

How war in Ukraine is derailing climate action

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These slides will be made available at: <https://www.sgr.org.uk/>

Presentation given at a campaigners' day school, 'War the climate emergency', Oxford, 29th October, 2022

This presentation will cover...

- Military carbon emissions
- Threat to climate from nuclear weapons
- 'Greening the military' – what does it really mean?
- Military spending v climate spending
- Redefining security
- (Fossil fuels and energy security)



- The issue of fossil fuels and energy security will be covered at various points during the presentation

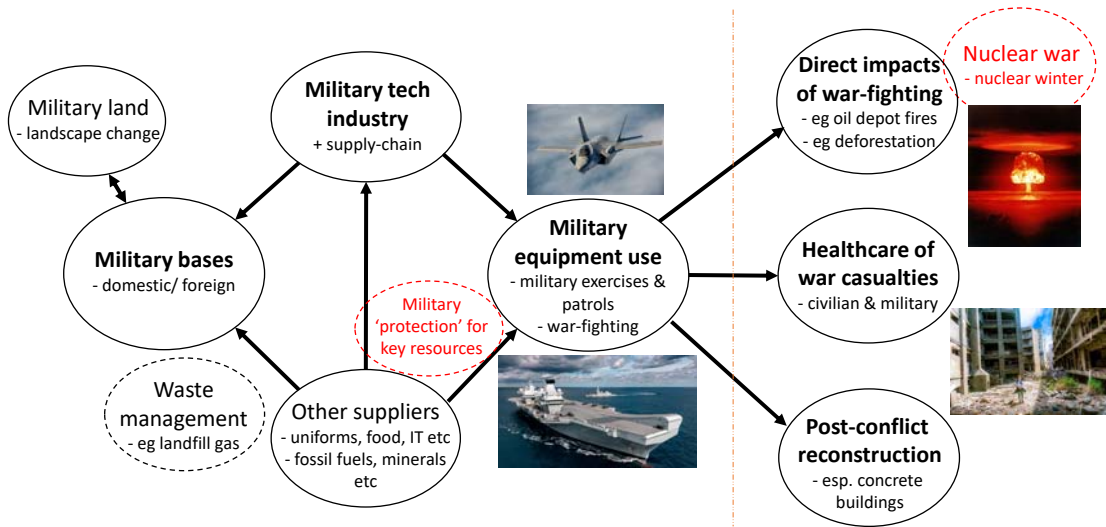
[image credit: USAF]

How big is the military carbon footprint?



[Image: Clker-Free-Vector-Images]

Military carbon footprint: key components

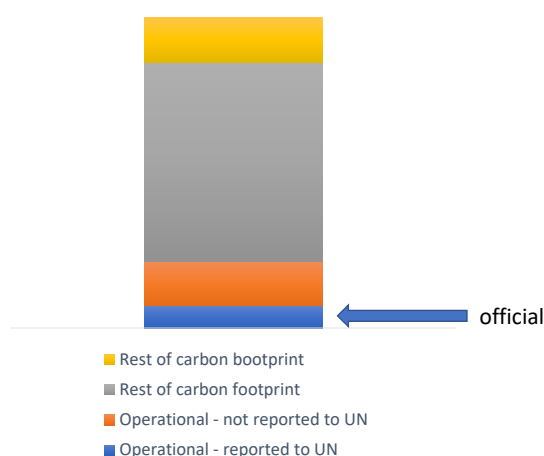


- Carbon footprint covers (black) items to the left of dotted line – and is comparable with similar categories in civilian sectors
- Carbon 'bootprint' is broader and also includes the items to the right of dotted line
- For more analysis, see (e.g.) SGR (2020).

