LUXEMBOURG DEFENCE GUIDELINES 2035

THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of Foreign and European Affairs

Directorate of Defence

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Ministerial Foreword

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Today, after the conclusion of the Alliance's military engagement in Afghanistan, the conduct of a full-scale war of aggression by Russia against Ukraine, the rise of China, the devastating effects of several natural disasters on national territory, the COVID-19 pandemic, the adoption of the new North Atlantic Treaty Organisation (NATO) Strategic Concept and the Strategic Compass of the European Union (EU), as well as the adoption of new and particularly structuring capability objectives, a revision of the 2017 edition of the Guidelines is necessary.

More vigilance will be required as a profound change in global political and security stability manifests itself. Diplomatic and economic relations will have to be analysed and reconsidered through the inclusion of the security and defence dimensions. A redefinition of the common security and defence policy has become inevitable. A general strengthening of the operational posture, including NATO's deterrence posture, has to be a key priority of defence policy.

In line with the previous publication, this document emphasizes the continuity of the national defence policy in securing the legitimate confidence that Luxembourg must inspire in its citizens, the Member States of the EU, Allies and European partners. This new reference document in defence matters therefore aims to underline the continuity of the Luxembourg Armed Forces' missions, their orientation in terms of transformation and is firmly based on the EU's and NATO ambitions and capability priorities.

In this profoundly changed geopolitical context, marked in particular by the war in Ukraine, the Luxembourg Defence must be able to act and contribute to the common effort in terms of deterrence and collective defence, as well as crisis prevention and management. It is therefore more important than ever to develop capabilities in line with a level of ambition that meets the expectations of the EU and NATO, without neglecting national requirements.

The Luxembourg Defence will seek to develop capabilities, first and foremost force elements, in the categories of readiness required to operate in different security contexts. In addition to the "traditional mission" of the Luxembourg Defence, land-based reconnaissance, which will remain at the centre of the Armed Forces' activities, new specialisations have been introduced and will be developed, in particular in the fields of air, cyber and space, while taking into account the risks associated with environmental changes.

Fulfilling all current and future tasks will require unprecedented efforts in terms of recruitment and budget, enhanced cooperation with our partners and reference institutions – NATO, the EU and the United Nations (UN) – and an improved balance between staff, equipment, infrastructure and operational commitments.

The implementation of the Guidelines will require, among other things, the creation of new careers within Defence that are essential for the development and deployment of various capabilities, whether on land, in the air, in space, in cyberspace or at sea. This ambition also implies further promoting the attractiveness of military careers for the whole population through the introduction of new careers and improved training.

New threats or risks to the security of the Grand Duchy will be taken into account by Defence in terms of redefining the security posture and reassessing the capability-building priorities in close coordination with NATO, the EU, the Benelux and other reference partners.

With regard to cooperation with the private sector, the above-mentioned institutions offer a wide range of cooperation and funding instruments that can create opportunities for industry, including small and medium-sized enterprises (SMEs), as well as for the various research and innovation actors at national and European level. For Luxembourg Defence in general, and the Armed Forces in particular, a major challenge will be to put in place the human resource structure, especially the necessary experts, to ensure an effective follow-up of these opportunities. These efforts will form the foundation for an unprecedented defence effort.

In implementing the Guidelines, the more complex activities to be undertaken, requiring long-term efforts, will create opportunities to make Defence more eco-friendly, more sustainable and more inclusive, in line with the 3rd National Plan for Sustainable Development (NPSD).

I would like to dedicate the new Guidelines to Colonel Paul Nilles, who unfortunately left us too soon in December 2021. As head of strategic planning, Colonel Nilles drafted the first version of this text.

François BAUSCH

Deputy Prime Minister
and Minister of Defence

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Executive summary

Executive summary

The new Guidelines of the Luxembourg Defence, which define the general framework of its development until 2035, describe the political orientations approved by the government, in full compliance with the commitments made at international level.

Luxembourg, a modern, dynamic and open country standing in solidarity, has, like any other nation, an active responsibility in formulating responses to the present challenges. Our country, which has enjoyed exceptional economic growth for decades, has been able to develop its economy thanks to the security of the Euro-Atlantic area which is provided through defensive alliance that is NATO, the EU and other relevant international bodies such as the UN and the Organization for Security and Cooperation in Europe (OSCE). It is important for the Grand Duchy to remain a committed and supportive actor in favour of multilateralism based on the rules, principles and values established and defended by these international reference organisations.

The usefulness and credibility of Luxembourg's defence efforts are essential aspects of how Luxembourg perceives its role both within NATO and the EU. Similarly, the Grand Duchy intends to maintain its position at the forefront of European integration.

Faced with a severely deteriorated, increasingly unpredictable and unstable international security environment, security and defence policies must be reoriented in favour of credible deterrence and collective defence. Like its regional partners and Allies, the Grand Duchy has to readjust its defence policy. These Guidelines aim at translating this new policy into a continuous and profound transformation of the Luxembourg Directorate of Defence and the Luxembourg Armed Forces, the key actors to face current and future security challenges.

The “traditional mission” of the Luxembourg Defence, the intelligence, surveillance and reconnaissance (ISR) activities, will be further developed. The creation and joint operation of a bi-national medium combat reconnaissance battalion with Belgium by 2030 will be at the nucleus of these efforts. In recent years, the Luxembourg Defence has also specialised in new areas such as strategic air transport, space and cyber. Contributing to the defence against new threats, special attention is dedicated to cyber threats. The same applies to security risks related to the effects and implications of global environmental changes, especially climate change. These specialisations will therefore be strengthened and further developed in the coming years.

As increased competition for natural resources is a growing source of conflict, Luxembourg Defence also has a role to play in preventing such conflicts and in the ecological transition in line with the 3rd NPSD of 2021 as well as the European 'Green Deal', which aims to achieve carbon neutrality by mid-century.

Human resources at the service of the Luxembourg Defence remain at the heart of this ambitious transformation. The substantial increase of the defence effort decided by the government will go hand in hand with a reasonable diversification of the fields of activity of Defence, thus creating more career opportunities for the personnel, which also paves the way for an increase of the feminisation rate in the Luxembourg Armed Forces.

The Guidelines are based primarily on the following main objectives and guidelines:

- strengthening the European defence pillar within NATO;
- strengthening the military capabilities of the EU;
- fulfilling both NATO Defence Planning Process and EU Permanent Structured Cooperation (PESCO) commitments;
- increasing the defence effort to 1% of GDP by 2028 in line with the Luxembourg government commitment;
- continued military support for Ukraine to exercise its right to self-defence against the Russian aggressor;
- transformation of the Luxembourg Defence according to the capability requirements emanating directly from the capability shortfalls identified first of all on the NATO and EU side, without forgetting the national requirements;
- evolution of the Luxembourg Armed Forces in line with their missions of national defence, deterrence and collective defence, crisis prevention and management as well as cooperative security;
- thorough modernisation of land reconnaissance capabilities, which remain at the heart of the Luxembourg Armed Forces' activities, with a view to interoperability, responsiveness, robustness and operational availability in line with current and future challenges (in particular through the creation of a Belgian-Luxembourg medium combat reconnaissance battalion);
- further development of space and cyber skills and capabilities;
- development of the air component, above all in close cooperation with Belgium, the Netherlands and the other members of the *European Air Transport Command* (EATC)[1];
- strengthening the development of research and innovation activities in order to maintain the technological edge and reach 2% of the

1 Located in Eindhoven.

defence effort in line with the commitments made in the framework of the PESCO;

- creation and identification of investment opportunities for national and European industry in close coordination with the relevant actors, including Luxinnovation, the Ministry of the Economy and the European Commission;

- development of existing partnerships within the framework of NATO, the EU, the Benelux countries and the German-led "Framework Nations Concept" (FNC);

- contributing to increasing the country's resilience by promoting the development of a whole-of-government approach;

- contributing to the facilitation of military mobility on national soil, within the Alliance and the EU, in close coordination with the relevant actors;

- further development of stabilisation capabilities in response to agreed capability goals.[2]

In the context of the implementation of the above-mentioned multiple projects, Defence will make sure to:

- acquire, develop and maintain high added-value capabilities in the selected priority areas;

- study each project in the light of a possible economic and social return for Luxembourg, increased resilience and respect for sustainable development criteria without undermining operational efficiency;

- reassess budgetary priorities taking into account the availability of the necessary personnel as well as the volatility of the security environment.

2 NATO terminology refers to stabilisation and reconstruction in its defence planning. It should be noted that reconstruction activities are not within the remit of the Luxembourg Defence.

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Introduction: why an update

Introduction: why an update

The present update of the Luxembourg Defence Guidelines has been drawn up against the background of a security context profoundly shattered by the Russian Federation's war of aggression against Ukraine. The breakdown of the European security order, but also beyond European borders, and its consequences require a thoughtful re-evaluation of Luxembourg's defence policy. Added to this is the persistent asymmetric threat of terrorism and growing competition between great powers. Finally, the impact of emerging and disruptive technologies (EDT), which bring opportunities but also risks and which are becoming one of the main fields of international competition, technological superiority being one of the factors of military victory. This document aims to describe the context, the framework and the orientations of Luxembourg's defence policy.

While the security environment has deteriorated significantly since the first Guidelines were issued in 2017, the underlying motivation for this publication remains unchanged – to communicate transparently on the interests, objectives and means of the Luxembourg Defence.

A defence effort implies strategic foresight.

This process does not take place in a conceptual vacuum. Beyond national requirements, the structuring frameworks for Luxembourg's planning remain NATO and the EU. In 2022, these two multilateral institutions have published their own strategic orientation documents in the field of defence: the *Strategic Compass for Security and Defence* on the EU side and the Strategic Concept 2022 on the NATO side.

An important consequence of this orientation is a significant increase in our defence effort to 1% of GDP by 2028. This substantial increase goes hand in hand with continued responsible management of the budgets in question, while ensuring a focus on defence requirements expressed in the NATO, EU and national frameworks.

At the national level, a major overhaul of the legislative framework for Defence should also be mentioned with the "draft law on the organisation of the Luxembourg Armed Forces", which was introduced in the legislative procedure in 2021 and which aims, among other things, to modernise the legislative provisions regarding the Luxembourg Armed Forces and to create new career opportunities. This new legislative framework will thus be a key instrument in facilitating the recruitment of a sufficient number of qualified and committed personnel thus ensuring the achievement of the ambitious objectives defined in these Guidelines.

The implementation of these Guidelines will be further described in internal planning documents which will be regularly updated by both the Directorate of Defence and the Armed Forces Staff, in close coordination with other relevant national actors.

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International developments and the implications for transatlantic security

3.1 Underlying trends affecting defence policy

3.1.1 Challenges to the rules-based international order and the erosion of norms

Together with its Allies and partners, Luxembourg is facing the disruption of the security order established at the end of the Cold War. The main reference frameworks of Luxembourg's defence policy share this perspective. For example, NATO's new Strategic Concept 2022 notes that: "*The Russian Federation has violated the norms and principles that contributed to a stable and predictable European security order. We cannot discount the possibility of an attack against Allies' sovereignty and territorial integrity. Strategic competition, pervasive instability and recurrent shocks define our broader security environment. The threats we face are global and interconnected*." For the EU, in the 2022 Strategic Compass on Security and Defence, the analysis is similar: "R*ussia's unprovoked and unjustified military aggression against Ukraine […] grossly violates international law and the principles of the UN Charter and undermines European and global security and stability.*"

The impact of this evolution on defence policies of the Allies and EU Member States cannot be overestimated. Luxembourg is no exception in this regard. The fact that Russia is openly challenging the borders of Europe by use of military force has led to a fundamental adaptation of NATO's posture. Western defence capabilities are being reorganised. This adaptation will largely determine the direction of defence in the years to come.

