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Military climate strategies: Are they just greenwash?



Military climate strategies

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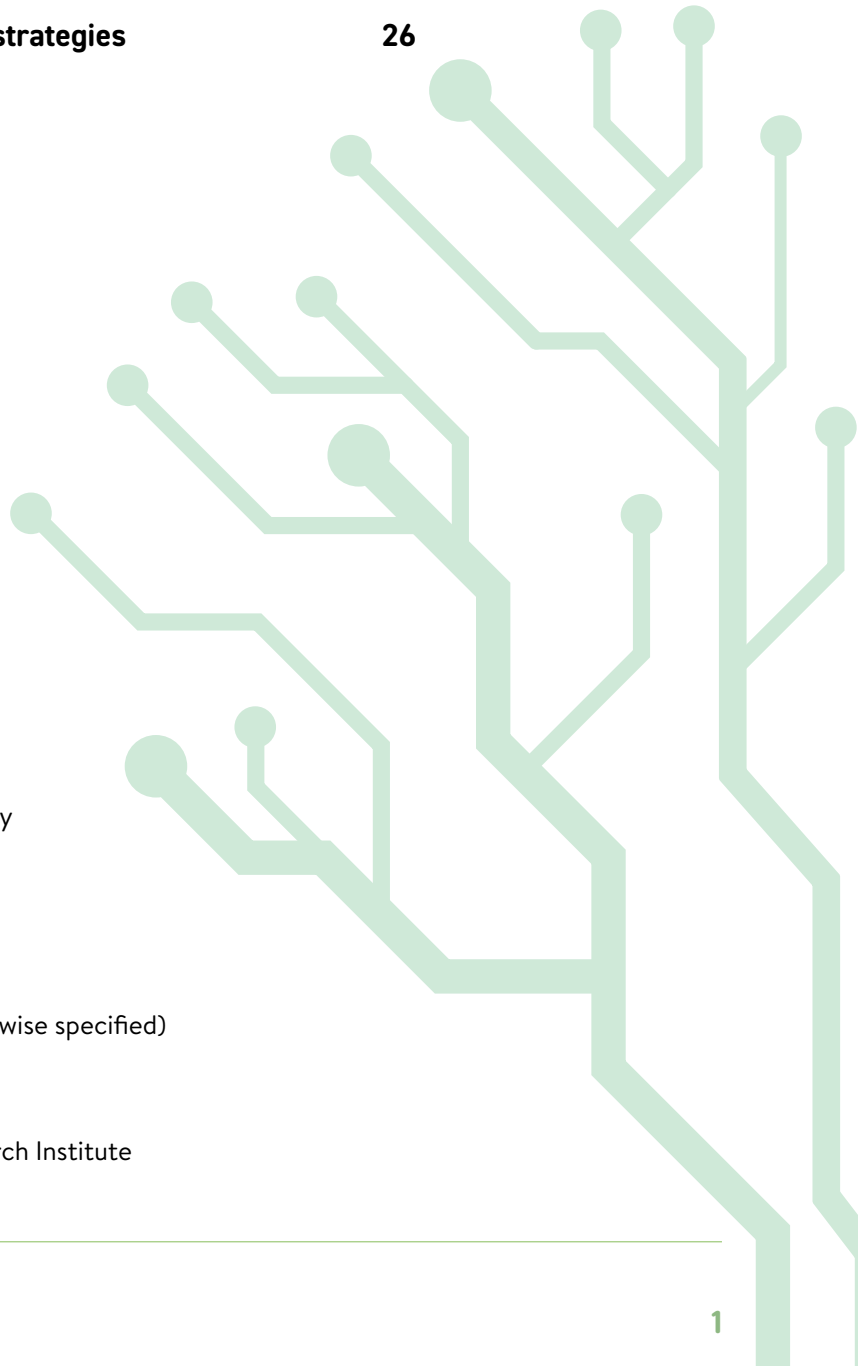
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Acronyms

AAFs	Alternative Aircraft Fuels
CEOBS	Conflict and Environment Observatory
CSG	Carrier Strike Group
GDP	Gross Domestic Product
GHG	greenhouse gas
MEG	Military Emissions Gap
MOD	Ministry of Defence (UK, unless otherwise specified)
NATO	North Atlantic Treaty Organisation
SGR	Scientists for Global Responsibility
SIPRI	Stockholm International Peace Research Institute
tCO ₂ e	tonnes of carbon dioxide equivalent



Executive summary

The global military carbon footprint is thought to be large – around 5.5% of the world’s greenhouse gas (GHG) emissions – and rising rapidly. A growing number of militaries recognise that they need to put into place climate change strategies, i.e. plans which govern both the adaptation of militaries to climate change risks and the mitigation (reduction) of GHG emissions arising from military activities. However, most of the world’s militaries do not seem to have compiled such plans, and if they have, they tend to focus on adaptation much more than mitigation.

This report has reviewed the GHG emission mitigation plans for the militaries of 26 nations – 20 which are members of NATO and six which are not. It has also looked at the emission commitments of NATO itself. The 26 nations are almost all democracies and hence among the most likely to be taking action in this area. We could not find similar climate strategy documents for any other major military, for example, that of China or Russia.

The report’s findings give much cause for concern. They show that most military emissions within these 26 nations are not covered by any specific targets, most of the targets that do exist are unambitious, and most of the emission reduction achieved to date has relied on civilian action (especially decarbonisation of national electricity grids), temporary reductions in military activity, or military base closure programmes. The most positive finding, from a military perspective, is that significant emission reductions have been achieved at bases in seven nations through building energy efficiency improvements and, increasingly, by onsite renewable energy generation. These emission reductions seem to have been achieved without reducing military war-fighting capabilities. But military base

emissions represent a small fraction of the total military carbon footprint and, notably, the two most successful nations in achieving this progress seem to be Ireland and Switzerland. It is probably no coincidence that they are also both militarily neutral countries.

In more detail, the report findings are as follows.

- Only five nations out of 26 (Australia, Canada, Germany, Slovenia, Switzerland) have explicitly stated an intent for a ‘net zero military’.
- Of the top 15 military spending nations in NATO, only seven had explicit targets for reducing GHG emissions (Belgium, Canada, France, Germany, Norway, Romania, UK) while two others had targets for reducing fossil fuel or energy use (Netherlands, Denmark). One nation (USA) has abandoned its targets.
- Of the nine nations in our sample with the most explicit emission targets, only four had near-term targets (up to 2035) covering 100% of their core (Scope 1 and 2) military emissions (Australia, Ireland, Slovenia, Switzerland). The other five had near-term targets covering between 17% and 92% of core emissions (Canada, France, Germany, Norway, UK). The incomplete coverage of targets can cause serious confusion. None had near-term targets covering supply-chain (Scope 3) emissions.
- For the nine nations with the most explicit targets, we extrapolated the planned decarbonisation rate to cover all core military emissions to give a ‘best case’ estimation of the year for reaching net zero. For two nations (Ireland, Slovenia), this was before or near 2050. For four nations (Australia, Norway, Switzerland, UK), this

was during the 2060s to 2080s. For two nations (Canada, Germany), this was around 2100. For the other nation (France), this was after 2200. For the USA's now abandoned emission targets, the projected best case net zero dates were between 2090 and 2180, depending on the armed forces branch. The aim of most national climate strategies is for net zero emissions by 2050 so, even under 'best case' conditions, most of these targets are far outside this aim. Indeed, given the numerous technological, economic, environmental, and ethical obstacles to decarbonising weapons systems, the path to net zero is highly contested.

- Regarding targets for NATO emissions, these only apply to a small amount of assets

and activities directly controlled by the organisation itself (the 'NATO Enterprise'), not to the militaries of the whole 32-nation alliance. Indeed, to date, there has been no clear explanation of the activities covered, and no subsequent reporting of emissions. The targets are also not mentioned on the 'Environment, climate change and security' section of NATO's website, leading to concern that they have been quietly abandoned.

- For seven nations publishing emissions data on their progress (Australia, Canada, Germany, Ireland, Norway, Switzerland, UK), all seven were making significant progress in reducing core stationary emissions (at military bases). Four of these significantly



Most military emissions within the 26 case study nations are not covered by any specific targets, and most of the targets that do exist are unambitious.

benefited from civilian electricity grid decarbonisation (Australia, Germany, Ireland, UK). Two of these significantly benefited from base closure programmes (Germany, UK). The two nations with the most successful military programmes for reducing core stationary emissions seemed to be Ireland and Switzerland. No clear evidence was presented in any progress reports that efforts to decarbonise mobile military technologies (war-fighting capabilities) were yet having a significant impact on emissions. Where stated, the main factor influencing core mobile emissions was a change in the level of military activity.

- Only one nation was found to be carrying out extensive monitoring of Scope 3 (supply-chain) emissions (Norway) and only one nation has set (long-term) targets for reducing supply-chain emissions (Canada). The data from Norway indicates that supply-chain emissions can be the largest fraction of a military carbon footprint (over 80%), so this major emissions source is being widely neglected. The Norwegian data also shows an increase in recent years, which would be expected due to increasing spending in line with NATO targets.
- All military climate change mitigation strategies stated that efforts to reduce emissions would be focused on technological measures, and that military capability ‘would not be compromised’. No consideration was given to the potential emission reduction benefits of a change in military strategy or doctrine, for example, closing overseas bases or switching to ‘non-offensive defence’ postures which would involve shorter-range (and therefore lower carbon) military capabilities.

