foreign supplier required by the State Treasury. The main advantage of offset agreements is the possibility of transferring modern technologies. Poland, despite having a developed defense sector, often needs the latest technologies, which may be available only from foreign partners. Thanks to such cooperation, Polish companies can gain access to innovative solutions that are key to the modernization of military equipment.

Framework agreements specify the maximum predictable value of the subject of the order and its quantity. However, they do not give rise to a claim on the part of the contractor for the execution of the order. In simple terms, it can be stated that framework agreements are a form of a letter of intent in which both parties declare their willingness to cooperate in the implementation of the subject of the agreement.

Implementation agreements are provisions binding on both parties indicating the specific value and quantity of what is ordered, as well as the time of execution of the agreement and the delivery schedule.

Therefore, in the thicket of information regarding arms contracts for the Polish army, it is necessary to distinguish between individual types of contracts in order to be able to break through the information noise and draw accurate conclusions.

As an example, several contracts concluded for the modernization of the Armed Forces of the Republic of Poland should be presented. On April 28, 2023, an executive contract was signed for the delivery of 22 Rocket and Artillery Sets (ZRA) Pilica+. The value of the order is almost three billion PLN. The "Łucznik" Arms Factory signed a contract for the delivery of an additional 70,000 MSBS Grot A2 carbines for the amount of PLN 826 million. Subsequent orders for this factory include the delivery of 250 Grot 762N sniper rifles and an additional 88,000 Grot carbines worth PLN 1 billion, as well as 28,000 VIS 100 pistols worth PLN 160 million. The Maskpol company signed a contract with the Armaments Agency for the delivery of several dozen thousand bulletproof vests, worth PLN 490 million. On December 19, 2023, the Armament Agency and the PGZ-NAREW Consortium signed an implementation agreement for the delivery and servicing of 24 P-18PL (UW-10) long-range radar sets. The contract is to be implemented in the years 2023-2035, and its value is over PLN 3.1 billion. On December 22, 2023, the PGZ-Amunition Consortium and the Armament Agency concluded an implementation agreement for the delivery of nearly 300,000 pieces of 155 mm artillery ammunition implemented under the National Ammunition Reserve

program. The order is worth nearly PLN 11 billion and will be implemented in the years 2024-2029. An agreement was also signed between PIT-RADWAR and Wojskowe Zakłady Elektroniczne and the Norwegian concern Kongsberg Defence & Arerospace (KDA) for the production and delivery of two Naval Missile Units and the servicing and production of NSM missiles. In addition, PGZ companies signed agreements with the Armament Agency for the delivery of nearly 400 Light Reconnaissance Vehicles and two framework agreements for the delivery of Heavy Infantry Fighting Vehicles and a New Wheeled Armoured Personnel Carrier, as well as for the delivery of BAOBAB-K Scattered Mine Laying Vehicles and mines manufactured by the Bydgoszcz company Belma. It is also worth mentioning that the Armament Agency of the Ministry of National Defence signed an agreement with the RADMOR company (part of the WB GROUP) for the delivery of software-defined radio stations and accompanying equipment. The order includes devices intended for installation on mobile platforms. In turn, on September 5, 2023, the Armament Agency of the Ministry of National Defense signed a contract with GRUPA WB for the delivery of nearly 1,700 FlyEye unmanned aerial systems. The framework contract is to be completed by 2035.

These are just some of a number of new framework and implementation agreements. There is also increasing talk of the need to purchase a squadron or two air superiority fighters, pointing to the American F-15 and heavy transport helicopters CH-47 Chinook. If these agreements are concluded, the value will be counted in billions of zlotys.

IV. Opportunities and Threats for the Defense Industry in Poland

The ambitious plans of the Polish authorities to modernize and expand the army and increase its combat capabilities necessarily require huge financial outlays.

Referring to the domestic possibilities of supporting the Polish defense industry, it should be noted that they are related to the Act of October 7, 1999 on supporting the restructuring of the industrial defense potential and technical modernization of the Armed Forces of the Republic of Poland (Journal of Laws 2020.1663 consolidated text of 2020.09.28), the Act of March 11, 2022 on the defense of the Homeland (Journal of Laws 2022.2305 consolidated text of 2022.11.14, hereinafter referred to as the Armed Forces Support Fund), as well as the Fund established pursuant to Article 41 of this Act. This fund was created in the National Economy Bank, and its resources are allocated to the implementation of the goals specified in the Armed Forces Development Program. (Chochowski K., 2023, p. 196).