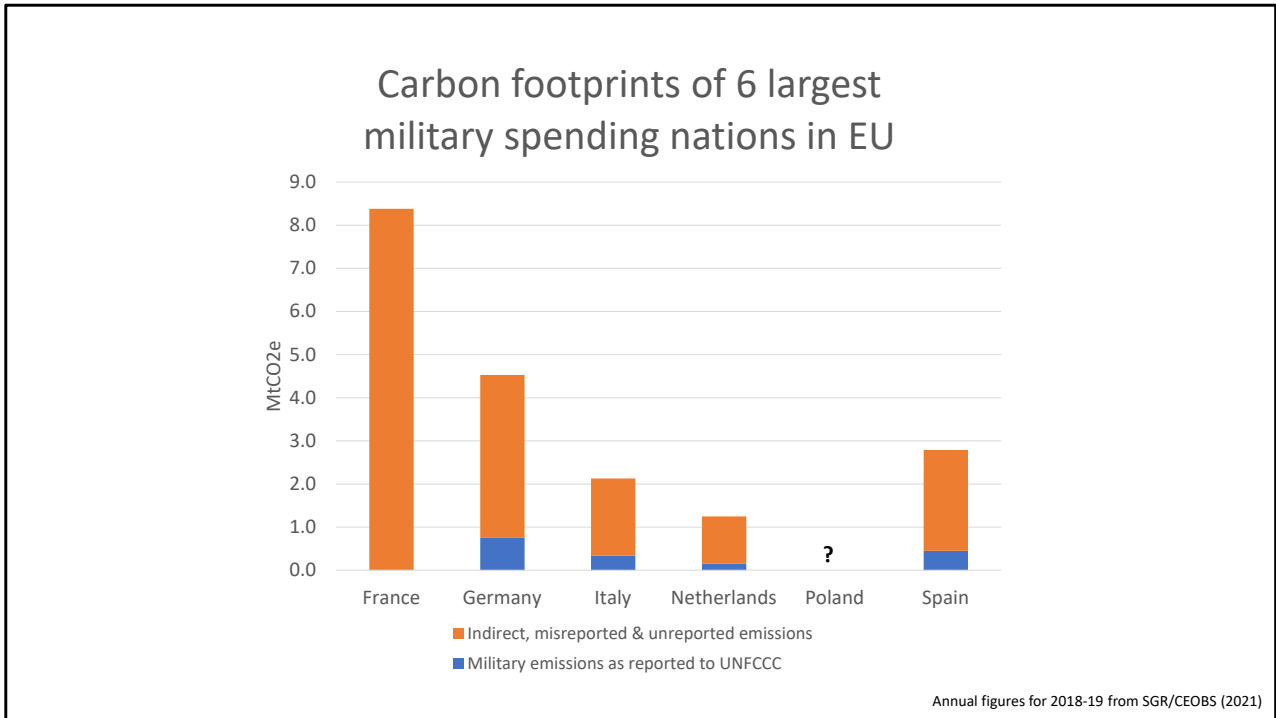
[image credits: MOD; Gerd Altmann; Free Photos]

How much data is there?

- Data on military carbon emissions is very poor
- Main categories
 - Operational (mobile + stationary)
 - Supply-chain
 - War-fighting impacts
- Supply-chain probably largest source of emissions
- Probably less than 10% of carbon footprint is officially reported to UN under climate treaties as military



- Data reported in 2021 under UNFCCC
 - 13 of 40 industrialised nations reported no mobile military emissions
 - 28 of 40 industrialised nations reported no stationary military emissions
 - Nearly all developing nations reported no data at all on military carbon emissions
 - Data that was reported incomplete in various ways
 - Source: Military Emissions Gap (2021)
- IPCC reports say very little about military carbon emissions
- Very few climate scientists work on military carbon emissions
- Some more detailed data has been published by NATO militaries
- UK military has better track record of reporting – but still many gaps
- Some analysis carried out by independent researchers like SGR
- Graph is illustrative – based on analysis by Crawford (2019), SGR (2020), TPNS (2020), SGR/ CEOBS (2021), Perspectives/ TPNS (2022)



- Data from SGR/ CEOBS (2021) – United Nations Framework Convention on Climate Change (UNFCCC) figures from 2018; total estimates based on 2019 data
- Some reasons for national differences:
 - Level of military spending – France and Germany especially high
 - Numbers of high-consumption vehicles, especially planes & ships – France especially high
 - Size of military technology industries – France especially high
 - Level of overseas military operations – France especially high
- UK military carbon footprint higher than all other EU/ European NATO nations – both in absolute terms and per head of population

How big is global military carbon footprint?

- Global military carbon footprint estimates: 1% to 5%
 - New estimates will be published soon
- Military footprint even larger
- Ukraine war emissions
 - Early estimates: direct: 31 MtCO₂e; reconstruction: 79 MtCO₂e
 - Total similar to Belgium's territorial emissions
- Nations with largest military emissions – probably:
 - USA, China, Russia, India



- Range of global estimates from: TPNS (2020)
- Ukraine war emissions estimated by Ukrainian govt – source: European Parliament (2022)
- Belgium emissions – source: Wikipedia (2022a)

[image credit: State Emergency Services of Ukraine]

Climate disruption ↔ Nuclear war



[Image credit: Gerd Altmann]

Risks of nuclear war are increasing

- Nuclear war by accident?
 - Historical evidence shows world has been lucky
 - average of 1 'near miss' every 3 years
 - Cyber attacks increase risk of launch in a crisis
 - Recent deterioration of relations between nuclear-armed nations
 - e.g. war in Ukraine
 - Climate change causes political instability
 - Pakistan and India particularly vulnerable
- Nuclear winter
 - Recent climatic research shows higher vulnerability to catastrophic global **cooling** from smoke from any nuclear conflict
 - Smoke comes from intense fires caused by nuclear explosions, and is injected into upper atmosphere