Huge increases in military spending are now underway – driven by factors including Russia’s 2022 invasion of Ukraine and NATO’s new 5% GDP spending targets for military and security measures. There are major doubts that these spending rises will lead to a more peaceful world – indeed, the widespread concern is

that they will lead to more conflict. One clear likelihood is that these spending rises are already increasing GHG emissions – supply-chain emissions, core mobile emissions, and (in most nations) core stationary emissions as well. While some gains have been achieved by a few nations in reducing stationary emissions, it is likely that even in these places the savings will be quickly overwhelmed by rises elsewhere. This report has included some projections for ‘best case’ decarbonisation dates which, we argue, show a lack of ambition for the trajectories of core military emissions (let alone supply-chain emissions). However, even these dates look highly optimistic given the difficulties now being faced. Indeed, without a major change of direction, it is highly questionable whether any military will decarbonise this century – even putting aside the impossibility of decarbonising war-fighting impacts which inevitably involve destroying carbon reservoirs, such as forests (as well as taking human life). This will further jeopardise net zero targets at both the national and global levels.

This report therefore makes the following key recommendations.

- Defence ministries, especially those with large budgets in global terms, should annually publish robust data on national military GHG emissions. This data should be made publicly available. At minimum, data on core (Scope 1 and 2) emissions should be published, but this should be quickly expanded to include extensive Scope 3 reporting, including all major supply-chains.
- Defence ministries should enact emission reduction targets with as wide a coverage as possible. If military emission reduction targets do not cover 100% of core emissions, then an ‘effective target’ should also be stated taking into account the limited coverage. (For example, if a 30% reduction target only applies to 50% of core emissions, then the effective target would be 15%, i.e. 0.3×0.5). Target dates for reaching net zero should also be stated. These measures would help



National governments should prioritise changes to military strategies, alongside peacebuilding measures, to help reduce greenhouse gas emissions.

to reduce any confusion surrounding these targets. Strong emission reduction targets should also be imposed on major suppliers.

- Militaries should pursue ambitious programmes for the reduction of core stationary emissions – such as building energy efficiency programmes and onsite renewable energy projects – as these have been the most effective to date. These programmes also have wider benefits, including increasing energy security and lowering costs.
- Militaries should ramp up efforts to monitor emissions related to armed conflict – known as Scope 3+ emissions. Serious efforts should be introduced to minimise such emissions.
- National governments should prioritise non-offensive defence strategies alongside diplomatic cooperation, non-violent conflict resolution, international arms control and disarmament agreements, and other peacebuilding measures. These would include closing overseas bases and curbing military spending. Not only are these likely to reduce the risks of armed conflict, they will also help to reduce GHG emissions, and allow spending to rise on urgent measures to tackle global poverty and environmental problems, which in turn will improve international security.

1. Introduction

The global military carbon footprint – not including the impacts of war-fighting – was estimated to be between 3.3% and 7.0% of global greenhouse gas emissions (GHG) in 2019, with a central estimate of 5.5%.¹ Since then, the international security situation has considerably deteriorated, and military spending has skyrocketed,² not least due to the 2022 Russian invasion of Ukraine, wars in the Middle East, and the new NATO spending target of 5% GDP on military and security measures. A recent review by Scientists for Global Responsibility (SGR) of 11 research studies estimated that, for each increase in international military spending of \$100 billion, GHG emissions would rise by around 32 million tonnes of carbon dioxide equivalent (tCO₂e).³ At the same time, wider efforts to reduce GHG emissions across the world remain grossly inadequate, with the Paris climate target of 1.5°C set to be breached in the next few years.⁴

Many militaries have long acknowledged that the global climate crisis will negatively affect international security, but debate continues on exactly how. Militaries also have numerous concerns about how climate change might affect their equipment and operations. However, recognition that militaries should try to curb their GHG emissions is a rather more recent phenomenon, and is still not accepted in much of the world. Nevertheless, since around 2020, numerous militaries have published climate change strategy documents which,

in some way, include aims to control their emissions.

Do these strategies mark a sea-change in military attitudes towards reducing GHG emissions? Or do they just represent wishful thinking, lacking the political support to actually achieve their goals? Perhaps they are more concerned with improving the image of the military in the eyes of an increasingly climate-concerned public, rather than a serious effort to greatly reduce carbon emissions? In short, are military climate strategies more greenwash than committed climate action? This study aims to provide an answer to these questions.

To do this, data has been compiled from military climate strategy documents and related material from 26 nations and one international body.

The 26 nations are:

- 20 which are members of NATO – the top 15 by military expenditure, together with five others: USA; Germany; UK; France; Poland; Italy; Canada; Türkiye; Spain; Netherlands; Sweden; Norway; Denmark; Romania; Belgium; Greece; Portugal; Estonia; Luxembourg; and Slovenia;
- Three European nations which are not members of NATO: Switzerland; Austria; and Ireland;
- Three other non-European nations: Japan; Australia; and New Zealand.

1 Parkinson, S. & Cottrell, L. (2022) *Estimating the Military's Global Greenhouse Gas Emissions*. Scientists for Global Responsibility (SGR)/Conflict and Environment Observatory (CEOBS). <https://www.sgr.org.uk/publications/estimating-military-s-global-greenhouse-gas-emissions>

2 Stockholm International Peace Research Institute (SIPRI). (2026) *Trends in World Military Expenditure, 2025*. <https://www.sipri.org/publications/2026/sipri-fact-sheets/trends-world-military-expenditure-2025>

3 Parkinson, S. (2025) *Military spending rises and greenhouse gas emissions: what does the research say?* SGR. <https://www.sgr.org.uk/publications/military-spending-rises-and-greenhouse-gas-emissions-what-does-research-say>

4 Climate Change Tracker. (2025) *Progress of Global Climate Change: Key Messages*. <https://climatechangetracker.org/climate-change-progress#key-messages>

The international body examined is NATO.

We could not find GHG emission reduction plans for any other major military.

This study looks at several key factors:

- The extent to which a commitment has been made to become a net zero military (section 2.1);

- The extent and ambition of targets to reduce military GHG emissions (sections 2.2 to 2.5); and
- Progress made by militaries to meet the targets that have been set (section 3).

The main findings and recommendations are provided in section 4.

To help with the discussion, Box 1 lists the main terminology used in this report.

BOX 1. SUMMARY OF MILITARY GHG EMISSIONS TERMINOLOGY

The terminology used to describe military GHG emissions is quite extensive, and there has often been inconsistency between different studies. Here is a summary of the main terms used in this report, expanded from that first published by SGR in 2025,ⁱ and based on methodologies recommended by the GHG Protocolⁱⁱ and the Conflict and Environmental Observatory (CEOBS).ⁱⁱⁱ

Scope 1/ direct emissions.

These are due to activities carried out using equipment, buildings etc owned by the specific organisation under study. These activities most commonly include fossil fuel combustion by aircraft, naval craft, and land vehicles, and for the heating of buildings.

Scope 2 emissions.

These are most commonly due to electricity use by a specific organisation, where the electricity is produced by a third-party energy utility burning fossil fuels. Emissions due to utility-owned district heating networks are also included in this category.

Core emissions.

The total of Scope 1 and 2 emissions. These are commonly reported by many major organisations.

Scope 3/ supply-chain emissions.

These result from activities in the upstream or downstream supply-chain of an organisation, for example, in the production of goods and services. For a military, the overwhelming majority of Scope 3 emissions are upstream.

Indirect emissions.

The total of Scope 2 and 3 emissions.

Carbon footprint.

The total of Scope 1, 2, and 3 emissions for a specific organisation.

Carbon footprint.

The total of Scope 1, 2, 3, and 3+ emissions for a specific military.

i Parkinson, S. (2025b). *Military greenhouse gas emissions reporting: how reliable is it?* SGR. p.6. <https://www.sgr.org.uk/publications/military-greenhouse-gas-emissions-reporting-how-reliable-it>

ii GHG Protocol (2015). *Corporate Standard* (revised). <https://ghgprotocol.org/corporate-standard>

iii CEOBS (2022). *A framework for military greenhouse gas emissions reporting*. <https://ceobs.org/report-a-framework-for-military-greenhouse-gas-emissions-reporting/>

BOX 1. CONTINUED

Carbon toeprint.

A partial carbon footprint, including the total of Scope 1, 2, and some Scope 3 emissions. The term has been recently coined by Prof Mike Berners-Lee of Lancaster University.^{iv}

Stationary military emissions.

Emissions arising from activities at military bases and other military-owned buildings. Emissions arising from overseas bases can be included in this category. In general, only core emissions are included and not Scope 3 emissions.

Mobile military emissions.

Emissions arising from the use of military craft, including aircraft, ships, land vehicles, and spacecraft. Confusingly, this does not usually include civilian vehicles owned by defence ministries (sometimes called the 'white fleet'), which are counted under stationary emissions. Again, these generally include only core emissions not Scope 3 emissions.

Scope 3+ / war impact emissions.

A recently defined category including additional emissions due to the impacts of armed conflict. Included within this category is: the destruction of carbon reservoirs such as fossil fuel storage facilities or forests; transport of refugees; and post-conflict reconstruction.

Conflict emissions.

An alternative, but overlapping, accounting system using a specific war/ armed conflict as the basis for assessment. It includes Scope 1, 2, 3, and 3+ emissions specifically related to that conflict.

All figures in this report for GHG emissions are given in tonnes of carbon dioxide equivalent (tCO₂e).

iv See, for example Berners-Lee, M. (2020). *How bad are bananas? The carbon footprint of everything*. Profile Books. pp.8–9.

2. Military GHG emission reduction targets

This section reviews the targets and commitments that have been established to date for reducing military GHG emissions within nations and international bodies, drawn from our sample of 26 nations and one intergovernmental body.

