

NATO's Responsiveness to Climate Change

Madara Melnika*

European University Institute, Florence, Italy

madara.melnika@eui.eu

International legal debates on accountability and liability for conflict-related greenhouse gas emissions would increase their practical persuasiveness by acknowledging the governance processes already underway within national forces and international organisations such as North Atlantic Treaty Organization (NATO). The integration of the worldviews, interpretations, and vocabulary developed in these processes would bridge the gap between climate law, international humanitarian law, and military worldviews regarding their priorities.

The Alliance's 2022 Strategic Concept states that NATO should become the leading international organisation in understanding and adapting to the impact of climate change on security.¹ In 2021, the Climate Change and Security Agenda² and Climate Change and Security Action Plan³ set out NATO's goals to increase Allied *awareness* of climate change in NATO's strategic environment, NATO's assets and general security, to *adapt* to climate change, to *contribute* to mitigation through the assessment of emissions and energy demand and consumption, and, finally, to enhance international *outreach*. These pledges might be seen as a way for an institution to remain relevant and agile, following the keywords of the time. Likewise, this might have been a matter of reputation, as it foregrounds the military sector's internal accountability and participation in global regulatory processes. However, the underlying reasons are much deeper, significantly increasing the normative weight of this plan and the instruments associated with it.

In military discourse, climate change is a threat multiplier. It both adds to the operational stress and transforms the broader security environment by increasing insecurity and intensifying conflict risks. Armed forces that do not

* PhD Scholar (EUI), LL.M. Human Rights and Social Justice (UConn), LL.M. in Comparative, European and International Laws (EUI).

¹ NATO 2022 Strategic Concept (adopted by Heads of State and Government at the Madrid Summit), 29 June 2022, paras 19, 46.

² NATO, *Climate Change and Security Agenda* (endorsed by NATO Foreign Ministers, March 2021).

³ NATO, *Climate Change and Security Action Plan* (agreed by Heads of State and Government, 14 June 2021).

want to suffer the impacts of supply chain disruptions, excessive heat-related deaths among their personnel, or threats to military equipment and weapon systems caused by permafrost thaw or other climate-related hazards must adapt to the changing operational and global environment and incorporate its considerations into mission planning. Exceedingly more often, the military also gets involved in responses to environmental hazards such as wildfires and flooding, distorting its main missions. Therefore, climate change inescapably transforms the field in which the military operates, requiring adaptation and awareness.

Following the logic of threat multiplication, the sector's contribution to climate change adds to the threats, resulting in a feedback loop of causation and adaptation. This contribution is massive, swelling to at least 5.5 % of global emissions.⁴ Strategic mitigation within the military, provided it is compatible with operational effectiveness or even enhances it, would break the vicious circle and, in the long term, help reduce climate-change-related pressures on global society and the military alike.

The need for climate-impacting transformation is also reinforced by other factors. Military reliance on non-renewable energy⁵ requires a constant and secure supply, which can accordingly lead to dependency on one's enemies or to paralysis of action, including battlefield vulnerabilities.⁶ Fossil-fuel-related energy infrastructure is also an easy target. It is also costly: historical examples show that the additional security measures taken to prevent sabotage of fossil fuel shipments, along with supply chain hurdles, raised the final gasoline prices to as high as \$400 per gallon.⁷ Finally, green transition-related changes in civilian infrastructure, if not accompanied by a military transition, might lead to the sector's isolation and, accordingly, increased difficulties in procuring fossil fuels. That especially applies to long-term military planning, as the procurement of traditional vehicles might lock in carbon emissions for decades. Therefore, the discourse on energy security might also encompass

⁴ Stuart Parkinson, Scientists for Global Responsibility (SGR) with Linsey Cottrell, Conflict and Environment Observatory (CEOBS), *Estimating the Military's Global Greenhouse Gas Emissions*, November 2022, 8, available at <https://ceobs.org/wp-content/uploads/2022/11/SGRCEOBS-Estimating_Global_Military_GHG_Emissions_Nov22_rev.pdf>, last access 17 June 2026.

⁵ Oliver Belcher, Patrick Bigger, Ben Neimark and Cara Kennelly, 'Hidden Carbon Costs of the "Everywhere War": Logistics, Geopolitical Ecology, and the Carbon Boot-Print of the US Military', *Transactions of the Institute of British Geographers* (2019), 1-16 (3).

⁶ Neta C. Crawford, *Pentagon Fuel Use, Climate Change, and the Costs of War* (Brown University 2019), 4-5.

⁷ Nathan Hodge, 'U.S.'s Afghan Headache: \$400-a-Gallon Gasoline: Military Air Drops Fuel Barrels to Avoid Dangerous Convoys', *Wall Street Journal*, 6 December 2011, <<https://www.wsj.com/articles/SB10001424052970204903804577080613427403928>>, last access 17 June 2026.

not only the protection of critical infrastructure but also the enhancement of energy efficiency within military forces through common standards, reduced dependence on fossil fuels, and the implementation of energy-efficient solutions.

