

# DIMENSIONS

THE RHEINMETALL MAGAZINE

ISSUE 1/2024

## CONFLICTS

THE NEW FACES OF WAR CALL FOR  
INTEGRATED SECURITY.



## COMBAT IN THE NET

Modern conflicts are multidimensional in the extreme. Getting to grips with the many challenges these conflicts pose at every level demands closely networked cooperation between allied and partner countries as well as military and civilian actors. This is the only way to reliably safeguard stability, security and peace. Our picture shows German defence minister Boris Pistorius visiting the Bundeswehr's Cyber and Information Domain Service at Rheinbach near Bonn in July 2023. On the battlefields of tomorrow, having digitalized armed forces will be essential. The latest technologies link humans and machines, networked intelligence services and NATO allies. Real-time data and algorithms provide combat troops in battle with a vital information edge, one which will be even more important in future than today, making them a matter of life and death, victory or defeat.



**DEAR READERS,**

We're living in a world where dictators and terrorists are seeking to overturn international law and are putting our rule-based world order under considerable pressure. Like Putin's brutal invasion of Ukraine before it, we were horrified to learn of the attack by Islamist militant group Hamas against Israel. Germany and its allies are being called upon not only to protect their own populations but also to show solidarity to those under attack and strength in opposition to those who seek to undermine our values. The declaration 'Never Again Is Now', a phrase that has been uttered many times since 7 October 2023, is an acknowledgement of the need to take responsibility in times of dramatic change.

This notion of responsibility has become a guiding principle here at Rheinmetall. These changing times have prompted the company to reconsider the purpose and meaning of its work and to recalibrate its identity: responsibility for protecting people and societies by delivering cutting-edge security technology; responsibility for sustainability through our technological progress in areas such as electric transportation, hydrogen and energy efficiency; responsibility for the towns, cities and communities where we live and work by embodying the notion of corporate citizenship.

Over the next few pages, read how Rheinmetall's corporate claim 'Taking Responsibility in a Changing World' is shaping the self-conception and daily working lives of our 33,000+ employees worldwide. Read about how Rheinmetall is providing training for Ukrainian soldiers, producing heat pumps for electric trucks and building the F-35 production centre in the Lower Rhine area. Read also about the important social work being undertaken by Frank Pape, whose efforts are deserving of all our support as part of our commitment to corporate citizenship. These are all examples of the myriad ways in which we at Rheinmetall are taking responsibility.

I hope you enjoy reading this and that it inspires lively discussion.

Sincerely,

Philipp von Brandenstein  
Head of Corporate Communications  
Rheinmetall AG



#### ABOUT THE TITLE PAGE

Vanishing act on the battlefield: for over a hundred years, camouflage nets have been an effective means of concealment from enemy eyes. The latest generations even block out radar and infrared radiation.

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From 2025, Rheinmetall will manufacture parts for the F-35 combat aircraft at its Weeze site.

## A SMART POWER SUIT

When Tony Stark puts on his legendary Iron Man suit, the engineer and defence industrialist turns into a superhero who can save the universe with his superhuman powers.

Although the exoskeletons currently available on the market may not quite be able to compete with the high-tech kit seen in the Marvel films, the two do have something in common, which is that they both make physical exertion easier for the people wearing them. Originally designed for military purposes and the medical rehabilitation of patients with paraplegia, exoskeletons are becoming an increasingly common sight in industrial production facilities. One such place is Rheinmetall's site in Kassel, where the defence and technology company develops and manufactures tactical wheeled vehicles. The Ottobock exoskeleton, which takes some of the strain off warehouse and production workers carrying out overhead work, weighs just under two kilos. Using sophisticated spring and cable technology, the equipment significantly reduces the effort needed to perform work above shoulder height. The exoskeleton is worn like a rucksack. You put the straps over your shoulders then fasten the belt around your waist and the cuffs around your arms and you're done. Thanks to the biomechanical support, working puts much less strain on shoulder muscles and joints. The exoskeleton assists Rheinmetall workers with lifting objects as well. All in all, that means better ergonomics in the workplace, fewer physical complaints and thus a healthy and productive workforce.





At the 6th German-Ukrainian Business Forum of the German Chamber of Industry and Commerce, Ukrainian prime minister Denys Schmyhal (r) presented German Chancellor Olaf Scholz with a certificate marking the registration of the Rheinmetall joint venture.

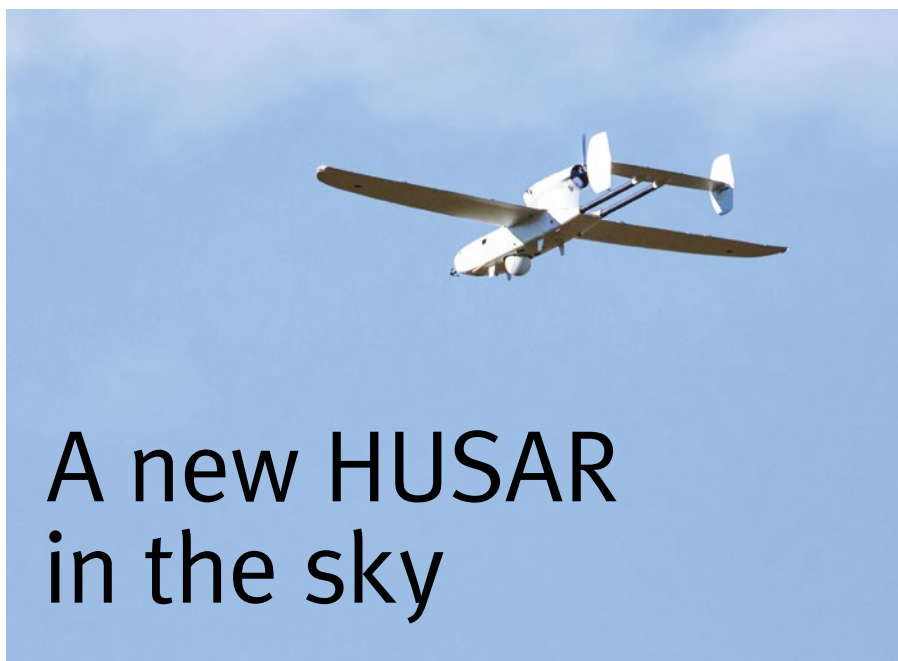


## JOINT VENTURE IN UKRAINE

The tech enterprise Rheinmetall AG and Ukraine’s state-owned Ukrainian Defense Industry JSC (UDI, formerly Ukroboronprom) have established a joint venture company in Kyiv. The Ukrainian prime minister, Denys Schmyhal, announced the move in October 2023 at the German-Ukrainian Economic Forum in Berlin, which

Chancellor Olaf Scholz also attended. The Düsseldorf-based Group holds a 51 percent stake in Rheinmetall Ukrainian Defense Industry LLC, with UDI holding the remaining 49 percent. This cooperative venture is intended to bolster Ukraine’s domestic defence industry and, ultimately, its national security. The joint venture is already

maintaining and repairing military vehicles. The next step calls for building Fuchs/Fox wheeled armoured vehicles in Ukraine, to be followed by other armoured fighting vehicles. In terms of order volume, Rheinmetall is Ukraine’s largest source of military materiel.



## A new HUSAR in the sky

The German Bundeswehr has awarded Rheinmetall an order for the LUNA NG air-supported reconnaissance system. Worth around €200 million, the contract encompasses a prototype system and twelve full-scale production systems. Dubbed HUSAR by the German military, this medium-range unmanned air vehicle will enable German Army reconnaissance and artillery units to detect, recognize and locate targets in real time. Owing to its ultralight, aerodynamic design, the LUNA NG can remain aloft for over twelve hours. Experience gained during the war in Ukraine has highlighted the great importance of real-time data in networked operations. The first production system is slated for delivery in the second quarter of 2025.



# Rheinmetall bids farewell to its pistons business

Rheinmetall has completed its withdrawal from pistons production and its small-bore pistons business. Rheinmetall and Comitans Capital AG recently concluded a purchase agreement encompassing Rheinmetall's small-bore pistons operations and related production facilities worldwide. Business operations and production

are to continue at all locations. The move is in line with Rheinmetall's strategy of focusing on new technologies and alternative drive solutions in its civil sector business. The Group's large-bore pistons unit had already been sold to Koncentra Verkstads AB of Sweden.



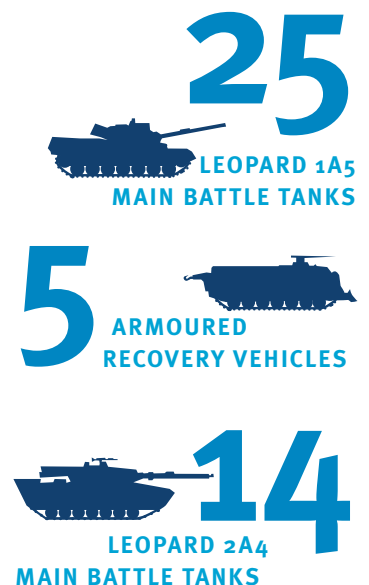
## PANTHER READY TO POUNCE

The government of Hungary has awarded Rheinmetall a development contract to prepare the Panther KF51 main battle tank for series production. Signed in December 2023 in Zalaegerszeg, Hungary, the contract is worth around €288 million. The plan calls for constructing and qualifying a demonstrator version of the Panther KF51 Evo armed with a 120mm gun, paving the way for subsequent

full-scale production. Rheinmetall is cooperating in the project with the state-owned Hungarian holding company N7, which also holds a 49 percent stake in the joint venture Rheinmetall Hungary. Furthermore, Hungary has recently awarded the Düsseldorf-based tech enterprise and arms maker a contract to develop a Skyranger-30 turret for the future air defence variant of the Lynx KF41.

## MILITARY AID FOR UKRAINE

Germany and its NATO allies the USA, Denmark and the Netherlands are supporting Ukraine with weapons and equipment on a major scale. Here, Rheinmetall is an important source of defence technology, with around €3 billion in orders for Ukraine currently on its books. In the second half of 2023, additional large-volume orders came in, either issued or financed by Germany and other countries. In addition to training, logistical support, spare parts and other support services, deliveries due to take place in 2024 already include:



LARGE AMOUNTS OF  
ARTILLERY, TANK  
AND MORTAR  
AMMUNITION OF  
VARIOUS TYPES  
AND CALIBRE

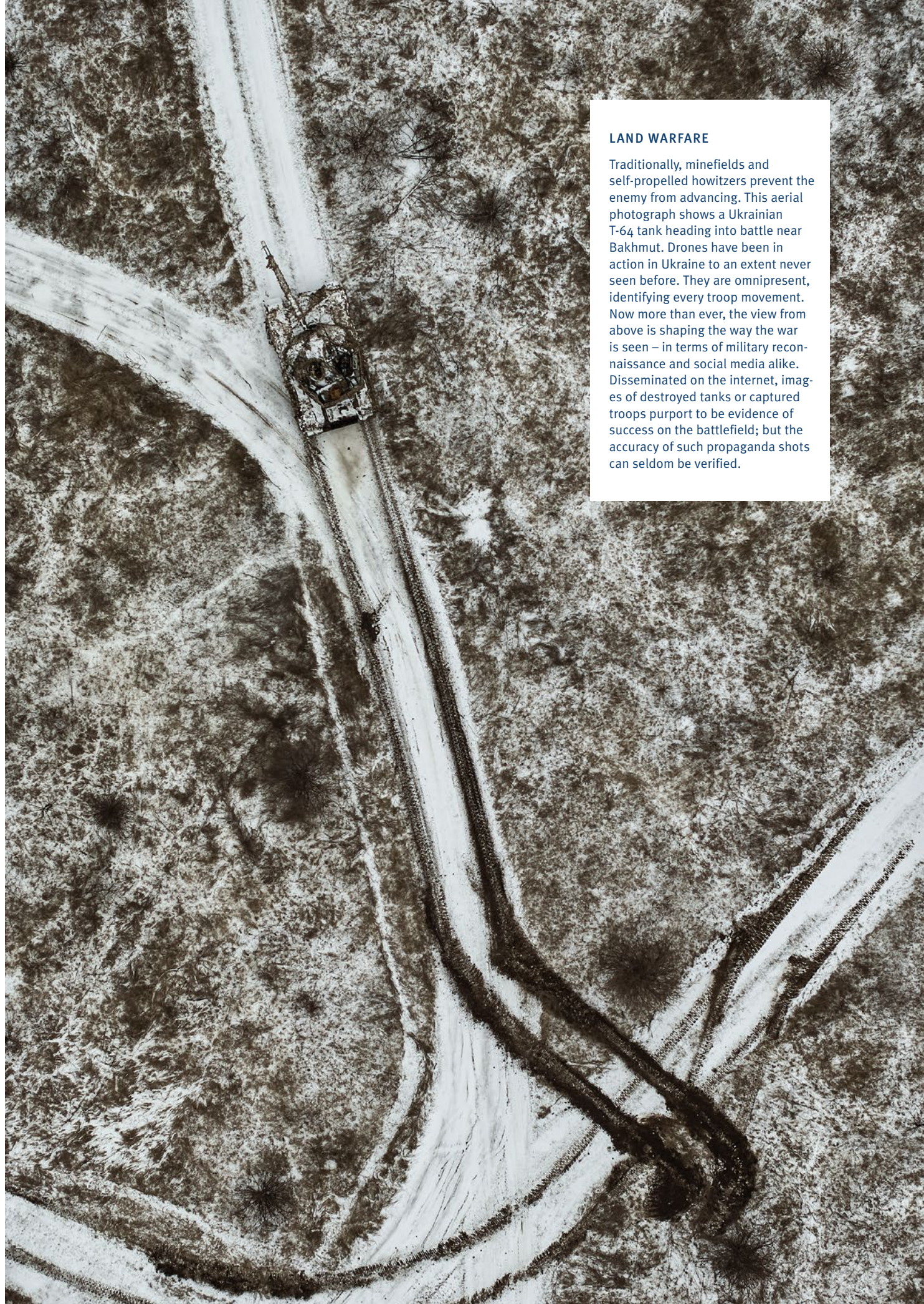
→ You can find all the latest news, information and background stories on the DIMENSIONS website: [www.dimensions-magazin.de/en](http://www.dimensions-magazin.de/en).

The war in Ukraine has swept away the illusion that modern conflicts would somehow be fought in cyberspace with few human casualties. Instead, a new type of high-intensity war is raging. According to United Nations data, up to half a million Ukrainian and Russian troops have been killed or wounded in the conflict. Thanks to satellites, drones, sensors and mobile phone data, battlefields are increasingly transparent. Moreover, the war has been devouring weapons and ammunition at a ferocious pace, posing huge production and logistical challenges. If Ukraine is to have a chance of prevailing against Russia's war machine in the long run, a lot will depend on how much equipment and financial aid it receives from its Western partners.



#### TRENCH WARFARE

Scorched and cratered landscapes, mud and deep trenches – what to us calls to mind the First World War and the fruitless battles of the Western Front over a century ago, are a grinding daily reality now for soldiers fighting in Ukraine. The front currently runs for around a thousand kilometres, with very little movement in recent months, as here in Bakhmut. The conflict has evolved into a brutal war of attrition, greedily consuming men, women and material.



#### LAND WARFARE

Traditionally, minefields and self-propelled howitzers prevent the enemy from advancing. This aerial photograph shows a Ukrainian T-64 tank heading into battle near Bakhmut. Drones have been in action in Ukraine to an extent never seen before. They are omnipresent, identifying every troop movement. Now more than ever, the view from above is shaping the way the war is seen – in terms of military reconnaissance and social media alike. Disseminated on the internet, images of destroyed tanks or captured troops purport to be evidence of success on the battlefield; but the accuracy of such propaganda shots can seldom be verified.



#### **A WAR OF ATTRITION**

As in the trench wars of the last century, soldiers on both sides were quick to dig in. Now they attempt to hold the line while subjecting each other to machinegun, mortar, and tank fire. Multifarious weapon systems run through ammunition at an astonishing rate. Both sides have long since been forced to ration their shells. In the meantime, the pace of ammunition procurement in the EU is picking up. More than anything else, Ukraine needs artillery shells. As the world's largest producer of artillery ammunition, Rheinmetall can tip the balance here.

# The bygone future of war

Novel tactics, state-of-the-art weapons systems, all-seeing reconnaissance – advanced technology and digitalization are changing the face of modern armed conflict. Yet at the same time, traditional forms of warfare are experiencing a comeback. Is this the beginning of a new era in the history of war?

*Author: Dr Gerd Portugall*

**DR GERD PORTUGALL**

has worked as a social scientist and journalist specializing in security policy and military issues for over 35 years. He has served as a freelance editor for a military publishing house in Germany since 2022.





1 A soldier from a Ukrainian assault brigade fires a 122mm mortar at Russian positions on the frontline near Bakhmut in the Donetsk region.

**T**he Russian invasion of Ukraine, the increasingly blatant military threats directed against Taiwan by the People's Republic of China, North Korea's attempts at nuclear intimidation and the recent flareup of fighting in the Middle East have largely reduced the already shaky architecture of international peace to rubble. Throughout the West, people have been quick to criticize the long years of disarmament and the accompanying "peace dividend" that followed the end of the Cold War. This seems unfair. After all, it was a time when Germany was "completely surrounded by friends", as the country's then defence minister, Volker R  he, put it in 1992: boosting German defence spending would have been illusory. Besides, politicians and the public were demanding just the opposite back then: less money, fewer troops and less equipment for Germany's armed forces – the same as elsewhere in Europe.