Section 2.1 assesses the extent of national commitments to a 'net zero military'. Sections 2.2 to 2.4 examine the extent of national military targets for reducing GHG emissions – looking first at the commitments made by leading NATO member states, then comparing the ambition of military targets using a standardised framework, and then assessing the intended ambition of the recently abandoned US military targets, should they be reinstated. Finally, section 2.5 looks at NATO's commitments on emission reduction.

2.1 National military net zero commitments

The first area we look at is to what extent militaries have made a commitment to becoming a 'net zero military'. Table 1 summarises leading examples of these commitments for 10 nations in our sample, in order of descending military spending.

Of these nations, only five – Germany, Australia, Canada, Switzerland, and Slovenia – explicitly state that their aim is net zero military GHGs. Although it is not always clearly stated in military climate policies, this aim generally applies only to core emissions, i.e. Scope 1 and 2. However, Canada has also committed to developing a net zero strategy for the procurement of military supplies, a major component of Scope 3 emissions. In the UK, the air force has made an explicit commitment to a net zero target (for core emissions only), but the rest of the military

has not. In Belgium, the net zero commitment only applies to stationary emissions, i.e. those from military bases. The tendency – as shown in the table by the quotes from the UK, France, Netherlands, Austria, and Ireland – is to use looser wording, such as 'contributing to the national net zero target'. For other nations in our sample, the commitment is even weaker, such as 'contributing to climate goals' or 'reducing emissions' or even just 'controlling emissions'. Such wording leads to concerns that these militaries do not consider themselves responsible for implementing action to fully comply with a net zero commitment.

NATO has also set a target for net zero GHG emissions, but this differs materially from commitments by national militaries, so is discussed separately in section 2.5.

Importantly, all military climate policies explicitly state that military operational capabilities – i.e. war-fighting ability – will not be compromised for environmental goals.



Table 1. Examples of national military commitments which specifically mention targets for “net zero”, “carbon neutrality” or similar

Nation	Commitment
Germany	“The German armed forces must... undergo a comprehensive transformation process by 2045 with the aim of becoming a climate-neutral military.”
UK	“Defence... as a department is contributing to the achievement of the UK legal commitment to reach net zero emissions by 2050.” The Royal Air Force will “become the first net zero air force by 2040.”
France	“France [is] committed to... becoming carbon neutral by 2050... The Ministry for the Armed Forces... contributes to achieving the government’s objectives.”
Australia	“Defence’s emission reduction targets are...net zero emissions by 2050.”
Canada	Target: “Reduce greenhouse gas emissions... from real property and the conventional light-duty fleet, and achieve net-zero emissions by 2050.” Target: “Support the GC [Govt of Canada] commitment to achieve net-zero emissions by 2050 from the NSS [National Safety and Security] fleet considering availability, affordability, compatibility and operational feasibility.” Target: “Develop a net-zero 2050 strategy for materiel acquisition and support.”
Netherlands	“Defence is contributing to the national climate goals... By 2050, the Netherlands must reduce greenhouse gas emissions by 95% compared to 1990.”
Belgium	Objective: “To achieve the ambition of having a CO2-neutral, sustainable and resilient Defence property portfolio by 2040.”
Switzerland	Vision: “By 2050 at the latest, the carbon footprint of the Swiss armed forces will be neutral (net zero).”
Austria	Goal: “Contribution to Austria’s climate neutrality by 2040.”
Ireland	“The Defence Forces... share the ambition in the EU... to create a carbon neutral continent by 2050.”
Slovenia	Key action: “Reduce direct and indirect emissions... to reach the 2050 carbon neutrality target.”

Notes and references

Countries listed by military budget, from highest to lowest, according to SIPRI. (2026). *Op. cit.* Quotes for Germany, Netherlands, Belgium, and Switzerland have been translated from the original.

Germany: BMVG (2023). Nachhaltigkeits- und Klimaschutzstrategie für den Geschäftsbereich des Bundesministeriums der Verteidigung. p.14. <https://www.bmvg.de/resource/blob/5712718/ef73034715dcfaa80447ddb19cbf896b/nachhaltigkeits-und-klimaschutzstrategie-data.pdf>

UK: Ministry of Defence (MOD) (2021a). Climate Change and Sustainability Strategic Approach. p.10. <https://www.gov.uk/government/publications/ministry-of-defence-climate-change-and-sustainability-strategic-approach> ; MOD (2023a). Defence Aviation Net Zero Strategy. p.2. <https://www.gov.uk/government/publications/defence-aviation-net-zero-strategy>

France: MDA (2022). Climate and Defence Strategy. p.7. <https://www.defense.gouv.fr/ministere/politique-defense/strategie-climat-defense>

Australia: Dept of Defence (2024). Defence Net Zero Strategy. p.11. <https://www.defence.gov.au/about/strategic-planning/defence-net-zero-strategy>

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Switzerland: VBS (2021a). Energie und Klima: Aktionsplan. Vision. p.6. <https://www.vbs.admin.ch/de/aktionsplan-energie-klima>

Austria: BMLV (2022). Climate crisis and the role of armed forces. Goal 4. p.40. <https://inside.bundesheer.at/documents/475963/0/Austrian+MoD+Publication+Climate+Crisis+and+the+Role+of+Armed+Forces.pdf/81102752-ecf5-af6a-f099-3275ff2496e9>

Ireland: Dept of Defence and Defence Forces (2023). Strategy Statement 2023–2026. p.12. <https://assets.gov.ie/273347/81698c68-9e4a-4954-973d-c34c718064dc.pdf>

Slovenia: Ministry of Defence (2024). Long-term guidelines for increasing climate resilience. pp.22–23. https://www.gov.si/assets/ministrstva/MO/Gradiva/climate_guidelines_mo24_eng_spr_gov.pdf

2.2. Military emission targets in NATO member states

Digging deeper, Table 2 summarises the key GHG emissions targets set by the top 15 military spenders in NATO, again in descending order of national military spending.

Only five nations (Germany, UK, France, Canada, Norway) have emissions targets up to 2035 and only five (Germany, UK, Canada, Romania, Belgium) have set explicit targets between 2035 and 2050. The USA did set targets for both periods, but these were abandoned by the Trump government in 2025.⁵ Two additional countries (Netherlands, Denmark) have set targets for reducing fossil fuel use. For example, the Netherlands is aiming to reduce its dependence on fossil fuels in military operations “by at least 70%” over the period 2010–2050.⁶ This will cut GHG emissions but they have decided not to be explicit about how much. It is also apparent from the table that the emission targets that have been set often only apply to certain sub-sectors of the military, most commonly the stationary sector, i.e. military bases and administrative activities, rather than the mobile sector, i.e. military craft used for war-fighting. As we shall see below, this often represents less than half of core (Scope 1 and 2) emissions. Furthermore, virtually no militaries in NATO have set targets for reducing Scope 3 emissions, which mainly includes supply-chains. This is deeply problematic since data from Norwegian and British militaries indicates that Scope 3 emissions could make up over 80% of a military’s carbon footprint.⁷

One net zero target, and its associated strategy, is particularly noteworthy: Britain’s ‘Defence Aviation Net Zero Strategy’, published in 2023.⁸ This sets a target of net zero (core) emissions by 2040, and lays out the technologies and related measures which are currently envisaged to reach that target, and the proportion of emissions that they are projected to save:

- 34% from ‘sustainable’ aviation fuels (including biofuels and synthetic fuels);
- 30% from energy efficiency improvements (due to improvements in both aircraft and air-traffic management);
- 20% from ‘reimagined capability provision’ (including uncrewed aerial vehicles, also known as drones, and training using flight simulators);
- 15% from carbon removals (including afforestation and carbon capture and storage); and
- 1% from zero emissions propulsion (including hydrogen and battery electric propulsion).

Other militaries are also looking to use these options, although they have so far been less specific about how they might contribute to emission reduction and by when. Importantly, there are numerous technical, economic, environmental, and ethical obstacles related to these technologies and practices⁹ which is leading to much scepticism about whether they can be developed and implemented successfully given the urgency of the climate crisis.

5 *Scientific American* (2025). Trump Pentagon Is Purging “Climate Change Crap,” Hegseth Says. 14 March. <https://www.scientificamerican.com/article/trump-pentagon-purging-climate-change-measures-hegseth-says-raising-military/>

6 MVD (2023). *Roadmap Energiëtransitie - Operationeel Materieel*. p.9. <https://www.defensie.nl/downloads/publicaties/2023/01/31/roadmap-energiëtransitie-materieel>

7 Parkinson, S. (2025b). *Op. cit.* pp.13–15.

8 MOD (2023a). *Defence Aviation Net Zero Strategy*. <https://www.gov.uk/government/publications/defence-aviation-net-zero-strategy>

9 See, for example: Edwards, N. (2026). The military green transition: Decarbonisation as warfighting opportunity. *Political Geography*, vol.129: 103573. <https://www.sciencedirect.com/science/article/pii/S0962629826000892>

Table 2. Specific military GHG emission reduction targets of the top 15 spenders in NATO

Nation	GHG emission targets up to 2035	GHG emission targets 2035-2050	Notes
USA	none	none	Emission targets abandoned in 2025 (see section 2.4)
Germany	1990-2030: -65%; stationary only; Scope 1+2	2045: -100%; Scope 1+2	
UK	2018-2025: -30%; stationary only; Scope 1+2	2040: -100%; air force only; Scope 1+2	Scope 3 business travel is also included in the 2025 target
France	2010-2030: -50%; stationary only; Scope 1+2	none	
Poland	none	none	
Italy	none	none	
Canada	2005-2025: -40%; stationary only; Scope 1+2	2050: -100% Scope 1+2; Scope 3 (procurement)	
Turkiye	none	none	
Spain	none	none	
Netherlands	none	none	Targets instead set for reducing fossil fuel use
Sweden	none	none	
Norway	2019-2030: -20%; mobile only; Scope 1	none	Additional targets for reducing fossil fuel energy
Denmark	none	none	Targets instead set for energy saving
Romania	none	2040: -50%; base year unspecified; Scopes unspecified	
Belgium	none	2040: -100%; stationary only; Scope 1+2	

Notes and references

Countries listed by military budget, from highest to lowest, according to SIPRI (2026). *Op. cit.*

Germany: BMVG (2024). Nachhaltigkeitsbericht 2024 des Bundesministeriums der Verteidigung und der Bundeswehr. p.32. <https://www.bundesregierung.de/resource/blob/975274/2324394/a39a7ea33fddb9151c2524523d54d354/2024-12-09-nachhaltigkeitsbericht-verteidigung-data.pdf>

UK: Dept for Environment, Food & Rural Affairs (Defra) (2022). Greening Government Commitments 2021 to 2025 (update). Annex A. <https://www.gov.uk/government/publications/greening-government-commitments-2021-to-2025/greening-government-commitments-2021-to-2025> ; MOD (2023a). *Op. cit.* p.2.