On a regional level, the changing security environment has led to a fundamental shift in Finland and Sweden's political stance towards NATO. These two countries are net contributors to security and also play an important role for security in the Euro-Atlantic area due to their key geographical position. Luxembourg supports the will of these countries to strengthen their security and reaffirms its solidarity with them. The Grand Duchy has been working together with both nations for decades, both in the UN and the EU as well as in the framework of their close partnership with NATO. Finland and Sweden share our values and our ambition in maintaining the rules-based international order. Luxembourg welcomes the accession of Finland to the Alliance and hopes that Sweden will also join NATO in the near future to jointly defend our values, our freedom and the security of the Euro-Atlantic area.

The European project continues to witness internal dissension. The departure of the United Kingdom has raised the risk of the reversibility of the European project, while certain national measures in the context of the management of the COVID crisis have given a glimpse of what it would look like if the Schengen agreements were to be questioned (closure of borders, etc.). While the economic and societal consequences of such developments for Luxembourg are

obvious, they also have an impact on the Luxembourg Defence, which is largely dependent on multinational and cross-border cooperation, even for the day-to-day management of activities (capabilities based outside the national territory, access to cross-border ammunition depots, refueling, etc.).

Beyond the European continent, we are witnessing a hardening of the competition between the great powers – a competition that can be read as an expression of rivalry between opposing political systems (autocracies vs. democracies). In this context, both the EU and NATO have sought to redefine the nature of their relations with great powers that do not adhere to democratic principles. Thus, the EU's 2022 Strategic Compass notes that: "*China is a partner for cooperation, an economic competitor and a systemic rival*".

The NATO Strategic Concept 2022, for its part, elaborates on the subject as follows: "*The People's Republic of China's (PRC) stated ambitions and coercive policies challenge our interests, security and values. The PRC employs a broad range of political, economic and military tools to increase its global footprint and project power, while remaining opaque about its strategy, intentions and military build-up. The PRC's malicious hybrid and cyber operations […] It strives to subvert the rules-based international order, including in the space, cyber and maritime domains. The deepening strategic partnership between the People's Republic of China and the Russian Federation and their mutually reinforcing attempts to undercut the rules-based international order run counter to our values and interests.*"

Through its multilateral affiliations, the enhanced strategic competition with the People's Republic of China also concerns Luxembourg, and this goes beyond economic relations, particularly with regard to resilience aspects. The outbreak of an armed conflict between the island of Taiwan and the People's Republic of China would risk causing catastrophic disruption of global political stability as well as the disruption of international trade and supply, production and value chains with significant consequences for Luxembourg.

It is certainly not a question of seeking confrontation with Beijing. However, remaining indifferent to the security risks emanating from this actor – for example its military-civilian fusion strategy, its industrial policy, the deepening of its partnership with Russia, its espionage activities, its use of EDTs, the development of its nuclear arsenal, activities in the fields of space, cyber or maritime, etc. – is not a viable option either.

Luxembourg has a strong interest in the EU continuing to act in a united manner in the context of defining a strategy towards the People's Republic of China.

3.1.2 Impact of technology

Maintaining a technological edge is critical in ensuring the ability to dominate strategic competitors and thus, in fine, to guarantee a

credible Euro-Atlantic deterrence and defence posture in the face of potential threats. In this respect, the EDTs constitute a major challenge – for the Alliance, for the EU and therefore necessarily for Luxembourg – but also, if properly exploited, a real opportunity. Without a strategic build-up in this area, Western countries risk letting adversaries and competitors gain a competitive advantage. The loss of this advantage would translate into an increased vulnerability, potentially challenging the strategic stability and the fundamental pillars of deterrence. Any state or non-state actor dominating this technological race would be able to threaten the very foundations of our societies and thus undermine political cohesion at national but also NATO and EU level.

Both NATO and the EU have recently launched major initiatives in this area. In this way, a wide range of EDTs of particular relevance to defence and security have been identified. These include artificial intelligence (AI), big data capabilities, robotics and autonomous systems, quantum technologies, biotechnologies, hypersonic technologies, space related technologies, new materials, renewable energies, innovative and carbon neutral fuels and propulsion systems. For Luxembourg, it is essential to consider green technologies in this context, as they have the potential to improve both the operational efficiency and effectiveness, as well as the resilience of defence capabilities. Indeed, these technologies can have a positive impact on operational autonomy, the supply chain, the security of supply, as well as the carbon footprint of capabilities. Ideally, future military capabilities will be designed by integrating green technologies from the outset in line with the principles of the circular economy.

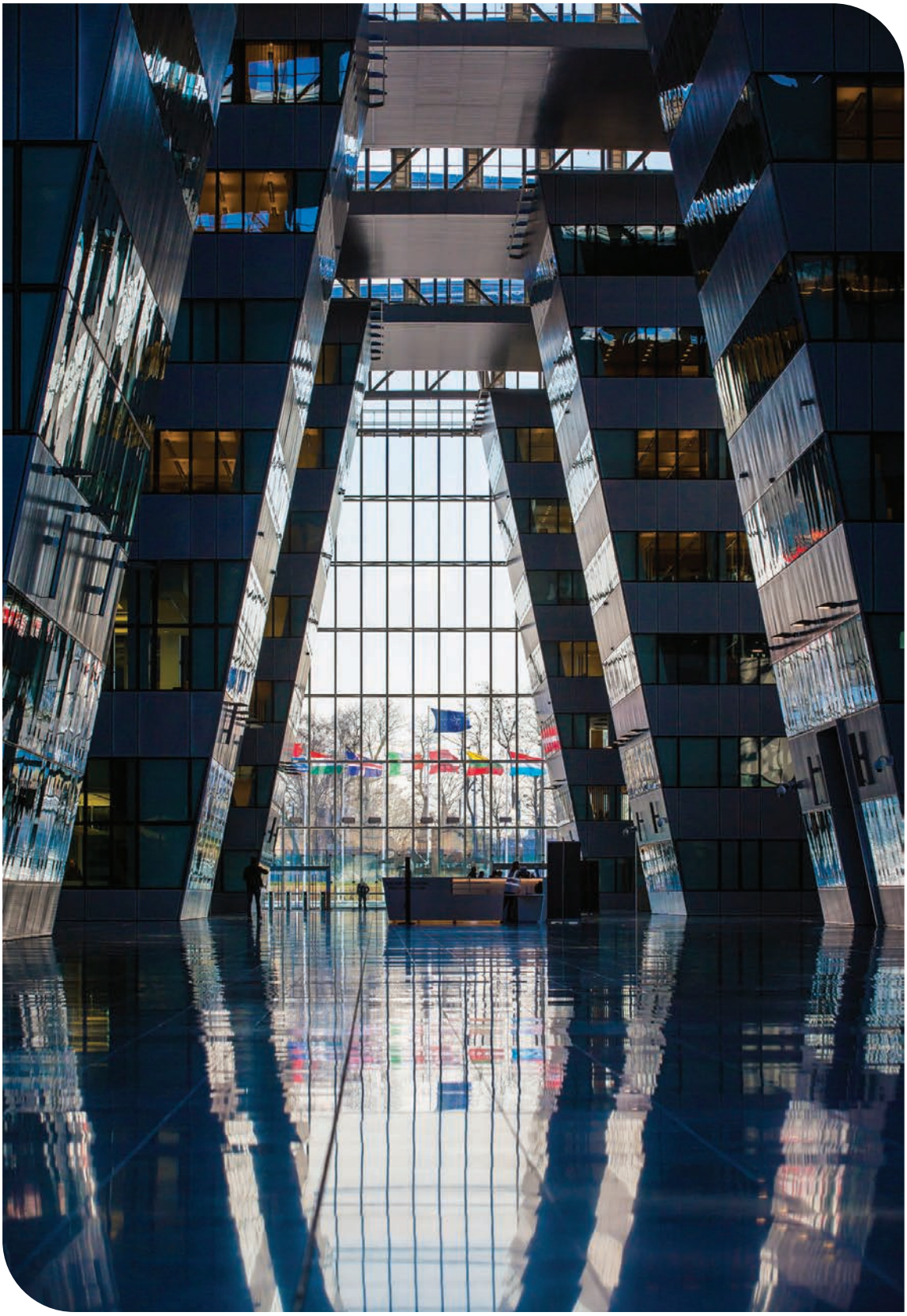
Beyond the purely technical and implementation related issues, some of the EDTs also raise fundamental ethical questions. With regard to lethal autonomous weapon systems (LAWS), Luxembourg will develop national standards within the framework of an interministerial working group created for this very purpose by the Minister of Defence. At the international level, Luxembourg will actively participate in the drafting and implementation of norms and standards in this area.

3.1.3 Security risks related to environmental change

Among the “non-traditional” risks that can significantly jeopardise our common security are the impacts and implications of global environmental change, including climate change, loss of biodiversity and loss of fertile land or desertification.

These have an increasing impact on security, especially in Europe's neighbourhood: whether through conflicts over access to natural resources such as agricultural land or water, for example in the Middle East and the Sahel, tensions over access to fishing grounds, or through the growing interest in access to and control of the Arctic region, which is now navigable and rich in raw materials.

Increasingly sophisticated studies are establishing a causal link between the degradation of natural resources, accelerated in



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particular by climate change, and the beginning of tensions and conflicts in several regions of the world. While climate change is not the only cause of these conflicts, it does contribute to their aggravation and is seen as a multiplier of security risks and threats.

For example, the civil wars in Syria and Libya had several years of acute drought as antecedents. In the Sahel, erratic rainfall and prolonged periods of drought have strongly contributed to the degradation of agricultural and pastoral land in the face of rapidly increasing population densities and land governance that is still largely informal and, in the meantime, completely outdated. Violent conflicts between communities, particularly over access to rural land, have subsequently multiplied, resulting in the recruitment of young fighters from abandoned areas by jihadists.

Increasing human expansion into remote primary ecosystems is not only leading to accelerated biodiversity loss, but is also resulting in an increased risk of pandemics, due to increasingly frequent contact of human populations with pathogens in wildlife.

As climate change mitigation and adaptation strategies emerge, it is likely that a gradual transition from a hydrocarbon-based to a renewable energy economy will not only significantly reduce our energy bills, but will also have a huge economic impact on oil and gas exporting countries. The resulting decrease in their relative economic and geopolitical weight could not only reduce some current tensions, but also create new ones and represent a source of future instabilities, which we must begin to anticipate and prepare for. We are already witnessing a new geopolitical competition, notably around critical raw materials, which are necessary for the energy transition and digitalisation and are therefore increasingly sought after.

Potential resulting vulnerabilities should be prevented by promoting circular economy models in all industrial sectors, including defence, allowing for the reuse of components, materials and resources. Furthermore, it is essential to establish mutually beneficial partnerships with countries exporting such resources, without creating significant dependencies.

Climate change also affects our country through the increased frequency and violence of extreme weather events (droughts, fires, tornadoes, floods, etc.) affecting our cities and infrastructures, including critical infrastructures, and requiring more and more frequent support from the Luxembourg Armed Forces for rescue, first aid, civil protection and crisis management operations. While this assistance has a definite added value in terms of disaster relief, crisis management, civil-military coordination and societal acceptance of the Luxembourg Armed Forces, the scale and intensity of these events in turn weaken the capacity for training and preparation for military tasks.

