



INDEFENSIBLE:

The true cost of the global military to our climate and human security

The case for deep cuts to global military spending and emissions

Full Report

TIPPING POINT NORTH SOUTH

A co-operative that supports and initiates creative, campaign-driven projects that advance the global social justice agenda

MILITARY SPENDING: A HIDDEN DRIVER OF CLIMATE CHANGE

The global military is a major driver of climate change. At UN level it is exempt from reporting its carbon emissions despite some countries' militaries being among the largest consumers of fossil fuels in the world. This is a scandal that needs exposing.

These emissions are a direct result of runaway global military spending since the former cannot happen without the latter. Combined, they ensure that international development and human safety is harmed in myriad ways. *As a matter of urgency* we need this issue addressed as an international development, environment and human safety concern.

Last but not least, policy-makers concerned with *Green New Deal* economic thinking (in the UK, Europe, the USA and elsewhere) must take account of the links between these closely linked issues: military spending, climate change and sustainable human safety.

INDEFENSIBLE: The true cost of the global military to our climate and human security is one of Tipping Point North South's *Transform Defence* series of reports and briefings.

Collectively they seek to offer (i) a framework for progressively converting military spending into funding for development, strengthening human safety and averting climate catastrophe and (ii) new ideas on how to reshape current foreign and defence policies that better advance our collective human security. Tipping Point North South's *Five Percent Proposal* for cuts to runaway military spending is at the heart of our *Transform Defence* project and is funded by Polden-Puckham Charitable Foundation.

This report is also pertinent to Tipping Point North South's *Green New Deal Plus* (see Appendix One), which is designed to complement all current variations of Green New Deal economic proposals. *GND Plus* is supported by the Ratcliff Foundation.

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Tipping Point North South is a 'for the benefit of community' co-operative, supporting and initiating creative, campaign-driven projects that advance the global social justice agenda.

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AUTHORS' NOTE

This report was completed in 2019, before the pandemic began, and whilst this does not directly affect the subject of this report – the global military's impact on climate change, human security and development and what we must do about it – it has been revised to take account of both the pandemic and new research relating to the global military and climate change.

COVID-19 has shed yet another strong, bright light on how many of us have been let down by our defence planners. The most illuminating example is the United States where President Donald Trump cancelled his predecessor Barack Obama's pandemic planning, enabling pandemic financing to become yet another trough from which the defence contractors can feed.¹ All this as the USA has the highest COVID-19 deaths in the world and as of October 3, U.S. Centers for Disease Control and Prevention estimated there have been 299,028 excess deaths, more than the total number of U.S. war casualties since WWII.²

Meantime, the UK government identified pandemic as one of the top 4 (Tier 1) security threats in successive '*National Security Strategies*' (NSS) 2010 and 2015.³ The risk of human pandemic disease "remains one of the highest we face", reported the 2010 NSS. Yet nothing was done in practice to prepare or mitigate it – instead it landed on a National Health Service (NHS) facing unsustainable funding cuts and privatisation, all in the name of austerity. In the UK more people have died as a result of COVID-19 than in the Blitz – and in a shorter time period.⁴

We are now in desperate need of a paradigm shift on how we define 'defence.' Our present day collective foreign, security and defence policies are rooted in 19th-century politics and economics. Today, climate change is our greatest collective threat. And it has been a virus, not a foreign adversary, that has brought fear to the human family and the global economy to the brink.

We are all hoping for a post-pandemic recovery that is green and just. We are all hoping that the Black Lives Matter (BLM) movement – and the Me Too (#MeToo) movement – will consolidate their campaigns and move us ever more forward. We must also **transform defence** and demand that our leaders – north, south, east, west – collectively review foreign and defence policies such that they are fit for the 21st century.

PREFACE

Indefensible: The true cost of the global military to our climate and human security is a major new report on the role of military emissions in causing climate change.

I write this preface from the United States in the wake of the election of Joe Biden as 46th President of the United States. Biden has promised some spectacular about-turns in U.S. foreign policy, including immediately rejoining the Paris Climate Agreement. That is a welcome development, but as this report shows, more is required.

Climate change is now a “national security” issue

The U.S. national security establishment has acknowledged for more than a decade that climate change is real, and that it needs to adapt to operate in climates that are becoming – depending on the region – hotter, wetter, or drier. The military has also speculated that climate change is a “threat multiplier” — certainly increasing migration and displacement, and potentially leading to conflict over scarce resources, and armed conflict.

While the U.S. and other militaries have focused on adapting to climate change, they have failed to address their role in causing it

Advanced air forces, navies and armies use equipment that emits enormous quantities of greenhouse gas. Further, military bases and other infrastructure are also significant contributors to greenhouse gas emissions. Yet militaries have not acknowledged their significant role in causing climate change, and therefore their role in causing potential increased risks to global security.

Until recently, there has been no effort to quantify military emissions

This is partly because of the way emissions are reported under international rules. As part of the Kyoto Protocol, signed in December 1997, the U.S. insisted that fuels used by ships and aircraft engaged in international transport and multilateral military operations (“bunker fuels”) should not be included in a country’s total emissions.⁵ As the U.S. Undersecretary of State Stuart Eizenstat said in testimony to the U.S Congress on the Kyoto Protocol:^{i, 6}

“We took special pains, working with the Defense Department and with our uniformed military, both before and in Kyoto, to fully protect the unique position of the United States as the world’s only super power with global military responsibilities. We achieved everything they outlined as necessary to protect military operations and our national security.”

At Kyoto, the parties... took a decision to exempt key overseas military activities from any emissions targets, including exemptions for bunker fuels used in international aviation and maritime transport and from emissions resulting from multilateral operations, such as self defense, peacekeeping, and humanitarian relief.

This exempts from our national targets not only multilateral operations expressly authorized by the U.N. Security Council, such as Desert Storm or Bosnia, but, importantly, also exempts multilateral

ⁱ Even though the US never ratified the Kyoto Protocol, the exemptions for the military stuck for every other signatory nation. See Page 15.

operations that the U.S. initiates pursuant to the U.N. Charter without express authorization, such as Grenada.”

This exemption means that the Intergovernmental Panel on Climate Change continues to treat national military emissions, specifically international aircraft and naval bunker fuels, differently to other emission types.⁷

Military emissions are a significant contributor to global greenhouse gas emissions

Two recent studies have focused on U.S. military emissions: Oliver Belcher, Patrick Bigger, Ben Neimark, and Cara Kennelly have calculated one year’s fuel use for the U.S. military by using previously unavailable data,⁸ while my own analysis, using publicly available data, has calculated U.S. Pentagon emissions from 1975 to 2019. While these reports use different methods, they come to the same conclusion: the U.S. Defense Department is an enormous greenhouse gas emitter.⁹

Specifically, with annual emissions averaging an estimated 83 million metric tons CO₂e, from 1975 to 2019, the U.S. military is one of the largest greenhouse gas emitters in the world. In other words, its average annual emissions for this period are larger than the entire emissions for many countries.

Indefensible: The true cost of the global military to our climate and human security by Tipping Point North South, is an important addition to the growing evidence on the significant role of military emissions in causing climate change. Using a novel methodology, it widens the analysis to all the world’s militaries. As it says, “If we were then to rank the world’s militaries together as a single country, collectively they would rank as the 29th biggest oil consumer in the world, just ahead of Belgium or South Africa and behind Argentina or Malaysia.” Further, it connects the dots between military fuel use, military spending, war, and the burden of climate change on development. Finally, it offers important solutions.

Indefensible: The true cost of the global military to our climate and human security is essential reading for all those concerned with climate change and the path to a sustainable and secure future.

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9 November, 2020

EXECUTIVE SUMMARY

This report focuses specifically on the military-oil industry relationship to reveal its role in climate breakdown. It argues that we must start to quantify, expose and act upon the climate burden put upon people and planet by the world's big military spenders.

Until now, we have collectively and consistently ignored the massive yet unaccounted for responsibility of the world's militaries for climate change, from their day-to-day operational activities to the wars and conflicts of which they are part. We must start to factor both into climate calculations because we are ignoring them at our peril.

The 8-point recommendation plan at the end of this report aims to address this.