France: MDA (2022). *Op. cit.* p.20.

Italy: SMDD (2019). Piano per la Strategia Energetica della Difesa. <https://www.difesa.it/assets/allegati/1884/a7fde885-c661-4ed2-8711-e730fe44df71.pdf>

Canada: Dept of National Defence (2023). *Op. cit.* Targets 4, 9 & 18. pp.15-25.

Spain: Ministry of Defence (2023). Strategy on the Challenge of Climate Change. https://publicaciones.defensa.gob.es/media/downloadable/files/links/e/s/estrategia_minisdef_reto_cambio_clim_tico_ingl_s.pdf

Netherlands: MVD (2023). *Op. cit.* p.9.

Sweden: Forsvarsmakten (2026). Hållbarhet. <https://www.forsvarsmakten.se/om-forsvarsmakten/myndighetsinformation/hallbarhet/>

Norway: Forsvaret (2022). Forsvarssektorens klima- og miljøstrategi. p.6. https://www.forsvaret.no/om-forsvaret/miljo/Forsvarssektorens%20klima-%20og%20milj%C3%B8strategi_fullversjon.pdf/_/attachment/inline/a218ff79-3a20-4541-bc3c-bb8c1f0c931e:94e6670c72fae916273baabb408c64e6214cdcf8/Forsvarssektorens%20klima-%20og%20milj%C3%B8strategi_fullversjon.pdf

Denmark: Danish Ministry of Defence (2021). Green Action Plan 2021-25. p.6 <https://www.fmn.dk/globalassets/fmn/dokumenter/strategi/miljo/-danish-mod-green-action-plan-2021-2025-.pdf>

Romania: Ministry of National Defence (2023). Strategy on preparing Romanian Armed Forces to address climate change and energy transition. p.13. https://english.mapn.ro/programs_and_strategies/programs_and_strategies.pdf

Belgium: La Défense (2023). *Op. cit.* p.14.

Additional information from: Thomasen G (2025). NATO and Climate Change: Towards a Joint Understanding and Response. BASIC. <https://basicint.org/wp-content/uploads/2025/03/NATO-and-Climate-Change-2nd-Editon-Feb-2025.pdf>

For example, on ‘sustainable’ aviation fuels – or, arguably more accurately, ‘alternative aircraft fuels’ (AAFs) – there are numerous questions. Several militaries have made prominent announcements¹⁰ and carried out high profile demonstrations¹¹ using these fuels. These follow similar upbeat messaging by the civilian aviation industry. However, there are significant problems with AAFs made using both biological materials and synthetic processes.¹² If biological AAFs are produced from energy crops, then the lifecycle carbon emissions can offset a large proportion of the planned reduction. Furthermore, energy crops can displace food crops contributing to food insecurity. AAFs made from waste biological material are an option that can deal with these problems. However, the supply of these waste materials is very limited, and is already fully utilised by other industries. Synthetic AAFs produced using renewable energy are generally superior to biological AAFs, but the production process is not very efficient, so it is currently not an effective way to use renewable energy, given the higher savings that can be achieved for other uses of this cleaner energy source. These reasons are central to why attempts to rapidly expand the use of AAFs in civilian aviation are falling far short of targets.¹³ Indeed, some airlines are now facing legal action as sustainability claims for AAFs breach new EU regulations on greenwashing.¹⁴

Overall, the GHG emission targets shown in Table 2 demonstrate two conflicting pressures. On the one hand, given the agreement by NATO members of its Climate Change and Security Action Plan in 2021,¹⁵ including explicit recognition of security threats related to the climate crisis, together with the NATO emission targets agreed in 2022 (see section 2.5), the limited nature of the commitments made to reducing military emissions is very disappointing. On the other hand, given the 2022 Russian invasion of Ukraine, NATO’s 2025 spending targets, and the technological obstacles to military decarbonisation, the limited targets are not surprising. However, given the urgency of the climate crisis – which will continue to accelerate even while NATO prefers to focus on rearmament programmes – neglecting the environmental threat will only deepen the security threats facing the alliance.

2.3 Standardised national military emissions targets across the world

The variety of targets, the fraction of emissions that they cover, and the timeframes over which they apply all make it very difficult to assess how ambitious they are. Hence, some form of standardisation would be useful. Table 3 provides an example of this for 10 national military emissions targets up to 2035. We have chosen to compare near-term targets – up to 2035 – as these tend to be the most robust

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- 10 See, for example: UK MOD (2024). *Royal Air Force missions fuelled sustainably*. 14 August. <https://www.gov.uk/government/news/royal-air-force-missions-fuelled-sustainably>; Defence Connect (2025). *Royal Australian Air Force Base East Sale begins 12-month SAF program*. 10 February. <https://www.defenceconnect.com.au/air/15491-royal-australian-air-force-base-east-sale-begins-12-month-saf-program>
- 11 See, for example: *The Aviationist* (2025). *Red Arrows Display at RIAT 2025 Will Use Sustainable Aviation Fuel*. 9 July. <https://theaviationist.com/2025/07/09/red-arrows-sustainable-fuel/>; Australian Government Defence (2025). *Flying clean at Talisman Sabre 2025*. 17 July. <https://www.defence.gov.au/news-events/news/2025-07-17/flying-clean-talisman-sabre-2025>
- 12 Asher, F. (2022). *The mirage of zero-emissions flying*. *Responsible Science*, no.4. <https://www.sgr.org.uk/resources/mirage-zero-emissions-flying>
- 13 See, for example: Possible (2022). *Missed Targets: A brief history of aviation climate targets*. <https://www.wearepossible.org/our-reports/missed-target-a-brief-history-of-aviation-climate-targets>; *The Guardian* (2026). *Airline industry chiefs say 2050 net zero goal now unlikely*. 8 June. <https://www.theguardian.com/environment/2026/jun/08/airline-industry-chiefs-willie-walsh-2050-net-zero-unlikely>
- 14 Climate Home News (2025). *Airlines risk legal challenges by advertising jet fuel as “sustainable”, NGO warns*. 16 July. <https://www.climatechangenews.com/2025/07/16/airlines-risk-legal-challenges-by-advertising-jet-fuel-as-sustainable-ngo-warns/>
- 15 NATO (2021). *NATO Climate Change and Security Action Plan*. 14 June. <https://www.nato.int/en/about-us/official-texts-and-resources/official-texts/2021/06/14/nato-climate-change-and-security-action-plan>

Table 3. Analysis of reduction targets for core military GHG emissions up to 2035 for 10 selected nations

Nation	Target period	Official target for emissions	% core emissions covered	Effective target for core emissions	Standardised target per year	Effective year for reaching net zero core emissions (best case)
Germany	1990–2030	-65%	50%	-33%	-0.8%	2113
UK	2017–2025	-30%	42%	-13%	-1.6%	2081
France	2010–2030	-50%	17%	-9%	-0.4%	2245
Japan	2013–2030	-50%	unknown	unknown	unknown	unknown
Australia	2006–2030	-43%	100%	-43%	-1.8%	2062
Canada	2005–2025	-40%	55%	-22%	-1.1%	2096
Norway	2019–2030	-20%	92%	-18%	-1.7%	2079
Switzerland	2001–2030	-40%	100%	-40%	-1.4%	2074
Ireland	2016/18–2030	-51%	100%	-51%	-3.9%	2042
Slovenia	2022–2035	-46%	100%	-46%	-3.5%	2051

Notes and references

Countries listed by military budget, from highest to lowest, according to SIPRI (2025). *Op. cit.*

% core emissions covered – percentage of total Scope 1+2 emissions in base year covered by target.

Standardised target – annual percentage reduction in total Scope 1+2 emissions over target period (calculated by dividing ‘effective target’ by ‘target period’).

Germany Target: BMVG (2024). *Op. cit.* p.32.

Emissions covered: 1990 data available for stationary emissions but not for mobile, so 50% is used as a conservative estimate based on stationary and mobile data in later years, e.g.: BMVG (2024). *Op. cit.* pp.50–51.

UK Target: Defra (2022). *Op. cit.* Annex A.

Emissions covered: Stationary data (2017–18): MOD (2025). Annual report and accounts, 2024–25. p.60.

<https://www.gov.uk/government/publications/ministry-of-defence-annual-report-and-accounts-2024-to-2025>

Mobile data (2018–19): MOD (2021b). Annual report and accounts, 2020–21. p.267.

<https://www.gov.uk/government/publications/ministry-of-defence-annual-report-and-accounts-2020-to-2021>

(Mobile data from 2018–19 used due to data quality problems with that from 2017–18.)

France Target: MDA (2022). *Op. cit.* p.20.