Finally, the action and effectiveness of the Luxembourg Armed Forces may also be directly affected by the consequences of climate change, whether in the context of extreme weather

phenomena affecting defence infrastructures or equipment, or in the context of military operations in extreme weather conditions (heat, torrential rain, flooding) that greatly reduce the operational performance of personnel and equipment.

3.2 Threats

3.2.1 Conventional and nuclear

Through its war of aggression against Ukraine, the Russian Federation has fundamentally altered the overall security environment and substantially exacerbated tensions on the European continent and particularly with NATO and the EU.

NATO's new Strategic Concept and the EU's Strategic Compass identify Russia as a primary and direct security threat leading to a fundamental shift in posture.

Russia maintains powerful conventional military assets, and a robust nuclear arsenal, which pose a threat to the entire Euro-Atlantic area. Since February 2022, the Russian President has repeatedly emphasised the relevance of this threat in his speeches directed towards the NATO Allies. At the same time, Russia uses a wider range of hybrid tools on a daily basis, including offensive cyber assets, disinformation campaigns, energy blackmail and the instrumental use of migration flows.

Furthermore, as demonstrated in Ukraine, the use of Russian military capabilities is not limited to legitimate military targets but extends to civilian targets, including critical infrastructure.

3.2.2 Asymmetric and hybrid

Terrorism remains the other significant threat described by NATO's Strategic Concept. It exists in many forms and it is important to respond to this threat in a united and supportive manner. The Luxembourg Defence will strive to contribute to its mitigation within the framework of its competences and means.

Hybrid actions are a mixture of coercive and subversive activities, traditional (e.g. diplomatic, military, economic) and unconventional (e.g. misuse of social networks, manipulated information) methods used in a coordinated way by state and non-state actors to achieve certain political objectives, without reaching the threshold of an officially declared war. The characteristic of these hybrid actions is that they are difficult to attribute to a specific actor. Consequently, the choice of response will be limited. The fact that these threats cannot at all times be countered in their entirety, underlines the importance of the resilience of State tools, especially in regards of defence.

With the rise of EDTs, these threats are and will increasingly be able to target and potentially destabilise societies by degrading public trust in State institutions, polarising political positions at national and international levels, denigrating the fundamental values of democratic societies and affecting the decision-making capacity of policy makers.

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3.2.3 Cyber

In recent years, with the increasing digitalisation of our society, the cyber domain has become essential for the proper functioning of society as well as for the conduct of many military activities. This increasing dependence creates vulnerabilities to attacks and destabilisation attempts. These disruptions can be described as complex, destructive and coercive. As these activities are carried out clandestinely and remotely, they are difficult to attribute to a specific perpetrator, even if detected in time. The means to carrying out attacks are easily accessible and inexpensive, and therefore make all forms of attacks particularly attractive and profitable. The main perpetrators of cyberattacks are States, organised crime organisations, terrorists, or ideological activists. Cyber threats can be classified into six categories according to the objectives targeted: cybercrime, espionage, destabilisation (subversive activity in relation to hybrid threats), sabotage, strategic pre-positioning or action by isolated individuals. Today, cyber weapons tend to approach the lethal potential of conventional weapons. AI and the misuse of algorithms are beginning to play a major role in cyberattacks as well as in LAWS. In addition, there is a closer link between cyber and space, as seen with the Russian cyberattack on the satellite communications operator Viasat immediately prior to the invasion of Ukraine in 2022.

Such attacks, being more and more destructive, harbour the potential for escalation which could also lead to the invocation of Article 5 of the North Atlantic Treaty (collective defence).

3.3 Assessment of the strategic environment

The year 2022 was marked by the outbreak of a high-intensity war of aggression by Russia against Ukraine, thus in the immediate vicinity of EU and NATO territory. Since then, Europe has found itself in an unprecedented strategic context. The remarkable resistance of the Ukrainian forces against the Russian aggressor, supported by a large part of the international community, has pushed Russia into an unanticipated strategically difficult situation. Without exaggeration, this period can be seen as particularly dangerous. With the capability imbalance still in Russia's favour against Ukrainian forces, the war in Ukraine is likely to be a long-term one with the potential to spread to other countries. As a result, the overall situation on the European continent and beyond is marked by great tension and uncertainty about future developments in the geopolitical context. Even if the risk of a confrontation between NATO and Russia appears to be limited, it is important to be prepared for a possible rapid deterioration of the situation.

The Indo-Pacific region has become another hotbed of tension impacting international relations in a significant way. We witness the emergence of an assertive Chinese policy, oriented towards competition in most areas, including military. The massive modernisation of China's military apparatus, notably in terms of disruptive technologies, constitutes a real challenge. With the second largest defence budget in world, Beijing is investing heavily in its ambitions.

More vigilance will therefore be required as a profound change in global political and security stability is increasingly confirmed. Diplomatic and economic relations will have to be analysed and reconsidered by including the security and defence dimensions more prominently. A redefinition of the common security and defence policy has become inevitable. A general strengthening of the operational posture, including NATO's deterrence posture, must be become one of the priorities of defence policy.

The scale of the security challenges is recognised both in the Strategic Compass and in NATO's new Strategic Concept. This realignment also concerns Luxembourg, whether it be in terms of capabilities, operational orientation and preparedness, the approach to resilience or inter-ministerial cooperation at national level to define an integrated response.

Given the size of the Luxembourg Armed Forces, it must be stressed that not all missions, both international and domestic, can be carried out simultaneously. Indeed, if the battalion were to be engaged abroad, the Armed Forces could only provide limited support to their national missions.

While the conventional threat is the obvious focus of attention, trends with long-term consequences should not be overlooked. Space and cyberspace, including social networks, are not spared and have become the new battlegrounds. The interconnection between technological developments, especially EDTs, and the threats arising from them is already apparent on the battlefields in Ukraine (e.g. importance of satellite communications, use of

unmanned aerial vehicles (UAVs) and loitering munitions). This interconnectedness has the potential to scale up the effects of asymmetric, hybrid and cyber threats. The increasing use of AI will definitely act as a multiplying factor increasing their harmful impact.

We will be increasingly confronted with these new threat types, which are favoured in a context where actors aim to remain below the threshold of open or easily attributable hostilities. By their nature, these threats aim to affect targets beyond the defence domain, testing the resilience of both society and security and defence actors at national and international level.

As the number of LAWS is growing, an adequate and agreed regulatory framework, taking into account all ethical aspects, becomes an urgent priority.

Apart from the observation that it is causing an increasing number of military missions on national territory, the climate crisis or environmental changes in general, which are likely to cause a rapid deterioration of the security situation in many parts of the world, are likely to lead to more crisis management and stabilisation missions. At the same time, the contestation of the rules-based international order may potentially result in a lack of agreement on the mandates (especially in the UN context) framing these missions.

It is obvious that the range of threats, requiring profound transformation processes in the short, medium and long term, will require a significant amount of work on the part of the Luxembourg Defence. Given the number of challenges, it will be necessary to proceed to a weighted prioritisation by means of adapted strategic objectives.

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The goals of Luxembourg's defence policy

4.1 Promoting our values internationally 26

4.2 Preservation of Luxembourg's essential security interests through the multilateral system based on international law 27

The goals of Luxembourg's defence policy

In a changing world, Luxembourg has interests and values which it chooses to protect through a principled defence policy and by contributing to the collective security and defence systems of which it is a part.

Through its Armed Forces and Defence as a whole, the Grand Duchy of Luxembourg intends to contribute to the global response of the EU, NATO, the UN and the OSCE to security and defence challenges. Each organisation acts, in its own field and in its own way, in promoting and defending our common values.

Luxembourg Defence will continue to contribute to key areas and to fair burden sharing amongst Allies, Member States and partners.

NATO is the cornerstone of the Euro-Atlantic security. Today's forces are called upon to become more robust, responsive and available to contribute within their means to NATO's three core tasks – deterrence and collective defence, crisis prevention and management, and cooperative security. Among these tasks, collective defence can be described as “primus inter pares”. Indeed, the deterrence and defence posture is and will remain essential to preserve peace. It is therefore a matter of contributing to these efforts in peacetime, in order to contribute to the credibility of the Alliance. For the European Allies, this means strengthening its European pillar, and thus the EU, NATO's main strategic partner. This will be achieved first and foremost through the implementation of the commitments made in the framework of PESCO, in particular participation in EU crisis management operations, in EU battlegroups, the coordination of defence policies, the joint acquisition and pooling of equipment, joint training and the strengthening of interoperability as well as of the deployment capability of European forces. The Luxembourg Defence will continue to support the activities of the OSCE, especially in the field of confidence- and security-building measures, including in particular arms control.

Is this enough? The answer is clearly no. The complexity and scale of the current and potential challenges and conflicts require a whole-of-government approach. In the event of a national crisis, a central role will be played by Luxembourg Defence under the governance of the High Commission for National Protection (HCPN).

4.1 Promoting our values internationally

Luxembourg's defence policy promotes, among other things, the rule of law, respect for human rights, democracy, freedom, international solidarity, sustainable development and the maintenance of peace and security through an effective multilateral system. Our values guide the actions of our Defence and are also reflected in the political commitments of the Grand Duchy of Luxembourg.

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4.2 Preservation of Luxembourg's essential security interests through the multilateral system based on international law

Luxembourg's defence policy contributes to the protection of Luxembourg's essential security interests, namely:

- safeguarding the integrity of the territory, independence and sovereignty of Luxembourg;
- safeguarding the freedom and security of the population in a stable, open and dynamic society;
- protection of the foundations of Luxembourg's prosperity, economic security and strategic supplies; and
- resilience of society, the State and public services.

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Structural principles of Luxembourg's defence policy

5.1 Solidarity

In order to be fully recognised as an EU Member State and NATO Ally, Luxembourg cannot delegate the safeguarding of security to its partners but must instead assume its fair share of the collective defence effort. The personnel of the Luxembourg Armed Forces is the face of our external action in theatres of operation. Their deployment, with the inherent risks of an operation, is the highest expression of our solidarity and fair sharing of risks.

5.2 Decision-making autonomy

Decision-making autonomy relates firstly to the freedom of strategic policy choices and secondly to the control of operational activities and the life cycle of capabilities.

5.3 Transatlantic Partnership

The importance of the transatlantic partnership, which is based on solidarity commitments, no longer needs to be demonstrated in the field of defence. This is why Defence remains a central link in this transatlantic bond.

5.4 Adaptability and military specificity

Given the rapid changes in the security context, the Luxembourg Defence must show itself capable of agility and reactivity in order to anticipate and respond rapidly to multinational initiatives and opportunities for cooperation that arise. This applies to the organisational, operational and capability levels.

The adaptability and specificity of the military profession means that the Luxembourg Armed Forces cannot be subject to all the same rules and laws as those applicable to civil servants and other state agents. This is due to the unique nature of their missions, which include emergency response, engagement in peacekeeping operations as well as combat readiness. Therefore, specific legislation is needed to regulate the activities of the military and to ensure that it can fulfil its obligations effectively in accordance with applicable international legal and ethical standards. This legislation should include specific laws on labour regulations, military discipline, procedures for the conduct of operations and military justice procedures. It is important that this legislation be reviewed regularly to ensure that it remains relevant to the ever-changing environment in which the Luxembourg Armed Forces operate.

5.5 Partnerships and pooling & sharing

Few countries have the capability to conduct complex operations of significant scale on their own. Given our structural limitations, our international partnerships of reference – Belgium, The Netherlands, France Germany and the United States of America as well as NATO Support and Procurement Agency (NSPA), European Defence Agency (EDA), Organisation for Joint Armament Co-operation (OCCAr), etc. – are essential. These partnerships will guarantee our operational and mutual added value, as well as of our credibility.