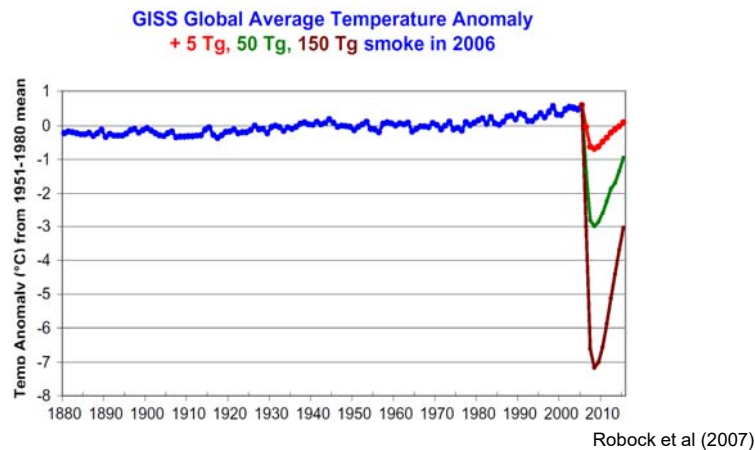
- Average of 1 'near miss' every 3 years from 1962 to 2002 (Lewis et al, 2014)
- For examples of cyber security threats to nuclear weapons systems, see: Dato (2017); SGR (2018)
- For a summary of recent research on nuclear winter, see: Parkinson (2022)

Nuclear winter: the key steps



Image credit: Alicja via Pixabay

Nuclear war: global temperature scenarios

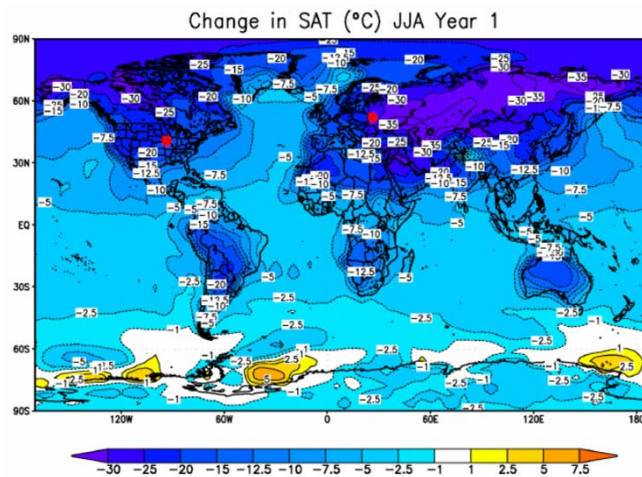


- Scenario 1 (Red) – ‘regional’ nuclear war, e.g. India-Pakistan, UK arsenal
- Scenario 2 (Green) – ‘global-low’ nuclear war, e.g. all current ‘active’ US-Russian weapons
- Scenario 3 (Brown) – ‘global-high’ nuclear war, e.g. mid-2000s weapons level

- 3 nuclear war scenarios and the resultant ‘global cooling’
 1. 5 million tonnes (Mt) of black carbon (soot) injected into stratosphere
 2. 50 Mt of black carbon
 3. 150 Mt of black carbon
- From research led by Prof Alan Robock, Rutgers University, USA, published in 2007
- Blue line is measured global temperature change 1880-2006 (relative to 1951-1980 average level)
- For UK nuclear scenarios, see: SGR (2015).

Nuclear winter scenarios

- 'Global-high' USA-Russia war scenario

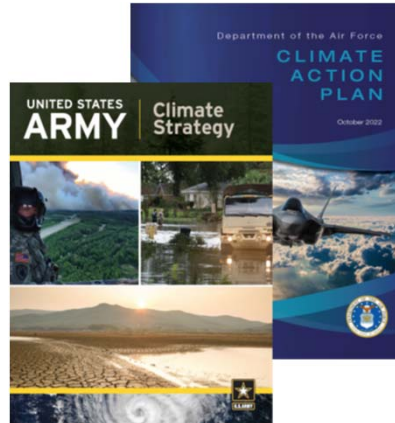
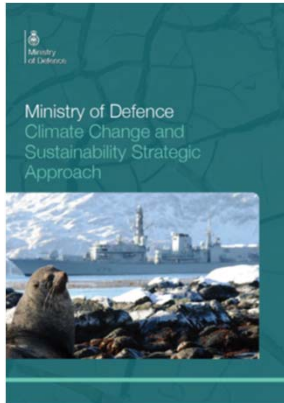


Robock et al (2007)

- Graph: Surface air temperature changes (degrees Celsius) for the '150 Tg case' – i.e. a major nuclear war between USA and Russia using arsenals available in mid-2000s leading to emissions of 150 million tonnes of black carbon into the upper atmosphere, mainly in the form of smoke – averaged for June, July, and August of the year of smoke injection and the next year. Effects are largest over land, but there is substantial cooling over oceans, too. The warming over Antarctica in Year 0 is for a small area, is part of normal winter interannual variability, and is not significant. Also shown as red bursts are two example locations for nuclear weapon explosions.
- 'Global-low' war scenario – reductions in temperature are about half the magnitude, but follow a similar geographical distribution

'Greening' the military?