Emissions covered: Stationary and mobile data only available for 2019 from French military sources – for details, see: Parkinson, S. & Cottrell, L.

(2021). Under the Radar: the carbon footprint of Europe’s military sectors. SGR/CEOBS. pp.17-18. <https://www.sgr.org.uk/publications/under-radar-carbon-footprint-europe-s-military-sectors>

Japan Target: Ministry of Defense (2022a). Ministry of Defense Response Strategy on Climate Change. p.2. https://www.mod.go.jp/j/approach/agenda/meeting/kikouhendou/pdf/taishosenryaku_202208_e.pdf

Emissions covered: stationary data for 2013–14: Ministry of Defense (2022b). Plan Establishing Measures to be Implemented by the Ministry of

Defence Concerning its Administrative Affairs and Operations for the Reduction of Greenhouse Gas Emissions (Japanese). p.13. <https://www.mod.go.jp/j/approach/chouwa/kankyotaisaku/pdf/gasu.pdf>

Australia Target & emissions covered: Australian Government Defence (2024). Defence Net Zero Strategy. pp.11, 17 & 21. <https://www.defence.gov.au/about/strategic-planning/defence-net-zero-strategy>

Canada Target: Dept of National Defence (2023). *Op. cit.* pp.15–25.

Emissions covered: stationary and mobile data for 2005–06 calculated from:

Government of Canada (2025). Greenhouse Gas Emissions Inventory: Open Govt. Portal. Items 1 & 6. <https://open.canada.ca/data/en/dataset/6bed41cd-9816-4912-a2b8-b0b224909396>

Norway Target: Forsvaret (2022). *Op. cit.* p.6.

Emissions covered: stationary and mobile data for 2019:

FFI (2024). Forsvarssektorens miljø- og klimaregnskap for 2023. p.51. https://www.forsvaret.no/om-forsvaret/miljo/Forsvarssektorens%20klimaregnskap%20for%202023.pdf/_attachment/inline/c1183920-f674-4c03-bf75-b821a40492ec:b7ad2b1ae98e5290f8e88a59799e40b8be9c5778/Forsvarssektorens%20klimaregnskap%20for%202023.pdf

Switzerland Target: VBS (2021a). *Op. cit.* p.8.

Emissions covered: stationary and mobile data for 2001: VBS (2021b). Energiekonzept 2020: Schlussbericht. p.14. <https://www.vbs.admin.ch/dam/de/sd-web/la6dLhje4TtXt/Energiekonzept-VBS-2020-Schlussbericht-de.pdf>

Ireland Target & emissions covered:

Dept of Defence (2024). Climate Action Roadmap. pp.9–10. <https://assets.gov.ie/312562/7a69eb00-be87-47d5-94ee-4a03d9d6210c.pdf>

Dept of Defence & Defence Forces (2025). Annual Report 2024. pp.60–61. <https://www.gov.ie/en/department-of-defence/publications/department-of-defence-and-defence-forces-annual-report-2024/>

Slovenia Target for 2035 & emissions covered calculated from: Ministry of Defence (2024). *Op. cit.* pp.22–23. For further discussion of their target, see main text.

especially because they are not decades into the future. There is also a major climate benefit from early emissions reduction because it is cumulative emissions upon which global temperature changes depend. We have also focused on core emissions because, as stated earlier, virtually no targets have yet been set for Scope 3 emissions.

The results are very revealing. Only two countries – Ireland and Slovenia – have set near-term targets consistent with achieving net zero emissions before or close to 2050. Indeed, Slovenia’s target is actually for an annual reduction of 3.5% for the whole time period from 2022 to 2050. Extrapolating Australia’s target means that it would reach net zero emissions in the 2060s, and Switzerland and Norway would reach this point in the 2070s. It is striking that three of the nations which seem to have the most ambitious headline targets – Germany (-65%), France (-50%), and Japan (-50%) – are revealed to be among the least ambitious due to some combination of the following: (a) the limited coverage of the target; (b) the long timeframe; or (c) incomplete data on military activities not covered by the target. Indeed, France and Japan perform especially poorly. These results demonstrate the importance of openness and clarity on any targets – and the use of standardisation to compare them.

Militaries might argue that only comparing near-term targets is unfair as they would intend steeper annual reductions in (for example) the 2040s as new lower carbon technologies are developed. However, there are several flaws in this perspective. Firstly, there is a major climate benefit from early emissions reduction because it is cumulative emissions upon which global temperature changes depend. Rapid reductions in the late 2040s (assuming they were actually achieved in practice) are considerably less effective than reductions over the next decade. Secondly, there are numerous technological

options already available – such as building energy efficiency improvements and small-scale renewable energy technologies – which could be implemented at military bases immediately (see section 3). Failure to pursue these options demonstrates a lack of interest in tackling the climate problem. Thirdly, targets for reducing core emissions benefit from existing civilian action to decarbonise national electricity grids as most military bases rely on this source of electricity (also see section 3). Grid decarbonisation is progressing rapidly in many nations, especially in Europe, mainly thanks to wind, solar, and energy storage technologies. Finally, there are numerous obstacles – both technological and economic – to developing low carbon weapons systems and other military technologies,¹⁶ so there is a real possibility that emissions reduction action will become significantly harder in the future.

It is also important to remember that the assessment of targets in Table 3 only covered core emissions – not Scope 3. As discussed in section 2.2, Scope 3 emissions could represent over 80% of a military’s carbon footprint so this, of course, is a very serious shortcoming.

2.4 Standardised military emission targets in the USA

Turning to the case of the USA, although the government has currently abandoned its targets for reducing military GHG emissions, it is likely that a future government will reinstate them in some form. Hence, in Table 4, we have also subjected the four targets set by the US military during the Biden administration to the same analysis that we carried out for other nations in Table 3.

Analysis of these targets was especially complicated by incomplete descriptions in the climate plans for the air force, navy, and army. In particular, there was almost no mention of the exemptions granted to the emissions

16 See, for example: Edwards, N. (2026). *Op. cit.*; *The Guardian* (2026). *Op. cit.*; Possible (2022). *Op. cit.*

of combat aircraft, ships, and land vehicles provided for by the Presidential Executive Order 14057.¹⁷ Hence, again, headline targets appeared much more ambitious than the emissions reduction action actually demanded.

Indeed, the US Army secured an even less demanding target by opting for a different base year – 2005 rather than 2008. Army emissions were significantly higher in 2005 due to its heavy involvement in the Iraq War, hence drawdown from that controversial war was essentially being counted as ‘climate action’.

Overall, our analysis finds a similar problem to that outlined for many of the other nations above: the pace of action demanded by the targets set up to 2035 was not consistent with decarbonisation before 2050. Indeed, the US military targets were among the least ambitious, only being sufficient to reach net zero, at best, by the end of the this century (for the US Army) and, at worst, near the end of the next century (for the US Air Force).

Table 4. US targets for military GHG emissions before abandonment by Trump administration

Branch	Pre-2035 target period	Official target for emissions	% core emissions covered	Effective target for core emissions	Standardised target per year	Effective year for reaching net zero core emissions
Dept of Defense (overall)	2008–2030	-65%	35%	-23%	-1.0%	2105
Air Force	2008–2033	-50%	29%	-15%	-0.6%	2180
Navy	2008–2030	-65%	23%	-15%	-0.7%	2155
Army	2005–2030	-50%	58%	-29%	-1.2%	2091

Notes and references

% core emissions covered – percentage of total Scope 1+2 emissions in base year covered by target. In all four cases, only stationary emissions (Scope 1+2) were covered by targets.

Standardised target – annual percentage reduction in total Scope 1+2 emissions over target period (calculated by dividing ‘effective target’ by ‘target period’).

All branches also had 2050 targets to reach net zero for stationary emissions. The navy also had a net zero target for mobile emissions, although emphasised the role of carbon offsets.

Targets:

Federal Register (2021). Presidential Documents: Executive Order 14057 of December 8, 2021: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability. Vol.86, No.236. Sec.102iv & Sec.602b.

<https://www.govinfo.gov/content/pkg/FR-2021-12-13/pdf/2021-27114.pdf>

Dept of the Air Force USA (2022). Climate Action Plan. p.10. (Key Result 1.6) <https://web.archive.org/web/20230506170648/https://www.safe.hq.af.mil/Portals/78/documents/Climate/DAF%20Climate%20Action%20Plan.pdf>

Dept of the Navy USA (2022). Climate Action 2030. p.13. <https://web.archive.org/web/20220531172223/https://www.navy.mil/Portals/1/Documents/Department%20of%20the%20Navy%20Climate%20Action%202030%20220531.pdf>

US Army (2022). Climate Strategy. p.5. https://web.archive.org/web/2022022044343/https://www.army.mil/e2/downloads/rv7/about/2022_army_climate_strategy.pdf

Emissions covered:

Dept of Defense (overall): Stationary and mobile data from FY08. US Dept of Energy (undated). Federal Energy Management Program: Comprehensive Annual Energy Data: Dept of Defense: Fiscal Year 2008. <https://ctsedwwweb.ee.doe.gov/Annual/Report/ComprehensiveGreenhouseGasGHGInventoriesByAgencyAndFiscalYear.aspx>

Air Force, Navy, Army: Stationary and mobile data from 2010. Department of Defense (2021). Report on Greenhouse Gas Emission Levels. https://www.documentcloud.org/documents/22067222-usa001358-21-rtc-greenhouse-gas-emissions-levels_updated_report-only/

17 “The head of an agency may exempt from the provisions of this order any vehicle, vessel, aircraft, or non-road equipment that is used in combat support, combat service support, military tactical or relief operations, or training for such operations or spaceflight vehicles, including associated ground-support equipment.” Federal Register (2021). Presidential Documents: Executive Order 14057 of December 8, 2021: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability. Vol.86, No.236. Sec.602b. <https://www.govinfo.gov/content/pkg/FR-2021-12-13/pdf/2021-27114.pdf>

Table 5. GHG emission targets of the NATO Enterprise, as announced in 2022

International body	GHG emission targets up to 2035	GHG emission targets 2035–2050	Notes
NATO Enterprise	2019–2030: -45%; all Scope 1+2	2050: -100%; all Scope 1+2	Scope 3 'business travel' is also included (see main text)

Source: NATO (2022). Opening speech by NATO Secretary General Jens Stoltenberg at the High-Level Dialogue on Climate and Security, NATO Public Forum. 28 June. <https://www.nato.int/en/news-and-events/events/transcripts/2022/06/28/opening-speech>

2.5 Emission targets for the 'NATO Enterprise'

In addition to some national militaries, NATO has also set a target for net zero GHG emissions, as shown in Table 5.

