Military greenhouse gas emissions: large, hidden, unaccountable

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Download slides from: https://www.sgr.org.uk/

Presentation given at a webinar organised by the Women's International League for Peace and Freedom; 19 September, 2025
(All references listed in final slides)

Some definitions

- Greenhouse Gas (GHG) Protocol/ CEOBS
  - Scope 1: direct GHG emissions
  - Scope 2: indirect emissions – mainly electricity
  - Scope 3: indirect emissions – mainly supply-chain
  - Scope 3+: indirect emissions – conflict-related (new)
- Other jargon
  - Core GHG emissions – scope 1, 2
  - Carbon footprint – scopes 1, 2, 3
  - Carbon bootprint – scopes 1, 2, 3, 3+

- For further info, see: Greenhouse Gas Protocol (2015); CEOBS (2022); SGR/ CEOBS (2022)

[image credits: UK MOD; Free Photos]

Reporting for direct (scope 1) emissions

- UN reporting system for military GHGs is deeply flawed
  - National Inventory Reports
- Specific category for reporting military GHGs
  - But some civilian emissions can also be included without disaggregation
- International military activities can be excluded
- Military base emissions can be reported unlabelled in other civilian categories
- Military craft emissions (air, sea, land) can be reported unlabelled in other civilian categories
- Better data can be reported separately by Defence Ministries

- Military GHGs reported under category 'energy (non-specified)'
- For further details, see: SGR (2020); MEG (2024)

Examples: Top 15 military spenders

- Reporting of direct military GHGs to UN
- 5 nations have *never* reported
  - India, Saudi Arabia, Japan, Iran, Israel
- 1 has *stopped* reporting
  - USA
- 2 do not *meaningfully* report
  - China, Russia
- 4 definitely *under-report*
  - UK, Germany, Australia, Canada
- 3 report, but quality *uncertain*
  - France, South Korea, Italy

- Latest data analysed is for year, 2021.
- For further details, see: MEG (2024)

Detailed examples: 5 ‘leaders’

Nation	Military GHGs reported to UN (million tCO2e)	Military GHGs reported by Defence Ministry (million tCO2e)	% under-reported to UN
USA	17.87	39.04	54%
UK	1.58	2.54	38%
Germany	0.99	1.31	24%
Canada	0.28	0.94	70%
Australia	0.82	0.92	11%

Sources: UN FCCC; Defence ministries

Average under-reporting (2021): 39%

- All data is direct GHGs (scope 1)
- Calculated by SGR based on data from UNFCCC, as summarised in MEG (2024), and Defence Ministries.

Reporting for indirect (scopes 2, 3, 3+) emissions

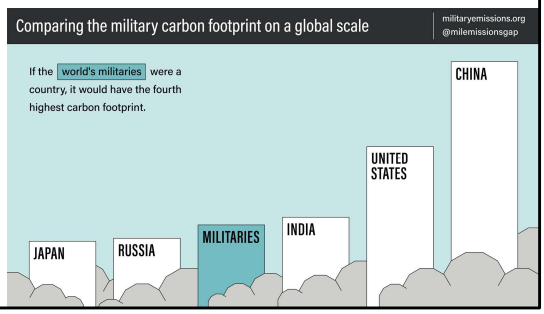
- Only in Defence Ministry reports
- Scope 2 emissions
  - Mainly emissions due to electricity supplied by national grid
  - Growing numbers of militaries reporting: quality generally good
- Scope 3 emissions
  - Very few nations report *any* data
  - Supply-chain emissions potentially very large – only 1 military reporting: Norway
  - Norway's scope 3 emissions are **80%** of military carbon footprint
  - Some nations report small fractions of scope 3
- Scope 3+ emissions
  - None reported by military organisations to date

- For further details, see: MEG (2024)
- For Norwegian military figures, see: FFI (2024). This assessment uses an 'environmentally-extended input-output' (EEIO) model, a specific type of economic model.

Global estimate: military carbon footprint

- Global total (best estimate): **2,750 million tCO_2e/ 5.5%**
- **Larger than Russia's** total carbon footprint
- Estimate for 2019
- Extrapolated from US/UK/EU data, using proxy data
- Uncertainty range
  - 3.3% to 7.0% of global GHG emissions
- Incomplete estimate
  - Not including war impacts (scope 3+)
  - Not including upper atmosphere effects

SGR/CEOBS (2022)



- tCO2e – tonnes of carbon dioxide equivalent
- Data from 2019 (i.e. before COVID-19 pandemic and Russian invasion of Ukraine)
- Proxy data includes: number of military personnel; ratio of stationary to mobile emissions
- NB Supply chain multiplier uses data from UK EEIO model – and is similar size to Norwegian multiplier
- Aviation emissions cause additional heating effects in upper atmosphere
- Source: SGR/CEOBS (2022)

Military spending rises & GHGs

- Major military expenditure (milex) rises, especially since 2022
- At least 11 studies have tried to model relationship between milex and GHG emissions
- SGR review of these studies (just published):
  - For each $100bn increase, military carbon footprint rises by **32 million tCO_2e**
  - NATO
    - Rise between 2019-24: **64 million tCO_2e**
    - Further rise to meet 3.5% GDP target: **132 million tCO_2e**
    - 10 years of spending at 3.5% GDP level: extra total of **1,320 million tCO_2e**
  - Uncertainties high (again)

- Milex data can be found in: SIPRI (2025)
- 64 million tCO2e – similar to territorial emissions of Bahrain
- 132 million tCO2e - similar to territorial emissions of Chile
- Emissions data from: SGR (2025)

What decisions do we need from COP?

- National Inventory Reports to UN
  - Complete & transparent reporting of direct military GHGs (scope 1) within 1y
- Defence Ministry annual reports etc
  - Reporting of core military GHG emissions (scopes 1, 2) within 1y
  - Reporting of military carbon footprint (scopes 1, 2, 3) within 2y
  - Reporting of military carbon bootprint (scopes 1, 2, 3, 3+) within 3y
- Military emissions included within national targets
  - Nationally Determined Contributions
- No just transition while military emissions remain hidden

Main references

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