THE ELEPHANT IN THE ROOM: MILITARY SPENDING AS A DRIVER OF CLIMATE CHANGE

The UN Environment Programme's *Emissions Gap Report 2018* confirms that global efforts to decarbonise are way off track, and despite pledges to cap them, global emissions continue rising on the back of economic growth. One hugely important economic sector consistently ignored in attempts to tackle climate change – it ranks as the UK governments 4th largest area of expenditure¹⁰ and a sector that has made negligible efforts to decarbonise – is the defence/military sector. Greenhouse gas (GHG) emissions from military activities and wars are not included in global emissions totals, meaning we have significantly underestimated the total global GHG emissions from *all* human activities so far.

Greenhouse gas emissions from day to day military activities and attendant wars are so substantial that we will never achieve the zero-emission goal recommended by the Intergovernmental Panel on Climate Change (IPCC) by 2050 *without also making our militaries carbon neutral*. If we do not decarbonise our militaries and urgently reframe our approach to foreign policy, security thinking and defence spending, the world's militaries will themselves become a threat to our collective “human security”¹¹.

By analysing the existing data and research, we can piece together a disturbing picture of the global military's environmental impact:

- **The carbon footprint of the global militaries and associated defence industries is 445 million tonnes of CO2 equivalent (2017); this is larger than the annual greenhouse gas emission of the entire country of Italy, and not much smaller than the total GHG emissions by UK (505 million tonnes of CO2 equivalent) and France (482 million tonnes of CO2 equivalent) respectively.**
- **The global militaries and defence industries account for at least 1% of the total global greenhouse gas emissions, and the figure could be as high as 5%. For comparison, civil aviation accounts for approximately 2.1 % of global GHG emissions, and international aviation alone is responsible for around 1.3% of global GHG emissions. This means that the global military-industrial complex accounts for the compatible amount of greenhouse gas emissions as civil aviation which is essential for global trade and our modern well-being. When everyone is thinking to do their bit by taking fewer flights and buy local food and consumer products, militaries are having a free pass to buy and operate as many big-ticket**

gas guzzlers (eg, F-35s and Eurofighter Typhoons) as they want, with no hard question asked by our politicians.

- If we rank the world's militaries together as a single country, they would be the 29th biggest oil consumer in the world, just ahead of Belgium or South Africa. To put it another way, this is half the oil consumption of the world's 5th biggest economy, the UK or the 6th biggest, France.
- The total carbon footprint of EU15's militaries and defence industries is 60 million tonnes of CO₂ equivalent – that is the same amount of emission as Ireland and roughly 2% of the total greenhouse gas emissions by EU15 in 2017. In the EU, direct CO₂ emissions from aviation account for about 3% of total emissions. The EU prides themselves to be the world's first region to address CO₂ emissions from international aviation so it is inexcusable for them to neglect the climate impact of their militaries and defence industries when both sectors generate compatible amount of greenhouse gases.
- The total GHG emissions of the nine-year Iraq War (between 2003 and 2011) were approximately 254 million tonnes of CO₂ equivalent. That's slightly more CO₂ released than the 14th biggest economy in the world, Spain, in 2016, and only a quarter less than the 6th biggest economy, France.

This ongoing emissions burden will be sustained as long as excessive global military spending is used to develop and purchase ever more oil-dependent expensive jets, tanks and missiles, which in turn create destruction and greenhouse gases (all the while generating significant shareholder profits). The irony, indeed hypocrisy, of the USA and other leading military nations' spokespeople being among some of the loudest voices calling for action on climate change (summed up by 'everyone but us') is not lost on some observers, since it is precisely those same military nations that know their own contribution towards creating the climate crisis in the first place. But that inconvenient truth is skilfully masked by another narrative that is more easily and widely taken up – the need to *manage* the consequences of climate change and the resulting emergencies and chaos.

And governments are covering the climate burden of their respective militaries' tracks well. At the time of the Iraq War, the USA negotiated an exemption from reporting emissions. To this day, the reporting each country is required to make to the UN on their emissions excludes any fuels purchased and used overseas by the military. And under the Paris Agreement of 2015, countries are still not obliged to cut their military emissions.

Oil, military spending and conflict are currently indivisible, and combined have played and continue to play a major role in impeding or reversing development in communities and nations across the global south as ordinary people pay the price in myriad ways. There seems to be no end in sight as governments (especially the big military spenders) are themselves locked into foreign, security and defence spending strategies that are self-destructive, with endless war-for-oil conflicts that create millions of refugees; conflicts that result in ever-greater military spending on ever-more fossil-fuel dependent equipment operated by fossil-fuel reliant militaries.

Our collective future in this post-climate change world must be guided by social, economic and environmental justice, and in doing so, more fully deliver the global human security we all need

to survive and thrive. Unfortunately, the world's militaries (and the biggest beneficiaries of these budgets are the defence companies) are not working to that measure of 'defence'.

We are now on the brink of a new conventional and nuclear arms race. Global military spending is rising ever closer to 'the \$2 trillion redline',¹² with 85% of global annual military spending (\$1.9 trillion) accounted for by the top 20 spenders alone.¹³ The 'peace of mind' secured by nations through foreign, security and defence policies derived from fossil-fuel dependent militaries is – on many critical counts – no longer fit for the 21st century. The time has come to replace outdated notions of 'national security' with policies that reflect *all* 21st century threats to our collective safety.

While this report highlights the destructive merry-go-round of war, devastation and rebuilding, it presents a **ground-breaking new formula** to help countries progressively convert their military spending into funds for meeting environmental and human needs. The *Five Percent Proposal* is a two-part formula that: 1) halves global military spending over 10 years, with those savings redirected to human need; and 2) implements a *5% threshold formula*, designed to rein back military spending thereafter. It has been developed through lessons learned on campaigns such as debt, trade and tax.

There are now just 11 years (at the time of writing) to meet the international pledge to limit global warming to moderate levels (below 1.5°C) by cutting global greenhouse gas emissions to 45% below 2010 levels by 2030.¹⁴ On 1st May, 2019, and after intense pressure, the UK parliament finally declared 'a climate emergency.'¹⁵ Thereafter, the Department for Transport's (DfT) Head of Aviation said "it may be necessary to consider the Committee on Climate Change's recommended policy approach" to restrict the growth of flying in the UK.¹⁶ This statement was only in relation to commercial aviation, ignorant of the UK's significant military aircraft emissions burden.

We need a quantum shift in our willingness to address the significant role of the global military in climate change and the urgent need to decouple it from oil. And if we *do* make progress on this issue, then (albeit belatedly) we will have recognised that our collective 'defence' is as much about how we resource early warning and disaster risk reduction and all it entails, as it is about terror threats and conventional warfare. Every aspect of human activity is now under the climate spotlight and demands transformational re-thinking. The global military should be no exception.



INTRODUCTION

“Climate change is the defining issue of our time – and we are at a defining moment. We face a direct existential threat. Climate change is moving faster than we are – and its speed has provoked a sonic boom SOS across our world. If we do not change course by 2020, we risk missing the point where we can avoid runaway climate change, with disastrous consequences for people and all the natural systems that sustain us.” UN Secretary-General António Guterres¹⁷

*“The contribution of military activities to the unprecedented series of environmental crises facing the world today has been largely overlooked and, to an extent, willfully ignored.” Abeer Majid, **‘The Impact of Militarism on the Environment’**¹⁸*

*“The United Nations Environment Programme acknowledges that there has been insufficient oversight and scant research at the international and national level on the military’s impacts on the natural environment and climate change.” **‘Demilitarization for Deep Decarbonization,’ International Peace Bureau**¹⁹*

This report focuses specifically on the military-oil industry relationship, its role in climate change and impact on international development and ‘human security’²⁰. Tipping Point North South’s *Five Percent Proposal* offers a framework and a formula to help address this complex and urgent issue through progressively converting military spending into funding for development, strengthening human security and averting climate catastrophe (see Five Percent Proposal and Formula section).

PRIMARY AUDIENCE FOR THIS REPORT

This report is primarily written for policy-makers and NGOs working across sectors including international development, the environment, human rights, and peace/conflict prevention. It proposes a number of recommendations to get a vital conversation started on the role of the military in climate change and human insecurity, in the effort to get governments and international institutions to take urgent action.