Without being exhaustive, it is worth mentioning Luxembourg's participation in multi-national programmes such as the A400M, Multi-Role Tanker Transport (MRTT), Allied Ground Surveillance (AGS), Airborne Warning and Control System (AWACS), which are realities today and continue to grow in importance. They allow us to meet the ambitions and requirements of both NATO and the EU.

5.6 Commitment to Luxembourg society

Defence is an integral part of Luxembourg society. Under the control of the Parliament, Defence ensures the transparent and responsible management of the important resources allocated to it. As shown by the numerous interventions of the Luxembourg Armed Forces at national level in recent years, Defence fulfils its role to support the population in case of major incidents such as extreme weather events. Defence also secures the population on a daily basis by fulfilling its mission of removing and desposing of munitions from the two world wars. At the same time, Defence maintains its commitment to the successful transition of volunteers from the military to the private and public sector after their military service. Finally, Defence also regularly contributes to the duty of remembrance.

5.7 Foreign and security policy of the “3D”

Luxembourg traditionally applies a holistic approach to security and defence issues, favouring a mutually supportive method in a multilateral system that combines diplomacy, development cooperation and defence – commonly referred to as the “3D”-concept and fully in line with the Common Foreign and Security Policy (CFSP) (which advocates an “integrated approach”). The Luxembourg Defence, one of the nodes of the EU’s Common Security and Defence Policy (CSDP), of NATO's common defence policy and necessarily of the Grand Duchy's foreign and security policy which, in complementarity with the means of traditional diplomacy and development cooperation policy,

contributes to conflict prevention and post-conflict reconstruction. In this respect, Luxembourg attaches particular importance to modes of action that are not solely military, and contributes to the development of capabilities that enable third countries to ensure their own security in accordance with our values.

Today, with the emergence of hybrid aggressions, this traditional approach needs to be complemented by a range of other instruments in view of the complexity of threats and drivers of instability. It is essential to support an integrated approach that brings together all relevant state instruments to respond to a crisis. The range of these instruments includes diplomatic, economic, communication, financial, intelligence, legal, environmental and internal security instruments.

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Goals to be achieved

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Goals to be achieved

The overall objective will be to develop capabilities, first and foremost force elements, in the readiness categories, required to operate in the various security contexts, in order to participate primarily in the achievement of NATO's and EU's level of ambition.

It should be made clear that a capability is not just about equipment, but also includes relevant dimensions such as doctrine, organisation, training, interoperability, human and budgetary resources, infrastructure and the necessary command and management structures.

In addition to the "traditional missions" of the Luxembourg Defence, namely ISR activities, which will be further developed, the Luxembourg Defence has specialised in recent years in the air, space and cyber domains, thus contributing to the defence against new threats and types of risk. Indeed, particular attention is dedicated to cyber threats as well as to security risks related to the impacts and implications of global environmental changes, notably including climate change. As a result, these specialisations will be further strengthened and developed in the coming years.

Logically, the objectives are not set in stone and may evolve according to the volatility of the security environment, whether international or national, within the limits of legal constraints – procurement laws – and budgetary constraints. Finally, one has to consider the human resources aspect.

6.1 At the organisational level

The Luxembourg Armed Forces will have to increase their manpower in order to have a sufficient mass of military personnel, available quickly, for an extended period of time and capable of operating in a multipurpose manner. The level of ambition in terms of operational availability of personnel will be oriented according to the requirements of the new rapid reaction mechanisms being developed, both on the NATO and EU sides.

In light of the current international dynamics, the foresight function will be strengthened through a more appropriate presence in the EU and NATO structures. Such an effort will also contribute to a better burden sharing.

The Luxembourg Defence, as a whole, continues to develop its communication capability to inform on defence policy, commitments in multilateral institutions, bi-national cooperation, the defence effort, the use of resources, the activities of the Directorate of Defence and the Armed Forces, the scope of strategic issues, the deterrence and defence posture, and decisions on operational commitments – always within the security constraints. At the same time, these communication capabilities will also be used to counter hostile information activities and particularly disinformation.

The Luxembourg Armed Forces will strengthen their command and support capabilities to ensure the planning, preparation and conduct of several simultaneous but limited engagements in different contexts. Parallel engagements on the eastern and southern flanks of the European continent are considered possible. At the same time, it remains possible to provide support to the nation on national soil. In short, this is part of a 360 degree approach, adapted to the capabilities of the Luxembourg Defence.

Defence continues to complete the capability development function that applies international best practices and meets national requirements.

In view of the increased complexity of the equipment and the operational environment, the training and education areas are further developed to ensure the operational maintenance of capabilities. This includes the development of simulation and the diversification of training grounds in Luxembourg and abroad.

6.2 In terms of capability

The Luxembourg Defence pursues a sound capability development policy, consisting of increasing the responsiveness, combat power, resilience and networked operation of its capabilities and their respective supports, and developing capabilities, preferably dual-use, that contribute to improving this robustness in line with that of our partners. This robustness includes the ability to operate in urban areas and in severe climatic conditions.

However, given the often unfathomable consequences of rapid and far-reaching technological developments, the Luxembourg Defence regularly reviews its capability portfolio in the different areas of operations, verifies that its capabilities are fit for purpose and analyses whether there are capability solutions that better match this portfolio or are more efficient.

Further specialisation in one or another capability niche carries the risk of a loss of decision-making autonomy. Similarly, this would have resulted in a lack of flexibility in the commitment of the available units. Moreover, advanced specialisation focuses on support capabilities, whereas, in order to honour the principle of solidarity, each Ally is obliged to provide kinetic capabilities capable of operating in a high-intensity context.

Responsiveness is the ability of a capability to be operationally available within the timeframe required to fulfil its mission or function. The higher the required responsiveness, the faster the capability must be available.

Combat power is the ability to participate together with our partners in the domination of an operational situation. This requires a high degree of interoperability with our partners, a capacity for rapid change of posture, including

escalation and de-escalation, and therefore, depending on the context, also an offensive capability.

Resilience is the ability to continue operating in a degraded environment. It requires, among other things, extensive individual training including ethics, hardiness training, trust in command and a group dynamic that places mission success as the top priority. Equipment resilience is about maintaining performance in a degraded environment. The resilience factor is paramount in the face of evolving threats. Climate change is likely to have a significant impact on the performance of capabilities operating in climate degraded conditions, thereby increasing vulnerabilities and operational risks.

Networking is the ability to connect and participate fully in the activities of the network.

"Dual-use" refers to capabilities that have both civilian and military applications. Dual-use capabilities are favoured in the choices made by Defence to consolidate its capability profile. The aim of this approach is also to strengthen Luxembourg's resilience. It must be recognised, however, that many of the Luxembourg Armed Forces' requirements arising from NATO and EU planning do not qualify as dual-use capabilities.

6.3 At the operational level

Contributions to crisis management and collective defence operations

The Luxembourg Defence will continue to participate in peace-keeping and conflict prevention missions and operations, as well as in crisis management. Luxembourg's contribution may take the form of deployments of military or civilian personnel, military capabilities or financial contributions, in compliance with the criteria of usability of forces defined by NATO or the EU.

The Luxembourg Defence will continue to participate in exercises and deployments designed to strengthen the deterrence and defence posture through an advanced presence in Alliance countries, in close cooperation with our key partners, thus illustrating solidarity among Allies.

The Luxembourg Defence will contribute to EU and NATO rapid reaction forces. Relevant norms and standards will be applied, including in the preparation phase. A substantial contribution will be considered at regular intervals, in principle every four to five years, taking into account the planning of our key partners.

Close cooperation with the Grand Ducal Police is also necessary in this context. NATO requires the provision of military police elements that can be deployed in different theatres of operation.

Performing national missions

The Luxembourg Armed Forces will maintain the resources required to carry out its legislated national missions. Recent natural disasters as well as the COVID-19 pandemic have confirmed the importance of the Armed Forces' support in dealing with such national contingencies.

Defence will contribute to the fulfilment of Luxembourg's obligations as a host nation. In particular, Luxembourg will contribute to improving military mobility in Europe, a key element of the integrated approach, by facilitating the rapid deployment of personnel and equipment of Allies and Member States passing through Luxembourg.

The Luxembourg Defence will contribute to strengthening national resilience, including through the protection against hybrid threats and cyber threats.

Conflict prevention

While most of the work undertaken in conflict prevention does not fall under the responsibility of the military, the Luxembourg Defence can contribute to these efforts through its ISR capabilities that provide early warning and document factual situations on the ground. In the area of conflict prevention, Defence will contribute to efforts to support partner countries to take responsibility for their own security, including through training and equipment support. Defence will contribute also by the means of experts and instructors who can be made available to international operations.

Stabilisation

Stabilisation[3] is a particularly important aspect of the restitution of civil society, which is often severely affected by conflicts. Here too, Luxembourg is committed to bringing together experts from outside Defence who are able to intervene in crisis areas, within the framework of multilateral initiatives. The Luxembourg Defence will be able to support the preparation and deployment of these experts, while contributing to their protection.

Humanitarian aid

In accordance with the European Consensus on Humanitarian Aid, under very specific circumstances and in line with the 2007 Oslo Directive on the use of foreign military and civil protection assets in disaster relief, humanitarian aid may rely on military assets, in particular for logistical and infrastructural support mainly in the case of natural disasters. It is imperative that humanitarian principles (neutrality, humanity, impartiality and independence) are preserved in such cases. Defence will continue to make its airlift capabilities available for humanitarian purposes.

3 NATO refers to stabilisation and reconstruction in its defence planning. It should be noted that reconstruction activities are not within the remit of the Luxembourg Defence.

The Luxembourg Armed Forces may also be entrusted with humanitarian aid tasks, both nationally and internationally. These tasks include, in particular, assistance to other public administrations and to the population in cases of major public interest or disasters. Furthermore, such tasks may be an integral part of the mandates of peacekeeping and crisis management operations and missions to which the Armed Forces are requested to contribute. This will be done in coordination with the ministry in charge of the coordination and implementation of humanitarian action policy, where appropriate, in the framework of a coordination platform established for this purpose.

6.4 Defence effort

The Luxembourg Defence, respecting its commitments within the NATO and the EU, pursues the objective of remaining a supportive and reliable partner. Consequently, Luxembourg's defence effort will grow substantially during this decade.

In response to this general objective, defence efforts will be pursued, based on the principle of reasonable, sustainable and fair effort, in a proportion comparable to the efforts of its non-nuclear European partners. This forecast on the defence effort will require the maintenance of a substantial investment effort, while ensuring a balanced budget structure between investments and operation.