#### **A NEW DIMENSION NEAR AT HAND**

The ongoing Russian-Ukrainian war has forced many nations to fundamentally rethink their procurement policies. It has also revealed how geographical proximity and distance influence public perceptions of military conflicts. The contrasts are glaring, supposedly rampant globalization and worldwide media coverage notwithstanding. While bloody civil wars have been raging in Syria ever since the "Arab Spring" in 2011 and since 2014 in Yemen, subsequently internationalized by the intervention of outside actors (much as in the Balkan wars), the concern triggered by these conflicts has been quite muted in Europe. And this despite Syria directly bordering on Turkey, a NATO member nation on the periphery of Europe.

By contrast, when war broke out in Ukraine almost two years ago, the shock to European civil society was huge. The millions of Ukrainians who have sought refuge in various European countries heightened the emotional impact and public awareness of the war. By the same token, those countries – such as Germany – that have provided Kyiv with military, humanitarian and financial aid have repeatedly been the target of various forms of hybrid warfare, with attacks traceable back to Russia and other actors. The

impact of events currently unfolding in Israel and Gaza has played out differently, with the regional conflict in the Middle East increasingly making itself felt in the streets in Germany and all over Europe.

### **HYBRID WARFARE – BLURRING THE BOUNDARY BETWEEN WAR AND PEACE**

Violent conflict today is taking on new forms: the Kremlin is waging its war not just with soldiers but with a combination of military and political pressure, including cyberattacks, disinformation and covert operations. On 7 October 2023, Israel suffered a massive attack by the terrorist organization Hamas, in which the means selected were in marked contrast to a conventional military assault. But what makes hybrid warfare qualitatively different – and in what ways does it reflect the constants found in every war? What threats do we have to prepare for? And what lessons can we draw from what has already happened?

Thinking in “either/or” categories – something we are all too inclined to do in Germany – won’t result in an adequate answer. One thing is for sure: the complexity demands a “both/and” approach. In its current manifestations, war has become a mix of archetypal contradictions, in which the boundaries between war and peace become blurred and military action spreads into civil domains. The following phenomena are characteristic:

- Modi operandi: Openly, in ways that can be clearly traced; and covertly (e.g. espionage and propaganda)
- State and non-state actors (e.g. political parties, corporations, NGOs and terror organizations)
- Military and non-military instruments (diplomatic and economic, for example, but also manipulating migration)
- Symmetric peer-on-peer wars and asymmetric guerrilla wars and terrorism
- Conventional and unconventional ways of waging war
- Regular and irregular combatants

The arsenal of hybrid warfare primarily serves one purpose: asserting one’s own aims, including in the face of resistance, while avoiding open military conflict. Mounting a direct attack can have grave consequences, resulting in an all-out defensive effort by the country on the receiving end, right through to multinational intervention by allied third parties. Some are therefore inclined to speak of a Cold War 2.0 between Russia and the West.

### **PARAMILITARIES ARE ON THE MARCH WORLDWIDE**

Concealment at several levels is a typical characteristic of hybrid warfare. This includes using mercenaries and regular troops without national insignia. The latter played a decisive role in the violent seizure of Crimea in 2014. “Little green men” – Russian troops without insignia and therefore irregular combatants under international law – caused confusion in Ukraine as well as in the West.

The best-known private military company in the first decade of the 21st century was Blackwater USA, which was primarily active in Iraq. Today, the most notorious mercenary force is the Russian Wagner Group, who have been conducting their nefarious activities first and foremost in Syria, the Sahel and, until recently, in Ukraine. Criminals from the worlds of organized crime, terrorism and piracy can mutate into security policy-relevant actors. Examples include the drug cartels in Colombia and Mexico or Islamists and pirates in Somalia.

In mercenary forces, in paramilitary groups, in warlord-led militias and foreign legions, foreign and domestic volunteers are paid to go to war, with perhaps the prospect of a new identity. Convicts, too, are recruited as “volunteers” with the promise of a pardon. This situation comes very close to what the German political scientist Herfried Münkler calls “buy-your-way-out post-heroic societies” which are unwilling to sacrifice their own *jeunesse dorée*, i.e. the children of the elite, on the battlefield. But for state actors, too, deploying their own regular troops can be problematic. It’s not a coincidence that unmanned and quasi-autonomously operating systems like attack drones are augmenting traditional “boots on the ground”, thus reducing the need to expose troops to the hazards of combat operations.

### **CIVILIANS AS HUMAN SHIELDS**

Non-state actors often misuse civilians as human shields. When, for instance, an organization like Hamas operates in a densely populated urban area and is suspected of placing its command posts under mosques and hospitals, combatting them with military means is obviously difficult, especially given the high political price of the unavoidably large number of civilian casualties this is bound to entail. The situation is doubly difficult for regular armed forces, which, as instruments of state policy, are obliged to adhere to international humanitarian law, including the Geneva Convention and the Hague Convention respecting the Rules







2 Night after night, an aerial war has been raging in the skies over Tel Aviv and other Israeli cities on a scale the world has never seen: Israel's "Iron Dome" air defence system in action against rockets fired from the Gaza Strip.

3 Palestinians posing with a captured tank on the border between the Gaza Strip and Israel. The brutal surprise attack by the Islamist terror group Hamas came as a shock to Israel and its Western allies.

and Customs of War on Land, to which paramilitary forces and terrorists clearly never feel bound.

### NEW FORMS OF GEOPOLITICAL CONFLICT

Today, physical damage can be inflicted not only through kinetic-physical means but by cybernetic-digital modalities as well. Technical advances in the Information Age have long since given rise to a new form of warfare: cyberwar in virtual space. National critical infrastructure and civilian facilities are especially at risk. The supposedly US-Israeli malware program "Stuxnet", which is believed to have damaged Iran's nuclear centrifuges, is just one example among many. Outside of conflict zones, not only government agencies but private-sector companies are vulnerable to cyberattacks. Here, too, the boundaries of war are increasingly blurry.

Global climate change harbours additional potential for interstate conflict. Natural dis-



3

asters trigger massive population movements that can have a destabilizing effect on transit and destination countries. As was recently the case with Belarus, autocratic regimes instrumentalize refugees as a means of exerting political pressure. At the same time, climate

change is leading to increased competition for scarce resources like water, while in the Arctic, our warming planet is making precious natural resources accessible and opening new trade routes of great geostrategic significance. Nations are getting greedy.

**THREATS OF VIOLENCE: THE RHETORIC OF ESCALATION**

In addition to attacking Ukraine physically, Russia has been waging what amounts to psychological warfare in Europe. The UN Charter states that “threats or the use of violence are incommensurate with the goals of the United Nations”. This hasn’t prevented Russia from repeatedly threatening to use nuclear weapons. As if nuclear sabre rattling wasn’t enough, Moscow regularly tries to intimidate the nations of NATO’s eastern flank, particularly the Baltic States and Poland – to say nothing of threatening to cut off the flow of oil and gas.

At the same time, Russia continues to meddle in the internal politics of Western democracies, focusing on far-left and right-wing populist parties. In the United States, moreover, Moscow’s efforts to manipulate the domestic political debate during the 2016 election campaign have been attributed to tipping the election to Donald Trump.

In Germany, both the far-right Alternative for Germany, or AfD, and parts of the far-left Linke party have willingly allowed themselves to be courted by Moscow and instrumentalized for its Great Power policy ends. Both parties sit in the German Parliament, or Bundestag, as well as in many of the country’s state parliaments.

**FAKE NEWS AS A WEAPON**

The Information Age has more than just a technological dimension, the virulent stuff of cyberwar. It also has a psychological one: targeted disinformation. Both are elements in the information war, though cyberwar is a far more recent concept than psychological warfare, which goes back to the work of the British brigadier general and military historian J.F.C. Fuller in the 1920s. Today it takes the form of conspiracy theories, alternative facts and fake news. Instead of rational arguments, manipulative messaging aims to undermine the credibility of an opponent’s government institutions and the mainstream media, ultimately causing people to lose faith in everything and to believe in nothing. If the objective is to achieve public opinion supremacy, then social media – X, Instagram, Facebook, Telegram, TikTok, etc. – are the battlefield where the rival parties engage in a virtual propaganda war.

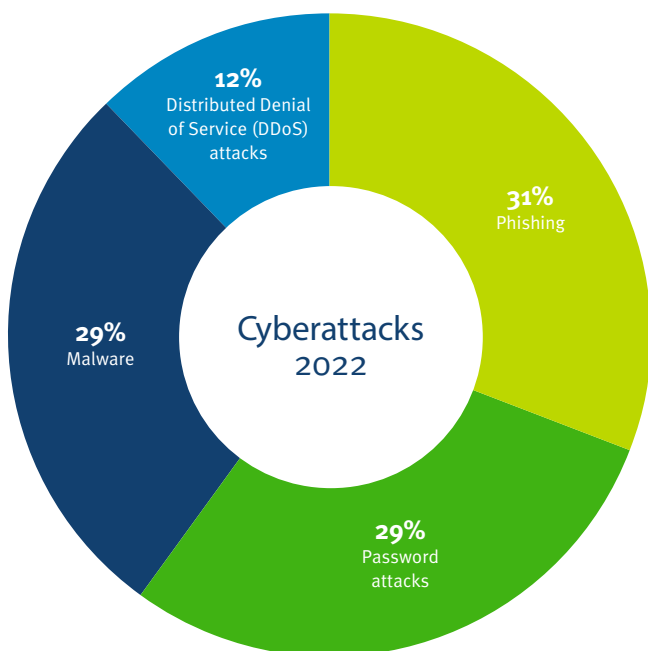
**OLD AND NEW: PEER-ON-PEER WAR**

Hybrid warfare has broadened the battlefield to include the economy, politics and society, including critical infrastructure and the information domain. The Russian-Ukrainian war leaves no room for doubt on this score. In purely military terms, this brutal conflict has manifested itself in an ambivalent mix of traditional tactics and military hardware from earlier wars with the very latest in high-tech weaponry. Long dismissed as antiquated, such traditional elements of warfare as trenches, minefields, tank traps, and the massive use of armour and artillery have featured prominently in this conflict. At the same time, all-seeing sensors mounted on high-tech drones, vehicles and machines support heavily armed troops on the ground engaging in networked operations. Unmanned aircraft and autonomously operating tanks are now a reality.



**THE THREAT FROM THE NET**

Cyberattacks have long since emerged as a serious threat. Almost the entire German economy is now affected. The ensuing damage now costs the country €148 billion annually. Since the start of the Russian invasion, most of the attacks have originated in Russia and China.



Source: Study commissioned by the digital association Bitkom in 2023

### A RETURN TO OLD-SCHOOL MASS ARMIES

The war in Ukraine has also altered estimates of force requirements. Until now, the idea of mass armies – the traditional *levée en masse* – seemed to have no place in 21st century military doctrine. As a result, many countries abandoned conscription. Even though Russia and Ukraine weren't among them, during this protracted conflict both have been forced to call up new cohorts. High-intensity combat exacts a heavy toll, both human and material. To meet the immense demand for weapons, munitions and equipment, Moscow and Kyiv have both placed their economies on a war footing.

### AI AND DIGITALIZATION

At the same time, both sides in the war have – as far as possible – adopted innovations in the way modern war is waged, including C5ISR, an operational network standing for Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance. Many high-tech military solutions are based on this: swarms of attack and kamikaze drones, for example, or satellite-supported GPS reconnais-

sance and the control of weapons systems via networks like Starlink, operated by the US aerospace company SpaceX. Thanks to advances in digitalization, mobile phones can be located for target acquisition, while modern air defence systems deliver reliable protection against short- and very short-range threats and enable interception of longer range ballistic missiles. But frontline communication via standard social media platforms also plays an increasingly central role.

### TRADITIONAL STOCKPILING VS FLEXIBLE SUPPLY CHAINS

Something else revealed by the war in Ukraine: the move away from traditional stockpiling after the Cold War to flexible supply chains in modern military logistics has had a negative impact on operations. In conflicts characterized by high-intensity combat, material wear quickly brings logistic support to a grinding halt. In February 2022, Russia was counting on a swift victory. Moscow assumed at the time that its forces were vastly superior, equipped with modern systems and professionally led. That its

### ETYMOLOGY

The terms “hybrid war” and “hybrid warfare” were popularized between 2005 and 2009 by Dr Frank G. Hoffman, an American strategy expert and former Marine Corps staff officer. A few years earlier, a German political scientist, Professor Herfried Münkler, coined the expression “New Wars”. Written in the shadow of the terror attacks on 9/11, his homonymous book explores the ambivalence and complexity of modern forms of war.

4



4 The transparent battlefield: Where are the enemy positions? How is the offensive progressing? Only reconnaissance drones can tell for sure, as here at Huliapole in Zaporizhzhia Oblast in southern Ukraine, some five kilometres from the Russian lines.



5

5 Whether high-tech military systems or commercial off-the-shelf models: in Russia’s war of aggression against Ukraine, both sides have made extensive use of drones – and not just for reconnaissance missions. Kamikaze drones can destroy military targets as well as damaging civilian infrastructure.

invasion failed even before reaching Kyiv was a further confirmation of the famous pronouncement of the Prussian chief of staff Helmuth von Moltke: “No plan survives first contact with the enemy!” Following the first defeats on the battlefield, military leaders in Moscow realized the need to adapt the structure of the Russian armed forces. This is why the militaries of both countries have demanded a mass mobilization of manpower, while the defence industry is increasingly calling for a return to traditional stockpiling of materiel.

**NEW MILITARY DOCTRINES ARE CHANGING MODERN WARFARE**

In addition to modifying their plans on land and in the air, many countries are shifting their naval doctrine from blue water battles to littoral warfare, including the ability to project military force from ship to shore. As already alluded to, air force doctrine now assigns an increasingly important role to unmanned systems. The trend here is towards mixed forms of manned and unmanned platforms, in short, a “system of sys-

tems”. The militarization of space and cyberwar and the corresponding technological underpinnings are opening new dimensions.

Conversely, the geostrategic consequences of modern warfare also mean a return to the tried and true: in the West, a forced renaissance in both conventional and nuclear deterrence is underway. What’s new here, though, is that conventional superiority now lies with the West, unlike in “Cold War 1.0”. Just as with Spain and Turkey at the time, in the new confrontation between East and West traditionally neutral nations like Finland and Sweden are now eager to come under NATO’s defensive umbrella or have already done so.

**LESSONS FROM THE WAR IN UKRAINE**

Following “Cold War 1.0”, thanks to the “peace dividend” and digitalization, European armed forces were expected to do more with less, i.e. enhancing their military capabilities with less money, fewer personnel and less materiel. With Chancellor Olaf Scholz’s proclamation of a

“turning point in history”, everything changed. Germany’s new defence policy envisages massive rearmament of the Bundeswehr, coupled with far-reaching financial and material support for Ukraine. Olaf Scholz, a lawyer who in the 1980s belonged to the peace movement, could theoretically underpin his policies with the words of the American president and political scientist Woodrow Wilson when he took the United States into the First World War in 1917: “Law and justice are more precious than peace.” In the meantime, the German defence minister, Boris Pistorius, has announced his intention of making the Bundeswehr “war-worthy” again.

Faced with this threat situation, NATO agreed to new defence plans at its summit in Vilnius in summer 2023 that spell out which capabilities are necessary to deter an aggressor in a crisis and to defend Alliance territory. Moreover, these plans extend beyond ground, air and naval operations to include space and cyberspace. Moving on from the goal of urging NATO member states to invest two percent of gross domestic product in defence, in Vilnius a two percent minimum was agreed.

### LOOKING AHEAD: THE ARMED FORCES OF THE FUTURE

Officials responsible for equipping the armed forces have already drawn lessons from the current conflict. New military capabilities are now the order of the day. At the same time, however, traditional military hardware and methodology are experiencing a renaissance. Speaking off the record, moreover, the military admit that much of what they had been saying about threat scenarios and modern warfare in recent years was completely wrong. It is therefore no coincidence that the German government is eager to rebuild the Bundeswehr’s ammunition stocks – and not just for artillery. A second lot of Puma infantry fighting vehicles for the mechanized infantry corps is on order, as is the nuclear-capable F-35A Lightning II fighter aircraft.

Furthermore, plans are now in place that will enable effective air defence against strategic threats as well as in the short- and very short-range spectrum. In a major step, the German Army’s Air Defence corps, deactivated in 2012, is now being reinstated. The vital importance of this capability has been plain to see in both Ukraine and Israel.

Even before the Vilnius summit but after the Russian invasion of Ukraine, the European

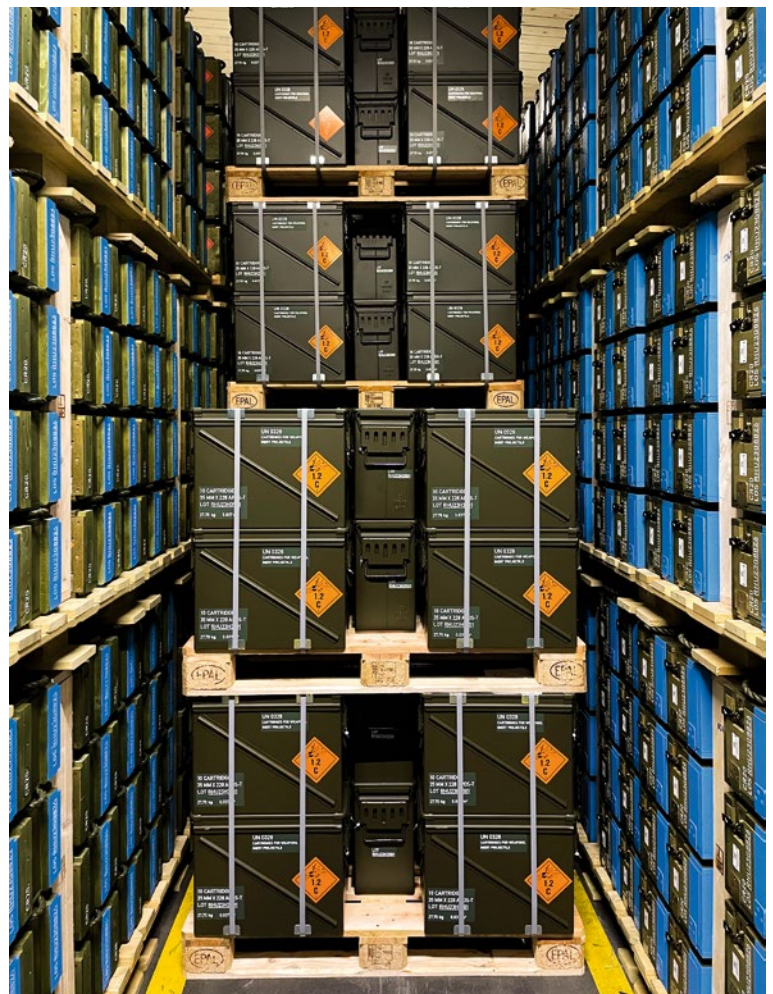
Rheinmetall is supporting Ukraine with urgently needed ammunition. If the conflict turns into a war of fixed positions lasting for years, a steady supply of equipment and ammunition could well determine the outcome.

member states of NATO launched an initiative to improve the continent’s defences against missiles, artillery shells and aircraft, the European Sky Shield Initiative, or ESSI (see article on page 24f). Under this initiative, procurement and service contracts for guided missiles, automatic cannons and high-energy laser weapons can be expected.