GREENHOUSE GAS EMISSIONS, DECARBONISATION AND THE MILITARY

The Intergovernmental Panel on Climate Change (IPCC) *Special Report on Global Warming of 1.5°C* (2018) states that to keep global temperatures from rising by more than 1.5°C, global greenhouse gas (GHG) emissions in 2030 would have to be 45% lower than today and reach zero by 2050. However, current projections estimate a temperature rise of 3.2°C by the end of this century – a situation that would destroy almost all coral reefs, make the Arctic ice-free once a decade and place hundreds of millions of people newly at risk of climate-related poverty. The IPCC says that limiting global warming to 1.5°C requires “rapid, far-reaching and unprecedented changes in all aspects of society.”²¹

Fossil fuel consumption – which produces most of the world’s greenhouse gases – is the fundamental driver of our global economic system.²² Economic growth goes hand-in-hand with the growth in GHG emissions, so to decarbonise our economy we must address all economic sectors – including transport, agriculture, industry and business, construction, tourism, and even fast fashion. However, the UN Environment Programme’s *Emissions Gap Report 2018* confirms that global efforts to decarbonise are way off track, and despite pledges to cap them, global emissions continue rising on the back of economic growth.

One hugely important economic sector consistently ignored in attempts to tackle climate change – it ranks as the UK governments 4th largest area of expenditure²³ and a sector that has made negligible efforts to decarbonise – is the defence/military sector.

GLOBAL MILITARY SPENDING, CONFLICT AND CLIMATE CHANGE: A SNAPSHOT

- Just 20 countries account for 85% of global annual military spending (\$1.9 trillion): USA, China, India, Russia, Saudi Arabia, France, Germany, UK, Japan, South Korea, Brazil, Italy, Australia, Canada, Israel, Turkey, Spain, Iran, Netherlands and Poland. (SIPRI 2020)²⁴
- Between 2003 and 2014, OPEC nations' military spending rose from \$64bn to \$159bn (inflation adjusted to constant 2016 US\$) – an increase of nearly 150%.
- According to “very conservative” estimates published by Oil Change International in its 2008 *The Climate of War* report, the Iraq War was responsible for at least 141 million tonnes of CO₂ equivalent from the start of war in March 2003 up to December 2007 – 28.2 million tonnes of CO₂ equivalent per year. If the Iraq war were ranked as a country in terms of GHG emissions, it would rank above 139 of the world's countries.²⁵ And if this annual emissions figure were multiplied by the number of years of the Iraq War, total GHG emissions for the war would be approximately 254 million tonnes of CO₂ equivalent – more than the 2016 emissions by Spain (the 14th biggest economy in the world), and only a quarter less than France (the 6th biggest economy in the world).
- At the height of the Iraq War in 2005, the Pentagon alone consumed daily the same amount of oil as the whole of Iraq – consumption that would rank the Pentagon 34th in the world ahead of Pakistan (with a very big population) and Sweden (with an advanced industrial economy).
- According to the Pentagon's own figures, the US military emitted 67 million tonnes of CO₂ equivalent a year in 2016, which if it were a country would be ranked the 51st top carbon emitter in the world, just behind Greece and ahead of Israel. This figure omits USA facilities, including around 800 overseas military bases, equipment and vehicles.
- The Costs of War Project (2019) estimated the total US military's carbon emissions for 2017 to be 339 million tonnes of CO₂ equivalent, consisting of 59 million tonnes of CO₂ equivalent emitted by the Pentagon and 280 million tonnes of CO₂ equivalent emitted by the US defence industry.²⁶ The Pentagon would be the world's 55th largest CO₂ emitter if it was a country, more than many industrialized nations including Sweden and Switzerland.²⁷
- The US Air Force is the largest user of fuel energy in the US federal government, consuming more than 2 billion gallons of jet fuel per year, and accounts for around 10% of total US aviation fuel use. A modern military typically consumes more than half of its total fossil fuel consumption on aviation fuels (e.g. over two thirds in the UK²⁸ and around 60% in the USA²⁹).
- The Pentagon uses around 100 million barrels of fuel a year, which is roughly 14 million tonnes of oil equivalent. We estimate global military energy use to be 35 million tonnes of oil equivalent a year. If we were to rank the world's militaries together as a country, it would rank as the 29th biggest oil consumer in the world (2016), ahead of Belgium and South Africa, and half the consumption of the UK and France.
- According to the 2020 report by Scientists for Global Responsibility, the UK military sector contributed 6.5 million tonnes of carbon dioxide equivalent to the Earth's atmosphere in 2017-2018. Of these, the report estimates that the Ministry of Defence's (MOD) total direct GHG emissions in 2017-2018 were 3.03 million tonnes of carbon dioxide equivalent, similar to the emissions of the UK's vehicle manufacturing industry.³⁰
- The Lockheed Martin F-35 Lightning II, with a projected service life up to 2070 and partially (10%) built by Britain's BAE Systems, has a fuel capacity that at least doubles the F-16's fuel capacity (3900 litres). Lockheed Martin expected to sell more than 3,000 F-35s worldwide.
- The US coalition dropped 4,000 bombs in Afghanistan in 2017 and more than 7,000 bombs in 2018.³¹ The Saudi coalition carried out 19,000 airstrikes, dropping British and American made bombs between March 2015 and January 2019 in Yemen.³² The US-led coalition (including the UK, France, the Netherlands and Iraq) has launched more than 15,000 airstrikes in Syria – in the battle for Raqqa alone, at least 21,000 munitions were dropped³³ – while Russia conducted 9,000 airstrikes between October 2015 and March 2016.³⁴ During Israel's seven-week Operation Protective Edge in 2014, more than 6,000 airstrikes were carried out in Gaza, the 3rd most densely populated place on earth.³⁵

- Cement production is one of the largest industrial sources of GHG emissions in the world – contributing an estimated 8% of total global CO₂ emissions.³⁶ In the World Bank’s 2017 *Toll of War* report on the consequences of war in the 10 worst-affected Syrian cities, it was estimated nearly 900,000 housing units were (partially) destroyed in 2017. The cement required to rebuild these units will release approximately 22 million tonnes of CO₂.

THE MILITARY: A GAS-GUZZLING DRIVER OF CLIMATE CHANGE

“The elephant in the kitchen when it comes to Climate Change is clearly the world’s military. The world spends something like 2 trillion US dollars a year on its military. At least half of that vast sum goes on military production with a massive CO₂ output. The military are both a major cause of climate change and hence, of the conflicts which result from the movement of peoples as deserts spread.” Bruce Kent, President of Movement to Abolish War, Vice President of Campaign for Nuclear Disarmament³⁷

Apart from the fossil fuel industry itself, the military and the arms industry (the military-industrial complex) possibly depends on fossil fuel more than any other sector. Military personnel and defence industry workers rely on the fossil-fuel economy for their livelihoods, while military equipment itself is made and run using fossil fuels – including during day-to-day (non-conflict) operations.

We are now on the brink of a new conventional and nuclear arms race. Global military spending is rising ever closer to “the \$2 trillion redline”,³⁸ with 85% of global annual military spending (\$1.9 trillion per annum) accounted for by the top 20 spenders alone³⁹ – 20 nations whose militaries have, thus far, escaped scrutiny and accountability for their individual and collective contribution to the climate emergency facing humanity today.

As an illustration, the United States Department of Defense (the Pentagon) is the biggest single institutional consumer of energy in the world, and is responsible for around 90% of all US government fuel consumption. Every year the US military consumes more than 100 million barrels of oil to power ships, vehicles, aircraft and ground operations.⁴⁰ At the height of the Iraq War in 2005, the Pentagon alone consumed daily the same amount of oil as the whole of Iraq at the time, ranking it as the 34th largest fossil fuel consumer in the world ahead of Pakistan (with a very big population of 154 million people⁴¹) or Sweden (with an advanced

President Eisenhower: Guarding “against the acquisition of unwarranted influence... by the military-industrial complex”

At his farewell address to the nation in 1961, President Eisenhower said: “This conjunction of an immense military establishment and a large arms industry is new in the American experience. The total influence — economic, political, even spiritual — is felt in every city, every statehouse, every office of the federal government. We recognize the imperative need for this development. Yet we must not fail to comprehend its grave implications. Our toil, resources and livelihood are all involved; so is the very structure of our society. In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by **the military-industrial complex**. The potential for the disastrous rise of misplaced power exists, and will persist. We must never let the weight of this combination endanger our liberties or democratic processes. We should take nothing for granted. Only an alert and knowledgeable citizenry can compel the proper meshing of the huge industrial and military machinery of defence with our peaceful methods and goals so that security and liberty may prosper together.”

industrial economy).⁴² This is not limited to the Pentagon – fossil fuels are the lifeblood of all modern militaries.