In addition to the domestic funds mentioned earlier, it is also worth considering the possibility of obtaining external funds from the European Union (European Defense Fund, European Defense Industry Program, the EU program supporting the production of ammunition ASAP), NATO (NATO Innovation Fund, NATO Security Investment Program) or received under special programs such as FMF Foreign Military Financing, under which, on December 6, 2024, Poland received a $4 billion loan for the rapid transformation of the Polish army.

When considering the financing of the Polish defense industry, it is impossible not to mention the decisions to recapitalize specific companies in the defense industry. For example, PGZ received PLN 400 million in funding from the State Treasury for its investments in the plants in Pionki and Skarżysko Kamienna, and the total value of the investment will amount to PLN 466.7 million. For investments in Huta Stalowa Wola, the plant received PLN 600 million in funding from the State Treasury, and the total value of the investment will amount to almost PLN 665 million. In turn, for investments in ZM Bumar, it will receive PLN 850 million from the State Treasury, which will constitute 100% of the investment value.

However, it would be worth supporting not only entities from PGZ but also those from outside it, especially those involved in the production of anti-drone systems and satellites, in order to develop domestic capabilities in the indicated scope. The technical solutions that Polish entrepreneurs have at their disposal do not differ from the latest ones used in the world. They fully deserve support not only to fill gaps in the state's security system, but also in the context of their potential export. What's more, over time they could gradually penetrate the civilian industry, enriching its possibilities to compete on the global market. It seems that this support will bring profits to the national economy, also in the long term.

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When analysing the issues of opportunities and threats, or challenges facing the Polish defence industry, it is necessary to first identify the key factors influencing its prospects. According to the authors, these include:

- The country's defence policy. Political decisions regarding the country's defence, such as the defence budget, defence strategies or decisions regarding the purchase and modernisation of military equipment, have a key impact on the prospects for the defence industry. Political stability and consistent support for the defence sector are conducive to its development.

- The changing geopolitical situation. Tensions in the international arena and the growth of security threats may lead to an increased demand for modern defence equipment. The Polish defence industry may benefit from such changes if it is able to deliver high-quality and modern solutions.

- Technological progress. Technological development, including innovations in the field of armaments, communication systems, cybersecurity and robotics, is shaping the future of the defence industry. Poland can benefit from these changes by investing in research and development and promoting cooperation between the public and private sectors.

- International cooperation. Integration with allies and participation in international defense programs can create new opportunities for the Polish defense industry. International cooperation can enable access to advanced technologies and joint development and production of defense equipment.

- Highly qualified staff. Access to highly qualified technical and engineering staff is crucial for the development of the defense industry. Poland must invest in education and professional training to ensure an adequate number of specialists needed to conduct advanced projects in the defense sector.

- Security of raw material supplies. The raw materials required for the production of defense equipment can sometimes be difficult to access or subject to price changes on the global market. Therefore, ensuring the stability and security of raw material supplies is crucial to ensuring the continuity of production in the defense industry.

- Harmonious cooperation between industry and the R&D sector. This issue takes on particular importance within the framework of a knowledge-based economy, to which, among others, the domestic economy aspires. One must agree with the thesis that "Many inventions created in research institutes working for the military later passed into everyday use by citizens." (Wilczyński P. L., 2013, p. 154). Innovations implemented in the Polish defense industry may, over time, permeate the civilian sector, increasing its attractiveness and competitiveness on the global market. Establishing cooperation between science and the defense industry is therefore of fundamental importance for the development of modern technological solutions in the area of defense. It is a process that enables the transfer of knowledge and know-how between the academic community, where new ideas and scientific research are generated, and the industrial sector, which has production capabilities and experience in implementing these ideas in practice.

Referring to the basic challenges facing the Polish defence industry, it should be noted that it is currently facing a number of significant challenges that require immediate attention and effective solutions.

The main problems that this sector currently has to face are:

- A shortage of multi-year military equipment purchase plans. The Polish defence industry suffers from a lack of coherent, long-term plans for the purchase of military equipment. The uncertainty associated with frequent changes in purchase plans hinders the stable functioning of companies and effective planning of investments in the development of production and infrastructure;

- Lack of investment in the development of domestic manufacturers and repair shops. Domestic defence companies often struggle with a lack of financial support and investment in modern technologies

and production infrastructure. This lack of investment inhibits innovation and limits the ability of Polish manufacturers to compete on the international market;

– Excessive dependence on foreign defence concerns. Polish national defence is largely based on imported equipment and technologies, which leads to excessive dependence on foreign suppliers. The dominance of external companies on the Polish arms market is associated with the expenditure of significant financial resources abroad and limits the sovereignty of the state in the field of defense;

– The need to quickly increase the defense potential of the army. Dynamic changes in the geopolitical situation, including the conflict in Ukraine, impose an urgent need to increase the defense potential of the Polish Army. However, the lack of a developed domestic defense industry means that Poland is unable to effectively and quickly respond to these changing security challenges. Understanding these key problems allows us to see the urgent need to introduce real, coherent multi-annual plans for the defense industry in Poland.