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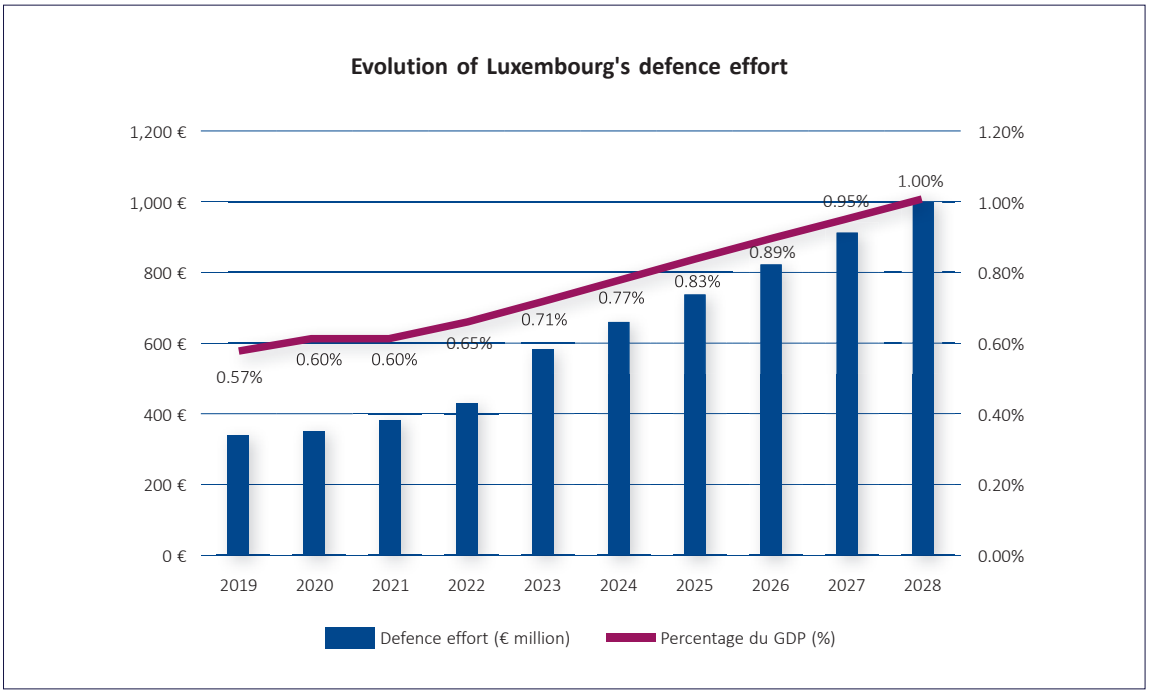
These Guidelines will orient Luxembourg's Directorate of Defence and Armed Forces with a view to progressively increase the defence effort to 1% of GDP, at the earliest by 2028, and to maintain it at this level while ensuring that a realistic level of ambition is maintained as a continuation of current efforts and taking into account available or potential human and material resources.

In June 2022, the broad outlines of the evolution of Luxembourg's defence effort were unveiled, envisaging the following growth trajectory:

It should also be noted that in response to EU expectations, the Grand Duchy will allocate the equivalent of 2% of its defence effort to research and development from 2023 onwards.

6.5 Prevention of security risks related to environmental changes

Although Defence, which is not bound either by the Kyoto Protocol or the Paris Agreement, is not the first responder to all climate change



related challenges, it has a role to play in a global response to climate change. For example, the EU and NATO have taken into account the security impact of climate change in their recent strategic documents.

NATO sees climate change as "*a defining challenge of our time, that has a profound impact on Allied security. It is a crisis and threat multiplier*". At the Madrid Summit in 2022, heads of State and government endorsed the Secretary General's proposals to reduce greenhouse gas emissions from NATO's political and military structures and facilities by at least 45% by 2030 and to achieve "net zero" by 2050, while maintaining operational, military and economic effectiveness. We will therefore integrate climate change considerations into all NATO's core tasks related activities.

At the Brussels Summit in 2021, NATO had already adopted a Climate Change and Security Action Plan in which it agreed on climate change adaptation and mitigation measures, including the objective of developing a methodology to measure and map greenhouse gas emissions from military activities and facilities. In addition to helping Allies formulate voluntary targets for reducing emissions from their military activities, such a methodology could also inform their future investment decisions and contribute to their operational planning.

In 2021, the Luxembourg Defence, as a forerunner in this field, was one of the very first Allies to establish a balance sheet of its direct and indirect greenhouse gas emissions using a methodology commonly used in industry. While emissions from operating buildings will be significantly reduced in the coming years, thanks to innovative technologies available on the market, it is difficult to reduce emissions from the purchase of goods and services and from aviation activities until carbon-neutral technologies and fuels are available.

While there are technologies available on the market to mitigate certain types of emissions (e.g. greenhouse gas emissions from buildings), they are still sorely lacking when it comes to reducing emissions from mobile combustion.

The response of the Luxembourg Defence to the major challenge of environmental change, including climate change, will comprise the following four strategic axes, with the aim of:

- contributing, within the EU and NATO, to better understanding, anticipating and adapting to the security and defence implications of environmental change;
- continuing – at national level – to support civilian actors in rescue, first aid, civil protection and crisis management operations as needed;
- continuing to measure, assess and reduce Defence's greenhouse gas emissions and

environmental footprint while improving its operational efficiency;

- continuing – through international partnerships – to prevent conflict and promote resilience.

As required by the EU in the framework of the Strategic Compass, a separate strategic document will be developed detailing the four strategic axes mentioned above with the respective responsibilities. In this context, it will also be determined how defence efforts are coordinated with the Integrated National Energy and Climate Plan (PNEC – *Plan national intégré en matière d'énergie et de climat*) and other civilian efforts in this field.

6.6 Deepening multinationalisation

Delivering capabilities through bilateral or multilateral cooperation will only be fully effective if we can develop relationships of trust with our partners. In addition to traditional ties, PESCO[4] or the German-led FNC[5] offer opportunities to achieve capability goals together. In this perspective, Luxembourg Defence cooperates Allies and Member States who share similar goals and risk assessments in terms of capability development, operational commitment and fair burden sharing. Such convergence is generally easier to organise in a regional context, if only for practical reasons. However, the decision to cooperate may also be based on common strategic interests beyond the immediate geographical neighbourhood. This is particularly the case for cyber and space cooperation.

The Luxembourg Defence must continue to be a reliable partner that honours its commitments and participates in the optimisation of multinational structures. This requires a clear communication of strategic objectives, a legitimate basis for the partnership through the preservation of democratic control of the means thus committed within partnerships

4 The Directorate of Defence closely follows the proposed projects since the first wave in 2018 and has joined seven projects as a "participant" – Military Mobility, European Medical Command (EMC), GeoMETOC Support Coordination Element (GMSCE), Common Hub for Governmental Imagery (CoHGI), Network of Logistic Hubs in Europe and Support to EU operations (NetLogHubs) Strategic C2 System for CSDP Missions and Operations (EUMILCOM) – and four projects as "observer" – Future Medium-size Tactical Cargo (FMTC), Cyber Threats and Incident Response Information Sharing Platform (CTISP), EU Radionavigation Solution (EURAS), European Military Space Surveillance Awareness Network (EU-SSA-N).

5 In this context, apart from the multinational force grouping dimension, Defence is engaged in three capability development activities – Logistics, enhanced Host Nation Support (eHNS), and Multinational Medical Coordination Center/European Medical Command (MMCC/EMC) – and is observing three others – Ballistic Missile Defense Lower Level (BMD LL), Ground-Base Air Defense (GBAD), Joint Fire Support (JFS). Two other activities in which Luxembourg was interested – Maritime Patrol Aircraft (MPA) and Coalition shared database (CSD) – were placed on a dormant status on the initiative of the framework nation.

and the preservation of the possibility of sovereign choices.

The increasing complexity of technologies and the different security contexts make it necessary to involve our partners earlier and on the long term, whether to harmonise requirements, acquire equipment, train together, share capabilities or use the same capabilities in operations. In concrete terms, this means integrating Luxembourg personnel into the structures of our partners, as it has already been implemented with the Belgian and Dutch armed forces and, in the near future, with the French armed forces.

Finally, the integration of our capabilities with those of our partners guarantees interoperability and thus the operational effectiveness of our contributions.

6.7 Increasing the percentage of women

The demographic structure of the Luxembourg Defence is still far from the realities of society. The rate of feminisation of the defence personnel is only about 10%, all categories of personnel included. Consequently, the Luxembourg Defence intends to better target this group in future recruitment campaigns.

A higher proportion of women is clearly recognised as a key factor for success, both in achieving operational objectives in the field and in promoting interest in the military profession. The Luxembourg Defence supports programmes to develop the role of women in conflict resolution. In its Resolution 2282 (2016) the UN is: "*reaffirming the important role of women in peacebuilding and noting the substantial link between women's full and meaningful involvement in efforts to prevent, resolve and rebuild from conflict and those efforts' effectiveness and long term sustainability, and stressing, in this regard, the importance of women's equal participation in all efforts for the maintenance and promotion of peace and security and the need to increase women's role in decision-making with regard to conflict prevention and resolution and peacebuilding*".

6.8 Supporting research and industry

In order to ensure that the technological advantage is maintained, particular importance must be attached to measures supporting innovation. Defence will further develop the ongoing cooperation with the ministries responsible for the Luxembourg economy and research, as well as with actors such as Luxinnovation and the Luxembourg National Research Fund (FNR – Fonds national de la recherche).

These collaborations have enabled the Luxembourg Defence to launch, in 2022, the first national call for research and development projects in the field of defence, particularly for dual-use capabilities. The aim of this initiative is to facilitate market access to national actors with little or no experience in defence, while they try to position themselves as precursors in certain technological niches.

The involvement of Defence in the EU and NATO initiatives mentioned above will be increased to the benefit of research and development, one of the pillars of Luxembourg's Defence. The actors targeted by this call for projects are SMEs, start-ups, but also research centres and any other national entity capable of carrying out research and development work.

In March 2022, the EU heads of State and government, meeting in Versailles, committed themselves to strengthening European defence capabilities in the face of the Russian military aggression against Ukraine. They agreed to:

- increase defence spending;
- intensify cooperation through joint projects;
- closing gaps and meeting capability targets;
- stimulate innovation, including through civil-military synergies; and
- strengthen and develop the defence industry, including SMEs.

The joint European Commission and European Defence Agency (EDA) analysis of the 2022 defence investment gap has identified capability gaps which they recommend should be urgently addressed, building on the solutions that the European defence industry can provide. The resulting capability priorities cover air, maritime, land, space and cyber as well as military mobility[6]. The vast majority of them are among the priorities of the Luxembourg Defence, which participates in numerous European and international initiatives on these subjects.

The EU has proposed several tools to strengthen the competitiveness of the European Defence Technological and Industrial Base

6 land: expansion of the existing stock of main battle tanks and armoured combat vehicles as well as development of new generation systems, strengthening of land combat capabilities and anti-tank systems and artillery platforms;
air: development of air-to-air refueling capabilities, air defence, anti-drone capabilities and multi-role combat aircraft;
sea: strengthening force projection capabilities, intelligence, surveillance and reconnaissance capabilities and the protection of maritime lines of communication;
space: investments in secure satellite connectivity, quantum encryption, Earth observation from space, protection of the EU's space infrastructure and all early warning systems;
cyber: building a full-spectrum cyber defence capability from search and detection to protection and response to active defence capabilities;
military mobility: maintenance, sustainment and movement of forces, equipment and supplies under the European Interconnection Facility (EIF).

(EDTIB) and to support investment in defence research and development, including the European Defence Fund (EDF) and the European Defence Investment Programme (EDIP). The EDF, with a budget of €8 billion, is the first European programme entirely devoted to defence. The interest it has aroused among European industrial and research players has been confirmed since its first round of calls for projects in 2021, with 142 project proposals submitted by more than 1,100 European entities, including a dozen Luxembourg players. 700 have been selected for funding. As for the EDTIP, its objective is to encourage Member States to jointly acquire defence capabilities developed together.

The EDA, the only EU body entirely dedicated to defence, brings together member states and European industry to organise, plan and develop the required military capabilities. The Directorate of Defence as well as many Luxembourg industrial and research experts support this work, which includes more relevant aspects of "green" defence or materials.