New military plans on climate



- Over last two years, UK, US and NATO have published military climate plans – but limited action promised on reducing carbon emissions

- Sources: MOD (2021); NATO (2021); US Army (2022); USAF (2022)

Military approaches to tackling climate change

- UK Ministry of Defence climate document
 - Aim: “seek to use the green transition to add to capabilities”
 - Aim: “fight and win in ever more hostile and unforgiving physical environments”
- Reducing carbon emissions
 - Many key proposals problematic
 - Use of biofuels/ synthetic fuels especially in military planes
 - More drones/ robotic/ cyber tech
 - More nuclear power in warships/ at bases
 - Use of offsetting – e.g. more trees on military land
- No consideration of alternative approaches to improving security
- No mention of climatic threat from nuclear weapons

Report of the
Defense Science Board Task Force
on
DoD Energy Strategy
“More Fight – Less Fuel”

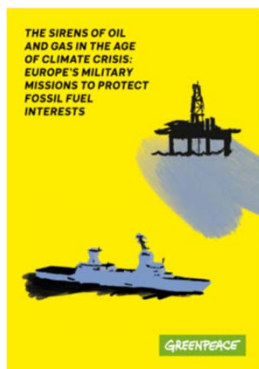


- Quotes and info from (e.g.) MOD (2021)
- Title of US DoD report shows the main motivation for energy saving measures - from: Lorincz (2015)
- Problems with proposals include:
 - Fuelling arms races and risk of war
 - Radioactive waste (nuclear tech)
 - Competition with land for food (biofuels)
 - Unreliability of carbon offsets
 - Use of speculative & energy-hungry tech that may not delivery emission reductions (synthetic fuels)

Unspoken strategy: Militaries helping to preserve global inequalities

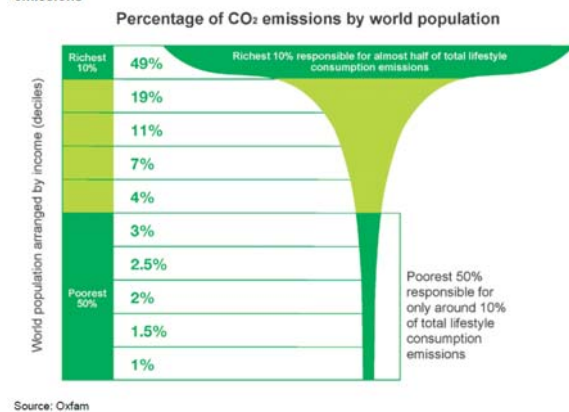
Militaries used to secure (e.g.):

- access to limited oil resources
- ability of wealthy to overconsume



“Almost two thirds of EU military missions are linked to fossil fuels”

Figure 1: Global income deciles and associated lifestyle consumption emissions



- Analysis of EU military missions from Greenpeace (2021)
- Carbon emissions inequality
 - ‘Champagne glass’ graph from: Oxfam (2015)
 - This research has just been updated - Oxfam (2021). Their projections, based on existing international policies, show this inequality will persist to at least 2030 – with richest 1% share increasing to 16% of carbon emission by then.

Energy security responses to Ukraine war

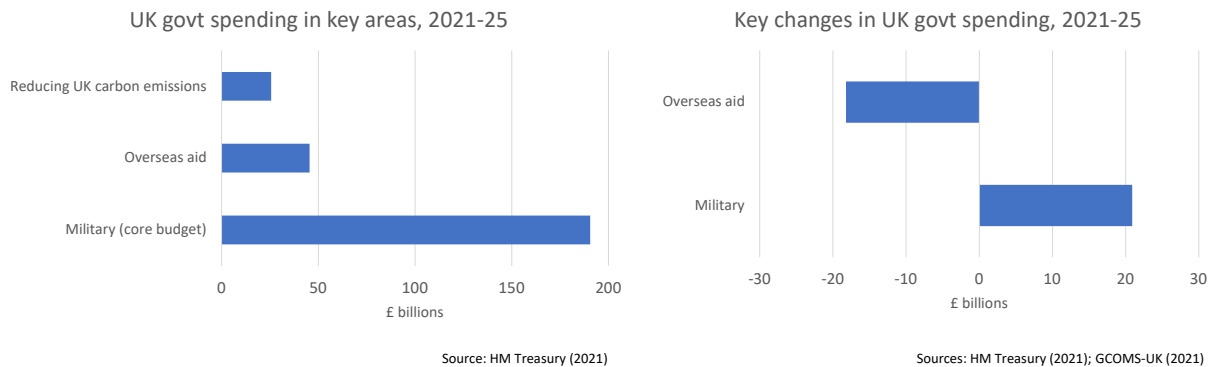
- Response of high consumption economies has been to prioritise switching fossil fuel suppliers (e.g.)
 - Oil – Western switch from Russia to Saudi Arabia/ other dictatorships and new exploration
 - Gas – Western switch from Russia to Qatar/ other dictatorships and new exploration
- UK (e.g.)
 - 100 new licenses offered for North Sea oil & gas exploration
- These are incompatible with 1.5C target
- But some signs of increased focus on energy conservation and renewables