### A DECADE-LONG TASK

The need for action is therefore multifaceted: in the conventional domain, ammunition depots need to be restocked, tanks, weapons systems and trucks reordered, and previous military capabilities re-established. At the same time, the next war – may it never come to pass – will require maximum digitalization and networkability, new forms of ordnance such as drones and other unmanned systems, and high-tech reconnaissance and countermeasure assets. Regaining the ability to wage war will take at least a decade and a society-wide effort. It will require substantial financial and human resources – and above all the declared will of society to protect its values and if necessary to defend them. ●

6



# Escalation in the Middle East

On 7 October 2023, squads of Hamas terrorists launched an attack on Israel, murdering around 1,400 people and taking over 240 people to the Gaza Strip as hostages. Israel responded with air strikes and a ground offensive, with several thousand people having been killed to date. DIMENSIONS talked to the Middle East and terrorism expert Guido Steinberg about the escalation in the conflict.

## **Steady progress had been made in the Middle East peace process over recent years. Was this one of the reasons for the Hamas attack on Israel in early October?**

I think so. The United States had been in negotiations with Israel and Saudi Arabia on the conditions of a potential peace treaty for a number of months. Hamas and other enemies of Israel would have viewed such a peace accord as a serious strategic defeat. The Israel-Palestine conflict was increasingly being forgotten about in many Arab capitals, and resolving the question of Palestine was no longer playing much of a role in the negotiations.

## **Security experts have expressed their surprise at the Hamas attack, its consequences, and the fact that the Israeli security services appear not to have been adequately prepared. Why do you believe this was the case?**

The security situation in the Gaza Strip and the West Bank had intensified considerably in recent years.

But an escalation of the conflict in this form was unexpected and took the Israeli army and security services entirely by surprise. Even if planned and successfully kept under wraps, a large-scale operation of this nature involving special forces would have been expected to originate from Lebanon rather than the Gaza Strip, as Lebanon is home to the considerably bigger and stronger Shiite organisation Hezbollah, which is supported by Iran. By contrast, Israel underestimated what Hamas was capable of.

## **What is the relationship between Hamas and Hezbollah?**

Because Hamas is Sunni, the two organisations do not share ideological religious convictions. However, Iran, Hezbollah and Hamas do have a common enemy. The latter is a member of the “Axis of Resistance” against Israel and the United States that was initiated by Iran in around 2004, and these extremely unequal partners are united by their hatred of these enemies. Hamas and Hezbollah are terrorist organisa-



Hamas terrorists show off a captured Israeli military vehicle in the streets of Gaza City.

tions and social movements simultaneously. That is what makes them so dangerous – and why they must be combated in a different way to the so-called Islamic State, for example.

## **Numerous cities in the West have seen and continue to see pro-Palestine rallies. What connections and networks exist between Hamas and Europe?**

A distinction should be made between spontaneous demonstrations of sympathy and organised activities. The former mainly came from members of the population with a Palestinian migrant background. In some cases, they were organised by supporters of the “Popular Front for the Liberation of Palestine”, which was formed in 1967 and still has several dozen members in Germany. Hamas and Hezbollah also have an organised presence in Germany. However, most of their mem-



**DR GUIDO STEINBERG**, born in 1968, works for the German Institute for International and Security Affairs (SWP) in Berlin. His research areas include the Middle East, Jihadism, Political Islam and Terrorism. The SWP advises the German government and parliament on all questions of foreign and security policy. An internationally renowned expert in Islamism and terrorism and a published author, Steinberg has also served as an expert witness in Germany, Austria, Denmark, Canada and the United States.

failing to vote against a resolution that calls for an Israeli ceasefire without also condemning Hamas terrorism [editor's note: on 28 October 2023], however, such pronouncements begin to lose their credibility. I increasingly suspect the grand words concerning the "matter of state" to be little more than cheap and empty political rhetoric. The federal government needs to learn to understand what is going on. The West as a whole is under pressure, and our opponents can sense this weakness – see Ukraine, see Iran, see the China-Taiwan conflict. Above all, the German government needs to do what it has failed to do over the past 20 years: It must get the Federal Armed Forces into shape, especially with a view to defending its territory and its alliance, but also with regard to the global fight against terrorism.

**What form might a peaceful solution to the conflict eventually take?**

A two-state solution has been highly unlikely since 2005 at the latest, but it remains the best option, at least in theory. As far as I am concerned, the first step in obtaining lasting peace would be to defeat Hamas. At the same time, the building of settlements would need to be halted. Next, a new Israeli government would have to be formed without the participation of settlers or right-wing extremists. The situation for the Palestinian people would also have to be improved, and a new Palestinian government would need to be formed. The Gaza Strip and the West Bank could be given greater autonomy or become part of a federation. However, the main insight to be taken away from the horrific terrorist attacks is that the question of Palestine cannot be ignored. Israel, the United States, Saudi Arabia and the other parties involved in the peace talks need to be aware of this. If they take the matter seriously, something good could yet come out of the current crisis. ●

*Interview conducted by Jan-Phillipp Weisswange*

→ You can read the full interview at [www.dimensions-magazin.de/en](http://www.dimensions-magazin.de/en)

bers take care to stay under the radar in order to avoid criminal prosecution.

**Is there a connection between the escalation in the Middle East conflict and other security hotspots, like the Ukraine war or the latent conflict between China and Taiwan?**

I do not see a strategic connection. At the same time, the world's attention is focused on the Middle East, and the United States finds itself involved in another trouble spot. Both of these things are beneficial to Russia's interests. Russia and Iran have certainly also become closer, and a Hamas delegation has visited Moscow. Enemies of the West are drawing closer together. No one yet sees a connection to the Far East, and the conflict is likely to have a minimal impact on that region. However, China is increasingly active in the Middle East and could find itself taking on a more important role.

**Can Europe and, in particular, Germany be expected to have a tangible impact on the parties involved and help to de-escalate the situation? Or is there nothing that can be done without the United States?**

As far as the parties to the conflict and the other players in the region are concerned, the United States has a critical influence on events. Europe's role is limited to that of providing finance. Europe does not have a common position and remains reliant on US support.

**Germany has declared Israel's security to be a "matter of state". Those are big words – but how is Germany actually supporting Israel in the current situation?**

In extreme circumstances, a declaration of this nature would entail defending Israel's security by force of arms. When we see Germany's representatives to the United Nations

# “Sky shield” over Europe

The European Sky Shield Initiative, or ESSI, initiated by Germany, aims to significantly improve Europe’s defences against possible air attacks. To date, 19 nations have joined the initiative. Their goal: to jointly procure, deploy and maintain radar systems, anticraft guns and surface-to-air missiles.

Author: *Dr Theodor Benien*

**T**he European Sky Shield Initiative, or ESSI, seeks to substantially enhance Europe’s air defences in coming years. It was prompted by Russia’s illegal war of aggression against Ukraine, which in February 2024 will have already lasted two years. One of the most important realizations: the civilian population in Ukrainian cities is not well protected against Russian air attacks, thus making them highly vulnerable. For this reason, the defence ministers of 15 NATO countries agreed in Brussels on 13 October 2022 to set up a comprehensive “sky shield” over Europe. The planned protective umbrella was called into being at Germany’s initiative. Experts see this as evidence that Germany is finally willing to take up a greater leadership role on the Western stage.

In a keynote address at the end of August 2022 in Prague, German Chancellor Olaf Scholz put European air defence squarely on NATO’s policy agenda. “We have some serious catching up to do in Europe when it comes to defending ourselves against threats from the air and space”, declared Scholz in his speech, going on to say that, “This is why we in Germany will be investing substantially in air defence in coming years.”

The Chancellor sees clear political, military and financial advantages here: “A jointly established air defence network in Europe would not only be less costly and more efficient than if each of us set up our own expensive, highly complex air defence systems. It would be a major gain for the security of all Europe – and an outstanding example of what we mean when we speak of strengthening the European pillar of NATO.”

## BRIDGING CURRENT CAPABILITY GAPS

The European Sky Shield Initiative aims to protect NATO’s European nations more effectively from aerial threats. This entails expanding existing capabilities and plugging current capability gaps. To do this quickly, ESSI member states plan to jointly procure, deploy and maintain systems such as radars, automatic cannons and anti-aircraft missiles.

## PROGRESS SINCE THE START OF THE PROGRAMME

Ever since its creation, observers have been intently watching to see if the political declarations would lead to concrete actions, especially since France, one of Germany’s most important security partners, has yet to join the initiative.

**DR THEODOR BENIEN** worked for over 30 years as Head of Communications in various divisions of the Airbus Group and was most recently Vice President Communications in the Eurofighter consortium. Since 2020, he has been working as an independent communications consultant with a focus on international security and defence policy.



However, despite lingering scepticism, the European project has made respectable headway during the past two years:

- October 2022: The new programme begins with 15 nations. In the meantime, its membership has grown to 19 countries, including Finland and NATO candidate Sweden as well as Austria and Switzerland, two neutral nations, in July 2023.
- June 2023: Germany's military procurement agency, the Federal Office of the Bundeswehr for Equipment, Information Technology and Utilisation, or BAAINBw, signs a contract for six fire units of the ground-based, medium-range IRIS-T SLM air defence system.
- Rheinmetall's Skyranger 30 is the future solution envisaged for the ESSI short-range domain (for defending against drones, for example). In Germany negotiations are currently underway for procurement of the Skyranger 30, to be mounted on the Boxer wheeled armoured vehicle. Hungary, another NATO member state, was the first country to order a prototype of the Skyranger 30, which it plans to install on its Lynx infantry fighting vehicles, a tracked system made by Rheinmetall. Denmark also recently announced that it would be procuring around fifteen Skyranger 30 air defence systems.
- September 2023: German defence minister Boris Pistorius and his Israeli counterpart, Joav Galant, agree on the purchase of the Arrow 3 anti-missile system, which is considered the best of its kind worldwide. Developed and manufactured by Israel and the USA, it is designed to intercept ballistic missiles outside the Earth's atmosphere. Procurement of Arrow 3 by the Bundeswehr is taking place outside of the ESSI framework.
- October 2023: In a further step, ten nations sign a memorandum of understanding containing the parameters for joint procurement of air defence solutions.

#### EUROPEAN SKY SHIELD INITIATIVE

At present, 19 European nations are taking part in ESSI: Germany, Bulgaria, the Czech Republic, Estonia, Finland, Denmark, Hungary, Latvia, Lithuania, the Netherlands, Norway, Sweden, Romania, Slovakia, Slovenia, the United Kingdom, Belgium, Austria and Switzerland.

#### THE UPSHOT: CLOSER DEFENCE COOPERATION IN EUROPE

The investments in air defence related to ESSI will have the potential to advance the cause of European defence cooperation in general. This makes sense not just in terms of military effectiveness and interoperability, but also from the financial standpoint. This is because the costs will be shouldered by multiple member states.

There's another advantage. Under this initiative, the government in Berlin can prove that it has the political will to assume greater responsibility for European defence and to take the lead in the urgently needed programme to revamp Europe's air defence capabilities. Moreover, several NATO nations have long expected their German ally to take this step. ESSI can therefore be seen as a political opportunity for Germany within the Atlantic Alliance. ●



#### DEFENDING AGAINST MISSILES, PLANES AND DRONES

Air defence describes the ability to defend against aerial threats such as missiles, mortar and artillery shells, drones, helicopters and fixed-wing aircraft. Experts differentiate between three layers of interception where capability gaps exist which ESSI seeks to address:

- Short range: ranges of up to 15 km at altitudes of up to 6 km
- Medium range: ranges of 15 to 50 km and up to a maximum altitude of 25 km
- Long range: ranges of over 50 km and altitudes of up to 35 km

# A holistic approach to security

After a prolonged tug-of-war, Germany finally has a National Security Strategy. In it, the German government is propagating a policy of integrated security. In the future, potential threats are to be countered through improved inter-ministerial cooperation.

Author: *Dr Theodor Benien*

**T**he ability to defend ourselves, resilient, sustainable and looking ahead. That is how the German government envisages its new long-term policy of “integrated security”. This was one of Chancellor Olaf Scholz’s most important messages when he presented the country’s National Security Strategy in Berlin on 14 June 2023 together with four ministers from his cabinet. Various described as “integrated” or “expanded”, the new approach to national security took shape in recent years, and now extends far beyond the traditional rubrics of internal and external security.

The Strategy Paper represents a departure in German security policy. In fact, this is the first time that the Federal Republic of Germany has ever had its own security strategy. It thus comes as no surprise that drawing up the strategy document was no easy task and ultimately the outcome of political horse trading. Due account had to be taken of the divergent priorities of the German government’s three coalition partners, as did the various interests of the Federal Chancellery, the Ministry of Defence, the Foreign Office and the Interior Ministry.

If you read the Strategy Paper carefully, one thing quickly becomes apparent: the expression “integrated security” takes centre stage. Henceforth, security is no longer to be conceived of in terms of internal and external security alone but will instead include significantly more dimensions. What does “integrated security” mean? The 74-page document defines it as follows: “We understand it to be the interaction of all relevant actors, resources and instruments which interlock to maintain the security of our country in full and strengthen it against external threats.”

In the view of the German government, security policy is “more than the sum of diplomacy and military power; it must bring together all the strands of policy.” Therefore, in addition to ex-



ternal and internal security, it encompasses inter alia cybersecurity and space security as well as energy and climate security, food security and security of supply, and social security.

No sooner was the Strategy Paper published than a political debate erupted, with critics assailing the failure to anchor a new national security council in the Security Strategy. The conservative Christian Democrats wanted this, as did the market-minded Free Democrats. But the coalition partners and relevant ministries were evidently unable to agree on this – due perhaps to the existence of the Bundesicherheitsrat, or Federal Security Council. Forming a second body might have led to bureaucratic turf wars.

Chancellor Olaf Scholz and four members of his cabinet presented the Security Strategy at a government press conference in Berlin on 15 June 2023.



## A COMPASS FOR GERMANY'S SECURITY

In its white paper, the German government analyses the political and strategic parameters in Europe and defines the country's security interests. The strategic building blocks and their objectives are as follows:

**The ability of Germany to defend itself.** This encompasses, for example, a credible ability to deter aggression and to defend the country; expansion of NATO's European pillar; and strengthening national and Alliance defences.

**Resilience.** The liberal democratic order must be protected against espionage, sabotage, disinformation and cyberattacks in order to bolster faith in a "democracy that can defend itself". According to the strategy, great innovative strength is decisive in assuring the ability to resist and compete. Technological and digital sovereignty are therefore fundamental components of integrated security.

**Sustainability.** The very first sentence of the subchapter on this building block of strategy sums up succinctly its most important message: "Global climate, environmental, food and resource policy are security policy." The framework for political action relating to this building block is Agenda 2030 of the United Nations with its global sustainability goals.

## DOES SECURITY HAVE TO BE A TOP EXECUTIVE MATTER?

Furthermore, some political observers found fault with the fact that the Foreign Office took the lead in drawing up the security strategy rather than the Chancellery, Ministry of Defence or Interior Ministry. After all, they complained, security strategy is a top executive matter and hence the province of the Federal Chancellor, who not only sets the policy agenda but, in times of war, is commander-in-chief of the German armed forces under the country's constitution.

No matter how one views the criticism, the main thing is that Germany finally has its own National Security Strategy, though the Federal Republic, unlike the United States, Great Britain or France, has never had a tradition of "strategic thinking". It was therefore admirably frank of Annalena Baerbock, the country's foreign minister, to admit in her introduction to the Strategy Paper that "The text is not an end point, but rather a beginning." Thus, the Strategy Paper is seen as a work in progress which will be continuously improved and updated.

## FACTS INSTEAD OF FEELINGS

Regarding the public in Germany, it would be desirable if the National Security Strategy would prove to be something more than just a way of keeping security experts busy in government agencies. Instead, it should contribute to a rational, fact-based discussion of strategic policy in Germany, and thus help strategic thinking in Germany to at least inch forward.

A sensible step here would be the creation of chairs of strategic studies or security policy at German universities. The fact that there is not a single, regularly funded chair in this field in Germany is an obvious deficit and one that politicians urgently need to address. The Kiel-based political scientist Joachim Krause quite rightly pointed this out in an article he penned for Germany's Frankfurter Allgemeine Zeitung. "Otherwise", he wrote, "Germany, the perceived leading power of Europe, will continue to suffer from strategic blindness." ●

→ The complete Strategy Paper is available online at [www.nationalesicherheitsstrategie.de](http://www.nationalesicherheitsstrategie.de)

# A mobile hospital for Ukraine

In September 2022, Rheinmetall received the order to deliver a mobile field hospital to Ukraine. A routine job, in theory. In practice, however, this was new terrain for all involved, because a Ukrainian team came straight from the front lines to Germany for training.