On the NATO side, two complementary initiatives have also emerged, one focusing on funding and the other on administrative and technical support for innovation actors. At the Madrid Summit in June 2022, 22 Allies decided to create a venture capital fund for start-ups active in disruptive innovation – the N*ATO Innovation Fund* (NIF). The fund will be domiciled in Luxembourg and will have a budget of one billion euros. In parallel, the *Defence Innovation Accelerator for the North Atlant*ic (DIANA)[7] – aims to support start-ups in the development of innovative capability solutions. Private Luxembourg actors are actively involved.

Thus, it is of fundamental importance that the Alliance and the EU remain innovative and at the forefront of technology as strategic competitors increasingly challenge this technological lead.

7 Launched by the Alliance at the Brussels Summit in June 2021.

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Priority capability development areas

7.1	Land	45
7.2	Air	48
7.3	Space	50
7.4	Cyber	52

Priority capability development areas

The Luxembourg Defence will continue to participate in multinational capability programmes – whether in a pooling & sharing framework or not – which can either be used directly by the Armed Forces or constitute a contribution by Luxembourg in the framework of its international commitments.

The NDPP) and the EU's Capability Development Plan (CDP) remain the key references to guide national capability development. Based on the priorities identified and the capability goals derived from these iterative processes, a lot of work is underway or about to start in the different areas.

The Coordinated Annual Review on Defence (CARD), an additional tool within the EU that has recently been added, facilitates the identification of partners and potential synergies between EU Member States and partners.

7.1 Land

In general, the Luxembourg Armed Forces, and in particular its Land Force, will continue to develop ISR capabilities capable of operating both in a crisis management and collective defence framework. The manoeuvre elements are also supposed to have the necessary logistic support capabilities for the execution of the different missions.

After the signature of two declarations of intent in 2021 and 2022, Luxembourg and Belgium are aiming for a bi-national cooperation agreement in 2023 to meet the NATO capability goal requiring the creation and joint operation of a medium combat reconnaissance battalion. By the term "medium" it should be understood first of all that this unit will be based on a family of more robust wheeled vehicles, as is being acquired by Belgium in the framework of the Franco-Belgian strategic partnership called CaMo[8] and closely linked to the French SCORPION programme.[9]

The Land Force, aiming to introduce beforehand lighter Command, Liaison and Reconnaissance Vehicles (CLRV), will follow Belgium Land Component in introducing a new

8 With the strategic partnership *Capacité Motorisée* (CaMo), the Defence and more particularly the land component enter into a strong partnership with France. CaMo will make the Motorised Brigade a powerful tool for the next 30 years. (https://www.mil.be/fr/l-evolution-de-la-defense/camo-un-partenariat-strategique-unique/#le-partenariat-strategique-capacite-motorisee-camo).

9 The SCORPION programme, for which the Directorate General of Armaments is the contracting authority, aims to modernise the joint battle groups in order to increase their effectiveness and protection in a global and coherent approach, making the best possible use of the new information exchange capabilities. (https://www.defense.gouv.fr/dga/programme-scorpion).

doctrine being developed under the auspices of France.

The future Belgian-Luxembourg reconnaissance battalion will be essential for Luxembourg to enable its reconnaissance forces to integrate into the rapidly developing structures of both NATO and the EU, which are primarily intended for collective defence. Maximising the interoperability of forces will logically be a key area of work over the coming decade. In addition, there will be a significant recruitment effort in order to have the necessary military personnel to carry out the Luxembourg share of the bi-national battalion.[10] The aforementioned cooperation agreement aims at harmonising the budgetary and capability planning of the two countries' Defences. The achievement of the Luxembourg government's objective of a substantial increase of the defence effort, aiming at 1% of GDP by 2028, will directly depend on this.

In addition to enhanced Belgian-Luxembourg military cooperation, a very close partnership with France will be essential to guarantee Luxembourg's access to the required technology and thus ensure that this future capability lives up to expectations. The signature of the above-mentioned cooperation agreement will definitively launch this future major military capability programme which will give birth to this battalion. Aiming at a strength of around 700 military personnel, they will be grouped initially into four reconnaissance companies, two of which will be Luxembourgish, supplemented by various bi-national support elements. During an initial phase, between 2025 and 2028, key Luxembourg personnel will be seconded to Belgium or even to France, to the competent headquarters, in order to set up the unit quickly. By 2030, the heart of the bi-national unit will be located in Arlon while maintaining a strong presence in the Grand Duchy. In concrete terms, branches with various force, support and back-up elements are supposed to be added in Belgium and Luxembourg. The sites in question will be located in Marche-en-Famenne and Diekirch, supplemented by additional logistic structures in the south of the Grand Duchy. In the long term, this bi-national unit is supposed to operate in both collective defence and crisis management frameworks, either by means of joint tactical sub-units or in a constituted manner.

In addition to the reinstatement of medium-range anti-tank capabilities and the introduction of the Joint Terminal Attack Controller (JTAC) capability to enable the evolution of ISR capabilities to ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance), the Land Force will field capabilities to improve operational performance in urban areas, severe

10 According to initial estimates, the recruitment of about 100 additional personnel should be envisaged to fill the positions necessary for the proper functioning of the battalion, in particular the command, support and combat support positions.

climatic condition zones and contaminated environments.

The Land Force will evolve its tactical UAVs to integrate them into high spectrum operations. They could be attached to a partner's unit, depending on the engagement framework and possible opportunities. A replacement of the tactical UAVs in service would be envisaged around 2028, taking into account the rapid technological evolution of such capabilities.

In parallel, the Land Force will aim to commission a counter-UAV capability to protect tactical military capabilities deployed in operations, especially with regard to combat reconnaissance capability. The protection of these assets against loitering munitions will also be foreseen.

The water purification capability will be upgraded to meet NATO requirements. It may be attached to a partner's unit, where possible, in line with the new deterrence and defence plans.

The demining capability will be regenerated to comply with NATO requirements. It will be able to be attached to a partner's unit in line with the new deterrence and defence plans, without encroaching on the remaining national missions in this respect.

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7.2 Air

While the commitment of Defence and more particularly of the Luxembourg Armed Forces in the air domain is still limited, especially in terms of volume and human resources, its impact will be all the more significant in terms of growth of the defence effort and high added value operational contributions.

The A400M and A330 MRTT strategic air capabilities are expected to reach full operational capability by early 2025 and will evolve in common agreement with our partners involved in these programmes. At the latest during the next decade, first upgrades will have to be considered.

The Airborne Early Warning & Control (AEW&C) programme, including some 15 AWACS aircraft, has commited Luxembourg for four decades. The ageing fleet will have to be replaced in the coming years. In addition to fulfilling its obligations to NATO, Luxembourg may be able to develop synergies with national space capabilities or even other high-tech industries in developing a replacement system, – the Alliance Future Surveillance and Control (AFSC) – to meet future requirements.

The Luxembourg Defence will continue its substantial support to the AGS programme, including the provision of the necessary bandwidth to implement this strategic Alliance capability.

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In addition to these strategic assets, lighter platforms could be added to the fleets, e.g. in cooperation with the Benelux countries or the FNC. In this context, the continuous provision of strategic medical evacuation capabilities, using a service provider, should also be mentioned.

Building on operational contributions and particularly rewarding experiences made since 2009 in various theatres, the Luxembourg Defence will continue its efforts in the field of maritime air surveillance using contracted aircraft. The latter could also support land-based engagements in various contexts. Allied exercises (e.g. Unified Vision), focusing on the interoperability of a range of sensors, are an appropriate environment for identifying and developing inter-force synergies.

On the basis of the above, opportunities for the acquisition of complementary air capabilities, or even additional participation in multinational programmes, will be assessed primarily from the point of view of NATO capability objectives but also in response to critical EU, EATC, Benelux, bi-national or even national capability requirements and priorities. A greater implication of the Luxembourg industry may event result from these defence investment opportunities.

The Luxembourg Defence will explore opportunities to join joint programmes to strengthen the Anti-Access/Area Denial (A2/AD) defence.

In the medium term, the above-mentioned efforts will necessarily be part of an overall framework to be developed in close coordination with our reference partners, ultimately to the benefit of the EU's enhanced strategic autonomy and the key requirements identified by NATO through the NDPP.

The Luxembourg Defence will contribute to the execution of search and rescue (SAR) missions with H-145M helicopters by 2025. In the medium term, Luxembourg Defence will assess opportunities to develop military use of its H-145M capability. Bi-national cooperation with an allied country will be part of this analysis.

7.3 Space

Space offers unprecedented opportunities for development and progress. However, the increasing dependence of our societies on space for their day-to-day functioning also generates vulnerabilities. Like cyber defence, space will gain in importance as a key national security issue.

Luxembourg Defence will strive to implement the sector strategy described in the first Defence Space Strategy of 2022. This strategy defines concrete objectives for Defence in order to consolidate Luxembourg's role as a reference partner in the field of space, both nationally and internationally, by strengthening existing capabilities and developing new ones. Luxembourg, having its own space capabilities, can have a significant impact and thus provide its fair share to the overall security and defence effort.

Particular attention is being paid to the development of dual-use capabilities and the use of such in accordance with international law. In order to promote responsible behaviour in outer space and in support of the United Kingdom's initiative within the framework of the UN to develop norms of responsible behaviour in outer space, Defence will continue to limit access to Luxembourg's sensitive space technologies to partners who respect international law and human rights.

The long-term objective of the space defence policy requires useful, sustainable, efficient space capabilities, governed by Defence and, as far as possible, implemented by the Luxembourg Armed Forces. Four development axes have been set:

- consolidate current space capabilities – communication, observation and navigation – increase their resilience and develop new systems;
- support freedom of action in and from space;
- foster national and international cooperation;
- attract and secure a skilled and motivated workforce.

In order to meet the increasing requirements, both nationally and internationally, and with the positive feedback from the GovSat public-private partnership, Luxembourg Defence will continue the efforts started in the field of secure satellite communications. Similarly, the Luxembourg Armed Forces will continue to develop its own capabilities in this regard, such as projectable support teams.

Participation in the Wideband Global Satellite Communications System (WGS) programme will continue. Through the Medium Earth Orbit Global Services (MGS) programme, Luxembourg Defence will have access to a significant amount of globally distributed O3b mPOWER capability.[11]

11 between 52 degrees North and 52 degrees South.

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In parallel, Luxembourg Defence will ensure the implementation of the Luxembourg Earth Observation System (LUX EOSys) and will closely monitor both technical developments and future needs.

Within the framework of Space Situational Awareness (SSA), Luxembourg Defence will strengthen cooperation with partner countries, in particular Germany, to develop these capabilities.

7.4 Cyber

In 2021, the Directorate of Defence published the first cyber defence strategy, which guides the work in this field over a ten-year horizon. The document is part of the national cybersecurity strategy and aims to strengthen the resilience of Luxembourg's defence.

To this end, the strategy focuses on improving personnel skills, building national resilience in cyberspace, supporting private sector capabilities and strengthening our engagement with our Allies and partners.

The long-term objective of the strategy is to ensure that Luxembourg has one of the most secure cyber defences through the maximisation of cyber defence capabilities.

Cyber defence is in the process of forging its place in the Luxembourg Armed Forces and in the Grand Duchy's cyber security landscape. The

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following strategic objectives have been selected for implementation:

- attract and secure a skilled and motivated workforce;
- further strengthen national and international cyber cooperation;
- integrate cyber defence into the overall activities, assets and culture of the Luxembourg Defence;
- Mapping a "Cyber Futures" landscape, identifying priorities and initiating a research programme.