- Main sources: BBC News (2022); Carbon Brief (2022)

**Military spending
v
climate spending**

UK spending plans: pre-2022



- This imbalance in military v climate v aid spending is even worse in many other wealthy nations
- UK govt spending
 - Data analysis summarised in GCOMS-UK (2021) based on data from HM Treasury (2021)
 - Military total does not include Trident contingency fund, military pensions etc
 - 'Reducing UK carbon emissions' covers spending commitments in the UK's new Net-Zero Strategy
 - Calculations on reductions in UK aid budget are based on the reduction from 0.7% to 0.5% of Gross National Income

UK spending plans: post-2022



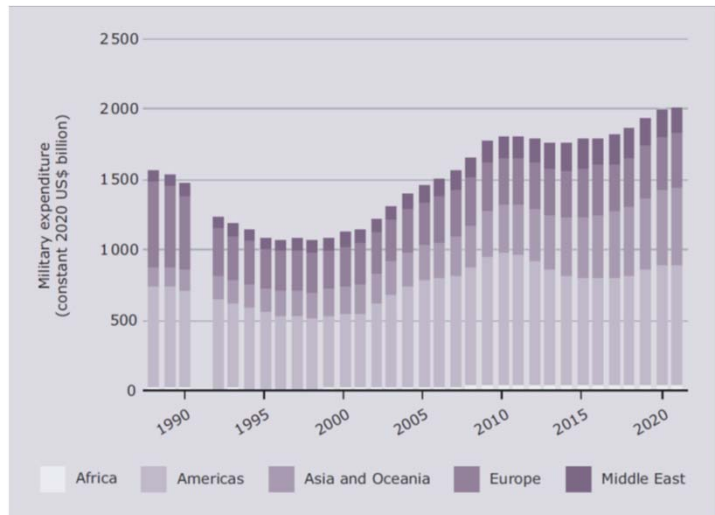
- PM Truss planned massive rise in military spending to 3% GDP (from 2.2%)
- Policy analysis suggests:
 - 60% spending increase *above* inflation – largest single rise for 70 years
 - 30% increase in troop numbers
 - Huge expansion of military industrial base – diversion from green sector?
 - To cover costs, either rise in income tax from 20% to 25% or massive cuts to public services
- Very few democracies have military spending of 3% GDP
- UK military ‘aid’ to Ukraine – £2.3bn in 2022

- Spending increase to 3% GDP would mean £157bn spending above inflation over 8 years (up to 2030) - analysis from: RUSI (2022)
- New defence review underway – few details as yet
- Figures for military aid to Ukraine from: UK Parliament (2022)

[image credit: RAF]

Global military spending

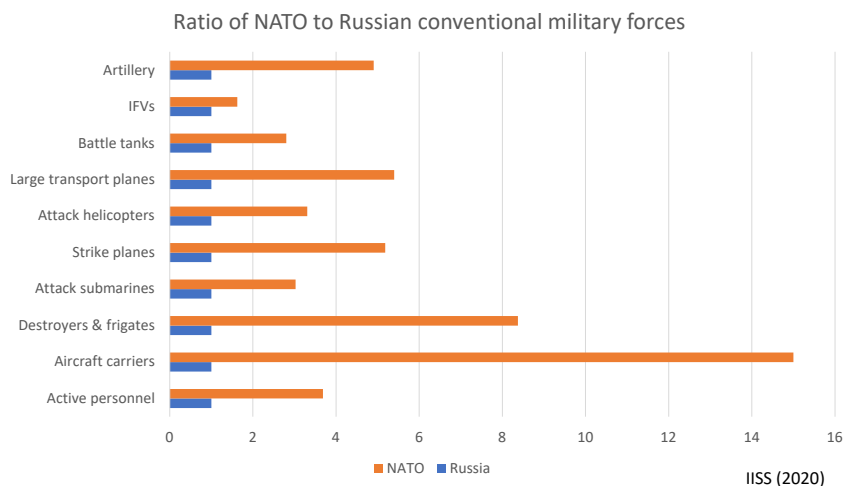
- Global military spending past **\$2,000,000,000,000** in 2021
- NATO/ Russia/ China already engaged in arms races
- Putin's invasion of Ukraine/ Xi's position on Taiwan has greatly accelerated those races