On May 1st 2019, and after intense pressure, the UK parliament finally declared ‘a climate emergency’⁴³. It is moments such as this that create opportunities for building public awareness of the role of ‘gas-guzzling’ militaries in climate change. After the emergency declaration, the UK Department for Transport’s (DfT) Head of Aviation said “it may be necessary to consider the Committee on Climate Change’s recommended policy approach” to restrict the growth of flying in the UK.⁴⁴ While the DfT was referring to commercial flights only, there was no mention of the MOD’s need to engage with this issue, despite the fact that its enormous fossil-fuel consumption is predominantly for aviation.

More than half of a modern military’s typical total fossil fuel consumption goes on aviation fuels (e.g. over two thirds in the UK⁴⁵ and around 60% in the USA⁴⁶). This is because all military aircraft are ‘gas-guzzlers’ and need to be regularly involved in exercises (if not actual combat missions) in order to keep them and their pilots ‘combat-ready’. The B-52 Stratocruiser, with eight jet engines, guzzles 500 gallons per minute – 10 minutes of flight uses as much fuel as the average driver does in one year of driving.⁴⁷ A General Dynamics F-16 Fighting Falcon burns 3,000 litres per hour, whereas a Boeing 737-800 consumes 900 litres per hour at similar speed and altitude.⁴⁸ It is therefore easy to see why the US Air Force is the largest user of fuel energy in the US federal government, consuming more than 2 billion gallons of jet fuel per year,⁴⁹ and accounts for around 10% of total US aviation fuel use.⁵⁰

The next generation fighter, the F-35 Lightning II (jointly made by the top two arms manufacturers in the world, USA’s Lockheed Martin and Britain’s BAE Systems⁵¹), with a projected service life up to 2070, has a fuel capacity that doubles (or triples depending on which variant, F-35A, F-35B or F-35C) the F-16’s fuel capacity

THE MILITARY-OIL INDUSTRY RELATIONSHIP

As an institution, the Pentagon runs on oil. Its jet fighters, bombers, tanks, Humvees, and other vehicles burn 75% of the fuel used by the Department of Defense. For example, B-52 bombers consume 47,000 gallons per mission, and when an F-16 fighter kicks in its afterburners, it burns through \$300 worth of fuel a minute. In fact, according to an article in the April 2010 issue of Energy Source, the official newsletter of the Pentagon’s fuel-buying component, the DoD purchases three billion gallons of jet fuel per year.

Thanks to the wars in Iraq and Afghanistan, the Department of Defense has been consuming vast quantities of fuel. According to 2008 figures, for example, US military bases in Iraq and Afghanistan used a staggering 90 million gallons per month. Given the base-building boom that preceded President Obama’s Afghan surge, the 2010 figures may be significantly higher.

The Pentagon’s foreign wars have left it heavily dependent on oil services, energy, and petroleum companies. An analysis published at Foreign Policy in Focus found that, in 2005, 145 such companies had contracts with the Pentagon. That year, the Department of Defense paid out more than \$1.5 billion to BP alone and a total of \$8 billion taxpayer dollars, in total, to energy-related firms on what is a far-from-complete list of companies.

In 2009, according to the Defense Energy Support Center, the military awarded \$22.5 billion in energy contracts. More than \$16 billion of that went to purchasing bulk fuel. Some 10 top petroleum suppliers got the lion’s share, more than \$11.5 billion, among them big names like Shell, Exxon Mobil and Valero. The largest contractor, however, was BP, which received more than \$2.2 billion – almost 12% of all petroleum-contract dollars awarded by the Pentagon for the year.

Nick Turse, *Kick Ass or Buy Gas?*,
TomDispatch.com, June 17, 2010

(3900 litres). Lockheed Martin expected to sell more than 3,000 F-35s around the world eventually⁵² (including 138 F-35Bs for the UK⁵³), despite never-ending problems since its development began in 1996⁵⁴ and expert claims of it being a “turkey”⁵⁵ that “can’t turn, can’t climb, can’t run.”⁵⁶

The over-consumption of aviation fuel has a significant consequence for climate change because CO₂ emissions from jet fuels are larger – possibly three times larger per litre – than those from diesel and petrol in vehicles. Radiative effects from jet exhaust, including nitrous oxide, sulphur dioxide, soot and water vapour also greatly exacerbate the warming effect of the CO₂ emissions.⁵⁷

So what is the place for these additional – already ordered – F-35s, as well as all the other legacy aircraft, in light of the IPCC goal of a carbon-neutral world by 2050? How can these competing and conflicting interests be reconciled, given that we cannot realistically expect any nation’s military to decarbonise its armaments within the IPCC timeframe? Perhaps once again the militaries and defence industries of the world will unite in arguing for an exemption.

THE MILITARY: UNABLE AND UNWILLING TO DECARBONISE

The militaries of the world are currently unwilling and unable to become carbon neutral, and there are many reasons for this.

Jet engines are essential for military aircraft. Their reliability and high power-to-weight ratio enable aircraft to fly much faster and more efficiently than other engines. There is currently no other viable renewable-energy powered alternative, other than replacing jet fuel with aviation biofuel – which comes with its own environmental and sustainability problems.⁵⁸ Electric engines are still less durable and reliable than fuel engines, making it inconceivable that the military can electrify their whole fleet.

Then there are ships. Consider the UK’s latest and largest-ever £6bn aircraft carriers, *Queen Elizabeth* and *HMS Prince of Wales*, which will run on gas and diesel (with a fuel capacity of 7 million litres)⁵⁹ rather than nuclear energy. If the UK Ministry of Defence (MOD) is as serious about sustainability and environment as it claims, it would have ordered the aircraft carriers to be at least nuclear powered (not ideal but a cleaner option), or better still, develop the technology to design the first generation of solar or wave powered carriers.

Thus, it is hardly surprising to read that the focus of the MOD’s *Sustainable MOD* annual reports⁶⁰ year after year focus on estate and business travel greenhouse gas (GHG) emission reduction, water use reduction, waste reduction and recycling. All these are worthy efforts, but any analysis and breakdown of the total fuel consumption and GHG emissions of MOD (including the armed forces) vehicles, ships, aircrafts and military operations/exercises is notable by its absence. Where are the environmental impact assessments of its day-to-day operations as well as its military (overseas) deployments and its many overseas bases?⁶¹ Where is the roadmap and progress summary for the MOD (and the armed forces) to help the UK meet its carbon-reduction pledges and obligations?

In the earliest available of these reports (2009–10),⁶² there is a clear, detailed breakdown of total GHG emissions from estate, ground motive fuel, marine motive fuel, aviation fuel, and business travel. Such breakdowns become less detailed in subsequent reports, and in the two

latest reports (2016–17 and 2017–18), the “total” GHG emissions figure quoted throughout the main report refers to estate and business travel, potentially misleading readers to think it includes armed forces’ vehicles, ships, aircraft and military operations/exercises. However, it is only in the annex that the “total” GHG emissions for *capability*ⁱⁱ can be found. Curiously these emissions are not accounted for in the final “total” *net* GHG emissions figure.

Why was the *capability* part omitted from the main analysis and discussion? In the 2017–18 report, the *capability* figure was missing all together, and replaced by the words “*not known*”. Despite this omission, one thing can be known for sure: to date, every MOD-reported *capability* figure is always much larger than the *estate* figure in any given year.