The opportunities for the defense industry in Poland should be seen primarily in:

- Creating new military units. A decision was made to create two new large tactical units, which, despite having the word infantry division in their name, are in fact mechanized divisions. These are: the First Legions Infantry Division (abbreviated as 1 DPLeg) and the Eighth Home Army Infantry Division (abbreviated as 8 DPAK). The 1 DPLeg will consist of 12 military units, including 4 general military brigades, an artillery brigade, 4 regiments of military types, and a command battalion, a reconnaissance battalion, and a chemical battalion. The 8th DPAK will consist of 11 military units: two mechanized brigades, a motorized brigade, an artillery brigade, an armored brigade, a logistics regiment, an anti-tank regiment, an anti-aircraft regiment, a command battalion, a reconnaissance battalion and a chemical battalion. The process of building these units has already begun.

- Construction of training grounds and training centers. As an example, it is worth mentioning the construction of a complex of facilities worth several hundred million złoty enabling the operation of equipment and conducting training classes, including using Abrams and K2 tanks at the Biedrusko training ground, belonging to the Land Forces Training Center in Poznań. Another example is the construction of a new training and testing center, implemented as part of the East Shield program on the premises of the Land Forces Training Center in Orzysz.

- Active and helpful role of public administration. Construction of new factories, change of production profile, securing supply chains - all this requires activity on the part of public administration and understanding of the situation in which NATO's eastern flank countries find themselves.

- Development of domestic space technologies. The Polish space industry offers a wide range of goods and services, starting from software, including that which uses artificial intelligence, through specialist tools and devices, to the production of nanosatellites and satellites and their launch into space. According to data from the Polish Space Agency (POLSA), our space industry consists of over 300 state and private entities, of a diverse nature, i.e. both business and research. It employs approximately 12 thousand highly qualified employees.

- Implementation of Operation Szpej. Operation Szpej assumes increased purchases of various types of individual equipment and withdrawal of obsolete equipment from use. Replacing equipment with new one is intended to increase soldiers' survivability on the battlefield, as well as increase their resistance to difficult weather conditions, ability to operate at night or fight in urban areas.

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- Launch of the East Shield program. This program assumes the construction of a number of fortifications, terrain obstacles and military infrastructure along the eastern border of Poland. Its value is estimated at PLN 10 billion.

- Reactivation of Civil Defense. The Act on Population Protection and Civil Defense adopted by the Parliament creates a comprehensive system of population protection and civil defense in our country. It specifies the tasks of population protection in peacetime and wartime; bodies and entities carrying out population protection tasks and the principles of planning population protection and civil defense. Funds in the amount of no less than 0.3 percent of GDP will be allocated annually to financing tasks in the field of population protection and civil defense.

- Smart factory and industry 4.0. In short, this concept means combining and integrating advanced digital technologies with physical production, thanks to which the vision of the so-called smart factory becomes a reality. As a result of this approach, it is possible to optimize the operations of a production plant, expressed, among others, in improved productivity and efficiency, increased flexibility, improved customer service or reduced costs. The observable drive to transform armaments plants towards smart factories is a good trend.

- Stable and long-term financing. For years, Poland has been fulfilling the financial obligations set by NATO to spend at least two percent of GDP on defense. For several years, we have been observing a growing trend in this area, culminating in the planned defense expenditure for 2025 in the total amount of PLN 186.6 billion, which is to constitute 4.7% of Poland's GDP.

- Cooperation with the R&D sector. In Poland, there are a number of research and scientific centers thanks to which it is possible to quickly develop and implement innovations in the industry. A good example here is the Łukasiewicz Research Network, which includes 22 Institutes, employing 4,500 scientists, and the research conducted within its framework covers the area of: smart and clean mobility, digital transformation, health, green and low-emission economy. It is worth paying attention to, for example, the work on rocket technology and the Polish suborbital rocket ILR-33 Amber 2K.

5. CONCLUSIONS

- Prospects for the Polish defence industry are good.

- The key to success will be the effective use of geopolitical and technological changes, appropriate government support and the ability to adapt and innovate. In this way, the Polish defence industry can become not only a tool for ensuring the country's security, but also a significant player in the international arena. To this end, it is worth reaching for not only domestic funds but also external ones (EU and NATO) and entering into cooperation with other entities.

- Strengthening the cooperation of the defence industry with the civilian industry, including the information and communication technology sector, can bring additional benefits in the form of technology transfer and increased innovation.

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