It should be noted that since the official inauguration of the Cyber Range platform in October 2021, its promotion to national and international partners has resulted in interesting use cases and collaborations. In order to promote these efforts and increase visibility, the Cyber Range platform is now listed in the Luxembourg Cybersecurity Portal and has its own website.[12]

The Directorate of Defence and the University of Luxembourg, in collaboration with other public and private stakeholders, have launched a project to set up a National Centre of Competence in Cyber Security and Cyber Defence Research. This competence centre, aligned with the government's cyber security and cyber defence strategy, will strengthen and increase Luxembourg's capability to address national and international challenges such as cyber threats and will also create the necessary skills to develop innovative cyber security and cyber defence solutions. The centre will carry out research, teaching and awareness-raising activities and will be complementary to the cyber security policy chair recently established by the Directorate of Defence and the University of Luxembourg. The chair will focus on more policy-oriented issues such as legal and political aspects at the intersection of digital technologies and networks, data protection, cybercrime, cyber defence, contract law, intellectual property law and human rights.

Considering the progression of digital transformation and the need to protect information throughout its life cycle, it is necessary to have a high-performance environment offering sufficient guarantees in terms of confidentiality, integrity and availability, as well as calculation and storage capabilities that can be easily adjusted to the evolving needs of the beneficiaries. To this end, Luxembourg Defence has launched, in close cooperation with the NSPA, a project to set up a private cloud for data storage and processing, called Luxembourg Cyber Defence Cloud (LCDC).

12 https://www.cyber-range.lu

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Additional and complementary efforts

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Additional and complementary efforts

The achievement of the objectives arising from the priority areas of capability development goes hand in hand with activities, work or contributions that facilitate, or even are essential to their achievement. These efforts also contribute significantly to the credibility of the Grand Duchy as a credible, supportive and reliable Ally, Member State and partner. The brand image and therefore the attractiveness of Luxembourg Defence and more particularly of its Armed Forces depend directly on this.

8.1 Strategic communication

In a world where the information environment is increasingly contested, a strategic approach to communication will be paramount. The communication efforts of the Luxembourg Defence will be in line with the ambitious efforts set out in this document and in other strategic references, both internally and externally, towards the general public, partners, Allies, EU Member States and other identified relevant actors. Strategic communication will actively contribute to deterrence efforts by conveying the message of credible defence. Based on a factual narrative, strategic communication will also aim to counter hostile information activities, in particular disinformation. These guidelines and other strategic documents should be seen as means to implement this strategic communication.

8.2 International headquarters and multinational organisations

The inclusion of personnel in various command and control structures, whether in NATO, EU, UN or other bodies, such as the European Corps[13], the EATC, or the NATO Space Center of Excellence[14], is a direct obligation of the Luxembourg Armed Forces' international missions as laid down by law. In general, these efforts can be combined with many NATO capability goals and, in addition, contribute to the EU's strategic autonomy. Such contributions, whether permanent or limited in duration, to the multilateral and bilateral cooperation of which the Grand Duchy is a part, will be preserved or even developed by taking into account first of all the contributions of force elements or capabilities. Priorities will be defined according to the nature of the commitment, the theatre of operation, the evolution of the security situation in general and in particular, as well as the resources available.

13 Located in Strasbourg.

14 Located in Toulouse.

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8.3 Verification and monitoring of the implementation of multinational treaties

Through daily cooperation at the level of the Benelux countries, the Luxembourg Armed Forces will pursue their efforts to participate in the verification and monitoring of the execution of international treaties to which the Grand Duchy of Luxembourg is part of. The Benelux Arms Control Agency (BACA) is the tool created for this purpose in 2014. Its mandate includes the implementation of conventional arms controls abroad in order to provide a clear and transparent picture of the number of sites housing weapons and military equipment. Through this cooperation, the Benelux holds a group of specialised military personnel who are committed to arms control.

8.4 Military medecine

Based on a concept developed by the Directorate of Defence, the Luxembourg Armed Forces will develop, in close cooperation with Belgium and France, a Medical Surgical Team (Med-ST) capability in accordance with NATO requirements. Since this is a deployable capability, it is important to underline that this is not related to the medical support that will be provided to the future bi-national battalion. Indeed, this highly specialised capability is intended for very specific engagements requiring larger medical structures.

The COVID-19 crisis revealed that health systems were not optimally prepared to deal with a large-scale health crisis. As a result, the Ministry of Health decided to strengthen health resilience and medical and health education. The Directorate of Defence will support these enhanced resilience efforts.

Luxembourg Defence will continue to provide aeromedical evacuation capabilities to the EATC and will continue its efforts to support the EMC in Koblenz and the co-funding of a medical facility for the Kosovo Force (KFOR).

The future capability programme for the bi-national battalion will necessarily also address the issue of medical support in a high-intensity environment, giving priority to joint solutions with Belgium and France.

8.5 Military mobility

In addition to the dimension of logistical support for the bi-national battalion, the creation of a *Multimodal Military Hub* (M3H) will be part of the EU's capability development mechanism, in which enhanced military mobility, both outside and within the EU, is a focus area. In the wake of this logic, Luxembourg is involved in the PESCO project Network of Logistic Hubs

in Europe and Support to Operations. The central objective of this project is to establish and operate a network of Logistics Hubs (or LogHubs) in Europe. In a wider context, shaped by the redesign of the deterrence and defence posture on the European continent, a Luxembourg M3H could potentially be used a key link in terms of host nation support or transit support within the reinforcement and support network established for the benefit of NATO forces. In concrete terms, this capability will aim to facilitate the activation, reinforcement and sustainment of Alliance forces when required.

8.6 Infrastructures and support

The Directorate of Defence, in close collaboration with the Luxembourg Armed Forces, the Public Building Administration, the National Roads Administration and other key partners, will continue or launch the necessary renovation or construction work on the Grand Duchy's military infrastructure. Thus, work is underway or about to begin on the *Caserne Grand-Duc Jean*, as well as on the ammunition depot and the Army's shooting range.

All of this work will be carried out in accordance with sustainable development criteria.

The Luxembourg Defence, together with the partners concerned – e.g. Warehouses Service Agency (W.S.A.), NSPA, Luxembourg Airport – will also develop capabilities to better meet its role as a host or transit nation.

On the basis of the bi-national cooperation agreement with Belgium on the establishment and joint operation of the medium combat reconnaissance battalion, various infrastructure synergies will be possible on both Belgian and Luxembourg soil.

Luxembourg Defence is pursuing the goal of acquiring and leasing more land for training purposes.

As the host country of the NSPA, Luxembourg has a particular interest in ensuring that the accommodation conditions in the Grand Duchy enable the agency to carry out the tasks entrusted to it by the Alliance.

In the context of the evolving needs of the NSPA, in particular following the expansion of its mission since 1st April 2015, an adaptation of the Capellen site to the current and future needs of the agency has proved necessary. Therefore, the Agency Supervisory Board of June 2019 gave a positive advice on the five-phase strategic infrastructure programme to redevelop the site by 2035.

The agency is the project manager for the infrastructure programme. Luxembourg, as host country of the NSPA, assumes the role of delegated project manager and assists the NSPA in the realisation of this major project, while bearing two thirds of the construction costs, in accordance with the commitment made by Luxembourg in the headquarter agreement.

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Challenges

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Challenges

To ensure its continued contribution to the common effort of deterrence and collective defence, the Luxembourg Defence is conditioned by the ability to evolve and adapt, often rapidly. Therefore, political commitment with a clear long-term vision is key, as well as continuous arbitration between objectives and available resources. One of the conditions for making the most of the momentum for transformation is skillful prioritisation, mitigating risks and ensuring the commitment of Defence personnel. The logic of the investments made requires that the capabilities are effectively used for the purpose and along the lines of government policy.

The Luxembourg Defence will continue to evolve through different forms of cooperation in large multinational groups. We will harmonise our strategic horizon with that of our partners. In the name of interoperability, integration and the pooling of functions and capabilities lead to an increasing interdependence of partners. The challenge is to preserve a sufficient degree of autonomy in the future. The commitment of an essential part of the Land Force to the bi-national battalion will make this challenge all the more important.

The Luxembourg Defence will continue to lean on the planning mechanisms of NATO and the EU. In view of the structural limitations of Defence, it is essential that Luxembourg's capability development is in line with the ambition levels of both the EU and the Alliance. In the face of multiple security challenges, both organisations are striving for a complete review of rapid reaction, deterrence and defence mechanisms. Enhanced NATO-EU complementarity and cooperation are considered essential. The third joint declaration of the two organisations is a step in the right direction to maintain coherence.

The Luxembourg Defence will have to strive to maintain a sufficiently diversified range of capabilities to meet the commitments made and to constitute a margin of manoeuvre allowing for political choices in terms of contributions. This capability profile must constitute a set that remains functional and resilient in the long term, even under the constraint of continuous operational commitments, in downgraded mode and in a high intensity setting.

9.1 Human Resources

In order to fulfil their missions, the Luxembourg Armed Forces require sufficient numbers of equipped, instructed, trained, and available personnel.

While the activities of the Luxembourg Armed Forces have increased considerably, the number of personnel has remained relatively stable. Similarly, we are now witnessing an increasing complexity of the military profession. To a large extent, the versatility required in the positions to be filled is less and less compatible with the requirements of Defence. There is every reason

to believe that this specialisation of jobs will continue to increase. However, specialisation also leads to a compartimentalisation of personnel in terms of the qualifications required, to the detriment of flexibility, and at the risk of a loss of operational added value, given the inevitably small number of specialist categories.

There is therefore a strong need for recruitment in the coming years in order to give the Armed Forces the human resources required to prepare and execute their increasingly complex missions. To meet this challenge, it is now necessary to identify and describe the profiles to be recruited, trained, mobilised and retained by reducing the uncertainties inherent in the career paths offered by the Luxembourg Armed Forces in order to increase the attractiveness of the military profession.

The multipolar world we live in means that today's certainties are not tomorrow's. This makes it difficult to predict the choices that people may make in the course of their working lives. Uncertainty, including the risks incurred in theatres of operation, is and will remain a characteristic of a military career. As a consequence, the Land Force in particular is facing a shortage of interested profiles on the Luxembourg labour market and retention will remain a difficult exercise.

The efforts to be made are in all segments of human resources management simultaneously and must take into account the evolution of our society, which tends to emphasise values less compatible with the military ethos.

In order to position themselves to meet the above-mentioned human resources challenges, the Armed Forces intend to rely on the upcoming organisation law. The objectives of this legislation are to:

- strengthen the Luxembourg Armed Forces operationality and responsiveness,
- update the organisation of the Armed Forces and,
- modernise and expand military careers.

At officer level, recruitment will be from a wide range of diplomas. Depending on the needs of the Luxembourg Armed Forces, recruitment will be done by direct recruitment (on a master's or bachelor's degree) or by indirect recruitment (on a high school diploma or bachelor's degree, before being sent to a military school or a specialised civilian institution to pursue military studies or to obtain a specific diploma).

With the future introduction of the B1 salary group (high school graduates) at the non-commissioned officer’s (NCO) level, the Luxembourg Armed Forces will undergo major changes in the composition of military personnel. This new salary group will be located at the execution level and will be the backbone of the Luxembourg Armed Forces, encompassing the bulk of the future career of NCOs.

In terms of gender equality, the Luxembourg Armed Forces are continuing their efforts to increase the rate of females among the military personnel. This effort will go hand in hand with

the principles of integration, inclusiveness and integrity, which are aligned with the Women, Peace and Security (WPS) programme, established by NATO in the 2000s following the adoption of UN Security Council Resolution 1325.

Long-term efforts are needed, including public campaigns, to increase the attractiveness of military careers and to attract specialist experts. In this way, the Luxembourg Armed Forces will be able to meet current and future challenges, the most important of which is the recruitment of sufficient numbers of military and civilian personnel to carry out a growing range of missions in its traditional field of action, the land, but also in more recent fields of action, such as space and cyber.