According to the latest report (2020) by Scientists for Global Responsibility (SGR), the Ministry of Defence’s (MOD) total direct GHG emissions in 2017-2018 were 3.03 million tonnes of carbon dioxide equivalent, more than three times the level of 0.94 million tonnes of carbon emissions reported in the main text of the MOD’s annual report, and is similar to the emissions of the UK’s vehicle manufacturing industry.⁶³

THE UK’S MINISTRY OF DEFENCE: THE BIGGEST ENERGY USER OF ALL UK GOVERNMENT DEPARTMENTS

As a rule, in the *Sustainable MOD* reports, figures generally refer to what is happening domestically, not overseas. For example, no data are held centrally for fuel purchased overseas (for ground or aviation operations), so fuel consumption estimates overseas are only rough estimates and therefore incomplete. Furthermore, the Greening Government Commitments (GGCs) introduced by the British coalition government in 2010 aim to reduce the impact that the “government’s estates and operations have on the environment,” but their scope is narrow and misses the elephant in the room: the MOD’s “operational and equipment energy is outside the GGC remit”.⁶⁴

The MOD (including the armed forces) is the biggest user of energy of all UK government departments *by far* and the majority of its use arises from *capability*. To deliberately omit this seriously undermines the UK government’s commitment to reduce carbon emissions. And as if this is not bad enough, not a single MOD sustainability report has ever mentioned the environmental and carbon impacts of any war or conflict that the UK’s armed forces have been part of – this is because no armed force anywhere in the world is obliged under any international treaty to reduce, or even fully report its GHG emissions. For example, emissions associated with the wars in Afghanistan and Iraq are unreported by countries including the UK and US as they are ‘incurred’ abroad and are therefore not captured in the national greenhouse gas inventories – inventories

THE UK AND DEFENCE SPENDING

In terms of value sold, the UK is the 2nd largest exporter of military products and services, with exports of \$120bn between 2007 and 2016, according to UK government’s own figures. UK military spending was around £48.7 billion during 2016–17 (HM Treasury). The UK’s defence budget is the 5th biggest in the world; in terms of spend per person, it is also the third highest in NATO. Defence is the 4th largest government department by expenditure, only behind Work and Pensions, Health and Education.

ⁱⁱ What ‘capability’ means is not defined in the report. However, we can infer from the available reports, it includes the uses of ground motive fuel, marine motive fuel and aviation fuel.

that all industrialised nations, including the US, report under the United Nations Framework Convention on Climate Change.

GOVERNMENTS HAVE ENSURED MILITARIES AND WARS ARE EXEMPT FROM NATIONAL AND INTERNATIONAL CARBON-REDUCTION TARGETS

During negotiations for the Kyoto Protocol (the international treaty setting out binding CO₂ emissions targets, concluded in December 1997), the US demanded, as a pre-requisite for signing, that any and all of its military operations worldwide (including operations in partnership with the UN and NATO) be exempt from measurement or reduction. After attaining this concession, the Bush administration then refused to sign the protocol, and the US Congress passed an explicit provision guaranteeing the US military exemption from any energy reduction or measurement. Even though the US never ratified the Kyoto Protocol, the exemptions for the military stuck for every other signatory nation. Even today, each country's report to the UN on their emissions excludes any fuels purchased and used overseas by the military.⁶⁵ Under the Paris agreement in 2015, countries are still not obliged to cut their military emissions.⁶⁶

The omission of GHG emissions from military activities and wars means we have been significantly underestimating the total global GHG emissions from *all* human activities so far.

THE CO₂-GENERATING MERRY-GO-ROUND: WAR, DESTRUCTION, RECONSTRUCTION

As we have argued, modern militaries are big greenhouse gases emitters, and the bigger they are, the more gases they emit. Let's take the most powerful and largest military in the world as an example.

According to the Pentagon's own figures, the US military emitted 67 million tonnes of CO₂ equivalent a year in 2016.⁶⁷ And if the US military were a country it would rank 51st on the list of top carbon emitters in the world, just behind Greece and ahead of Israel. And large though this figure is, it nonetheless omits USA facilities – including around 800 overseas military bases⁶⁸ – as well as equipment and vehicles abroad.

And then there are wars.

Fossil-fuelled military vehicles, ships and aircraft are not the only source of the GHG emissions. Missiles, bombs and the resulting destruction and burning all combine to create massive amounts of emissions. The reconstruction of infrastructure and buildings also relies on fossil fuel, and therefore more GHG emissions – one aspect

THE COST OF CONFLICT AND WEAPONRY

80% of the world's 20 poorest countries have suffered a major war in the past 15 years. Nine of the 10 countries with the world's highest child mortality rates have suffered conflict in recent years. (*War on Want: Banking on Bloodshed, 2009*)

Out of a global population of 7.4 billion, two billion people live in countries where development outcomes are affected by fragility, conflict, and violence. By 2030, at least half of the world's poor people will be living in fragile and conflict-affected settings. Conflicts drive 80% of all humanitarian needs. (*The World Bank, 2019*)

Military kit vs people: One aircraft carrier (\$5 billion) could reforest an area three times the size of Costa Rica in the Amazon (\$300 per hectare). One battle tank (\$780,000) could treat 26,000 people for malaria (\$30 per person). One B-2 stealth bomber @ \$1,000,000,000 could fund 1.1 million clean water wells or 31.5 million child immunisations or over 700,000 houses for families currently living in cramped, unsanitary and dangerous conditions or over 270,000 schools furnished with desks, chairs, tables, blackboards. (*Share The World's Resources, 2015*)

of the merry-go-round that is the military-oil industry relationship.

Another manifestation of this destructive merry-go-round is the (failed) Western ideology that to secure oil for the global fossil-fuel-based economy, military force must be employed to guarantee that those sources of oil remained in the West's sphere of control. This would go on to ensure that immeasurable amounts of oil would be burned in pursuit of 'protecting' oil sources, for example in the Middle East,⁶⁹ further enforcing the need to secure oil for the global economy.

Since the industrial age, oil has been as intertwined with war as bread is with butter. In 1940, the US military consumed 1% of the country's total energy use; by the end of World War II, the military's share rose to 29%.⁷⁰ A never-ending supply of wars⁷¹ (20th and 21st centuries) have fuelled and continue to fuel today's terrible climate change reality and impending catastrophe.

While it is hard to produce exact totals for conflict-related GHG emissions, they can be inferred from figures that are available. The Iraq War officially ended in late 2011. The Pentagon reported its GHG emissions in the whole year of 2011 to be 84 million tonnes of CO₂ equivalent – 17 million tonnes more than the 2016 figure. It is a lot of *additional* greenhouse gases emitted *domestically* to mobilise the country for a war overseas and 2011 is the *withdrawal* year. During the Iraq War, the Pentagon's reported GHG emissions for any given year is consistently higher

than in 2011. If it requires tens of million tonnes of GHG emissions to mobilise at home, it is valid to suppose that more tonnes of GHG emissions would be generated in carrying out the war abroad.



According to "very conservative" estimates in the report *The Climate of War* published in 2008 by Oil Change International, the Iraq War was responsible for at least 141 million tonnes of CO₂ equivalent from the start of war in March 2003 through to December 2007.⁷² That is 28.2 million tonnes of CO₂ equivalent per year. **The Iraq War's annual greenhouse gas**

emissions were more than annual national GHG emissions of most countries; 139 (60%) of the countries in the world emitted less than 28 million tonnes of CO₂ each in 2005.

If we take the annual emissions figure and multiply by the number of years of the Iraq War, we can approximate the total GHG emissions of the war to be 254 million tonnes of CO₂ equivalent. **That's slightly more CO₂ released than the 14th biggest economy in the world, Spain, in 2016, and only a quarter less than the 6th biggest economy, France.**⁷³

And this is only *one* war – the Iraq war; we have not added in the ongoing (civil) wars in Afghanistan (on course to become the longest war in US history), Yemen, Syria, Gaza (Palestinian Territories), Libya, Somalia and Ukraine, to name just a few. Top military spending nations are deeply involved in many of these: Iraq (USA, UK), Afghanistan (USA, UK, Germany, Italy, Australia, Canada, Turkey), Libya (NATO, particularly France and UK), Yemen (Saudi Arabia, UAE, UK, USA), Somalia (USA), Ukraine (Russia, USA), Syria (Russia, Turkey, Iran, Israel, USA) and Gaza (Israel).