SIPRI (2022)

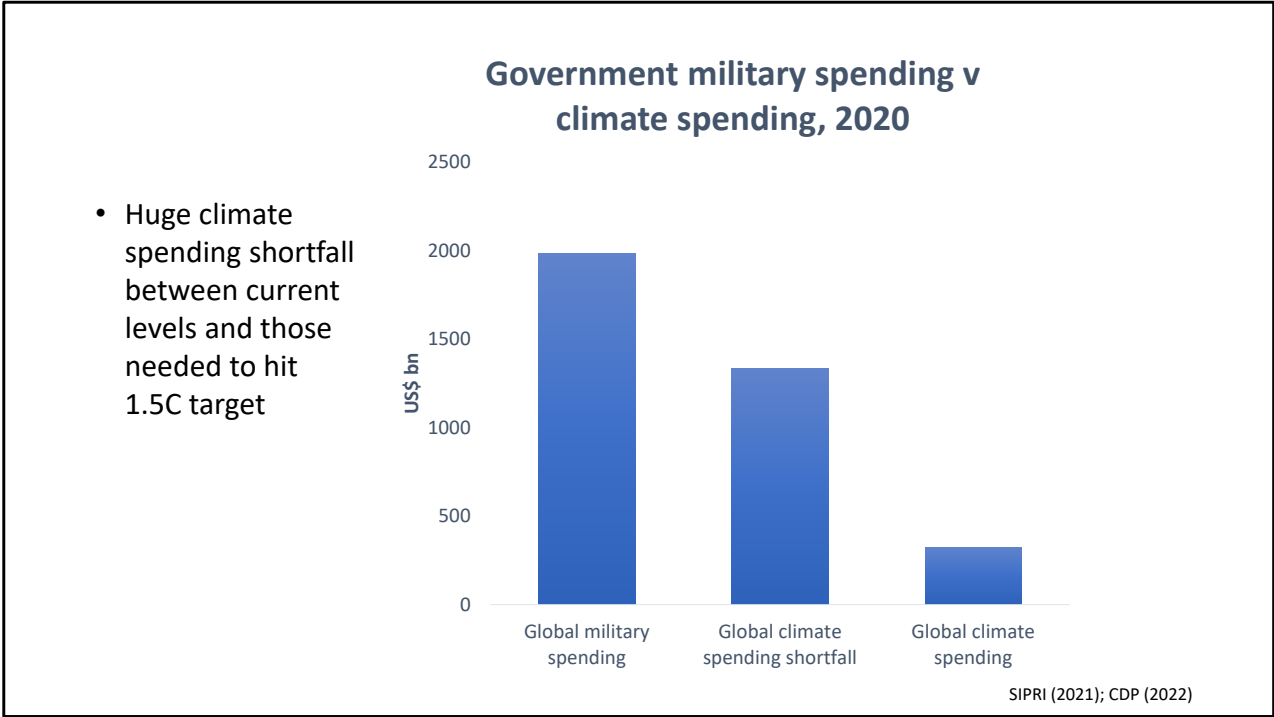
- In 2021, NATO military spending was over 55% of global total (SIPRI, 2022)
- By September 2022, 18 EU nations had announced plans to increase military spending, with Germany announcing €100bn increase over several years (ENAAAT, 2022)

NATO v Russian militaries: pre-2022



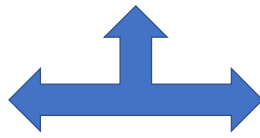
- NATO's combined military budgets over 17 times Russia's – and rising
- NATO nuclear forces only slightly larger than Russia's due to limits in New START agreement

- Does NATO need to increase military spending?
- Force data from: IISS (2020)
- Some military tech ratios even higher
 - Heavy drones – 50+ to 1
 - Tanker aircraft – 40+ to 1
- For more analysis of spending data, see: GCOMS UK (2022)
- For latest figures on nuclear forces, see: FAS (2022)



- Data from: SIPRI (2021); Climate Policy Initiative (2021)
- Global climate shortfall on track to grow from \$1,400 bn in early 2020s to \$1,900 bn by 2030

Changing course



The missing strategy: Demilitarisation for decarbonisation

- More focus on diplomacy and arms control/ disarmament treaties
- Redirect large fraction of military spending to 'just transition'
 - Including conversion of arms to low carbon industries
- Rapid phase out of nuclear weapons
- Shift focus from 'national security' to 'human security'
- Human security (UN definition)
 - Freedom from fear: including protection from violence and environment crises
 - Freedom from want: including provision of decent food, healthcare & housing
 - Freedom from indignity: including from human rights abuses