9.2 Decision-making autonomy

Extensive specialisation in one or other capability niche can lead to a more or less pronounced loss of decision-making autonomy, especially if it does not generate sufficient critical mass to provide operational added value.

Moreover, high specialisation places the emphasis primarily on support capabilities, whereas, to honour the principle of solidarity, each Ally is required to provide combat capabilities capable of operating in a high-intensity environment.

The Luxembourg Armed Forces' primary capability objective, the establishment of a bi-national reconnaissance battalion together with the Belgian partner, will certainly meet the principle of solidarity. However, it will also entail a reduced decision-making autonomy. The unilateral commitment of sub-units of this future unit by one partner, regardless of its duration or the context, will have a more or less profound impact on the rest of the unit and therefore necessarily the other partner. This challenge can also be identified for other capabilities or domains such as the A400M or the UAV platoon.

9.3 Multiplying of the defence effort

By continuing the trajectory announced in 2022, the defence effort will have increased fivefold by the end of the decade compared to 2014. The following challenges which hence will arise cannot be neglected:

- the structures must be able to absorb this defence effort;
- the programmes selected must provide added value to Luxembourg and therefore ideally be dual-use, an ambition that is anything but evident;
- NATO and EU planning deadlines are tighter than national deadlines; this is particularly true for infrastructure projects;

- sufficient budgetary flexibility will be needed for the acquisition of complex capabilities in large, long-term, multinational programmes. Planning in such a context depends not only on Luxembourg, but also on the progress of programmes, the evolution of financial disbursements and other sometimes unpredictable circumstances that require budgetary adjustments throughout the life cycle of a project and a high degree of responsiveness;

- the strive towards a more balanced budget structure should continue: 25% investment; 50% human resources; 25% implementation and support;

- Luxembourg will also continue to support a global and more differentiated view of national defence efforts. This includes taking into account, instead of GDP, GNI for the calculation of the defence effort, which is more representative of the economic reality of Luxembourg.

9.4 Strategic foresight

A coherent and sustainable defence effort goes hand in hand with strategic foresight, ideally extending over several decades. Indeed, the time needed to build credible military capabilities requires us to look far ahead. However, there are objective limits to any foresight effort. In order to be able to elaborate concrete and specific recommendations, and also in due time, it is important to harmonise our strategic horizon with that of our partners. This is where regular and focused exchanges both at bilateral and Benelux level as well as with the key actors of the Alliance and the EU – which are first of all the International Staff and the International Military Staff of the Alliance, the Allied Command Transformation (ACT), the Allied Command Operations (ACO), the European External Action Service (EEAS) and the EU Military Staff (EUMS) – are of major importance and will be able to facilitate these largely complex tasks. Finally, there remains the use of the expertise of the various competence centers.

The challenges described here, while not exhaustive, have been identified with our present analytical capabilities. A major strategic disruption, unexpected in nature, is nevertheless possible at any time.

9.5 Access to advanced technologies

In moving forward in the field of advanced technologies, especially when it comes to military technologies, even the Allies and EU Member States tend not to necessarily emphasise solidarity or pooling and sharing. For a country like Luxembourg, with few active players in the defence industrial sector, technological access presents a real challenge which must be met first and foremost by developing, if not strengthening, existing partnerships. In addition to the cooperation forums offered by the EDA, the Benelux countries or the German-led FNC, which offer a broader cooperation, close bilateral relations are equally important, especially in order to conclude security and cooperation agreements in good time. This access is all the more important to ensure interoperability and thus the integration of future weapon systems and defence capabilities.

Civilian commercial off-the-shelf (COTS) technology can present many opportunities. However, from a military point of view, it also entails risks that should not be underestimated, as standards often diverge significantly and can compromise the security of military structures and their forces on the battlefield. While the use of military off-the-shelf (MOTS) equipment has undeniable advantages, especially for a country like Luxembourg, it also has its limits, as it is not about preparing for tomorrow's war with yesterday's technology.

In all fields of application and action, the EDA, in close cooperation with NATO (NSPA, NCIA, etc.), is supposed to act as a catalyst for the benefit of the Member States, especially when the latter do not themselves have the necessary tools to keep up with these technological

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developments and to move towards sufficiently rapid implementation.

Access to EDTs and their timely integration into future military capabilities are of fundamental importance to safeguard the technological superiority of the Alliance and the EU towards potential adversaries and competitors.

The development of cooperation (cooperative security) with like-minded partners, particularly in the Indo-Pacific theatre – including Australia, South Korea, Japan, New Zealand, Singapore and Taiwan – and in the immediate neighbourhood, which share broadly similar views in terms of values and standards, is of fundamental importance both for this technological access and for energy and supply security in general.

9.6 Energy and supply security

In parallel to the decrease of the energy consumption of the military apparatus, the security of energy and supplies (rare earths, raw materials, semi-conductors, etc.) will further shape defence plans and consequently future weapon systems.

In order for industry, both defence and civilian – the latter being the supplier of many of the military COTS or dual-use capabilities – to be able to meet identified and future needs and thus to honour signed contracts according to agreed schedules, it is important to secure the supply chains. This is a particularly important strategic challenge identified and addressed at both European and transatlantic levels. Recycling of materials and waste is one of the levers to meet these challenges.

The armed forces of the future will be all the more effective if they manage to maximise their autonomy in terms of mobility and minimise their energy and general consumption.

9.7 Development of European defence autonomy and enhanced EU-NATO cooperation

A major challenge will be to achieve European strategic autonomy in defence matters while promoting EU-NATO cooperation. Luxembourg, like the other members of both organisations, will always be confronted with the challenge of the single set of forces and non-duplication. The signing of the third joint NATO-EU declaration is welcomed and perceived as a strong signal of unity in the face of adversaries and competitors, which will allow a better response to the above-mentioned challenge.

Luxembourg's contribution to the development of this autonomy in the field of EU defence may seem marginal at first sight, taking into account the structural limitations of the Luxembourg Armed Forces in particular. However, taking into consideration the key capabilities that the Luxembourg Defence has

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succeeded and continues to develop, notably in the framework of multinational partnerships, these efforts can today be rightly qualified as essential.

The development of European defence autonomy should be seen as an opportunity to generate complementarity, mutually beneficial to the EU and the Alliance. A real complementarity between these two international organisations, which are crucial for the security of the country and of the European continent as a whole, will make it possible to perfect military tools – for crisis management, deterrence and collective defence – in order to be able to face the challenges and competitors of the 21st century.

The reciprocal advantages of the transatlantic partnership, in the face of strategic competitors, are considered undeniable and irrevocable. Let us recall here that it is indeed the peace generated and preserved by NATO that has created the preconditions for the exceptional economic development of this EU and hence of the Grand Duchy. Taking into account the current and future security environment, a strong European pillar within NATO – which remains the cornerstone of collective defence – marked by a growing role for the EU, will be essential to face the new challenges – hybrid, cyber or other threats – amplified and organised by rapidly developing EDT.

The EU, which already has an impressive range of instruments at its disposal and is meanwhile deploying a growing defence effort, will have to meet these challenges by relying on collective resilience. Luxembourg will by developing an appropriate integrated approach with the support of its reference partners and other like-minded countries.

Glossary

A2/AD	Anti-Access/Area Denial
ACO	Allied Command Operations – Commandement allié Opérations
ACT	Allied Command Transformation – Commandement allié Transformation
AEW&C	(NATO) Airborne Early Warning & Control
AFSC	Allied Future Surveillance & Control
AGS	Allied Ground Surveillance
AI	Artificial intelligence – Intelligence artificielle (IA)
AWACS	(NATO) Airborne Warning and Control System
BACA	Benelux Arms Control Agency – Agence de contrôle des armements du Benelux
CaMo	Capacité Motorisé
CARD	Coordinated Annual Review on Defence – Examen annuel coordonné en matière de défense (EACD)
CDP	Capability Development Plan
CFSP	Common foreign and security policy – Politique étrangère et de sécurité commune (PESC)
CLRV	Command Liaison and Reconnaissance Vehicle
COTS	Commercial off-the-shelf
CSDP	Common security and defence policy – Politique de sécurité et de défense commune (PSDC)
DIANA	Defence Innovation Accelerator for the North Atlantic – accélérateur d'innovation de défense pour l'Atlantique Nord
EATC	European Air Transport Command
EDA	European Defence Agency – Agence européenne de défense (AED)
EDF	European Defence Fund – Fonds européen de la Défense (FED)
EDIP	European Defence Investment Programme – programme européen d'investissement dans le domaine de la défense
EDT	Emerging and disruptive technology/ies – technologies émergentes et de rupture
EDTIB	European Defence Technology and Industrial Base (EDTIB) – base technologique et industrielle de défense de l'UE (BITDE)

EEAS	European External Action Service – Service européen d'action extérieure (SEAE)
EU	European Union – Union européenne (UE)
EUMS	European Union Military Staff – Etat-major de l'Union européenne (EMUE)
EOSys	Earth Observation System – Système d'observation de la Terre
FNC	Framework Nations Concept
FNR	Fonds National de la Recherche – Luxembourg National Research Fund
GBAD	Groundbased Air Defence
GDP	Gross domestic product – Produit Intérieur Brut (PIB)
HCPN	Haut-Commissariat à la Protection nationale
ISR	Intelligence, Surveillance and Reconnaissance
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
JTAC	Joint terminal attack controller – contrôleur aérien avancé
KFOR	(NATO) Kosovo Force – Force (OTAN) pour le Kosovo
LAWS	Lethal Autonomous Weapon Systems – Systèmes d'armes létaux autonômes (SALA)
LCDC	Luxembourg Cyber Defence Cloud
LUXEOSys	Luxembourg Earth Observation System – Système d'observation de la Terre luxembourgeois
M3H	Multimodal Military Hub – hub militaire multimodal
MMF	Multinational MRTT Fleet
MMU	Multinational MRTT Unit
MOTS	Military off-the-shelf
MPA	Maritime Patrol Aircraft
MRTT	Multi-Role Tanker Transport
Med-ST	Medical Surgical Team
NATO	North Atlantic Treaty Organization – Organisation du traité de l'Atlantique Nord
NCIA	NATO Communications and Information Agency – Agence OTAN d'information de communication

NDPP	NATO Defence Planning Process – processus OTAN de planification de défense
NIF	NATO Innovation Fund
NPSD	National Plan for Sustainable Development – Plan national de développement durable (PNDD)
NSPA	NATO Support and Procurement Agency – Agence OTAN de soutien et d'acquisition
OCCAr	Organisation Conjointe de Coopération en matière d'Armement
OSCE	Organisation for Security and Cooperation in Europe – Organisation pour la Sécurité et la coopération en Europe (OSCE)
R&D	Research & Development – recherche & développement
PESCO	Permanent structured cooperation – coopération structurée permanente (CSP)
PNEC	Plan national intégré en matière d'énergie et de climat
SAR	Search and Rescue – recherche et sauvetage
SCORPION	Synergie du COntact Renforcé par la Polyvalence et l'Info valorisatiON
SME	Small and medium enterprises – petites et moyennes entreprises (PME)
SSA	Space Situational Awareness – Connaissance de la situation spatiale
S&R	Stabilisation and reconstruction
TBMD	Tactical Ballistic Missile Defense
UAV	Unmanned aerial vehicle – véhicule aérien sans pilote
UN	United Nations – Organisation des Nations Unies (ONU)
WGS	Wideband Global Satellite Communications System
W.S.A.	Warehouses Service Agency

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