To enable and sustain the political space at home to both wage war and prevent war weariness, leading military powers conduct these wars with air-power and aerial bombardment. The US coalition dropped 4,000 bombs in Afghanistan in 2017 and more than 7,000 bombs in 2018.⁷⁴



The Saudi coalition carried out 19,000 airstrikes in Yemen between March 2015 and January 2019, dropping British and American made bombs.⁷⁵ The US-led coalition (including UK, France, the Netherlands and Iraq) has launched more than 15,000 airstrikes in Syria – in the battle for Raqqa alone, at least 21,000 munitions were dropped⁷⁶ – while Russia conducted 9,000 airstrikes between October 2015 and March 2016.⁷⁷ During Israel's 7-week Operation Protective Edge in 2014, more than 6,000 airstrikes were carried out in Gaza, the 3rd most densely populated polity in the world, with an area size much smaller than London.⁷⁸

There is no end in sight for any of these wars – many more people will be killed or injured; yet more will become refugees. In the meantime, an obscene amount of (jet) fuel will be consumed; more bombs will be dropped on people, their homes and their land; and the appalling environmental impact – both as a result of conflict (pollution) and emissions – is added to the terrible human cost.

And after?

THE CLIMATE CHANGE BURDEN OF POST-CONFLICT RECONSTRUCTION

Life has to go on and countries need to be rebuilt. In the process, more GHG emissions are produced. Cement production is one of the largest industrial sources of GHG emissions in the world – estimated to contribute approximately 8% of total global CO₂ emissions.⁷⁹ The construction of a typical house requires some 30 tonnes of cement, based on ratios developed in the Polservice Study of 1980.⁸⁰ According to the International Energy Administration, cement production releases, on average, 0.83 tons of CO₂ per ton of cement produced.⁸¹ The World Bank's 2017 *Toll of War* report on the consequences of war in the 10 most-impacted Syrian cities estimated that nearly 900,000 housing units were (partially) destroyed in Syria in 2017.⁸² The cement required to rebuild these units will release approximately 22 million tonnes of CO₂. Furthermore, the massive task of clearing the debris before reconstruction can start will generate yet more GHGs. Twenty million tons of debris have accumulated in Aleppo and Homs alone, and it will take six years of continuous work and 28.3 million truck-kilometers to clear it,⁸³ while releasing 1800 tonnes of CO₂ in the process.⁸⁴

It is not just damaged houses that need rebuilding. Overall, in these Syrian cities, nearly two-thirds of water treatment plants, half of all pumping stations, a third of water towers, a quarter of sewage treatment plants, and a sixth of all wells have been destroyed or partially damaged. Two power plants were destroyed and six others partially destroyed. A total of 30km of roads and nine bridges were damaged or destroyed. Health and educational facilities have all been specifically targeted and used for military purposes during the war. In total, 15% of all health

facilities were completely destroyed and 42% were partially damaged. Specifically, 60% of all public hospitals and 48% of private hospitals were completely destroyed or partially damaged.

When it comes to educational facilities, 7% of primary schools, 15% of secondary schools, 6% of universities and 33% of education offices were fully destroyed. All these were wrongfully damaged or destroyed by munitions from fuel-powered aircrafts or tanks. And when reconstruction begins, materials manufactured by the fossil-fuel enabled processes will be used to rebuild them with fuel-powered heavy machinery and vehicles. Throughout this chain of actions, every step releases a huge amount of greenhouse gas emissions to exacerbate climate change.

ESTIMATING GREENHOUSE GAS (GHG) EMISSIONS BY THE WORLD'S MILITARIES

We do not know the full scale of the combined climate impact of conflicts around the world for the simple reason that data are scarce – certainly those who are able to report such data (i.e. state actors as opposed to non-state actors) have a vested interest in us *not* knowing the scale of atrocities committed. If such actors are reluctant to offer up accurate figures concerning the number of victims (so-called 'collateral damage'), there is even less hope that they would be transparent about GHG emissions resulting from conflict.

The militaries around the world are not required by law and treaty to report on their fuel consumption and costs. Tamara Lorincz, author of IPB's '*Demilitarization for Deep Decarbonization*' report, pointed out⁸⁵ that both UN's⁸⁶ and NATO's⁸⁷ military expenditures reporting template does NOT require fuel consumption/cost as a separate entry; military emissions are EXEMPTED from reporting to UNFCCC/IPCC, i.e. no transparency on disaggregated reporting of military fuel consumption and carbon emissions; the International Energy Agency (IEA) also do NOT gather data on fuel consumption by militaries. Nevertheless, it is possible to estimate the fuel use – and hence GHG emissions – of the day-to-day activities of global militaries. This is because:

1. Some countries publish the annual energy use of their militaries, bearing in mind the common limitation that data for conflicts or overseas operations are generally incomplete.
2. The observation that income is a strong predictor of an individual's carbon footprint is valid.⁸⁸ To extrapolate from this, it can be equally well argued that any given nation's annual military spending is a good predictor of annual energy/fuel usage of that nation's military. As discussed earlier, fossil fuel is the main energy source for the world's militaries since it is essential not just for personnel and estate but also for equipment and operations. More than half of fuel use will generally be aviation fuel. Fossil fuel is not cheap and the more we use, the higher the fuel bill.

Military spending can be roughly divided into three categories: personnel, maintenance and equipment. While personnel and maintenance costs are usually consistent, equipment cost fluctuates, especially when 'big ticket' items are procured. Such powerful military equipment is both money and energy heavy, e.g. F-35s with a price tag of £100m each, or the £3 billion HMS Queen Elizabeth aircraft carrier – both built in partnership by the pre-eminent British arms manufacturer BAE Systems. It is here we see the military-oil economy merry-go-round yet again. The higher the military spending, the greater the number of big-ticket items procured, and, therefore, the greater the amount of fossil fuel consumed, which in turn requires even higher military spending to cover the increased maintenance and operation costs. In this way, it is reasonable to suppose annual fuel usage of a military is proportional to its government's annual military spend.

According to the UK's Office for National Statistics, between 2003 and 2016 the total aviation fuel used for the UK's defence activities was 9.6 million tonnes of oil equivalent⁸⁹ – this equates to around 25 million tonnes of CO₂ produced in total, and on average 1.8 million tonnes of CO₂ per year.⁹⁰ In the same period, total fuel used for defence activities including all types of fuel (e.g. gas, petrol, diesel and aviation fuel etc.) is 14.5 million tonnes of oil equivalent, which produced roughly 38 million tonnes of CO₂, or an average of 2.7 million tonnes of CO₂ per year.

According to SIPRI,⁹¹ the UK's military expenditure in 2017 is \$47 billion. From start of the Iraq War, the MOD's fuel use averaged around 1 million tonnes of oil equivalent per annum. These two figures can be used to estimate other countries' military fuel use. We know that the Pentagon uses around 100 million barrels of fuel a year,⁹² which is roughly 14 million tonnes of oil equivalent. SIPRI's figure for the military expenditure of the USA in 2017 is \$610 billion. By using the UK's figures as a reference point and the proportionality of military fuel use to military spending outlined earlier, we arrive at a figure of 13 million tonnes of oil equivalent (not a bad prediction for such a simple calculation). This correlation can be further confirmed by looking at (very few) other countries who (occasionally) report their military's fuel consumption. The Defence Forces of Ireland consumed 19,000 tonnes of oil equivalent energy (221,000MWh) in 2017.⁹³ Ireland's military expenditure in 2017 was \$1.1 billion. When we apply this formula, it would predict fuel consumption of 23,000 tonnes of oil equivalent – very close to the actual figure. We can further apply this same calculation to France. In 2010, the French Ministry of Defence reported their fuel consumption at 925,000 tonnes of oil equivalent.⁹⁴ The UK and France's military expenditure were \$58bn and \$62bn in 2010 respectively, so from this we can estimate French military's fuel consumption at 1.07 million tonnes of oil equivalent. This figure is not far away from the reported figure of 0.93 million tonnes of oil equivalent.

If we extend this calculation for all the countries that SIPRI reported for 2017, the global military fuel consumption is thus estimated to be 35 million tonnes of oil equivalent (257 million barrels of oil equivalent)⁹⁵ a year.

