

Military Sustainability: The Need for a Holistic Approach

In an era defined by rapidly evolving threats and unprecedented environmental challenges — as starkly highlighted by the war in Ukraine — military sustainability is no longer a choice, but a strategic imperative. Embracing a bold and holistic sustainability agenda allows the armed forces of our nations not only to enhance operational effectiveness and resilience, but also to actively contribute to a safer and more sustainable future.

This integrated approach acknowledges the interconnectedness of environmental, social, and security dimensions. The recommendations outlined here provide a clear path to embed sustainability into core defence strategies and operations, ensuring that our military institutions remain modern, responsive, and aligned with the broader mission of promoting 21st-century security and stability.

Now is the time to lead by example — to demonstrate tangible commitment to a sustainable security paradigm. The lessons drawn from the Ukrainian conflict underscore the urgency of this transition and the need to act decisively and without delay.



INTRODUCTION

Our nations are facing a rapidly evolving landscape of threats and challenges. While traditional military preparedness remains fundamental, emerging threats, including climate change, resource scarcity, and geopolitical instability, must also be addressed. The ongoing war in Ukraine has highlighted how these challenges can exacerbate conflicts, disrupt operations, and strain the resources of member states. In this context, military sustainability has become a strategic imperative.

This analysis recognizes that the concept of "military sustainability" integrates several interconnected dimensions: the environmental impact of military activities, the security of energy supply, the efficient management of raw materials, the operational resilience of forces, and the effectiveness of logistics. Although these elements can be analyzed individually, it is essential to adopt a holistic approach to fully understand their complex interrelationships. Intervention in one area inevitably has repercussions on others, and vice versa.

This analysis aims to provide a holistic framework for integrating sustainability into fundamental strategies and operations. It outlines the challenges and opportunities associated with each of the key dimensions of military sustainability, considering existing initiatives, and formulates actionable recommendations to enable nations to adopt a global and ambitious sustainability agenda. The lessons learned from the conflict in Ukraine underscore the urgency of this transition and the need for a coordinated and integrated approach.

THE IMPERATIVE OF MILITARY SUSTAINABILITY

Armed forces, by their very nature, are significant consumers of resources. The need for fuel, materials, and water to ensure operational readiness and defence capabilities is immense. However, this high consumption has profound consequences that can undermine national objectives:

- **Environmental Impact:** Military activities contribute substantially to greenhouse gas emissions, soil and water pollution, and habitat destruction. These environmental impacts exacerbate climate change, degrade ecosystems, and undermine the well-being of populations around the globe. Climate change, in turn, acts as a "threat multiplier," increasing the risk of conflict and instability. The war in Ukraine has also demonstrated the direct environmental damage that can result from conflict, including the destruction of critical infrastructure and the release of hazardous materials.
- **Operational Vulnerability:** MoD's dependence on long and complex supply lines, particularly for fossil fuels, creates vulnerabilities that can be exploited by adversaries. Disruptions to these supply lines, whether caused by conflicts, natural disasters, or geopolitical manoeuvring, can severely hamper military operations and undermine the Alliance's ability to respond effectively to crises. The Ukraine war has highlighted the critical importance of secure and resilient supply chains, as well as the potential for energy infrastructure to become a target in conflict.
- **Economic Burden:** The consumption of resources and the management of military waste impose significant financial burdens on member states. These expenses strain national budgets and divert resources that could be invested in other critical areas, such as defence modernization, technological innovation, or social programs. The economic costs of the Ukraine war, including increased energy prices and the need for military aid, have further underscored the importance of resource efficiency and cost-effectiveness in defence spending.
- **Geopolitical Implications:** Competition for scarce resources, such as water and critical minerals, is likely to intensify in the coming decades, potentially leading to new conflicts and exacerbating existing tensions. The ability to operate effectively in a resource-constrained world will depend on its capacity to adopt sustainable practices and reduce its environmental footprint. The war in Ukraine, with its impact on global energy markets and food security, has demonstrated how resource competition can escalate into geopolitical instability.