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**F**riedrichshafen Exhibition Grounds. On this late summer day, the trade fair season is taking a few weeks off – so the exhibition grounds, usually buzzing with thousands of visitors, appears deserted at first glance. But not so in Hall B2. Here, swiftly assembled, stands a full mobile field hospital on an area of 60 x 60 metres, designed and manufactured by Rheinmetall Mobile System, which is based in nearby Meckenbeuren. It's bustling with activity, soldiers are in the hall and have a lot to do. They are wearing Ukrainian uniforms.

## DEPLOYMENT IMMINENT

Alexander Lutz, 51, is a sales manager at Rheinmetall in Meckenbeuren and has overseen around 20 mobile hospitals through to delivery before. A business graduate, Lutz has been with



the company since 2005, which is well before the local company was acquired by Rheinmetall (see box). With his expertise, he could easily pass for an engineer or a medical technician. He's been on the Ukraine project right from the start: "This specific case has meant nine months of intensive work for our team. In September 2022, Rheinmetall received the order to deliver the mobile field hospital from the Ukrainian Ministry of Defence. It was clear that the hospital will be deployed immediately after it is delivered."

It's an impressive sight. There's everything that even a permanent hospital can offer: 32 inpatient beds, eight of which ICU beds, an operating theatre, computer tomography, a laboratory, sterilisation and medicine storage facilities. Plus there are tents for administration, pre-op, a wait-

ing room and accommodation for personnel. Not to mention supply containers for sanitary facilities, transportation, fresh and industrial water, medical gases and the power supply. The water pipes are heated so that they don't freeze below zero – Rheinmetall's experts have really thought it through to the smallest detail. Alexander Lutz says: "We are bringing medicine to the people."

#### **THE RED CROSS IS A TARGET**

But two other things set the Rheinmetall hospital apart from a hospital as we know it: the decontamination tent, in case of contact with CBRN substances (chemical, biological, radiological, nuclear) and the triage room. In Germany as well, there was a great deal of talk about triage – selecting patients based on the severity of their illness or injuries – during the coronavirus pan-

**1** A Ukrainian soldier receives training from a Rheinmetall employee in the mobile field hospital. The cooperation between the two teams was friendly and highly professional.

**2** These containers and tents house a fully functional hospital on an area of 60 x 60 metres. For security reasons, the Ukrainians have removed the red cross marking every container and tent – that says a lot about the Russian warfare.

## RHEINMETALL MOBILE SYSTEME GMBH

Prior to being acquired by Rheinmetall in 2021, Rheinmetall Mobile Systeme GmbH was owned by a private majority shareholder and, until July 2023, was still operating under the name Zeppelin Mobile Systeme GmbH, which reveals its prior ownership by the Zeppelin Group. At Rheinmetall, the company based in Meckenbeuren was acquired by Rheinmetall Project Solutions GmbH, which bundles Rheinmetall's resources and capabilities for services for armed and security forces. The company predominantly operates in two areas: mobile medical care facilities and customised mobility solutions, which can be deployed as mobile communications systems (radar systems, ground control stations for drones/UAVs or command posts) and as supply systems for infrastructure requirements such as power, kitchens and sanitation. The Managing Director is Hauke Bindzus.

demic. But on the Ukrainian front, where this hospital is needed, the term has a very different meaning. Also, the reason why the red cross emblems have been dispensed with here, instead of being placed on medical equipment as large as possible as usual, seems especially insidious. For the Russians, a red cross makes for a very desirable target, say the Ukrainians. How bitter.

The agreed location for delivery entailed further planning stages. The otherwise standard procedure of delivering directly to the customer, including on-site training by a Rheinmetall team, was not an option. Instead, the exhibition hall was rented in Friedrichshafen and a team from Ukraine was flown to Germany for training. For the Managing Director of Rheinmetall Mobile Systeme GmbH, Hauke Bindzus, 35, this was the best solution: "The covered and enclosed space also allowed us to guarantee security, which is paramount on an operation such as this." Some of the ten soldiers were deployed directly on the front lines and were only recently informed of their departure to attend training in Germany.

As the project manager, Marcel Freivogel, 32, was the main point of contact for the Ukrainians at Rheinmetall. "It was a particular challenge," says the medtech engineer and trained paramedic. "Until they arrived, we didn't even know what level of training the Ukrainian team had or what condition they would be in." But this concern proved unfounded. Half of the soldiers had already had technical training, the other half medical. Interpreters helped to overcome the language barriers. "We were more than positively surprised – by the knowledge that they already had and above all by their motivation," says Freivogel. The Ukrainian team was put up in a hotel for their 14-day trip. And the Ukrainian guests were taken care of after the work was done as well – a point of pride!

### EVERYTHING HAS TO GO IN THE CONTAINERS

Work setting up the hospital began in Friedrichshafen. That was the "easier" part. "Taking it down is more complicated," says Alexander Lutz. After all, everything had to be packed away dry and neat, especially so that it would all fit back in the containers. The mobile hospital for Ukraine, in 20 containers in all, will be transported by ten trucks with trailers.

The tents are inflatable, some of the containers, also known as shelters, are equipped with expandable technology, which means that they look like normal containers when being transported, but the sides can be moved back when setting up, to make more room in the operating

For security reasons, the names and images of Ukrainian military personnel have been changed.

## MOBILE FIELD HOSPITALS – THE ROLE STANDARDS

Mobile hospitals are divided into three capability levels: Role 1, Role 2 and Role 3.



**Role 1** Field hospitals that predominantly remain on the vehicles and can be built and torn down within six hours. They can be transported quite far into the front and are used mainly for the rapid stabilisation of injured personnel for forward transport to a stationary treatment facility. Rheinmetall will also be delivering two field hospitals of this category to Ukraine around the end of 2023/start of 2024.



**Role 2** These hospitals consist mostly of containers and tents that are transported by truck but built on the ground. They are usually some distance behind the front line, with assembly and tear down requiring three days each. The Friedrichshafen project, which has an order volume of €10 million, belongs to this category.



**Role 3** These hospitals offer the most flexibility for treatment and come very close to permanent clinics. In some cases, Role 3 hospitals are installed on hospital ships. Ultimately, however, hospital standards are always categorised based on the depth of diagnosis and treatment possible.

theatre or in the laboratory, for instance. Every individual part of the hospital has been thought through in terms of function and transport capability. The beds have to be foldable and stackable. "Some of our room dimensions are limited. For example, our operating theatre has a height of just 2.20 metres. I have to plan the equipment based on that," states Alexander Lutz. A majority of this equipment comes from partners such as Siemens Healthineers or other well-known medical technology manufacturers.

All the equipment, even the highly sensitive yet extremely heavy CT scanner, has to be transported without being damaged. The hospital is designed to withstand transportation by air, land and sea as well as being disassembled into a relatively small transport volume. "Any mobile workroom in the field is delivered by Rheinmetall Mobile Systeme," says Hauke



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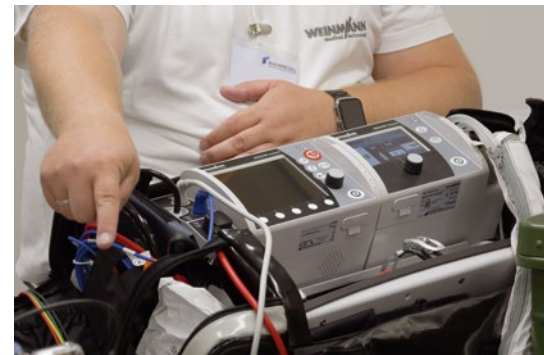
Bindzus. “Anyone can buy the individual parts involved,” he continues, “but configuring them into an overall system that makes sense is our speciality.”

**A VALUABLE CONNECTION WAS MADE HERE**

And this must be what makes the Rheinmetall team extraordinarily good – even the Ukrainian soldiers agree. “The selection of equipment is enormous. And as a medic, I can say that everything here has been very well thought out.” These words of praise come from Artem Kovalenko (name changed). An anaesthesiologist with the rank of captain, he is the highest ranking soldier in the Ukrainian delegation. He previously worked in a field hospital close to Zaporizhzhia. He would rather not talk about the war itself. He prefers to talk about Rheinmetall’s teamwork and hospitality: “We have felt welcome from the first moment. And we have learned to appreciate German thoroughness and organisation very much.” He adds: “Yes, we’re coming from very different circumstances. This has been a unique experience for me and I have learned a great deal. But that’s precisely why I now wish to return to my homeland.”



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The convoy with the mobile hospital has long since arrived at its destination. Ukraine’s military leadership alone knows exactly where it will be deployed. And the soldiers have returned home as well. The thought that these fond guests have left a safe Germany to return to the East Ukrainian front has left Hauke Bindzus, Alexander Lutz, Marcel Freivogel and the whole Rheinmetall team with a lump in their throats. Yet they also know that they have done their part so that many people there will now receive the best medical care possible. ● Pk

**3** Mobile field hospitals, like the one for Ukraine, consist of a variety of components from different manufacturers. Managing Director Hauke Bindzus sees configuring these into an overall system that makes sense as Rheinmetall Mobile Systeme’s speciality.

**4, 5 and 6** On-site discussion: The Ukrainians familiarise themselves with the mobile hospital’s state-of-the-art medical technology. Experts from the manufacturing companies are also on hand for the briefing. Besides the CT scanner, the equipment also includes a mobile respirator for emergency use and high-performance LED lights for the operating theatre.

# “I always believed in Rheinmetall”

Dagmar Steinert has been responsible for finance at Rheinmetall AG since December 2022 in the role of CFO. This makes her one of the few female Executive Board members at Germany’s DAX companies. In this interview, she talks about Rheinmetall’s soaring share price, new markets, future investments – and why success and sustainable business activity are inextricably linked.

**Ms Steinert, does the Rheinmetall CFO need to know the price of a tank?**

Of course. The Group relies on its operating business, and it is important for me to be familiar with our technologies and products. That said, there is no such thing as a list price for a tank – the prices vary considerably depending on the model type and the size of the order.

**At the same time, you always have your eye on the stock market. Rheinmetall’s share price is at a record high and is fast approaching the €300 mark. How do you see things developing from here?**

There is no doubt that our share price performance is extremely encouraging. But that alone is no reason for us to pop the champagne. After all, the sharp rise in our share price is a logical consequence of the current market situation – and the performance we are delivering. In other words, one thing follows the other. There is further upside potential because our prospects are good: Our annual sales are expected to increase

to €13-14 billion by 2026, accompanied by a margin of over 15 percent. According to analyst estimates in December 2023, the market is anticipating an average target price of almost €350.

**You are in charge of the Group’s finances and keep a close eye on cost control and the capital markets.**

**What else falls within your remit?** Above all, I am responsible for ensuring that we obtain the best possible financing conditions for our business activities. We realize large projects, some of which involve ten-figure volumes. Our goal is to keep interest expenses as low as possible. At the same time, we need to ensure that we always have enough liquidity to finance our operations throughout the year. Limiting exchange rate risk is also important with a view to our global business.

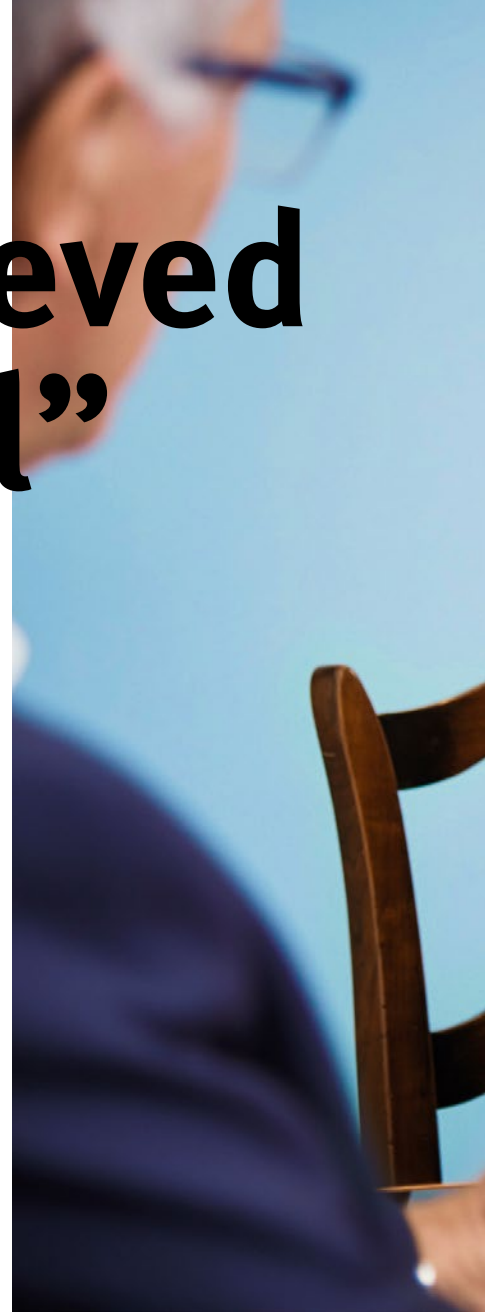
**Looking at the global picture, we find ourselves in a world in turmoil, with outbreaks of war and growing tension in various regions...**

Yes, the political and economic environment is a challenging one. There

are a lot of dependencies, especially for Germany and its export-oriented economy. The security situation is a critical factor. As far as global supply chains are concerned, the most important aspect is a stable political situation in Asia, and especially in China. Various factors will determine whether we slip into a recession or begin to see an economic recovery. In Germany, the way in which the automotive industry addresses technological change will play a key role.

**And yet the Group’s business success appears to be unaffected...**

It is true that our military business is benefiting from the dynamic market environment and the sharp rise in demand. By contrast, the situation for our civilian business is currently







**“Our military business is benefiting from the dynamic market environment at present and the sharp rise in demand.”**

**DAGMAR STEINERT,**

born in 1964, is responsible for finance at Rheinmetall AG in the role of CFO. After obtaining a degree in business administration, the certified auditor and tax advisor worked for various audit companies. She joined Rheinmetall in 2003, where she served as the Head of Accounting for ten years. She was a member of the Supervisory Board of KSPG from 2008 and remained in this role until the end of 2015, even after leaving Rheinmetall. Dagmar Steinert joined Fuchs petrolub SE in Mannheim in April 2013. After almost three years as Head of Investor Relations, she was appointed as the company's CFO on 1 January 2016. She returned to Rheinmetall in December 2022, when she was appointed to the Executive Board of the technology group in the role of Chief Financial Officer.

less favourable, and there is certainly room for improvement in terms of profitability. But we are making good progress towards successfully exiting the area of combustion technology. All in all, we believe we are very well positioned.

**The Russian invasion of Ukraine was a turning point in its own right, but it also marked the start of a new era for Rheinmetall. Was this one of the reasons behind your move to Rheinmetall in late 2022?**

No, I made my decision as long ago as 2021, when some people still had an unfavourable view of the Group. I had always believed in Rheinmetall – and I know what I am talking about, since I worked for the company from 2003 to 2013.

**20 March 2023 was an important day in the company's history: Rheinmetall was included in the DAX, the stock market index of Germany's biggest companies. You attended the opening bell ceremony at the Frankfurt Stock Exchange...**

Yes, it was an unforgettable day – the kind of event you are happy to have experienced at least once in your life. More than anything, though, I was delighted for the company's employees, whose hard work made this achievement possible in the first place. My own contribution was modest by comparison.

**One exciting major project where you did make a big contribution was the acquisition of the Spanish company Expal Munitions. Financ-**

**ing is critical for any transaction of this kind...**

Absolutely. We chose to issue convertible bonds with a volume of EUR 1 billion. The tight schedule was only achievable thanks to outstanding teamwork – including with the advisors and banks involved. This enabled us to place the two bonds at extremely good conditions within a short space of time.

**Rheinmetall was included in the MDAX index for mid-cap stocks until March 2023. Has the promotion to the DAX made it easier for you to get the attention of analysts, investors and banks?**

If you are not getting the necessary attention as a member of the MDAX, you are not doing your job properly.

Having said that, interest among banks has increased significantly since our inclusion in the DAX. This is also a natural consequence of the market situation and the boom we are enjoying. Our media presence has also grown considerably, and our membership of the DAX is undoubtedly one of the reasons for this.

**Rheinmetall is forecasting annual sales growth of around 20 percent over the next few years. Are these encouraging prospects also accompanied by challenges and risks?**

Needless to say, we will have to manage our growth, get our products on the road, and make sure we satisfy our delivery obligations on schedule and in the quality that is expected of us.

**Delivery capacity is an important issue. How do you secure your supply chains? What precautions do you take?**

We make sure that we have adequate stocks of critical parts and materials, but we are aware that this ties up financial resources and impacts our free cash flow. As such, it is important that we do not make too many advance payments and that we secure corresponding payments from our custom-

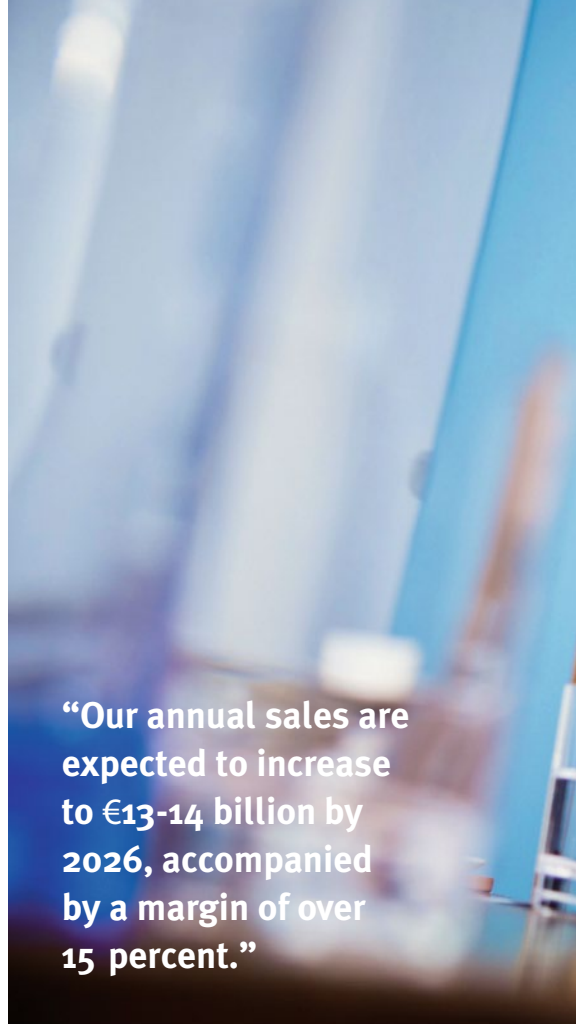
ers in order to limit our own funding requirements.