If we were then to rank the world's militaries together as a single country, collectively they would rank as the 29th biggest oil consumer in the world, just ahead of Belgium or South Africa and behind Argentina or Malaysia.⁹⁶ To put it another way, this is half the oil consumption of the world's 5th biggest economy, the UK, or the 6th biggest, France.

We should also bear in mind that this figure accounts mainly for the day-to-day (domestic) running of the militaries only. It does not include operations overseas and conflicts/wars. *In other words, to simply maintain our militaries and keep them ready for war and ready to defend at any time requires nearly as much oil as some of the world's most industrialised economies.*

It must be stressed again that estimates for militaries' fossil-fuel consumption only provide us with the *minimum* estimates for the militaries' carbon emissions. And moreover, *direct* fossil fuel use is not the whole story. To estimate the total carbon footprint of the militaries, we have to also include indirect emissions from other activities in addition to the direct emissions from consumption of fossil fuel. Amongst these indirect emissions, the most significant includes the impact of wars as well as emissions by the arms industry. The Costs of War Project of Brown University estimated the *total* US military's carbon emissions for 2017 to be 339 million tonnes of CO₂ equivalent, consisting of 59 million tonnes of CO₂ equivalent emitted by the Pentagon and 280 million tonnes of CO₂ equivalent emitted by the US defence industry.⁹⁷ Therefore, the US military's total carbon footprint alone accounts for an incredible 6% of the total greenhouse gas emissions in the USA.⁹⁸ It must be noted that this percentage would be even higher if the impact of overseas wars conducted by US military was included.

In the UK, Scientists for Global Responsibility, using the input-output model of Mike Berners-Lee,⁹⁹ estimated the British military and arms industry's total carbon footprint to be 13 million tonnes of CO₂ equivalent, accounting for 3% of the national total carbon emissions.¹⁰⁰ Since the USA is both the biggest military spender and also the largest arms exporter by far, the Costs of War Project's figure of 6% sets the upper bound estimate for a country's military-industrial complex's contribution to the national total greenhouse gas emissions. And because it can be argued that the British military and arms industry are amongst the most carbon efficient in the world, the equivalent dollar spend on other, less efficient countries' military and arms industries (most other countries, for example, BRICS nations) will likely produce more greenhouse gases than on British ones. Therefore, balancing out all these factors, it is reasonable to estimate the carbon 'footprint' of the global military-industrial complex to sit somewhere between 3% and 6% of the global total greenhouse gas emissions, most likely at 5%.¹⁰¹

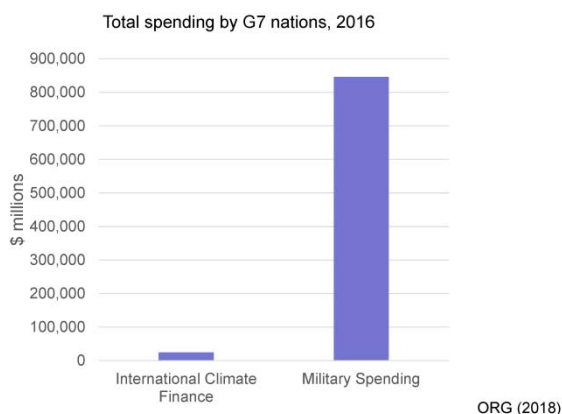
We can further confirm the scale of greenhouse gas emissions by the global militaries and associated defence industries by applying the same input-output model provided by Berners-Lee. We estimate the carbon footprint of global military-industrial complex in 2017 to be 445 million tonnes of CO₂ equivalent, accounting for about 1% of the total global carbon emissions.¹⁰² This is a considerably larger carbon emission figure and contributing more to climate breakdown than, for example, the entire country of Italy and not much smaller than the total greenhouse gas emissions by the UK (505 million tonnes of CO₂ equivalent) and France (482 million tonnes of CO₂ equivalent) respectively.¹⁰³ Bearing in mind that both British military and arms manufacturers are considered to be the most energy efficient in the world, the true figure would be much higher if we take inefficiencies by other militaries and arms manufacturers into account. And again, this figure does not include carbon emissions from the impacts of wars and conflicts around the world.

In truth, whether the global militaries' carbon footprint is 5% or 1%, it all leads to the same conclusion in this devastated climate changed world. The global military and defence industry combined have historically been and remain a significant and wholly unaccountable driver of climate breakdown. A comparison may put this in some perspective. Civil aviation accounts for approximately 2.1 % of global CO₂ emissions, 65% of which are for international flights, and hence international aviation alone is responsible for around 1.3% of global CO₂ emissions.¹⁰⁴ This means that the global military-industrial complex accounts for (at the very minimum) the compatible amount of greenhouse gas emissions as international aviation. We are all, rightly, being told not to fly and the inspiring climate activist Greta Thunberg sailed the Atlantic to make the point.¹⁰⁵ While the imperative now is to take fewer flights, buy local food and fewer consumer products, the global military has a free pass to buy and operate as many big-ticket gas guzzlers (eg, F-35s and Eurofighter Typhoons) as it wants, with no hard questions asked by politicians. These military carbon emissions are astronomical compared to civilian activities. For illustration, the carbon emissions of a-35 fighter jet per mission (28 tonnes of CO₂ equivalent)¹⁰⁶ is equal to one person's emissions (living in the UK) over 2 years¹⁰⁷; More, one B-2 Stealth Bomber produces 251 tonnes of CO₂ equivalent per mission¹⁰⁸ whereas a trip from London to New York generates around 0.986 tonnes of CO₂ equivalent per passenger¹⁰⁹. Until this military-climate awareness is raised, only some will be made to play their part in reducing emissions, and the truth is, one fewer civilian flight is much less impactful on climate mitigation than one fewer military flight.

And military aviation is at the heart of conflicts today, as we have seen in Iraq, Syria Afghanistan and Yemen. These wars have also taught us about the futility of reliance on 'aerial supremacy' - aerial bombardment does not lead to more security; in fact, the opposite is true.¹¹⁰

Finally, as if we needed any more evidence of how governments are failing to get on the right side of history, including those EU nations in the G7 – UK, France, Germany and Italy – these tables below illustrate the disparity between investment in climate change related needs and the investment made ready for the military.

Military v climate spending



Military v climate spending

Spending by G7 nations, 2016

	International Climate Finance (US\$M)	Military Spending (US\$M)	Climate Finance as % of Military Spending
Canada	230	15,157	1.5%
France	4,097	55,745	7.3%
Germany	9,117	41,067	22.2%
Italy	249	27,934	0.9%
Japan	8,466	46,126	18.4%
UK	1,495	48,253	3.1%
USA	1,244	611,186	0.2%

ORG (2018)

Military spending vs climate spending¹¹¹

According to Climate Policy Initiative's analysis, total public expenditures on climate change, both international and domestic, amounted to \$141 billion in 2016, compared with military expenditures of \$1.66 trillion.¹¹² On average, the expenditure of national governments on climate change amounted to 8.5% of what they spent on defence, a ratio of 12:1.¹¹³ The G7 and other industrialised countries committed to spend \$100bn a year under UNFCCC to support climate action in developing countries.¹¹⁴ In truth, they didn't and what they spent in International Climate Finance is completely overshadowed by their military spending (\$21bn versus \$845bn spent by G7 in 2016).

And so the question must be asked: is this over-consumption of valuable resources in the belief that it delivers security, backfiring? The release of such huge amounts of greenhouse gases only serves to fuel runaway climate change. The coming climate catastrophe is already acknowledged as the biggest threat to human survival and therefore is the **real** 'security' issue of our time. Outdated notions of 'national security' should now be replaced by the concept of 'human security'. The 'peace of mind' derived from a fossil-fuel driven military is – on many critical counts – no longer fit for the 21st century. We must 'transform defence'.

Our militaries are supposed to defend us from our enemies. But the truth is that they are an intrinsic driver of the biggest threat, we face – climate catastrophe – and therefore have a vested interest in maintaining the status quo.

How can true global human security be won? And can it be done quickly enough to help avert climate catastrophe?