In response to these and other considerations, NATO has adopted multiple institutional incentives and instruments, both scientific and normative.

The first among these is energy transition. The NATO Energy Security Centre of Excellence (ENSEC COE), accredited in 2012, has produced an extensive selection of scientific outputs. While the Centres of Excellence, as independent military organisations, primarily serve their sponsoring states, the delegations of tasks by NATO's Supreme Allied Command Transformation (SACT) ensure the synergy and collaboration between COEs and NATO's overall needs.⁸ Accordingly, alongside other projects, the ENSEC COE has contributed to the development of the NATO Operational Energy Concept, tested innovative energy production and distribution systems, integrated smart microgrids and researched the optimisation of sustainability and energy efficiency of special railway vehicles.⁹ More comprehensively, the allies' drive to increase the energy efficiency of their military forces was cemented by the adoption of the Green Defence Framework in 2014.¹⁰

The years 2021 to 2023 saw the Alliance's direct climate terminology grow. In line with the Climate Change and Security Agenda and the Climate Change and Security Action Plan, in 2022,¹¹ 2023,¹² and 2024,¹³ NATO released its Climate Change and Security Impact Assessments (Secretary General's Reports). The Compendium of Best Practice,¹⁴ published in 2023, provides concrete examples of emission reduction policies and procedures introduced by the Allies. Simultaneously, Greenhouse Gas Emissions Mapping and Analytical Methodology¹⁵ provides guidelines and tools for calculating emissions from civilian and military facilities. Finally, the Climate

⁸ Supreme Allied Commander Transformation, *NATO-Accredited Centres of Excellence 2026 Catalogue* (Supreme Allied Commander Transformation 2026), 5.

⁹ Supreme Allied Commander Transformation (n. 8), 36-37.

¹⁰ NATO, *Green Defence Framework* (approved by the North Atlantic Council), February 2014.

¹¹ NATO, Climate Change and Security Impact Assessment, 28 June 2022.

¹² NATO, Climate Change and Security Impact Assessment, 11 July 2023.

¹³ NATO, Climate Change and Security Impact Assessment, 9 July 2024.

¹⁴ NATO, Climate Change and Security Action Plan: Compendium of Best Practice, July 2023.

¹⁵ NATO, The NATO Greenhouse Gases Emission Mapping and Analytical Methodology, 11 July 2023.

Change and Security Centre of Excellence (CCASCOE)¹⁶ was accredited in 2024.

None of these documents, outputs, or pledges has a binding force in a traditional sense. The practical consequences will depend on the authority of the initiatives and the priorities of states' departments of defence. However, the underlying arguments of interoperability, the changing operational environment, financial costs, and energy risks lend confidence that climate-change- and energy-transition-related incentives and targets will not merely wither away, even in post-2022 circumstances. This is supported by the fact that multiple member states' defence departments have issued guidelines on environmental protection and climate change that include references to NATO's climate terminology. Finally, empirical scholars have also observed adaptation and mitigation processes.¹⁷ As the underlying rationale for these transformations is a pragmatic need to maintain a competitive edge and capabilities, they align with allies' military interests.

All in all, these normative and scientific instruments highlight that the relationship between the climate system and military strategy does not centre on a one-directional act of pollution, but rather on reciprocal, multidimensional interactions, informed by adaptation needs, awareness, and targeted scientific research. This entry point allows us to reframe the requirements for emission targets, pre-action carbon cost assessments, and increased awareness of the principle of proportionality as operational interests, rather than as contestable external pressure. This shift in argumentation, which connects the military success and climate change regime rather than treating them as mutually exclusive interests, might help prevent some of the excessive climate harm, both from everyday action and specific attacks.

Furthermore, the scientific achievements of the COEs, alongside the Secretary General's guidelines for emission assessment and the compendium of best practices, showcase the sector's potential. In these practical cases, operational effectiveness has already been balanced with climate needs, indicating that they constitute the industry's minimum acceptable standard. Some scholars have noted that these best practices should be taken into account in interpreting the term 'appropriate' measures for the prevention, mitigation, and remediation of peace operations under Principle 7 of the Protection of the Environment in Relation to Armed Conflicts (PERAC) Principles.¹⁸

¹⁶ NATO Climate Change and Security Centre of Excellence (CCASCOE), <ccascoe.org>, last access 25 April 2026.

¹⁷ Rita Floyd, 'NATO and Climate Change', *Defence Studies* 25 (2025), 707-714.

¹⁸ Mario Pasquale Amoroso, 'Fighting in a Warming World: The Emergence of Climatic Considerations in the Conduct of Hostilities under International Humanitarian Law', *RECIEL* 35 (2026), 1-12 (6).

However, this line of argumentation should also extend to broader military activities, including conflict.

Accordingly, a sensitivity towards the military's doctrine and scientific achievements, transformed into a demand to live up to the best available standards in line with the sector's own interests, might lead to a more effective, pre-emptive reduction of climate harm.