At first sight, the targets seem to be relatively ambitious – at least compared with those declared by individual states (including members of NATO). However, it is important to note some unique features of these commitments. While NATO is the world's largest military alliance, currently comprising 32 nations and responsible for about 55% of global military expenditure,¹⁸ the target does not include any emissions of the national militaries of member states. It only applies to

the emissions of the assets directed owned by the 'NATO Enterprise', including Scope 1, 2, and the business travel component of Scope 3.¹⁹ These assets include buildings used by NATO staff, some surveillance aircraft, and some ships,²⁰ so are very small compared with nearly all national militaries. Indeed, a figure for the total GHG emissions covered by the NATO Enterprise has not been publicly published to date, nor even a full list of assets covered within the total. Furthermore, although NATO's emission targets were the subject of a high-profile announcement in 2022 (see Table 5), at the time of writing, these targets are not mentioned on the relevant section of the NATO website,²¹ leading to concern – especially given current US government policies – that they have been quietly abandoned.

18 SIPRI (2026). *Op. cit.* p.8.

19 NATO (2023). *Greenhouse Gas Emissions Mapping and Analytical Methodology*. July. pp.7-11. https://www.nato.int/content/dam/nato/legacy-wcm/media_pdf/2023/7/pdf/230710-NATO-GHG-Methodology.pdf

20 See, for example: SHAPE (2021). *NATO Assets*. Supreme Headquarters Allied Powers Europe. <https://shape.nato.int/news-archive/2021/nato-assets>

21 NATO (2024). *Environment, climate change and security*. 18 July. <https://www.nato.int/en/what-we-do/wider-activities/environment-climate-change-and-security>

3. Progress against targets

This section examines the progress militaries have made towards meeting their emissions targets to date. Only seven militaries have publicly published sufficient data to be able to adequately assess this progress – four NATO nations and three non-NATO nations. Their targets were summarised in section 2.3, and the progress is presented here in order of the effective net zero target date, starting with the most ambitious, i.e. Ireland, Australia, Switzerland, Norway, UK, Canada, and Germany. A summary of the key findings is given in Table 6. For consistency, the data presented in this section is for core emissions (Scope 1 and 2) only, even though some nations have included small amounts Scope 3 (usually business travel) within their targets.

The latest data reported for Ireland's military²² shows that, in 2024, its core emissions were approximately 33,000 tCO₂e. This is a 49.5% reduction from the baseline level (an average over 2016-18), compared with the target of a 51% reduction by 2030. In short, Ireland is well ahead of its target. The fall seems to have been achieved mainly by efforts to reduce stationary emissions, including improving energy efficiency in buildings (e.g. through insulation and efficient electrical devices), phasing out direct fossil fuel use in buildings (e.g. through the use of bioenergy, solar power, and heat pumps), and the purchase of some civilian electric vehicles (EVs). During this period, there has also been a large decarbonisation of the

national electricity supply, with carbon intensity (measured in grams of carbon dioxide per kilowatt-hour) falling by approximately 33%,²³ so this has also made a significant contribution. Reductions in mobile emissions also seem to have been significant, but no separate details have been provided on these.

The latest data reported for the Australian military²⁴ shows that, in the financial year 2024–25, its core emissions were approximately 1,649,000 tCO₂e. This is a fall of 14% from the baseline level (in 2005–06), compared with a target of a 43% reduction by 2030. In short, Australia is currently well behind its intended progress. The reduction to date has all occurred in stationary emissions (which have fallen by 29%), and mainly seems to be due to decarbonisation of the national electricity grid – which has experienced a 30% reduction in carbon intensity over the period.²⁵ Installation of solar panels at bases, building energy efficiency improvements, and purchase of civilian EVs have also made significant contributions to the decline. Core mobile emissions have fluctuated significantly during the 19-year period, with the level in 2024–25 being 1% higher than the baseline level.

The latest data reported for the Swiss military²⁶ shows that, in 2024, its core emissions were approximately 154,000 tCO₂e. Emissions covered by targets were 43% lower than the baseline level (in 2001), compared with a target

22 Irish Dept of Defence & Defence Forces (2025). *Annual Report 2024*. pp.60–61. <https://www.gov.ie/en/department-of-defence/publications/department-of-defence-and-defence-forces-annual-report-2024/>

23 Calculated from: Our World in Data (2026a). *Lifecycle carbon intensity of electricity, 1990 to 2025*. Ireland. <https://ourworldindata.org/grapher/carbon-intensity-electricity?tab=line&country=~IRL>

24 Australian Government Defence (2025). *Defence Annual Report 2024–25*. p.208. <https://www.defence.gov.au/about/accessing-information/annual-reports>

25 Calculated from: Our World in Data (2026b). *Lifecycle carbon intensity of electricity, 1990 to 2025*. Australia. <https://ourworldindata.org/grapher/carbon-intensity-electricity?tab=line&country=~AUS>

26 VBS (2025). *Klimapaket Bundesverwaltung Bericht 2025 Zur Umsetzung im VBS*. pp.8–13. <https://www.vbs.admin.ch/dam/de/sd-web/ivTW-ifdZAsH/Klimapaket-BV-Umsetzung-VBS-Bericht-2025-de.pdf>

Table 6. Reported progress in GHG emission reduction for seven militaries

Nation	Reporting period	Emissions covered	Target/ Year	Reported change/ Year	Main reasons for change
Ireland	2016/18 to 2024	Core stationary & Core mobile	-51%/ 2030	-49.5%/ 2024	National grid decarbonisation; Military base decarbonisation; Not specified for mobile emissions
Australia	2005-06 to 2024-25	Core stationary & Core mobile	-43%/ 2030	-14%/ 2024-25 (stationary: -29%; mobile: +1%)	National grid decarbonisation; Military base decarbonisation
Switzerland	2001 to 2024	Core stationary & Core mobile	-40%/ 2030	-43%/ 2024 (stationary: -67%; mobile: -32%)	Military base decarbonisation; Reduction in mobile military activity
Norway	2019 to 2030	Core mobile	-20%/ 2030	+1%/ 2024	No significant change
	2019 to 2030	Core stationary	no target	-14%/ 2024	Military base decarbonisation
UK	2017-18 to 2024-25	Core stationary	-30%/ 2025-26	-34%/ 2024-25	Military base closures; National grid decarbonisation; Military base decarbonisation
	2017-18 to 2024-25	Core mobile	no target	-35%/ 2024-25	Reduction in mobile military activity
Canada	2005-06 to 2024-25	Core stationary	-40%/ 2025-26	-39%/ 2024-25	Military base decarbonisation
	2005-06 to 2024-25	Core mobile	no near-term target	-18.5%/ 2024-25	Not specified
Germany	1990 to 2023	Core stationary	-65%/ 2030	-82%/ 2023	Military base closures; National grid decarbonisation; Military base decarbonisation
	2008 to 2023	Core mobile	no near-term target	-26%/ 2023	Not specified

Notes

References are given in the main text. Data and references for the targets are given in section 2.3.

reduction of 40% by 2030.²⁷ Like Ireland, Switzerland is also well ahead of its target. Core stationary emissions fell by 67%, while core mobile emissions fell by 32%. Again, more efficient use of energy in buildings and an ongoing phase-out of fossil fuels in favour of onsite renewables for heating and electricity have been important factors. Expanded use of EVs has also made a contribution. Since the Swiss national electricity supply has already been almost completely decarbonised, there were already very few emissions from this source. A key reason for the fall in mobile emissions has been a reduction in the number of flight hours by the Swiss air force. This is expected to be temporary, and so these emissions will increase again.

The latest data reported for the Norwegian military²⁸ shows that, in 2024, its core emissions were approximately 260,000 tCO₂e – approximately the same as in the baseline year (2019). Core mobile emissions – those covered by targets – were 1% higher than in 2019, compared with a target reduction of 20% by 2030. In short, Norway was not on course to hit its target. Core stationary emissions fell by 14% over the period, although these are (unusually) not covered by a target. The main reason for this fall seems to be building energy efficiency improvements. As in Switzerland, Norway's national electricity supply has already been almost completely decarbonised, hence there were already very few emissions from this source. The proportion of renewable energy used for military bases in Norway (for

both electricity and heating) has been high for several years, and stood at 94% in 2024. As mentioned earlier, Norway is the only nation that compiles extensive figures for Scope 3 emissions. The latest data shows that these rose by 11% between 2020 and 2024.