- High potential for shift in skilled workers from military tech industries to renewable energy, energy storage, and energy efficiency industries – see (e.g.) SGR (2020); Rethinking Security (2021)
- Rapid phase out of nuclear weapons would be via 2017 UN Treaty on the Prohibition of Nuclear Weapons

Human security approach: examples



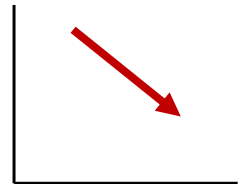
- Scale of problems:
 - 6,000 to 29,000 civilian deaths due to Russian invasion of Ukraine in 2022
 - Fuel poverty currently affecting 7 million UK households and rising
 - 75% increase on 2021
 - 345 million people globally in 'acute food insecurity'
 - 150% increase on 2019
- Human security approach would prioritise:
 - Rapid, negotiated end to war in Ukraine to reduce: civilian casualties; international energy & food prices - therefore poverty & energy/food insecurity; nuclear war risk; carbon emissions
 - Protection for budgets for overseas aid & benefits for low income groups
 - Massive home energy conservation programmes to reduce: fuel poverty; carbon emissions; fossil fuel demand/ energy prices/ energy insecurity
 - Rationing energy for the wealthy?

- Ukraine war casualty figures – Wikipedia (2022b)
- Fuel poverty in the UK
 - 4 million households in fuel poverty in Oct 2021 – so increase of about 75% in 1y
 - 7 million is about 30% of households or nearly 20 million people
 - Figures on fuel poverty and further discussion at: The Conversation (2022)
- Food security figures from: World Food Programme (2022)

[image credit: Vegfam]

How did past demilitarisation affect carbon emissions?

- Historical data shows potential of carbon emission reductions due to demilitarisation
- After end of Cold War (1991-2000)
 - Operational emissions of US military fell by 44%
 - Aviation/ marine emissions of UK military fell by 32%
 - Reductions in Soviet Union/ Eastern Europe probably much larger



- Calculations based on data from Crawford (2019) and BEIS (2021)

Campaign goals for military and climate

1. Robust, transparent reporting on all military carbon emissions
2. All military activities covered by zero carbon targets compatible with Paris target of 1.5C
3. Demilitarisation/ shift to human security priorities should be key element of zero carbon plans
4. Nuclear weapons abolition



- SGR's suggestions

[image credit: Escif - <https://www.facebook.com/Escif-116160785113488/>]

Actions



- Peace campaigners
 - Educate others about role of military in climate crisis & real solutions
 - Especially climate/ youth/ international development/ health/ trade union
- Climate/ other campaigners
 - Integrate military/ security issues into your campaign work
 - Work with peace campaigners to challenge militarism agenda
 - Integrate arms conversion into just transition work
- Scientists/ researchers
 - Robust emissions estimates for all major military nations/ alliances
 - Estimates for effect of demilitarisation on emission levels
 - Economic analysis of arms conversion/ just transition programmes
 - IPCC special report on military and climate

References (p1)

- BBC News (2022). UK defies climate warnings with new oil and gas licences. <https://www.bbc.co.uk/news/science-environment-63163824>
- BEIS (2022). <https://www.gov.uk/government/collections/uk-territorial-greenhouse-gas-emissions-national-statistics>
- Carbon Brief (2022). <https://www.carbonbrief.org/new-fossil-fuels-incompatible-with-1-5c-goal-comprehensive-analysis-finds/>
- Climate Policy Initiative (2021). Global Landscape of Climate Finance 2021. <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2021/>
- The Conversation (2022). <https://theconversation.com/energy-crisis-the-uk-is-still-heading-for-widespread-fuel-poverty-despite-the-governments-price-cap-190290>
- Crawford N (2019). Pentagon Fuel Use, Climate Change, and the Costs of War. Brown University. <https://watson.brown.edu/costsofwar/papers/ClimateChangeandCostofWar>
- Datoo A (2017). Could Trident be hacked? SGR website. <http://www.sgr.org.uk/resources/could-trident-be-hacked>
- ENAAT (2022). News from the Brussels Bubble, 2/9/22. https://enaat.org/wp-content/uploads/2018/03/ENAAT-NBB-2022-3_02.09.2022.pdf
- European Parliament (2022). Presentation by Ukrainian govt to EP Committee on Environment, Public Health and Food Safety. https://multimedia.europarl.europa.eu/en/webstreaming/envi-committee-meeting_20221003-1900-COMMITTEE-ENVI
- FAS (2022). <https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/>
- GCOMS UK (2021). Briefing points on the UK Autumn Budget and Spending Review. Global Campaign on Military Spending, UK branch. October. <https://demilitarize.org.uk/gcoms-uk-briefing-points-on-the-uk-autumn-budget-and-spending-review/>
- GCOMS UK (2022). <https://demilitarize.org.uk/is-the-invasion-of-ukraine-really-the-fault-of-nato-under-spending/>
- Greenpeace (2021). The sirens of oil and gas in the age of climate crisis: Europe's military missions to protect fossil fuel interests. <https://www.greenpeace.de/publikationen/Military%20missions%20protect%20fossil%20fuels%202.pdf>
- HM Treasury (2021). HM Treasury (2021). Autumn budget and spending review 2021. October. <https://www.gov.uk/government/publications/autumn-budget-and-spending-review-2021-documents>