THE STRATEGIC ADVANTAGES OF A SUSTAINABLE APPROACH

Embracing military sustainability is not simply about mitigating risks; it is also about unlocking a range of strategic and operational advantages for the MoDs:

- **Enhanced Operational Effectiveness:** Reducing reliance on fossil fuels through the adoption of renewable energy sources, such as solar, wind, and geothermal power, can enhance the resilience and agility of our forces. Sustainable energy solutions can be deployed in remote locations, reducing the need for vulnerable fuel convoys and enabling more distributed and adaptable operations. The Ukraine conflict has shown the importance of energy independence and the ability to operate in austere environments with limited logistical support.
- **Improved Energy Security:** Diversifying energy supply sources and reducing dependence on fossil fuels protects MoDs from price volatility and supply disruptions. This enhanced energy security strengthens the Alliance's ability to conduct sustained operations and reduces its vulnerability to economic coercion. The war in Ukraine has exposed Europe's reliance on Russian energy and the strategic vulnerabilities that this dependence creates.
- **Cost Savings:** Investing in energy-efficient technologies and sustainable practices can generate significant long-term cost savings. Reduced fuel consumption, lower waste management expenses, and decreased maintenance requirements can free up resources for other critical defence priorities. In the context of the Ukraine war, with its associated economic costs, these savings can be even more valuable.
- **Technological Innovation:** The pursuit of military sustainability can drive innovation in a range of technologies, including advanced materials, energy storage, and resource management. These innovations can have broader applications in the civilian sector, contributing to economic growth and technological leadership. The demands of the Ukraine war have accelerated the development and deployment of new technologies, some of which may have sustainability benefits.
- **Strengthened Partnerships:** Demonstrating a commitment to sustainability can enhance the image and strengthen the relationships with partner nations and international

organizations. This can facilitate cooperation on a range of security challenges, including climate change adaptation, disaster relief, and humanitarian assistance. The Ukraine crisis has underscored the importance of strong alliances and partnerships in addressing security challenges.

- **Mitigating Climate Change Impacts:** By reducing its greenhouse gas emissions, nations can contribute to global efforts to mitigate climate change, which poses a significant threat to international security. This proactive approach can enhance the Alliance's credibility and influence in the international arena. The war in Ukraine has not diminished the importance of addressing climate change, which remains a long-term threat to global security.

EXAMPLES OF SUSTAINABLE PRACTICES

Several nations are already taking concrete steps to integrate sustainability into their military operations. These examples demonstrate the feasibility and benefits of a more sustainable approach:

- **United States:** The U.S. Department of Defence has made significant investments in microgrids, electric vehicles, and alternative fuels to reduce energy consumption and greenhouse gas emissions. The Army's Net Zero initiative aims to achieve energy independence and reduce its environmental footprint across its installations.
- **Germany:** The German Bundeswehr is exploring the use of fuel cells and other renewable energy technologies to power its vehicles and equipment. The military is also implementing measures to improve energy efficiency in its buildings and reduce waste generation.
- **United Kingdom:** The UK Ministry of Defence has set ambitious targets for reducing greenhouse gas emissions and is investing in a range of sustainable technologies, including renewable energy, energy storage, and biofuels. The Royal Navy is exploring the use of sustainable fuels for its ships.
- **Canada:** The Canadian Armed Forces are working to reduce their environmental footprint through initiatives such as green procurement, waste diversion, and energy efficiency improvements. The military is also incorporating climate change considerations into its operational planning.
- **Netherlands:** The Dutch Ministry of Defence is committed to becoming more sustainable and

is investing in renewable energy projects, circular economy initiatives, and climate adaptation measures. The military is also working to reduce its reliance on fossil fuels and improve the energy efficiency of its equipment.