The latest data reported for the UK military²⁹ shows that, in 2024–25, its core stationary emissions were approximately 953,000 tCO₂e. Emissions covered by targets were 34% less than the baseline level (in 2017–18), compared with a target of 30% by 2025–26.³⁰ In short, the UK was slightly ahead of its target. One significant reason for the fall in emissions was decarbonisation of the national electricity grid – which experienced a 28% drop in carbon intensity over the period.³¹ Other important factors were base closures as part of the Defence Estate Optimisation programme³² and building energy efficiency improvements at existing bases, especially in new buildings. Expansion of onsite renewable energy projects (especially bioenergy and solar) and the purchase of EVs have also played a role. Although not subject to a target, the core mobile emissions of the UK military have also fallen compared with levels in 2017–18. These emissions were 1,164,000 tCO₂e in 2024–25, a 35% reduction. However, these emissions vary mainly with military activity (known as 'operational tempo'), which was especially low in that year.³³ A further example is the emission level in 2021–22, which was especially high due to Operation Fortis, which included the seven-month voyage of the reformed Carrier

27 *Ibid.* The emissions actually covered by targets were 171,000 tCO₂e in 2024. This total included some Scope 3 emissions due to business travel (also known as duty travel) and staff commuting. Business travel emissions have also fallen significantly due to a reduction in the number of civilian flights taken by staff.

28 FFI (2025). Forsvarssektorens miljø- og klimaregnskap for 2024. pp.49–55. <https://www.ffi.no/publikasjoner/arkiv/forsvarssektorens-miljo-og-klimaregnskap-for-2024>

29 MOD (2025). *Annual report and accounts 2024–25*. pp.60 & 240. <https://www.gov.uk/government/publications/ministry-of-defence-annual-report-and-accounts-2024-to-2025>

30 *Ibid.* The emissions actually covered by targets were 880,000 tCO₂e in 2024–25. The targets excluded emissions at overseas bases and fugitive emissions (Scope 1 and 2), but included UK business (duty) travel (Scope 3).

31 Calculated from: Our World in Data (2026d). *Lifecycle carbon intensity of electricity, 1990 to 2025*. UK. <https://ourworldindata.org/grapher/carbon-intensity-electricity?tab=line&country=~GBR>

32 MOD (2026). *Defence Estate Optimisation Portfolio*. <https://www.gov.uk/guidance/defence-estate-optimisation-deo-portfolio>

33 MOD (2025). *Op. cit.* p.240 (footnote 9).

Strike Group (CSG) to the Far East.³⁴ The CSG also undertook an extensive voyage in 2025,³⁵ so the yet-to-be reported mobile emissions for 2025–26 are likely again to be high. No separate reporting has yet been provided of aviation GHG emissions, so it is hard to judge the progress of the Defence Aviation Net Zero Strategy. Data on aviation fuel consumption has, however, been published,³⁶ and this shows a fall in 2024–25, but this also appears to be due to a drop in military activity rather than any technological changes. Indeed, with UK military spending growing rapidly to hit the new NATO spending targets, future activity levels look set to be higher in general – with a knock-on effect on GHG emissions.

The latest data reported for the Canadian military³⁷ shows that, in the financial year 2024–25, its core stationary emissions – those covered by near-term targets – were approximately 474,000 tCO₂e. This was a 39% fall compared with the baseline level (in 2005–06), compared with a target of a 40% reduction by 2025–26. In short, Canada is on course to meet this target. Some broad details have been provided on the measures that have been implemented in the latest progress report on the military climate strategy.³⁸ The report says that efforts to improve building energy efficiency, increase the use of renewable energy, and purchase EVs have contributed. Some degree of national grid decarbonisation

also seems to have contributed, although this is less significant than in, for example, Ireland or the UK.³⁹ Data is also provided on core mobile emissions, which are subject to a 2050 net zero target (so long as military capability is maintained – see section 2.2), but no interim targets. These emissions stood at approximately 522,000 tCO₂e in 2024–25, a fall of 18.5% from 2005–06.⁴⁰ Assuming a linear annual decline to meet the net zero target, these emissions would need to have fallen by 42% to be on course, so they are far behind the desired rate. No explanation is given for the reduction to date, or the extent to which it is due to reduced military activity or technological improvements. Data on the percentages of ‘low carbon fuels’ (biofuels and synthetic fuels – see section 2.2) used by the navy and air force showed a total of “less than 1%”, so this is not the reason. If it is due to reduced military activity – like the UK and Switzerland – then there is likely to be an intention to reverse this fall, especially given NATO’s current policies and new spending targets.

The latest data reported for the German military⁴¹ shows that, in 2023, its core stationary emissions – those covered by near-term targets – were approximately 875,000 tCO₂e. This was a 82% fall compared with the baseline level (in 1990), compared with a target of a 65% reduction by 2030. In short, Germany is well ahead of its target. However,

34 MOD (2023b). *Annual report and accounts 2022–23*. p.204 (footnote 7). <https://www.gov.uk/government/publications/ministry-of-defence-annual-report-and-accounts-2022-to-2023>

35 Royal Navy (2025). Carrier Strike Group. <https://www.royalnavy.mod.uk/carrier-strike-group>

36 MOD (2025). *Op. cit.* p.240.

37 Government of Canada (2026). Greenhouse Gas Emissions Inventory: Open Govt Portal. Items 1 & 6. April. <https://open.canada.ca/data/en/dataset/6bed41cd-9816-4912-a2b8-b0b224909396> NB Elsewhere on the GoC website, figures for the total emissions of the ‘National Safety and Security Fleets’ are given. These partially overlap with, but are not the same as, military emissions.

38 Dept of National Defence (2025). Defence Climate and Sustainability Strategy 2024–2025 Results Report. <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/defence-climate-and-sustainability-strategy-2023-2027/departmental-sustainable-development-strategy-report-2024-2025.html>

39 Our World in Data (2026c). *Lifecycle carbon intensity of electricity, 1990 to 2025*. Canada. <https://ourworldindata.org/grapher/carbon-intensity-electricity?tab=line&country=-CAN>

40 GoC (2026). *Op. cit.*

41 BMVG (2024). *Nachhaltigkeitsbericht 2024 des Bundesministeriums der Verteidigung und der Bundeswehr*. p.32 <https://www.bundesregierung.de/resource/blob/975274/2324394/a39a7ea33fddb9151c2524523d54d354/2024-12-09-nachhaltigkeitsbericht-verteidigung-data.pdf>

the target had already been exceeded before 2008 mainly due to mass base closures and large reductions in military personnel after the end of the Cold War, hence this is not a useful guide to planned future action to control GHG emissions. Instead, we consider the period from 2008 to 2023, not least because more detailed GHG emissions data is available for the core emissions of the German military – for both its stationary and mobile components. Core stationary emissions in 2008 were approximately 1,530,000 tCO₂e, and these fell to 875,000 tCO₂e in 2023,⁴² a fall of 43% over 15 years. One important contribution was the decarbonisation of the national electricity grid – which saw a 31% reduction in emissions intensity over the period.⁴³ Other significant contributors have been energy efficiency improvements in buildings (including district heating), installation of onsite renewable energy technologies (including bioenergy, solar, and geothermal), and behaviour change.⁴⁴ Core mobile emissions also fell during the 2008–23 period – by 26%.⁴⁵ There is little indication that this reduction was due to technological improvements, so it is more likely that it was because of a decline in military activity – as in the cases of the UK and Switzerland. If this is the situation then, given that a major German rearmament programme is now underway – driven by the Russia-Ukraine War and new NATO spending targets – these emissions could already be increasing.

Table 6 summarises the key information presented in this section. It shows that these seven nations are making significant progress in decarbonising their military bases, but that several of them have been helped significantly by large reductions in the carbon intensity of the civilian national electricity grids (Ireland, Australia, UK, and Germany) and/ or military base closures (UK and Germany). Only Switzerland and Canada seem to have achieved targeted reductions in these emissions mainly from technological measures implemented by the military. Arguably, an even more significant finding is that there is no clear data showing that efforts to reduce core mobile emissions through technological measures are having a significant impact. Where these emissions have fallen, the available evidence points to a drop in military activity being the main or only cause. Indeed, this was also a finding of a report by the US military before its emission reduction programme was abandoned.⁴⁶ A further important finding from Norway’s extensive data monitoring is that supply-chain emissions have risen significantly, which would be expected due to the increase in spending in line with NATO targets.

Although incomplete reporting hampers a full comparison of progress made by these nations, overall, the military base decarbonisation programmes of Ireland and Switzerland do seem to have been the most successful to date.

42 *Ibid.*

43 Calculated from: Our World in Data (2026d). *Lifecycle carbon intensity of electricity, 1990 to 2025*. Germany. <https://ourworldindata.org/grapher/carbon-intensity-electricity?tab=line&country=~DEU>

44 BMVG (2024). *Op. cit.* pp.31–35

45 BMVG (2024). *Op. cit.* p.50

46 The report stated that “The downward trend in OE-associated emissions [i.e. core mobile emissions] is largely a product of the gradual reduction in combat operations in Iraq and Afghanistan and the curtailment of collective training in response to the COVID pandemic.” US Dept. of Defense (2023). Department of Defense Plan to Reduce Greenhouse Gas Emissions. p.3 <https://media.defense.gov/2023/Jun/16/2003243454/-1/-1/1/2023-DOD-PLAN-TO-REDUCE-GREENHOUSE-GAS-EMISSIONS.PDF>

4. Main findings and recommendations

The global military carbon footprint is thought to be large and rising rapidly. A growing number of militaries recognise that they need to put into place climate change strategies, i.e. plans which govern both the adaptation of militaries to climate change risks and the mitigation (reduction) of greenhouse gas (GHG) emissions arising from military activities. However, most of the world's militaries do not seem to have compiled such plans, and if they have, they tend to focus on adaptation much more than mitigation.