References (p2)

IISS (2020). The Military Balance 2020. <https://www.iiss.org/publications/the-military-balance/archive>

Lewis P et al (2014). Too Close for Comfort: Cases of new nuclear use and options for policy. Chatham House. <http://www.chathamhouse.org/publications/papers/view/199200>

Lorincz T (2015). Demilitarization for Deep Decarbonization. Presentation. <https://www.sgr.org.uk/events/messages-paris-conference-forgotten-dimensions-climate-change>

Military Emissions Gap (2021). <https://militaryemissions.org/>

MOD (2021). Climate Change and Sustainability Strategic Approach. March. <https://www.gov.uk/government/publications/ministry-of-defence-climate-change-and-sustainability-strategic-approach>

NATO (2021). Climate Change and Security Action Plan. June. https://www.nato.int/cps/en/natohq/official_texts_185174.htm?selectedLocale=en

Oxfam (2015). Extreme Carbon Inequality. <https://policy-practice.oxfam.org/resources/extreme-carbon-inequality-why-the-paris-climate-deal-must-put-the-poorest-lowes-582545/>

Oxfam (2021). Carbon inequality in 2030: Per capita consumption emissions and the 1.5°C goal. November. <https://www.oxfam.org/en/research/carbon-inequality-2030>

Parkinson S (2022). The threat from nuclear winter. Presentation. <https://www.sgr.org.uk/resources/threat-nuclear-winter>

Perspectives/ TPNS (2022). Military and Conflict-Related Emissions: Kyoto to Glasgow and Beyond. <https://transformdefence.org/publication/military-and-conflict-related-emissions-report/>

Rethinking Security (2021). Human Security and the Integrated Review. <https://rethinkingsecurityorguk.files.wordpress.com/2021/04/human-security-and-the-integrated-review-april-2021.pdf>

Robock A, Oman L, Stenchikov G (2007). Nuclear winter revisited with a modern climate model and current nuclear arsenals: still catastrophic consequences. *Journal of Geophysical Research: Atmospheres*, 112:D13; DOI:10.1029/2006JD008235

References (p3)

- RUSI (2022). <https://rusi.org/explore-our-research/publications/occasional-papers/famine-feast-implications-3-uk-defence-budget>
- SGR (2015). UK nuclear weapons: a catastrophe in the making? Report. <http://www.sgr.org.uk/resources/uk-nuclear-weapons-catastrophe-making>
- SGR (2018). Artificial intelligence: how little has to go wrong? Report. <http://www.sgr.org.uk/publications/artificial-intelligence-how-little-has-gone-wrong>
- SGR (2020). The environmental impacts of the UK military sector. Report. <https://www.sgr.org.uk/publications/environmental-impacts-uk-military-sector>
- SGR/ CEOBS (2021). Under the Radar: the carbon footprint of Europe's military sectors. Report. <https://www.sgr.org.uk/publications/under-radar-carbon-footprint-europe-s-military-sectors>
- SIPRI (2021). Trends in World Military Expenditure, 2020. <https://www.sipri.org/publications/2021/sipri-fact-sheets/trends-world-military-expenditure-2020>
- SIPRI (2022). Trends in World Military Expenditure, 2021. <https://www.sipri.org/publications/2022/sipri-fact-sheets/trends-world-military-expenditure-2021>
- TPNS (2020). Indefensible: The true cost of the global military to our climate and human security. <https://transformdefence.org/publication/indefensible/>
- UK Parliament (2022). <https://commonslibrary.parliament.uk/research-briefings/cbp-9477/>
- US Army (2022). Climate Strategy. https://www.army.mil/article/253754/u_s_army_releases_its_climate_strategy
- USAF (2022). Climate Action Plan. <https://www.safie.hq.af.mil/Programs/Climate/>
- Wikipedia (2022a). List of countries by greenhouse gas emissions. https://en.wikipedia.org/wiki/List_of_countries_by_greenhouse_gas_emissions
- Wikipedia (2022b). Casualties of the Russo-Ukrainian War. https://en.wikipedia.org/wiki/Casualties_of_the_Russo-Ukrainian_War
- World Food Programme (2022). <https://www.wfp.org/global-hunger-crisis>