These examples highlight the diverse range of approaches that nations members are taking to advance military sustainability. They also demonstrate that sustainability is not a one-size-fits-all solution but rather a flexible and adaptable framework that can be tailored to the specific needs and circumstances of each member state. The war in Ukraine has further emphasized the need for our nations to accelerate their efforts to adopt sustainable practices, both to enhance their own resilience and to reduce their reliance on volatile energy markets.

RECOMMENDATIONS: A SUSTAINABLE SECURITY AGENDA

To be prepared to meet the challenges of the 21st century, including those highlighted by the war in Ukraine, our nations should adopt a comprehensive and ambitious agenda for military sustainability. This agenda should be integrated into all aspects of nations's operations, from strategic planning to procurement and training. To achieve this, the following recommendations are proposed:

1. **Develop a Wide Sustainability Strategy:** The national MoDs should develop a common comprehensive strategy that sets clear goals, targets, and timelines for reducing its environmental footprint, enhancing energy security, and promoting resource efficiency. This strategy should be aligned with the United Nations Sustainable Development Goals and the Paris Agreement on climate change. The strategy should also address the specific challenges and vulnerabilities that have been exposed by the Ukraine conflict, such as the need for more resilient supply chains and greater energy independence.
2. **Establish a Joint Centre of Excellence for Military Sustainability:** A dedicated centre of excellence should be established to serve as a hub for research, innovation, and best practice sharing on military sustainability. This centre would facilitate collaboration among member states, partner nations, and industry, and would provide training and education on sustainable practices. The centre should also focus on developing solutions to the specific

sustainability challenges that have been highlighted by the Ukraine war.

3. **Integrate Sustainability into Operations and Exercises:** Sustainability must be embedded throughout the entire lifecycle of military operations and exercises — from planning and execution to evaluation and after-action review. This means systematically incorporating practices that reduce fuel consumption, limit waste, and safeguard ecosystems. Informed by the operational realities exposed by the conflict in Ukraine, particular attention should be given to preparing forces for scenarios involving disrupted supply chains and compromised energy infrastructure. Building resilience through sustainable practices is not just environmentally responsible — it is operationally essential.
4. **Promote the Adoption of Sustainable Technologies:** Nations should actively promote the development and adoption of sustainable technologies, such as renewable energy systems, energy-efficient equipment, and advanced materials. This can be achieved through joint research and development programs, technology transfer initiatives, and the establishment of common standards. The war in Ukraine has underscored the importance of investing in technologies that can enhance energy independence and reduce reliance on vulnerable supply chains.
5. **Green the Defence Supply Chain:** Nations should work with industry to promote sustainable practices throughout the defence supply chain. This includes measures to reduce emissions from manufacturing and transportation, promote the use of recycled materials, and minimize waste generation. Given the disruptions to global supply chains

caused by the Ukraine war, there is a greater need to diversify supply sources and promote circular economy principles.

6. **Enhance Climate Change Adaptation:** Nations should enhance its capacity to adapt to the impacts of climate change, which pose a growing threat to military installations, operations, and personnel. This includes measures to improve the resilience of infrastructure, develop climate-resilient operational plans, and provide training on operating in extreme weather conditions. The Ukraine conflict has illustrated how conflict can exacerbate the impacts of climate change, creating additional challenges for military forces.
7. **Strengthen Partnerships on Environmental Security:** Nations should strengthen its partnerships with international organizations, such as the United Nations and the European Union, to address environmental security challenges. This includes cooperation on issues such as climate change adaptation, disaster relief, and the management of shared resources. The war in Ukraine has highlighted the need for greater international cooperation in addressing environmental security challenges, particularly in conflict zones.
8. **Increase Transparency and Accountability:** Nations should enhance its transparency and accountability on environmental performance by establishing clear reporting mechanisms and performance indicators. This will help to track progress, identify areas for improvement, and demonstrate the Alliance's commitment to sustainability. In the context of the Ukraine war, with its implications for public trust in military institutions, transparency and accountability are more important than ever.