**Prior to the outbreak of the war in Ukraine, the planned EU taxonomy was the subject of intensive political debate. The project is currently on ice, but it could return to the agenda. What is your position?**

The EU taxonomy is a regulatory and technocratic approach that I believe entails a significant competitive disadvantage for European companies. I expect the EU to take political countermeasures and adopt a more realistic position. Everyone is now well aware that we need security, and that taking the necessary precautions is a matter of national importance. Inadequate protection puts you at risk of losing your freedom. As such, there is no sense in stigmatising an entire industry that is indispensable as far as security is concerned. Sustainability ends where war begins.

**But you do consider sustainability to be more than just a buzzword?**

Of course! Striving for sustainability forms part of our DNA as a company. After all, we help societies to protect themselves. Responsibility is enshrined in our corporate culture, and



**“Our annual sales are expected to increase to €13-14 billion by 2026, accompanied by a margin of over 15 percent.”**

that includes a focus on sustainability. For example, our stated aim for the Group is to achieve carbon neutrality by 2035.

**Efforts to achieve sustainable business practices encompass the areas of environmental, social and governance. What role do ESG criteria play for you?**

A vital one. We can only be successful in the long term if we integrate economic, ecological and social criteria into our corporate strategy – as we already do. It goes without saying that we want to contribute to the economically stable and environmentally responsible development of our society. The responsible and considerate use of natural resources in line with environmental criteria is a matter of principle for us. With a view to social considerations, we believe in delivering security for society as a whole and engaging with our employees in a respectful and responsible manner. And when it comes to governance, I can only say that we would be making ourselves vulnerable and jeopardising our own business if we failed to pur-





sue responsible corporate governance at every level.

**So ESG is one of your core concerns...**

Definitely. And we want to be judged by the success we achieve. To this end, the remuneration paid to the members of the Executive Board and the next management level is also tied to the achievement of our ESG targets.

**Rheinmetall faces the challenge of satisfying the huge demand on the part of the armed forces – not only in Ukraine, but also among the NATO partners and the EU member states. You are expanding your capacities, recruiting additional employees and modernising your facilities. That all costs a lot of money...**

It is true that we are investing on a large scale. In 2023 alone, our investment volume came in at around EUR 550 million, after €350 million in the previous year. However, this is not a burden we are bearing on our own. When it comes to major projects, we receive some support from custom-

ers, such as for new plants. In other words, it depends on the cooperation with our partners. Everything we do has to pay off for us in the end.

**Rheinmetall acts globally, including on the financial markets. You have contacts in North America. Where do you see potential for investors?**

We are indeed seeing an encouraging level of investor interest in the US and Canada. Rheinmetall is considered to be an attractive investment.

**What arguments would you make in order to win over potential investors?**

Our order situation is excellent. Our Rheinmetall backlog is extremely high – almost €40 billion! – and this serves to secure our future business. We are in the middle of a strong growth phase and are forecasting average annual sales growth of more than 20 percent over the next few years, accompanied by high profitability. And because we work with government clients, defaults are unlikely. In other words, we have every reason to look to the future with confidence!

**In addition to its civilian activities, Rheinmetall has a clear focus on military business. Do the financial markets understand the Group's positioning, or do they expect you to concentrate on your business with armed forces?**

We will soon generate 80 percent of our sales from military business. That understandably raises questions about our civilian business. Market observers can see that our civilian activities are not as profitable as our military business. But we are working to improve this and establishing clear structures. We have now consolidated our civilian business in a new division, "Power Systems". We have adopted ambitious profitability targets for each area. We want to preserve our character as a broad-based technology company.

**Among DAX companies, men account for four out of every five Executive Board members. The proportion of women at the companies in the three biggest stock market indices is only around 15 percent. Would you be in favour of fixed quotas for women?**

No, I do not agree with the idea. To be successful, you need to be good at your job, whether you are a man or a woman. If you are a good fit for a company and its culture, your gender really doesn't matter. By imposing quotas, you run the risk of making successful women feel like they have to justify themselves as having got their job because of their qualifications rather than through box-ticking.

**What would be your advice for young women who might look to your career for inspiration?**

Think about your own strengths and weaknesses. If you are fully committed to what you do, you will do it well and be successful. And that is how you develop professionally. I did not originally intend to become a Chief Financial Officer. Young people should be open-minded – and try to stay that way even as they get older. ●

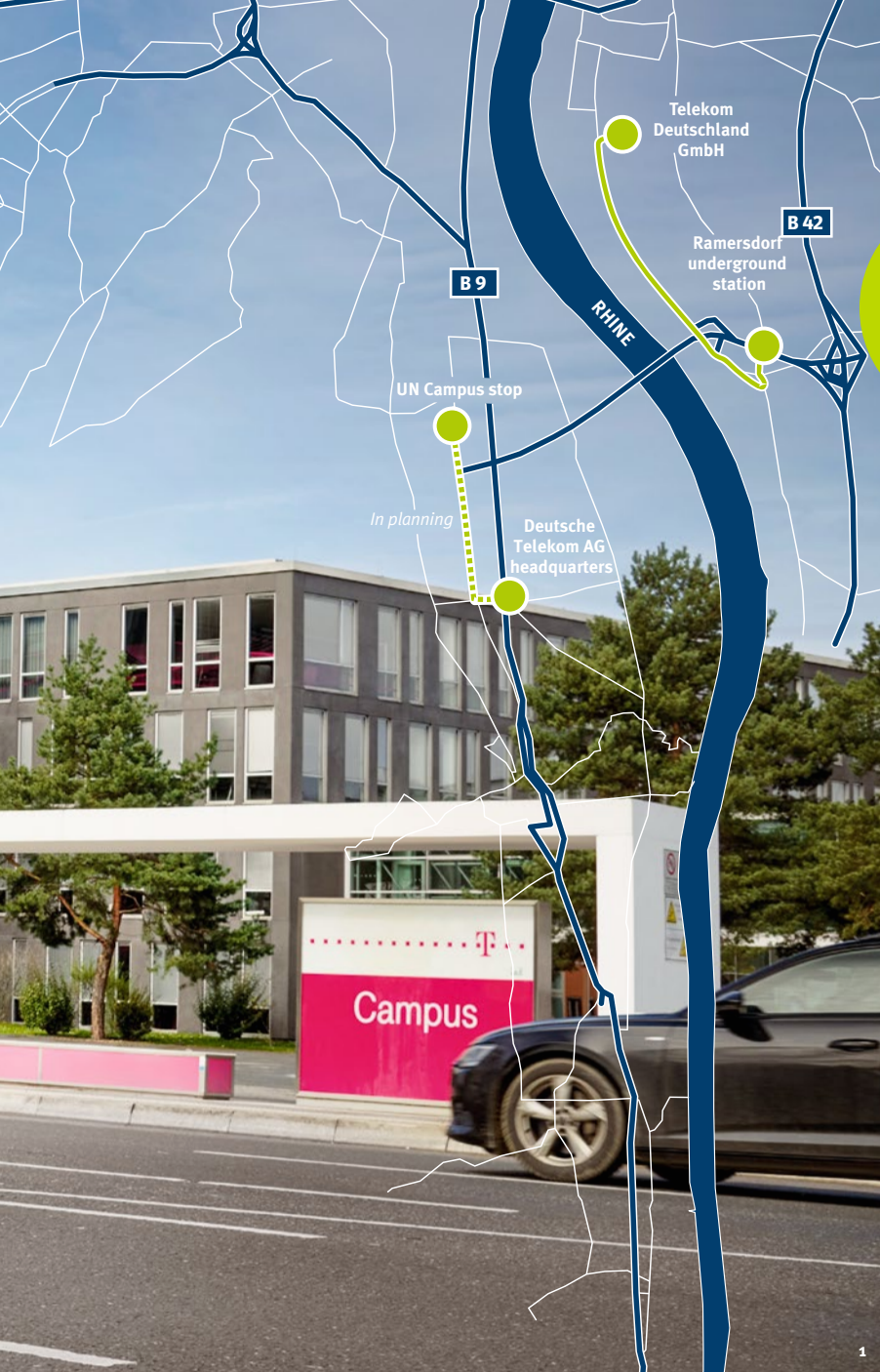
*Interview conducted by Oliver Hoffmann and Dr Philipp von Brandenstein*



# A very public acid test

A growing number of mobile providers are expressing an interest in teleoperated driving technology. Their reasons go beyond the wide range of future applications that driverless remote controlled vehicles are opening up for fleet operators and logistics companies.

Author: **Folke Heyer**



In the near future, a (driverless) shuttle will connect Deutsche Telekom's site on the right bank of the Rhine in Bonn with Ramersdorf underground station. Another route in the Gronau district is in the planning phase.

cess in order to avail itself of authentic test conditions for teleoperated driving. Andreas Korwes, Head of Brand and Communications at MIRA: "From the very start, we immediately wanted to develop our technology under real conditions on the public roads rather than limiting ourselves to screened-off areas, like decommissioned depots."

However, this firstly required engaging in extensive approval processes involving the Düsseldorf regional government and TÜV Rheinland. The Düsseldorf-based mobile communication specialist Vodafone quickly emerged as a suitable partner for the "living lab" that MIRA was establishing in the industrial port of the North Rhine-Westphalian state capital. In 2022, MIRA had already received approval to test the use of its technology under real conditions on the public roads within this defined area.

#### SUCCESS STORY

No sooner said than done. In its first living lab, MIRA gained extensive experience that it used to make numerous improvements to all of the system components, from the vehicle to the control station. The latter is located at MIRA's building in Derendorf and is where the 'driver' controls the teleoperated vehicles – which can be anywhere in the world as long as they are connected to a 5G network. The Düsseldorf-based mobile operator also received clear feedback on the specific demands that automated mobility will place on the network in future.

The success of its first teleoperated vehicle, a Volkswagen Golf, prompted the specialist to expand its fleet. Three MIRA vehicles, including two vans, are now a familiar sight around Düsseldorf – and beyond.

#### NEW NETWORKS

That is because another mobile provider, Deutsche Telekom, soon emerged as an interested party. The company is extremely open to innovative ideas and already entered into a partnership with MIRA in 2022. Just like Vodafone, technicians at Deutsche Telekom in Bonn are

<sup>1</sup> MIRA obtained approval for an additional operating area in Bonn in spring 2023.

One of the players on the young market for teleoperated driving is MIRA GmbH. In 2022, the Düsseldorf-based start-up emerged from the Rheinmetall Technology Center, which had performed fundamental development work on the technology in the previous years. Other specialist companies of the Düsseldorf group, which conducts research in the areas of automotive and defence technology, were also included in the development process. Today, for example, they deliver components for the necessary special equipment for teleoperated vehicles, as well as for the controls and operation centres that are also required.

#### REAL-WORLD APPLICATIONS

MIRA's particular strategy is to get 'on the road' as early as possible during the development pro-



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currently determining how they can adapt their 5G network to MIRA’s specific requirements. The aim remains to offer the best possible mobile technology that eliminates even the most minimal of delays, thereby ensuring optimum availability for the real-world operation of the technology. Approval for an additional operating area on the public roads in Bonn was obtained in spring 2023, and the approval procedure for another route is currently in progress. The aim of the partners is to establish a (driverless) shuttle between Deutsche Telekom’s locations in the near future. This will also provide the company with even better connections to the public transport network, as well as reflecting the growing demand for mobility – thereby making a clear contribution to relieving the burden on the city of Bonn.

But what are the particular requirements for mobile networks when it comes to teleoperated driving? Heinrich Dismon, who is jointly responsible for MIRA GmbH at Rheinmetall AG as one of the Managing Directors along with Klaus Kappen, knows the answer: “Unlike time-limited events where even “normal” users make full use of the available performance of their mobile connection, teleoperated driving involves extremely high data rates on a near-permanent basis.” Dismon adds that “the transfer of large volumes of data in close to real time is essential for vehicle teleoperation”.

**SPEED COUNTS**

In other words, teleoperation represents a challenge even for modern mobile communication technology. Putting aside the particularly quick and reliable uploads and downloads offered by these networks, this is an area of application that very few users require to this extent.

A clear litmus test for the providers, in other words. Testing helps them to determine where they need to optimise their networks in order to meet these particular requirements. This future-oriented application also underlines the importance of new network technology in the first place.

As such, it is hardly surprising that Deutsche Telekom presents the MIRA technology to experts at the large number of events it organises.



2 Deutsche Telekom CEO Tim Höttinges (fifth from left) was also keen to find out about the current state of the art in teleoperation.

3 and 4 Already a familiar sight: MIRA vehicles on the public roads.



4

The interest goes all the way up to Deutsche Telekom CEO Tim Höttinges, who was keen to find out all about the technology and the potential of teleoperated driving from the MIRA team. In 2023, MIRA was represented for the second time at Deutsche Telekom’s annual Digital X event in Cologne, and MIRA employees recently also took part in the ‘Night of Technology’ in Bonn.

#### REMOVING THE SAFETY DRIVER

So what’s next for teleoperated driving? The specialists have a clear answer: The next important and decisive step will be to obtain functional safety certification for the system, which is something that is currently being pursued. After this, the next development could be to obtain approval for removing the safety driver that is still required in teleoperated vehicles. Once this has been achieved and the current route limitations have been lifted, the way would be open for the technology to be rolled out on a wide scale. In the meantime, MIRA employees who represent the company at trade fairs and congresses are reporting a high level of interest among customers in industries such as logistics.

And many vehicle manufacturers want to know what enhancements they will need to make in order to keep pace with the new technology in future. In any case, the range of conceivable use cases is extremely broad. For example, an autonomous vehicle may be brought to a halt if it finds itself in a driving situation that the autonomous control system cannot resolve, such as having to cross a solid white line. A teleoperator could quickly navigate the vehicle through this “barrier”. In other words, teleoperation is not only beneficial for many areas of life and various industries, but is unquestionably also paving the way for fully automated driving. ●

## THREE QUESTIONS FOR MIRA MANAGING DIRECTOR KLAUS KAPPEN



#### **Why partner with mobile providers?**

Because we transmit large volumes of data via the mobile network, especially from our vehicles. Ensuring the lowest possible latency, i.e. time delay, is essential for safety reasons as much as anything else. We are also working with Deutsche Telekom to test out new network features that are specifically tailored to teleoperated driving.

#### **What are the future prospects for the technology?**

I firmly believe in the concept, and this conviction is supported in equal measure by our various customer contacts, i.e. the feedback we receive from the market. What’s more, we are not alone – I see the existence of other market players as a good sign that we are on the right track.

#### **Do you consider the new technology to have any other benefits?**

I am confident that our technology will help to improve the efficiency and sustainability of transport as a whole, which is becoming increasingly important in light of the growing burden on our cities in particular. In this way, teleoperated driving will also make at least a small contribution to climate protection in addition to the many benefits it offers in its own right.



**KLAUS SCHERER,** born in 1961, is a television journalist, author, and documentary filmmaker. As a foreign correspondent, the prize-winning NDR reporter headed the ARD studio in Tokyo before moving onto Washington, D.C. His travel shows and documentaries have won multiple awards. Scherer lives and works in Hamburg.

1 and 2 An open-air meeting at the company's proving ground in Unterlüß, where Rheinmetall CEO Armin Papperger briefed Hungarian defence minister Kristóf Szalay-Bobrovniczky on the armament and ammunition of the new Panther main battle tank. During a subsequent tour of the site, an airportable vehicle carrying the high-ranking visitor temporarily vanished in a cloud of smoke/obscurant.



3, 4 and 5 Carefully adhering to the safety and security regulations, the ARD team gained unique insights into the Group's ammunition production activities, including for the Gepard anti-aircraft tank.





# “Answers like these are heaven-sent”

The German TV documentary “Inside Rheinmetall: Between War and Peace” provides an extraordinary insight into the tech enterprise’s military side. DIMENSIONS spoke with the show’s maker, prize-winning German TV reporter Klaus Scherer.

During filming, the Group’s CEO and ordinary Rheinmetall employees made themselves available to answer questions. Reversing roles, Klaus Scherer agreed to talk to DIMENSIONS in return. Oliver Hoffmann conducted the interview.

## **Klaus Scherer, why did it take a war to get you interested in Rheinmetall?**

I can’t very well make a documentary if the topic isn’t relevant. The war has changed a lot of things – it was more than just a reason for choosing the topic, there was a new flight altitude and plunging risk, a new moral dimension. Moreover, a lengthy documentary won’t work if people can’t remember the reason for it later.

## **What appealed to you about the story?**

I figured I’d get access to exclusive images ... and to people, too. To come to life, a TV documentary needs people. And I had questions I wanted to get answers to.