This report has reviewed the GHG emission mitigation plans for the militaries of 26 nations – 20 which are members of NATO and six which are not. It has also looked at the emission commitments of NATO itself. The 26 nations are almost all democracies and hence among the most likely to be taking action in this area. We could not find similar climate strategy documents for any other major military, for example, that of China or Russia.

The report's findings give much cause for concern. They show that most military emissions within these 26 nations are not covered by any specific targets, most of the targets that do exist are unambitious, and most of the emission reduction achieved to date has relied on civilian action (especially decarbonisation of national electricity grids), temporary reductions in military activity, or military base closure programmes. The most positive finding, from a military perspective, is that significant emission reductions have been achieved at bases in seven nations through building energy efficiency improvements and, increasingly, by onsite renewable energy generation. These emission reductions seem to have been achieved without reducing military war-fighting capabilities. But military base emissions represent a small fraction of the total military carbon footprint and, notably, the two most successful nations in achieving this

progress seem to be Ireland and Switzerland. It is probably no coincidence that they are also both militarily neutral countries.

In more detail, the report findings are as follows.

- Only five nations out of 26 (Australia, Canada, Germany, Slovenia, Switzerland) have explicitly stated an intent for a 'net zero military'.
- Of the top 15 military spending nations in NATO, only seven had explicit targets for reducing GHG emissions (Belgium, Canada, France, Germany, Norway, Romania, UK) while two others had targets for reducing fossil fuel or energy use (Netherlands, Denmark). One nation (USA) has abandoned its targets.
- Of the nine nations in our sample with the most explicit emission targets, only four had near-term targets (up to 2035) covering 100% of their core (Scope 1 and 2) military emissions (Australia, Ireland, Slovenia, Switzerland). The other five had near-term targets covering between 17% and 92% of core emissions (Canada, France, Germany, Norway, UK). The incomplete coverage of targets can cause serious confusion. None had near-term targets covering supply-chain (Scope 3) emissions.
- For the nine nations with the most explicit targets, we extrapolated the planned decarbonisation rate to cover all core military emissions to give a 'best case' estimation of the year for reaching net zero. For two nations (Ireland, Slovenia), this was before or near 2050. For four nations (Australia, Norway, Switzerland, UK), this was during the 2060s to 2080s. For two nations (Canada, Germany), this was around 2100. For the other nation (France), this was after 2200. For the USA's now abandoned emission targets, the projected best case net

zero dates were between 2090 and 2180, depending on the armed forces branch. The aim of most national climate strategies is for net zero emissions by 2050 so, even under ‘best case’ conditions, most of these targets are far outside this aim. Indeed, given the numerous technological, economic, environmental, and ethical obstacles to decarbonising weapons systems, the path to net zero is highly contested.

- Regarding targets for NATO emissions, these only apply to a small amount of assets and activities directly controlled by the organisation itself (the ‘NATO Enterprise’), not to the militaries of the whole 32-nation alliance. Indeed, to date, there has been no clear explanation of the activities covered, and no subsequent reporting of emissions. The targets are also not mentioned on the ‘Environment, climate change and security’ section of NATO’s website, leading to concern that they have been quietly abandoned.
- For seven nations publishing emissions data on their progress (Australia, Canada, Germany, Ireland, Norway, Switzerland, UK), all seven were making significant progress in reducing core stationary emissions (at military bases). Four of these significantly benefited from civilian electricity grid decarbonisation (Australia, Germany, Ireland, UK). Two of these significantly benefited from base closure programmes (Germany, UK). The two nations with the most successful military programmes for reducing core stationary emissions seemed to be Ireland and Switzerland. No clear evidence was presented in any progress reports that efforts to decarbonise mobile military technologies (war-fighting capabilities) were yet having a significant impact on emissions. Where stated, the main factor influencing core mobile emissions was a change in the level of military activity.

- Only one nation was found to be carrying out extensive monitoring of Scope 3 (supply-chain) emissions (Norway) and only one nation has set (long-term) targets for reducing supply-chain emissions (Canada). The data from Norway indicates that supply-chain emissions can be the largest fraction of a military carbon footprint (over 80%), so this major emissions source is being widely neglected. The Norwegian data also shows an increase in recent years, which would be expected due to increasing spending in line with NATO targets.
- All military climate change mitigation strategies stated that efforts to reduce emissions would be focused on technological measures, and that military capability ‘would not be compromised’. No consideration was given to the potential emission reduction benefits of a change in military strategy or doctrine, for example, closing overseas bases or switching to ‘non-offensive defence’ postures⁴⁷ which would involve shorter-range (and therefore lower carbon) military capabilities.

Huge increases in military spending are now underway – driven by factors including Russia’s 2022 invasion of Ukraine and NATO’s new 5% GDP spending targets for military and security measures. There are major doubts that these spending rises will lead to a more peaceful world – indeed, the widespread concern is that they will lead to more conflict. One clear likelihood is that these spending rises are already increasing GHG emissions – supply-chain emissions, core mobile emissions, and (in most nations) core stationary emissions as well. While some gains have been achieved by a few nations in reducing stationary emissions, it is likely that even in these places the savings will be quickly overwhelmed by rises elsewhere. This report has included some projections for ‘best case’ decarbonisation dates which, we argue, show a lack of ambition

47 See, for example: Moller, B. (ed) (1994). *Non-offensive Defence For The Twenty-first Century*. Routledge. <https://www.taylorfrancis.com/books/edit/10.4324/9780429039300/non-offensive-defence-twenty-first-century-bjorn-moller>

for the trajectories of core military emissions (let alone supply-chain emissions). However, even these dates look highly optimistic given the difficulties now being faced. Indeed, without a major change of direction, it is highly questionable whether *any* military will decarbonise this century – even putting aside the impossibility of decarbonising war-fighting impacts which inevitably involve destroying carbon reservoirs, such as forests (as well as taking human life). This will further jeopardise net zero targets at both the national and global levels.

This report therefore makes the following key recommendations.

- Defence ministries, especially those with large budgets in global terms, should annually publish robust data on national military GHG emissions. This data should be made publicly available. At minimum, data on core (Scope 1 and 2) emissions should be published, but this should be quickly expanded to include extensive Scope 3 reporting, including all major supply-chains.
- Defence ministries should enact emission reduction targets with as wide a coverage as possible. If military emission reduction targets do not cover 100% of core emissions, then an ‘effective target’ should also be stated taking into account the limited coverage. (For example, if a 30% reduction target only applies to 50% of core emissions, then the effective target would be 15%, i.e. 0.3×0.5). Target dates for reaching net zero should also be stated. These measures would help to reduce any confusion surrounding these targets. Strong emission reduction targets should also be imposed on major suppliers.
- Militaries should pursue ambitious programmes for the reduction of core stationary emissions – such as building energy efficiency programmes and onsite renewable energy projects – as these have been the most effective to date. These programmes also have wider benefits, including increasing energy security and lowering costs.
- Militaries should ramp up efforts to monitor emissions related to armed conflict – known as Scope 3+ emissions. Serious efforts should be introduced to minimise such emissions.
- National governments should prioritise non-offensive defence strategies alongside diplomatic cooperation, non-violent conflict resolution, international arms control and disarmament agreements, and other peacebuilding measures. These would include closing overseas bases and curbing military spending. Not only are these likely to reduce the risks of armed conflict, they will also help to reduce GHG emissions, and allow spending to rise on urgent measures to tackle global poverty and environmental problems, which in turn will improve international security.

Appendix 1. Other national military climate strategies

This appendix lists national military climate change strategy documents within our sample of 26 nations, not otherwise mentioned in the report.

Estonia:

KM (2021). Valitsemissala keskkonna- ja Kliimapoliitika. https://kaitseministeerium.ee/sites/default/files/kaitseministeeriumi_valitsemissala_keskkonna-_ja_kliimapoliitika.pdf

Greece:

ΥΕΑ (2020). ΠΕΡΙΒΑΛΛΟΝΤΙΚΗ - ΕΝΕΡΓΕΙΑΚΗ ΚΑΙ ΠΟΛΙΤΙΚΗ ΠΡΟΣΑΡΜΟΓΗΣ ΣΤΗΝ ΚΛΙΜΑΤΙΚΗ ΑΛΛΑΓΗ. <https://www.greenarmedforces.mil.gr/politiki-klimatiki-allagi>

Luxembourg:

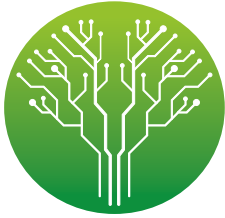
MFEA (2022). Luxembourg Defence Guidelines 2035. <https://gouvernement.lu/dam-assets/documents/actualites/2023/05-mai/11-bausch-lignes-directrices-2035-defense/luxembourg-defence-guidelines-2035-en.pdf>

New Zealand

Ministry of Defence (2019). Responding to the Climate Crisis – an implementation plan. <https://www.defence.govt.nz/assets/publications/Responding-to-the-Climate-Crisis.pdf>

Portugal:

Defesa Nacional (2023). National Defence Strategy for the Environment, Security and Climate Change. https://www.defesa.gov.pt/pt/comunicacao/documentos/Lists/PDEFINTER_DocumentoLookupList/Estrategia-Defesa-Nacional-Ambiente-Seguranca-Alteracoes-Climaticas_EN.pdf



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Military climate strategies:

Are they just greenwash?

This in-depth report assesses the carbon emission reduction plans for the militaries of 26 nations, mainly from Europe and North America. The findings give much cause for concern. They show that most military emissions within these 26 nations are not covered by any specific targets, most of the targets that do exist are unambitious, and most of the emission reduction achieved to date has relied on civilian action (especially decarbonisation of national electricity grids), temporary reductions in military activity, or military base closure programmes. Worse, the emission reduction that has occurred now looks like it will be overwhelmed due to massive rises in military spending.

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