**The show attracted a lot of viewers and won high praise. Did this success surprise you?**

Yes and no. We’re committed to success. Our whole team is dedicated to making the best film possible, from research to filming to editing. To that extent it didn’t surprise me. But I’m certainly happy about it. The documentary attracted a lot of viewers when it was broadcast on TV, and the same goes for people accessing it in our Media Library and on YouTube, with long viewing times. People who start watching it, keep watching it.

## **And what about internally? What did your colleagues think of it?**

There was plenty of positive feedback at our broadcasting company, NDR, and in the media sections of the press. The piece was perceived as fair, critical and informative.

## **What is your personal take on it?**

I think we succeeded in walking the tightrope. We managed to get very close to the story without sacrificing our independence. In other words, we preserved our credibility. That Rheinmetall was willing to go along with it in the first place was decisive, of course, even though they didn’t know how it would turn out in the end.

## **Was it difficult selling Rheinmetall on the project?**

The company was astonishingly open to the idea. When I contacted Rheinmetall’s PR department, you called me back the same evening. Totally transparent. I travelled to Düsseldorf, and we discussed what would be feasible. The executive board gave the project the go-ahead a short time later. Right from the start, it was all very professional and, yes, fair.

## **What does it take to make a project like this work?**

Trust. We made viable agreements that both sides stuck to. This was a bit risky for both of us. Nobody knew how things would develop.

## **What did the agreements entail?**

We had to adhere to the safety rules when filming in the ammo factory, for example. And we had to keep it a secret when we knew in advance that tanks were going to be shipped. And there were a lot of things that we were the first TV team to see that we had to keep to ourselves until the broadcast date. For example, I found out early that Rheinmetall’s first deal with the Panther would be with Hungary. Rheinmetall trusted us.

## **What did you get in return for this trust?**

I was able to ask questions whenever I wanted and wherever I went, completely off the cuff. Both sides were honest and sincere, I think. We had respect for

what you do and for your people, and you respected our work as journalists. There were no prearranged questions, no effort to pressure us or influence content. This was vital since we were obviously asked later if we'd discussed questions in advance or if Rheinmetall had had a chance to see the film before it was broadcast. We were able to deny this in every case. The viewers would have seen right through it anyway.



## A DOCUMENTARY VIEWED BY MILLIONS



“Inside Rheinmetall – Between War and Peace”: this 45-minute-long documentary had an audience share of 9.8 percent, an extraordinarily high number for the slot following the evening news. Produced by the public broadcaster Norddeutsche Rundfunk, or NDR, the film first aired on the German news programme “Das Erste” as well as on Phoenix and Deutsche Welle TV, on publicly owned regional stations, and the news channel tagesschau24. The average length of time viewers spent watching the show was unusually long: those who tuned in, stayed tuned in. Including Media Library requests, the piece has attracted millions of viewers. In addition to this comes YouTube, where the film logged over a million views in the first two weeks alone.



The ARD documentary can be accessed via the adjacent QR code.

### Did you have to overcome resistance at your broadcasting company?

No. My colleagues and higher-ups were all eager to see a film with lots of good visuals and interesting content and some surprising access. Of course, people were joking around in the newsroom about me coming to work in a tank soon.

### You approached Rheinmetall with certain expectations. What surprised you most?

The way doors opened when I least expected it. I mean, we were there, right up close when the Hungarian defence minister came to Unterlüß to see tanks and ammo being demonstrated. It was a lively encounter. We were quick to ask questions. And he was ready to answer them. The scene we shot at the Ukrainian Embassy in Berlin was another highlight for me. The familiarity between Rheinmetall’s boss, Armin Papperger, and the Ukrainian ambassador, who embraced and chatted like old friends, took me aback. And even though it was rather austere in terms of optics, being able to follow the general shareholders meeting from the critics’ standpoint was quite extraordinary.

### Some people say that you were sort of rough on Armin Papperger...

We conducted a lengthy closing interview in which we came straight to the points. But, hey, a CEO has got to be able to take it. I didn’t want to just work through a list of questions. I wanted to delve deeper. Tanks aren’t just another common garden variety technology. What does he find so fascinating about them? I think this worked. Anyway, as I see it, Papperger was a good sport. Later, in the cutting room, I noticed a twinkle in his eye and how his mouth would curve into a subtle smile after addressing a controversial topic. As far as I’m concerned, the interview was a core element of the documentary, a portrait, actually.

### How did the audience react?

The feedback was overwhelmingly positive – apart from a few outliers, of course. Some people wrote things like, “You totally blew it, how could you be so unfair?”. Others accused us of making a PR video for Rheinmetall. As you

can tell, all kinds of people tuned in. So I think we generally got things right...

### The war in Ukraine and the historical “turning point” have changed the way a lot of people view the defence industry. Do you feel the same way after this project?

I’ve learned a lot of details. I wasn’t in the Bundeswehr and I’m no gun nut, but I was never a pacifist, either. Even so, Russia’s attack on Ukraine shook me up. I have a lot of questions, including personal ones. Encountering such interesting protagonists was exciting. The ex-soldier, for instance, who gushed about the joys of driving a tank – before checking his enthusiasm: he’d been to war himself. Authentic answers like that are heaven-sent. This was a genuine Rheinmetall man.

### For much of the media, interest in the defence sector has been confined to covering scandals – at best. Are journalists prone to naïve pacifism?

It could be that the “dirty defence business” paradigm has lingered on too long – but that goes for the whole of society. My profession doesn’t play a special role in this context. A lot of the media are now reflecting how this has changed. We were gratifyingly quick, but we’re only part of it.

### You were an ARD [German public TV] correspondent for several years in the United States, where the military play a different role than in Germany...

Yes. Nip it [militarism] in the bud, as they say here – and from the standpoint of German history, this is by no means entirely wrong. We didn’t want to start any more wars. But it was Putin who started this one. We’re helping the country under attack to defend itself. Since then, I’ve been debating how the sentiment should be phrased: Are we nipping war in the bud by supplying tanks to Ukraine to resist aggression? Or does nipping militarism in the bud mean not making any tanks at all?

### What was your impression of people at Rheinmetall?

Likeable. Everybody I spoke with came across as credible. Our NDR team



6 When CEO Armin Papperger meets the Ukrainian ambassador in Berlin to discuss planned cooperation between Rheinmetall and Kiev, Klaus Scherer is also there with the ARD team.

6

always felt welcome. People were remarkably open. Nobody seemed to be worried about what they were allowed to say. Talking to them was interesting and enjoyable, including when we were chatting off camera. Talk turned then to the working atmosphere or to tougher times. Now and again, I heard that even in those times the board looked for ways to keep people onboard. That's very much in line with Papperger's image, who seems to run Rheinmetall like a family business.

#### **What did you think of our CEO?**

I believed him when he told me in the car on the way to the Frankfurt Stock Exchange that he thought a free press was important for democracy. That was the day Rheinmetall joined the DAX [Germany's index of top-performing corporations]. Obviously, he also knows how to instrumentalize the press, for instance when he makes headlines with plans for a Panther factory in Ukraine. But even critics like the former director of the Hamburg Institute for Peace Research told me: "You can believe in the man's patriotism." The public evidently does too. Papperger struck me as uncomplicated and relaxed in a positive sense. When we were filming at the Stock Exchange, he agreed to have a microphone attached to his collar, meaning that we could record all the interviews he gave

that morning. That's not something just anybody would agree to, but he trusted us.

#### **Is there a special corporate culture that sets Rheinmetall apart from other companies?**

It struck me as harmonious, even though I can't think of a proper comparison. Corporate culture is management driven, of course, and Rheinmetall really does feel like a family-run business. Hardly any CEOs have belonged to a company for so long and still know what it feels like to hold a spanner. Others jump from job to job and company to company. It all seems very credible to me. Though, yeah, maybe there are shadowy aspects to Rheinmetall that we touched on in the show but couldn't shed light on, and times when shareholder value ultimately trumps morality.

#### **You've experienced weapon systems and tanks live at Rheinmetall. Do you think you're at risk of falling prey to the fascination some people feel for this technology?**

Sure. Bundeswehr recruiting adds exploit this fascination with technology all the time. You've got to be careful not to let your enthusiasm for technology get out of hand. On the other hand, there are people who say that, when push comes to shove, a Leopard 2 has

a better chance of surviving than a Russian tank. I therefore think it's only right to highlight the accomplishments of engineers who are doing their utmost to do a good job.

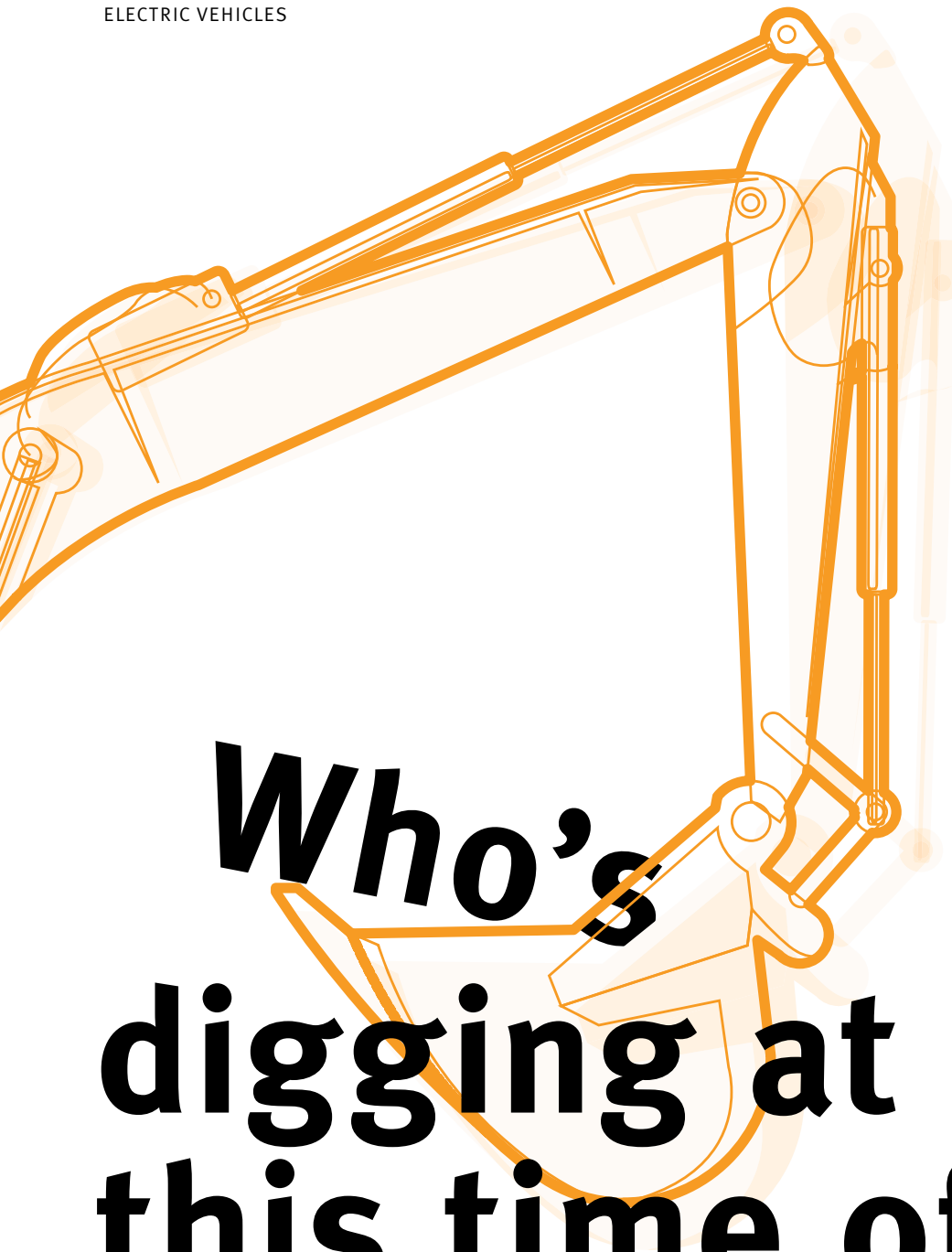
#### **Will the image transformation that companies like Rheinmetall are experiencing be lasting, or will the pendulum swing back?**

We've witnessed a correction in the one-sided image that used to hold sway. Things are bound to change again once the war in Ukraine finally ends. Given Germany's budgetary woes and NATO's two-percent goal, there are sure to be lively debates ahead. From the film, we know that it will probably take ten years to rebuild the Bundeswehr's inventories. But society's appreciation of the role of a reliable defence industry in making sure that our democracy can defend itself is unlikely to experience a complete reversion.

#### **Klaus Scherer, many thanks! May your future projects be as successful as this one! ●**

*Oliver Hoffmann is Head of Public Relations at Rheinmetall AG.*

→ You can access the entire interview at [www.dimensions-magazin.de/en](http://www.dimensions-magazin.de/en)



# Who's digging at this time of night...?

Established manufacturers are increasingly focusing on the electrification of off-road vehicles such as construction machinery – and not just because this can mean longer operating times. Start-ups and manufacturers of other off-road or agricultural machines are also looking for innovative solutions for efficiently electrifying their products.

Author: **Folke Heyer**

## WHAT DOES A THERMAL MODULE DO?

Thermal modules are used to regulate the temperature of batteries in electric drives. The air/water heat pump used by Rheinmetall in these devices follows the refrigeration principle. When the outdoor temperature is high, the process involves passing coolant from the battery over a heat exchanger in order to regulate the temperature of the battery itself or the driver's cab with cooling performance of up to 8 kW. The reverse occurs in cold temperatures: The "residual heat" from the ambient air is used to generate heat inside, thereby helping to regulate the battery temperature. This delivers heating power of up to 11 kW, effectively eliminating the need for additional heating.

**R**heinmetall is following this trend. Among other things, the company is currently working on components for electric off-road vehicles with the aim of increasing their range or their potential operating time.

The people who are hard at work in this area include Michael Lutz, head of the Energy Recovery Systems business unit, and his team of developers in Neckarsulm in Baden-Württemberg. They are currently working to bring a thermal module to market maturity as a complete solution for a wide range of vehicle types – and even boats. Building on the heat pump principle, the module aims to keep the batteries used in electrical drives within a temperature range that allows them to deliver optimal performance. The batteries are cooled or heated depending on their operating status and the outdoor temperature. The module can also be used in the same way to control the temperature in driver’s cabs.

#### QUICK INTEGRATION

Compactness and modularity are two of the main benefits of this Rheinmetall development. Designed as a plug-and-play solution, the system is pre-assembled and filled with refrigerant at the factory, allowing it to be integrated into existing vehicle architectures easily and – above all – inexpensively. Lutz: “Unlike the systems that are currently preferred in the automotive industry, the individual components of our module are not distributed throughout the entire vehicle. We can also integrate our complete solution into the customer’s powertrain thanks to our many years of expertise in the field of automotive technology.” Another major benefit offered by the Neckarsulm-based team.

#### WIDESPREAD INTEREST

The customer base for the current prototype phase is extremely widespread. In addition to producers of construction machinery and tractors, the interested parties include manufacturers of electric boats, trucks and busses. Also included are producers of other agricultural machinery, as well as companies from the mining industry. And batteries are not the only form of energy involved. Manufacturers of fuel cell drives are also showing interest in the compact module.

Lutz can currently point to more than twenty-five customers that are using prototypes to examine his solution for their particular use case or that have already placed volume production orders – a fact that makes him extremely proud of his sales team. To meet this demand, a small-scale production line was established in Neckarsulm



in 2023 and can be easily expanded as and when additional orders are received.

#### EXTENSIVE MARKET POTENTIAL

Marcus Gerlach, Head of the Central Division at the Rheinmetall Group, confirms: “The markets for the thermal module are currently developing extremely quickly. Although we are mainly handling smaller volumes at present, this technology is opening up huge potential. Our fellow subsidiaries in defence technology have also expressed their interest.”

With this in mind, the business unit – which adopted the advanced 800-volt technology at an early stage – is also examining the possibilities in entirely new areas of application beyond vehicle technology, not least since these also offer considerably greater market potential in the long term.

Meanwhile, the motivation for the current interested parties to use the thermal module is more than justified in light of the extended reach it offers and the potential use cases it encompasses. For example, an electric excavator at a city centre site would be considerably less disruptive than its conventional counterpart, allowing it to work much later in the day. ●

<sup>1</sup> Thanks to its compactness and flexibility, the thermal module can be used in a wide range of different vehicle architectures.

Rheinmetall is also working on a similar development specifically for the passenger car market, which DIMENSIONS will report on in a future edition.

# Fit for the future

Pierburg's Ústí nad Labem site in Czechia is dedicated to the automotive industry. The future is set to bring some challenges for the supplier – challenges that it is addressing through technical expertise and an exemplary corporate culture.



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**PORTRAIT**  
PIERBURG ÚSTÍ  
NAD LABEM



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Ústí nad Labem, around 60 kilometres from Dresden, is home to the Eastern European branch of Pierburg s.r.o. For the past 20 years, the site in Czechia has mainly produced exhaust, control and recirculation systems for cars and trucks. The spotlessly clean halls contain 21 assembly lines turning out up to 160 different products. Customers include car manufacturers like Renault, Mazda and Volkswagen. The site currently generates nine-digit annual sales. Around 135 of the plant's 286 employees are assembly workers.

The fact that the company is stable and healthy is not something that can be taken for granted, especially given the difficult situation affecting the entire industry at present. Like its competitors, Pierburg in Ústí has faced challenges like the diesel crisis, the coronavirus pandemic and supply bottlenecks for electronic components. "But we have overcome all of them," says Sascha Günther, Managing Director and head of the Pierburg plant in Ústí.

**READY FOR CHANGE**

For many years, the aforementioned challenges in the mobility industry have been accompanied by an elephant in the room: the future of the combustion engine. Pierburg has been actively

diversifying its portfolio for some time now so that it is no longer wholly dependent on combustion engines. "Rheinmetall is a very strong parent group that backs us and provides us with the necessary financial means to embrace this technological change," explains Sascha Günther. "Four years from now, we intend to generate around forty percent of our sales from components for electric vehicles and a further quarter from truck applications."

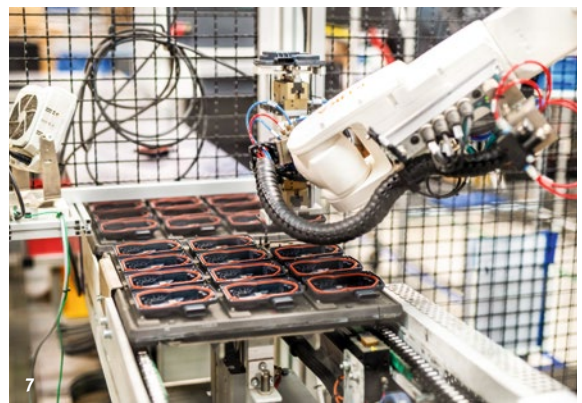
Starting from 2026, Pierburg's Ústí plant will manufacture a high-voltage protection device for electric vehicles developed in conjunction with BMW. In simple terms, the device cuts off the power supply to the electric car in the event of a crash, making salvage work significantly easier. But even with all the hype surrounding electric mobility, the head of the site does not expect electric cars to fully take over the automotive market any time soon. "Trucks will continue to use combustion engines or alternative drive systems like hydrogen for a long time to come."

**COMPANY CULTURE GUARANTEES SUCCESS**

Sascha Günther's optimism for the future is based on more than just the economic outlook. "Our corporate culture and the quality of our workforce at the site are one of the most import-

1 Employees are an important factor in the success of Pierburg's Czech branch. Almost half of them work in production roles.

2 In 2004, Pierburg s.r.o. in Ústí nad Labem in the north of Czechia was built on the green fields right next to a piston plant that no longer belongs to the Rheinmetall Group. Since then, the company (in the right foreground of the photo) has developed into a highly sought-after supplier to the European automotive industry.



**3** Plug-in hybrid vehicles with pressurised tank systems need tank shut-off valves. One of the places that makes them is Ústí nad Labem.

**4, 5, 6 and 8** Everything runs smoothly – from assembling throttles and solenoid valves and gluing components through to quality assurance.

**7** In addition to manual assembly, some product components are manufactured automatically – like these plastic covers with integrated position sensors. They are used in exhaust gas recirculation valves and actuators, among other things.





ant factors in our success.” Employees form the basis for every successful company, and this maxim has been taken to heart in Ústí. With Czechia currently having the lowest unemployment rate in the European Union at 2.8 percent, the management team has had to come up with some innovative ideas for attracting good employees.

“We encourage our employees’ creativity and invest in their personal development. We also give employees the leeway to use their abilities as effectively as possible for the company’s benefit in line with the Rheinmetall values of trust, respect and openness,” says Sascha Günther. The workplace atmosphere and the corporate culture are aspects about which the 51-year-old Koblenz native clearly feels strongly – and he is proud that the company has embraced them like it has. “We pursue a culture of togetherness and team spirit. And our employees give us back a great deal in return – a fact that is also reflected in our EFQM results.” Those results speak for themselves: In November 2023, Pierburg s.r.o. Ústí took second place in the Czech National Quality Award for EFQM.

### HOLISTIC QUALITY MANAGEMENT

The EFQM quality management system (see box) has been applied at Pierburg s.r.o. in Ústí since 2015. It enables a holistic approach to quality management. By evaluating factors such as leadership, processes and results, EFQM identifies the strengths and weakness of a company’s organisation as a means of enabling targeted improvements. “Permanent improvement is the core principle behind EFQM,” explains Sascha Günther. In 2020, the business studies graduate actually trained as an EFQM assessor himself, and he evaluates other companies in this role.

It goes without saying that a well-run company benefits customers as well as employees. Sascha Günther sees Pierburg not only as a supplier, but as a partner to the automotive industry. This good cooperation is another important factor in the company’s success. With this in mind, Sascha Günther is confident that “Pierburg will remain a relevant partner to the automotive industry in the future.” With a focus on change and driving innovation, Ústí is ready for whatever the future may bring. ● *Pk*

→ More information can be found at: [www.pierburg.cz/en/](http://www.pierburg.cz/en/)



Ústí nad Labem

## PIERBURG S.R.O. ÚSTÍ

An automotive specialist in the heart of Europe: Pierburg s.r.o. was established in Ústí nad Labem in the Czech Republic in April 2004. The company forms part of Rheinmetall AG’s “Power Systems” division.



### BUSINESS AREAS

Pierburg s.r.o.’s products are mainly intended for sub-systems used in emission reduction and air supply management, including actuators, control units, exhaust gas recirculation systems, secondary pumps and exhaust dampers. The company is also increasingly focusing on components for electric vehicles.

### MANAGEMENT

Dr Andreas Müller and Sascha Günther



EMPLOYEES

### QUALITY IS MORE THAN A GOOD PRODUCT

The “European Foundation for Quality Management” (EFQM) is one of the most established approaches for measuring company performance. The model is based on three pillars:

**Direction** of the company in terms of its purpose, vision, strategy, organisational culture and leadership.

**Execution** of improvements in line with certain criteria, including management, policy and strategy, employees, processes, partnerships and resources.

**Results:** The maximum score a company can achieve is 1,000 points. A score of over 500 is considered to be very good.

In 2019, Pierburg s.r.o. in Ústí was awarded five stars for excellence with a score of 538 points, placing it fourth in the Czech National Quality Award. In 2023, the company took second place. The target for 2024 is 600 points – and a push for first place.



# Made in Austria

Military trucks produced in Vienna set the international standard for quality in army logistics. Nor is it just their maker, Rheinmetall MAN Military Vehicles, that's pleased to see the Austrian Army now procuring large numbers of these locally built trucks.

**T**rucks made by Rheinmetall MAN Military Vehicles – including the HX, TGS and TGM – are an indispensable asset in the armies of many nations. Countries like Germany, the United Kingdom, Norway, Sweden and Australia use these tried-and-tested vehicles – many of them produced in Vienna's Liesing district – for logistical missions of every kind. Last year, the Austrian Army joined the company's growing list of major customers.

“This is a very special order”, declares Michael Wittlinger, chairman of the board of management of Rheinmetall MAN Military Vehicles, “and not just for our Vienna plant. It also underscores the Austrian government's clear commitment to Austrian industry!” Major General Harald Vodosek, Austria's National Armaments Direc-



1 At its plant in Vienna's Liesing district, Rheinmetall MAN Military Vehicles produces a vast variety of vehicles for numerous customers, including the German Bundeswehr (shown here), the Austrian Army and the Austrian Defence Force.

tor, concurs: “Rheinmetall’s Vienna plant plays a significant role in our security and defence industry. For the Austrian Army it’s very important to be able to rely on this kind of local defence industry presence.”

#### **AN ENORMOUS INVESTMENT**

The framework contract between Rheinmetall MAN Military Vehicles and Österreichischen Bundesbeschaffung GmbH Wien, Austria’s procurement agency, encompasses the delivery of various logistic vehicles for the Austrian Army. The contract runs for seven years and specifies the supply of up to 1,675 vehicles from the company’s HX, TGS and TGM lines. Last spring, Rheinmetall MAN Military Vehicles, or RMMV, already won all six military lots in a request for tenders for a total of 23 lots of trucks, with an additional lot awarded in December. Given the

various technical specifications for each lot, the company proposed vehicles from its TGM, TGS and HX series in multiple axle configurations. On top of this came multifarious build-on systems such as cranes, platforms, tippers, roll-off systems, swap-body systems and snow ploughs. Order volume could be as high as EUR 845 million. “This is an enormous contract”, states Michael Wittlinger, “especially when you consider that Austria’s military is a lot smaller than Germany’s, for example. But it goes to show the importance the Austrian Army attaches to effective logistics.”

The Austrian Army was already an RMMV customer before 2023, but the relationship has now taken on an entirely new dimension. That Austria chose this moment to overhaul its military logistics comes as no surprise. “Developments in

#### **RHEINMETALL MAN MILITARY VEHICLES**

Founded in 2010, the joint venture is co-owned by Rheinmetall AG, which holds a 51 percent stake in the company, and MAN Truck and Bus SE, with a 49 percent share. The company builds military trucks at its plant in Vienna. RMMV has subsidiaries in the United Kingdom, Australia and elsewhere.

the security and defence policy arena in recent months and years show how important having a largely autarkic domestic defence capability can be. Being able to rely on powerful partners in the defence industry will help us respond to the challenges facing Europe in coming years”, notes Harald Vodosek.

2, 3 and 4 The Vienna plant is an acknowledged centre of excellence, producing protected and unprotected versions of the company’s family of HX logistic vehicles.

Trucks made in Austria are a true success story. Ever since Rheinmetall and the truck maker MAN joined forces to found RMMV, numerous nations have found that they count on the joint venture’s versatile vehicles in a vast variety of logistical and tactical scenarios. Today, more than 20,000 trucks from the company’s HX series

are in service worldwide. Typically, MAN delivers individual components such as engines, axles and transfer cases to the Vienna plant for complete assembly.

**WITHOUT QUALITY, NO DEAL**

Reflecting the request for tenders, which specified vehicles for an extremely wide array of missions, the Austrian Army will soon be taking delivery of a correspondingly wide variety of new trucks. “We configure the vehicles in close consultation with the customer and make sure that the troops get the quality they’ve come to expect”, says Wittlinger. And it goes almost without saying that the Vienna plant is well prepared for this domestic order. Because one thing’s for sure: though Austria is obviously eager to safeguard local jobs, ultimately it was the quality of RMMV products that sealed the deal. Moreover, the fact that high-quality trucks are produced right in the country’s capital creates a win-win situation which RMMV and the Austrian Army both appreciate.

Finally, this major order is another big morale booster for the RMMV factory staff in Vienna. “We owe our success first and foremost to the outstanding teamwork of everyone involved”, declares Michael Wittlinger. Confirmation for this came from the highest level, when the Austrian Defence Minister, Klaudia Tanner, summed up her trip to the Vienna plant as follows: “I came away with an extremely positive impression of the plant, a centre of excellence for producing protected and unprotected military logistic vehicles which, as far as I’m concerned, is unique in Austria. I could clearly sense just how motivated the men and women who work there are.” ● Pk



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# “Mission Forward!”

In an interview with DIMENSIONS, Austrian Defence Minister Klaudia Tanner and Major General Harald Vodosek, the Austrian Army’s National Armaments Director, discussed protected mobility and the modernization of Austria’s armed forces.



**Madam Minister, like other countries, Austria has increased its defence budget. What security policy considerations lay behind this decision?**

The prolonged war in Ukraine and Israeli’s struggle with the terrorist organization Hamas, but also the volatile security situation in the Western Balkans, in West Africa and the Sahel – all of these are confronting Europe and Austria with drastically altered challenges. As a result, we’ve had to completely rethink the role of the Austrian Army and chart a new course. This is the only way that Austria can play an active role in shaping common security and defence policy and assure an efficient and resilient defence of our national territory.

**In financial terms, what importance do you attach to the Army’s logistical capabilities?**

Mobility and logistics are crucial factors for the Austrian Army. This is why it’s enormously important that we modernize these areas. Under our 2032+ expansion plan, we’ll be investing around €5.6 billion here. Mobility on the ground will be achieved through protected vehicles and transport capabilities, high-mobility vehicles for special operations units and the infantry, as well as protected combat engineer vehicles and field ambulances.

**General, what tasks are in store for trucks from Rheinmetall MAN Military Vehicles?**

These multifunctional vehicles, equipped with all kinds of build-ons, will primarily be used for transporting cargo – ammunition and fuel, operating materials and equipment and heavy vehicles. The new vehicles will also be used for recovery and towing operations.

**What criteria do modern trucks have to meet to pass military muster?**

Depending on their intended use, the vehicles must be medium, high, or extremely high mobility systems. And – once again depending on the mission – being able to equip them with a protected cab is crucial. For military purposes, concealment and camouflage are vital prerequisites, too. Special paint, for example, and IR blackout lighting. Military vehicles must be robust, durable, dependable, and easy to handle in different climate zones. In the interests of logistical uniformity, the full range of protected and unprotected transport, command and control, and special purpose vehicles

must meet the Austrian Army’s standardization criteria. Here, a reliable supply of spare parts, operating materials and tools is essential. Finally, in addition to all these characteristics, the vehicles of course need to be economical to operate, reasonably priced, and environmentally friendly.

**Madam Minister, trucks from Rheinmetall MAN Military Vehicles have proven themselves in action with numerous armed forces. Did this help to influence your procurement decision?**

Rheinmetall MAN is a longstanding partner of the Austrian Army. Vehicles from RMMV have proven their worth in numerous operations of our armed forces. And the fact that they’re primarily produced in Vienna was a clear advantage; the company plays an essential role in the Austrian economy. ●

*Interview conducted by Jan-Phillipp Weisswange*

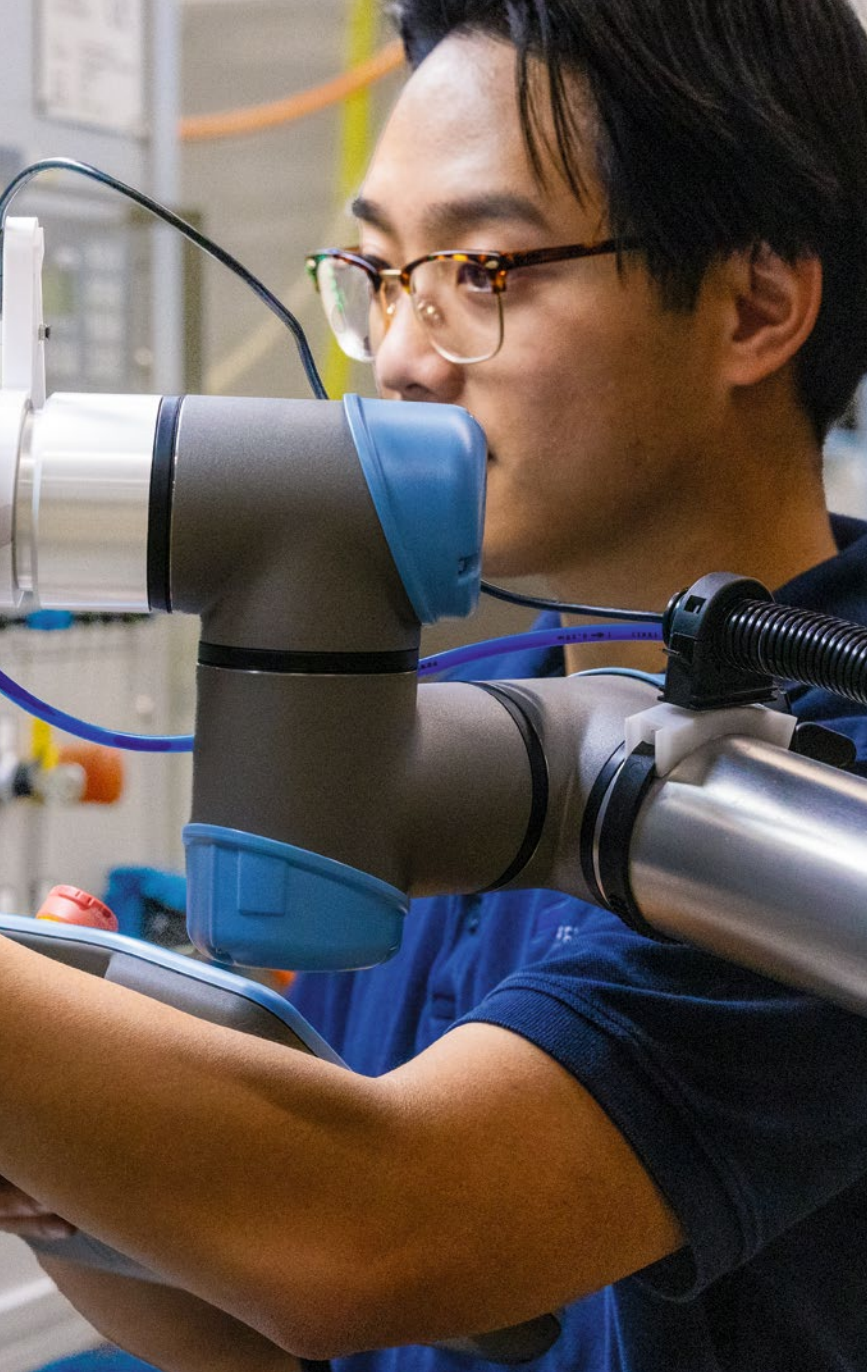
→ You can access the entire interview at [www.dimensions-magazin.de/en](http://www.dimensions-magazin.de/en)

# Cobots with a sensitive touch

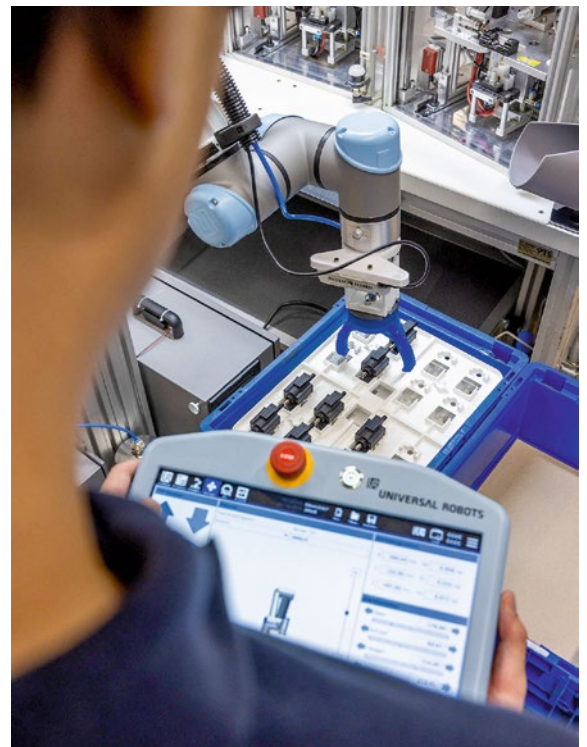


They assemble machines, take care of packaging, assist in quality control: developed inhouse, Rheinmetall subsidiary Pierburg's collaborative robot systems are boosting efficiency and competitiveness at the company's production plant in Neuss. Now, these smart helpers are poised to benefit other plants of the high-tech enterprise.

**F**inding qualified workers is an increasingly pressing issue in economies around the world. In Europe, German industry has been the hardest hit. According to a current DIHK report, more than half of all manufacturers in Germany now face personnel shortfalls. Among these is Pierburg GmbH, a subsidiary of Rheinmetall. It's in production that skilled labour is particularly scarce, reports Karsten Sonnenschein. Armed with a doctorate in engineering, he heads the renowned auto component maker's Electrification and Digitalization unit. "The persistent shortage of personnel and high labour costs in Germany have made manual assembly highly uneconomic in the meantime", explains Sonnenschein. To improve the competitiveness of its plants, Pierburg has been automating production for some time now,



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both at home and abroad. In 2021 alone, the company installed fifty new industrial robots in its factories around the world.

### HIGH FLEXIBILITY REQUIRED

“Fully automated assembly lines and robot cells are expensive”, concedes Sonnenschein, going on to note that it can be a long time before an investment pays for itself. At the same time, every product-specific modification results in equipment costs and downtimes, an increasingly common phenomenon: “Especially when it comes to newer components, shorter product lifecycles are now the norm.” He and his team at the company’s Niederrhein plant in Neuss therefore began to look for more flexible alternatives. They soon thought of collaborative robots. The gripper and vision systems for cobots on



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the market today failed to convince us”, recalls Lukas Romanowski, an engineering manager who took part in the project: “They’re tricky to program, aren’t sufficiently standardized and break down a lot.”

1 Owing to their soft grippers, cobots can handle even delicate workpieces. Moreover, their elastomer grippers mean that they can safely work side by side with the production personnel on the factory floor.

2 Commissioning and programming on location is straightforward.

3 Thanks to a built-in 3D camera and intelligent image processing, cobots can see like humans. In developing the vision system, Pierburg engineers cooperated with colleagues from Rheinmetall’s Electronic Solutions division.

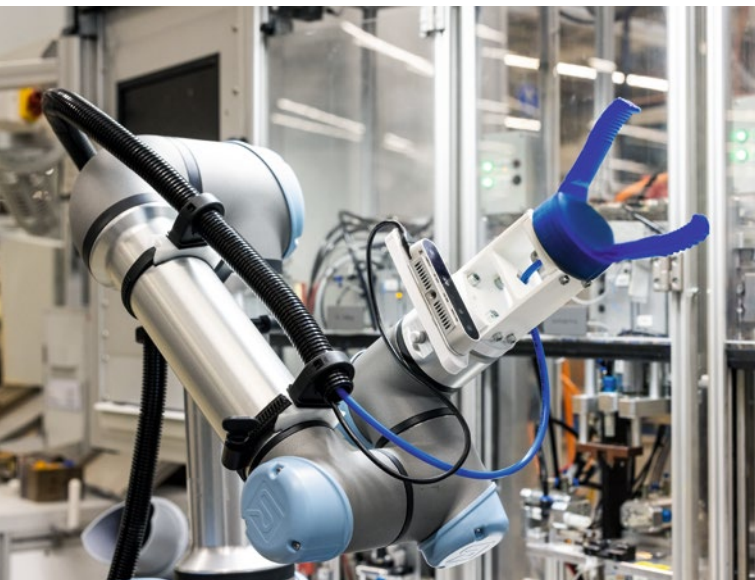


and push buttons, operate small load carriers, and detect signals. The cobot's integrated 3D camera and advanced image processing based on artificial intelligence make this possible. Sonnenschein and Romanowski point out that Pierburg worked together with colleagues from Rheinmetall's Electronic Solutions division on the vision system.

**ROBOTIC COLLEAGUES**

Thanks to their versatility, the autarkic mobile cobots can be flexibly integrated into all kinds of work processes: assembling machines, for example, or putting the finishing touches on castings. They can also operate at test benches or be put to work packing up components. Commissioning and programming are straightforward as well. What makes the cobots special is their Multisoft gripper. It minimizes the risk of injury, thus enabling safe, CE-compliant cooperation with human workers on the factory floor. "Now that they've overcome their initial scepticism, the teams at our Neuss plant are very happy with their robotic colleagues", reports Sonnenschein, adding that "the cobots take care of the monotonous tasks, leaving their human counterparts free to focus on more sophisticated, less physically demanding activities."

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4 Dr Karsten Sonnenschein heads Pierburg's Electrification and Digitalization unit. It took him and his team just over a year to develop a prototype smart cobot.

5 Pierburg's multitalented mobile cobots can perform all kinds of production tasks. Several collaborative robots are already in operation.

**INNOVATIVE SPIRIT, MADE BY RHEINMETALL**

The Pierburg engineers therefore quickly set about developing their own cobot system with soft grippers. In doing so, they benefitted from the wide-ranging experience that Pierburg and the Group have accumulated at their highly automated plants. At the same time, a great deal of proprietary company expertise in pneumatics, elastomers and control devices flowed into the collaborative robot.

Development was complete in just over a year. By 2022 the first prototypes were in action at the company's plant at the riverport in Neuss, just across the Rhine from Düsseldorf. "Thanks to their pneumatic elastomer gripper, the smart cobots are able to handle delicate tools with extreme tactile sensitivity, just like a human", exults Romanowski. They can flip switches

**THE "SMARTPHONE OF COBOTS"**

As Sonnenschein sees it, the use of robots and the increased efficiency they bring is a huge plus when it comes to keeping industry competitive in a high-wage Germany. He and his team are currently trying to get other Pierburg plants interested in the cobots. Talks are also underway with Rheinmetall's Waffe Munition unit. In the medium term, the company plans to market the collaborative robots externally as well. "The market potential is immense", says Sonnenschein. He sees excellent opportunities in the food processing industry and at medium-sized industrial and craft sector companies. "Our soft robotics solutions are, so to speak, the smartphone of cobots", says Sonnenschein, summing up his sales pitch. "Not only are they cheaper than other systems currently on the market, they also offer greater standardization, meaning that they can be deployed in a multitude of different ways." ● Pk



# A flagship project for changing times



1 The new factory in Weeze will feature technology to match that of Northrop Grumman's facility in Palmdale, California.

The invasion of Ukraine demonstrated just how important a powerful air force is for national and Alliance defence. It will not be long before Germany will be taking delivery of the F-35A, the successor to the ageing Tornado and the most advanced combat aircraft in the world. The centre fuselage sections for these aircraft are to be made by Rheinmetall at a state-of-the-art factory currently being built in Weeze. An array of top officials from politics, business and the armed forces reached for their shovels at a symbolic groundbreaking ceremony.



**A**sk most people in Germany about Weeze and aircraft and, until now, they will have associated them with the regional airport there. Soon, though, Weeze is once again going to be taking on a prominent role in the field of military aircraft. That is because there on the site of the former air station of the UK's Royal Air Force, Rheinmetall is currently building a state-of-the-art factory for one of the world's most important defence systems: the F-35 Lightning II multi-role combat aircraft. With the new factory, Rheinmetall will be working closely in partnership with Lockheed Martin and Northrop Grumman on a flagship project for transatlantic defence cooperation. Lockheed Martin, the manufacturer of the F-35, and Rheinmetall have enjoyed an excellent and close working relationship for years, and as of this year, that partnership also includes Northrop Grumman – the biggest supplier to the global F-35 programme – as a result of the cooperation on centre fuselage production.

## 2006

was when the F-35 flew for the first time

## 3,513

aircraft have been commissioned to date

## 19

countries have ordered the jet so far

### “DEMOCRACY NEEDS TO BE CAPABLE OF DEFENDING ITSELF,” SAYS HENDRIK WÜST

With Russia's war of aggression against Ukraine very much in mind, Hendrik Wüst, state premier of North Rhine-Westphalia, said in his address to

the groundbreaking ceremony that the defensive capabilities of democratic societies were essential to safeguarding our values. “We are being put to the test in terms of our willingness and ability to do more than merely pay lip service to these values but instead to make sure that we are capable of quite literally defending our way of life.” Wüst went on to say, “If you disarm democracies, you render freedom and the rule of law defenceless.”

### MORE THAN JUST AN INVESTMENT

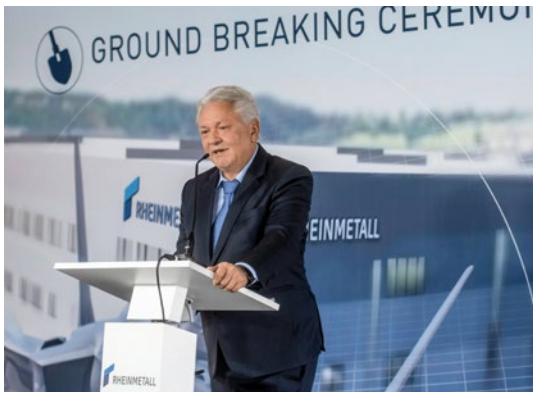
Rheinmetall CEO Armin Papperger made it quite clear just how important the €100 million capital expenditure is for the company and for Germany as a place to do business. “We're proud that our long-standing partnership with Northrop Grumman and Lockheed Martin and our decades-long relationship with the Bundeswehr are resulting in a genuine transfer of know-how to Germany. And we're very pleased to be contributing to the future viability of Germany as a technology powerhouse, and especially NRW, our long-standing corporate home. Close to the state capital in Düsseldorf, we're going to build a factory that sets standards Europe-wide.” The technology company is intending to produce at least 400 F-35A centre fuselage sections at its Weeze factory.



### F-35 LIGHTNING II

The Lockheed Martin F-35 Lightning II is set to be a cornerstone of many NATO and allied air forces. The F-35 is a single-seat jet aircraft with exceptional stealth capabilities, meaning that unlike other aircraft, it is virtually invisible to enemy radar. The jet can perform all the roles expected of a fighter aircraft – in other words, engaging aerial targets – but is also capable of striking ground targets. Depending on equipment, it can conduct reconnaissance and surveillance missions as well as electronic warfare. There are three versions of the F-35 in production. The F-35A is designed for conventional take-off and landing, version B for short take-off and vertical landing and the F-35C for deployment on aircraft carriers.

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### THE START OF A NEW ERA FOR THE GERMAN AIR FORCE

In the first stage of the process, the German Armed Forces are purchasing 35 F-35A combat aircraft, which are currently due to replace the Tornado system from 2027 onwards, representing a clear sign of the promised new era in national defence and a vital element of Germany's nuclear sharing as part of its role within NATO. The federal government will retain its obligation in the event of nuclear war to use the German Armed Forces to fly the US nuclear warheads stored in Germany and allow them to be deployed. Numerous other countries aside from Germany have also opted to purchase the F-35.

In planning for the project, Rheinmetall very much switched on the afterburners, as it were. Production of the first parts is due to start as soon as 2025. "We're pleased with Rheinmetall's swift site selection for the upcoming F-35 centre fuselage production facility. This marks an important milestone in the German F-35 programme – this increase in capacity helps meet the growing global demand that further enables the F-35 to stay ahead of evolving threats in the 21st-century landscape," said Mike Shoemaker, Vice President of F-35 Customer Programs at Lockheed Martin.

### KNOW-HOW FROM THE USA

When it comes to the production of aircraft components, Rheinmetall is able to bring to bear its experience as an integrated technology group in manufacturing complex systems. Furthermore, on this assignment, the Düsseldorf-based company is working closely with US partner Northrop Grumman, for which Rheinmetall works as a contractor. "Northrop Grumman will replicate our automated and manufacturing technologies of the Integrated Assembly Line in



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Weeze," said Glenn Masukawa, Vice President and F-35 Program Manager at Northrop Grumman. "Combined with Rheinmetall's capabilities, our collaboration with Lockheed Martin to manufacture the centre fuselage is critical in bolstering global security."

### A WIN FOR THE LOCAL REGION AS WELL

The factory will give the local region an economic boost much like the F-35's vertical take-off. More than 400 highly skilled new jobs in a wide range of fields are to be created in Weeze itself, as the factory will include not only the assembly line but also logistics and storage areas, laboratories, training facilities and quality control. Rheinmetall and its partners will also be getting a number of other companies on board as suppliers and service providers to the programme. That could mean an estimated 1,500 jobs at small and medium-sized enterprises in the region. Mona Neubaur, Minister for Economic Affairs, Industry, Climate Action and Energy for the state of NRW, commented, "Amidst changing times, it is essential for industrial policy to include the defence industry as well, which is why the announcement that a critical section of the F-35 jet is to be manufactured here marks a great day for Weeze, the wider region and the state of North Rhine-Westphalia." ● Pk

2 With the F-35 factory, Rheinmetall CEO Armin Papperger is aiming to create a new hub for aerospace technology in North Rhine-Westphalia.

3 The groundbreaking ceremony was attended by numerous guests of honour from politics, civil society, industry and the armed forces. Pictured here: Lieutenant General Ingo Gerhartz, Inspector of the Luftwaffe (left), talking to Pauline Kao, US Consul General in Düsseldorf, and Colonel Brian Kreitlow, US Air Attaché to the US Embassy in Berlin.

4 Hendrik Wüst, state premier of North Rhine-Westphalia, surrounded by journalists as he expresses his delight at the creation of 400 new highly skilled jobs in his state.

**FRANK PAPE**, born in 1970, is a social activist, entrepreneur and author. His book "Gott, Du kannst ein Arsch sein" made it onto the Spiegel bestseller list and was adapted into a film starring Til Schweiger and Heike Makatsch. In his biography "Ich mit Risiken und Nebenwirkungen", Frank Pape provides personal insights into the roller-coaster ride of his extraordinary life. The father of five lives and works with his family in Preussisch Oldendorf.



# A jet-setter finds a new purpose

Even as a young professional, Frank Pape demonstrated entrepreneurial spirit in the booming call centre industry. That was just the start of a meteoric rise that saw him working as an advisor to governments and corporate boards. Today, the former jet-setter works in a voluntary capacity supporting terminally ill people and those in need at his equestrian farm. The private hospice is funded via the family's coffee roasting and chocolate business, Familienrösterei & Chocolaterie Pape – whose customers include Rheinmetall.

**W**hen Frank Pape's daughter Mary was told at the age of 15 that she had lung cancer and did not have long to live, she began writing about her experiences. At her request, her father published a book telling the moving story of her last 296 days. The response to the novel and its subsequent film adaptation was huge. Afterwards, many people turned to Frank Pape and his wife Nicole for assistance. "In most cases, they are terminally ill, victims of abuse, or people grieving for their loved ones. They want to deal with their fear and pain or spend what time they have left in a caring atmosphere and with smiling faces all around them, just like our daughter did," explains the trained counsellor and entrepreneur.

Frank Pape founded a hospice at his equestrian farm in Getmold as a retreat for seriously ill and traumatised people. With great empathy, dedication and courage, the committed Christian began sharing in the most difficult hours of his guests' lives, laughing, crying and sympathising with them. When he and his wife were no longer able to fund their charitable commitment out of their own pocket, they turned their passion for coffee and chocolate into a business idea: Familienrösterei Pape.

The former strategy consultant trained as a master confectioner and chocolatier. The majority of the profits help to fund "Ein Lächeln für dich", the Papes' non-profit organisation. The husband-and-wife team proved to be adept at marketing, persuading companies like Rheinmetall to purchase high-quality Fairtrade coffee from their family-run coffee roasting business and support a good cause in the process. "We were extremely moved by Frank Pape's story," says Philipp von Brandenstein, Head of Corporate Communications at the defence and technology company Rheinmetall. "What the hospice does for people and for society deserves our respect and our support."

Purpose instead of profit. That is what drives Pape, now 53 years old. And he is not the only one with this attitude. Entire generations no longer want to just make money – they are also keen to do something that helps to make society better and fairer for all. Pape admits he used to have a different mindset. At 23, he established one of the first call centres in Germany. His start-up quickly expanded. Its clients soon included mobile phone companies along with banks and insurance providers. The market was booming. Call centres became the latest marketing tool for winning new customers. And Frank Pape developed the corresponding strategies. His subsequent career as a consultant found him rubbing shoulders with high-profile politicians and businesspeople. He started out working in the advisory team of the government of Malta. Later, he was a consultant for executives at HSBC, one of the world's biggest banks.

His days as a top manager were dominated by marketing and sales strategies, crisis meetings and business deals. He would often find himself flying to Paris for breakfast, having a lunch meeting in London then enjoying the sunset by the sea. "It was a jet-setting life," Frank Pape recalls.

But eventually he asked himself what it was all about. He founded his own strategy consultancy, moved to the countryside, trained as an emergency counsellor and took an interest in end-of-life care. "Welfare work gave me the feeling of doing something good," Pape explains. And since his daughter died, it has become his mission in life. In addition to his hospice, he is involved in youth outreach and prevention, helping victims of bullying and raising awareness of the dangers of drug use. "In her last days, my daughter made a point of saying how important it is to make sure that each day has a purpose," Pape recalls. "And she was absolutely right." ● *Pk*

## IMPRINT

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Some 1.6 million tonnes of unexploded ordnance from the Second World War lie at the bottom of the North Sea and Baltic, posing a serious hazard to people and the environment. Rheinmetall and its partners have developed a technology for safely and responsibly recovering munitions from the sea and destroying them. The Group and its partners are now competing for a contract to clean up the waters off the German coast.

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