The European Union

Before the expansion of the European Union in 2004 to include 10 more member states, mainly from Eastern Europe, the original EU15 comprised Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United

Kingdom. Unlike the newly acceded Eastern European countries, The EU15 are either countries with some of the highest (total or per capita) military spending or the most industrialised countries in the world (and many of them are both). In other words, the EU15 are countries similar to UK both in terms of industrialisation advancement and military capability, especially the larger nations of France and Germany. Therefore, we can readily extend the input-output analysis of the UK to EU15 and expect indicative results.

For the UK, defence industry and military generated 0.33 kgCO_{2e} per £ (0.26 kgCO_{2e} per \$ in 2017 exchange rate).¹¹⁵ By applying the same conversion rate to the total EU15 military spending of \$235bn in 2017,¹¹⁶ we obtain a total carbon footprint of EU15's militaries and defence industries of 60 million tonnes of CO₂ equivalent. For illustration, this equates to total annual greenhouse gas emissions of Ireland; or roughly 2% of the total greenhouse gas emissions by EU15 in 2017.¹¹⁷ In the EU, direct CO₂ emissions from aviation account for about 3% of total emissions.¹¹⁸ The EU prides itself to be the world's first region to address CO₂ emission from international aviation¹¹⁹ so it is inexcusable at best, hypocritical at worst, for them to wilfully omit the climate impact of their militaries and defence industries, when both sectors generates compatible amount of greenhouse gases.

To further compound the role of the military in climate breakdown, the European Commission has proposed a €40bn European Defence Fund for the research and development of weapons until 2027.¹²⁰ Specifically, spending on military research, development and related activities would increase to at least €5.5bn per year from 2021 onwards – 50 times the current level.¹²¹ Notably, this funding is *additional* to the large budgets already provided by national governments in Europe for military R&D. These initiatives signify a fundamental change of the European project from peace-building to readiness for (defensive) war.¹²² More money for the military-industrial complex, more carbon for climate breakdown.¹²³



THE FIVE PERCENT PROPOSAL AND FORMULA

DIVERTING MILITARY SPENDING TO HUMAN AND ENVIRONMENTAL NEEDS

The Five Percent Proposal offers a ground-breaking new formula to help countries progressively convert their military spending into funds to meet environmental and human needs. The Five Percent Formula comprises two steps with the aim of halving global military spending over 10 years (with those savings redirected to human need), followed by a 5% threshold formula, designed to rein-in military spending thereafter. It has been developed through lessons learned on international campaigns such as debt, trade and tax.

Diverting just 10% of world military spending would provide substantial funding to achieve major progress on key SDGs:¹²⁴

- ❖ Over 800 million people in the world are hungry;¹²⁵ 736 million people subsist on less than \$1.90 a day.¹²⁶ Furthermore, over 40% of people in the world live on less than \$2 per day. And this is not just confined to the global south – 40 million Americans are on food stamps.¹²⁷ A 2015 report from the UN Food and Agriculture Organization suggests that eliminating extreme poverty and hunger sustainably by 2030 (SDGs 1 and 2) would require an estimated additional \$265 billion a year on average (2013 prices).¹²⁸ This amounts to 16% of global military spending in 2015.
- ❖ The 2015 Education for All Global Monitoring Report found that providing universal primary and early secondary education of adequate quality by 2030 (SDG 4) would require an additional \$239 billion a year in spending (2012 prices).¹²⁹ This is 14% of global military spending in 2015.
- ❖ A 2015 report by the Sustainable Development Solutions Network found that achieving the SDGs in health, education, agriculture and food security, access to modern energy, water supply and sanitation, telecommunications and transport infrastructure, ecosystems, and emergency response and humanitarian work (SDGs 2, 3, 4, 6, 7, 9, 11, 13, 14 and 15), including additional sums to allow for climate change mitigation and adaptation, would require further spending from public sources of \$760–\$885 billion a year between 2015–30 (2013 prices).¹³⁰ This amounts to 46–54% of world military spending in 2015.
- ❖ In a 2018 study, it is estimated that if the UN had invested \$200 billion in peacekeeping operations with strong mandates during the period 2001–2013, major armed conflict would have been reduced by up to two-thirds (relative to a scenario with no peacekeeping operation) and 150,000 lives would have been saved. The actual budget over these 13 years was \$59 billion. The \$200 billion scenario is indeed a major increase on \$59 billion, but this larger commitment would decline over time as peacekeeping missions go on to significantly reduce current and future risk of conflict. The researchers conclude that “UN peacekeeping is clearly a cost-effective way of increasing global security.”¹³¹
- ❖ At current level, WHO’s annual \$2 billion underfunded budget is only 0.1% of annual \$1.9 trillion we spend globally on militaries.¹³² The cost of planning for a pandemic was estimated to be around \$1 per person per year.¹³³ That is \$8bn a year. Simply diverting 1%

of the annual global military expenditure (\$1.9 trillion) will make available \$19bn a year to fund both WHO and a new global pandemic prevention initiative.

WHAT DOES THE FIVE PERCENT PROPOSAL ARGUE?

This proposal argues that we need to place excessive global military spending alongside other established international development 'structural' campaigns such as debt cancellation and tax justice in order to divert taxpayers' money to better use and applied to international development, climate change and the global green economy. The proposal argues that there is a fundamental need to see military spending as every bit as central to understanding power, poverty, economic collapse, unjust distribution of resources as other structural campaigns like unrepayable debt, unfair trade, tax injustice, climate change and most recently the 'war on drugs.' It is not an adjunct to any of these issues – it is implicated in each and every one of them.

The impact of runaway military spending on the 'development' narrative is huge. We require more than simply the Arms Trade Treaty or SDG 16 to get to grips with this issue. War is one of the chief causes of poverty; the global military a major contributor to climate change. And as we see ever greater movement of peoples due to conflict and climate change this creates yet another opportunity for an even greater military 'security' presence. As we near the \$2 trillion global annual military spend, we must ask: is this 'security' really value for money? Who really benefits from the big ticket weapons systems paid for with taxpayer dollars, yuans, yens, pounds and euros?

"Our only hope today lies in our ability to recapture the revolutionary spirit and go into a sometimes hostile world declaring eternal hostility to poverty, racism, and militarism." Dr. Martin Luther King Jr

The Five Percent Formula is at the heart of the Five Percent Proposal, and includes the following:

1. Decade-long annual absolute cuts of 5% among the top 20 military spenders would equate to a 10-year compound cut of 40% for both military expenditure and carbon emissions.

The top 20 spenders account for 85% of all military spending. This would deliver an estimated \$700 billion over the decade to be redirected to core urgent human and environmental needs. The \$700 billion could be applied thus:

International savings \$350 billion: could be used for immediate and urgent poverty reduction; sustainable development – reflecting civil society activism on climate and economic justice; peace/conflict prevention and human rights; investing in the global green economy; global health and pandemic prevention and control.

Domestic savings \$350 billion: could be used for counteracting effects of austerity on public services; universal basic income/services; investing in clean, green jobs.

After this first decade, global spending will have been driven down to the lowest level since the Cold War – the mid-1990s when global military spending was at \$1 trillion.

(Today such expenditure stands at \$1.9 trillion, much closer to a runaway '\$2 trillion redline')

2. At this stage, we call upon all nations to adopt the 5% threshold rule to sustainably restrain global military spending: This threshold stipulates that no country's increase in

military spending can outstrip its economic (GDP) growth. The formula is designed to be mainstreamed into budgeting beyond the first 10 years, acting as both a military expenditure ‘dampener’ and an economic growth ‘accelerator’ for all nations, while facilitating and enabling the public to more deeply interrogate the many interlinked issues of the military spending debate.

For example: 0% economic growth = 5% cut to annual military spend; 2% growth = 3% cut to annual military spend; 5% growth = no increase; 7% growth = only 2% increase on annual military spend. *Most economies grow less than 3% annually; this effectively translates as 2% annual reduction to their military spending.* These savings are then divided equally to fund both domestic and international needs.

NOTE: This process must run parallel with the urgent decarbonisation of the global military and a rapid move towards truly sustainable defence policies – ones rooted in revisiting notions of ‘non-offensive defence’ along with a massive increase in peacekeeping and peacebuilding commitment and finance.

THE ‘OIL CURSE’: A DRIVER FOR MILITARY SPENDING, CONFLICT AND INSECURITY

After the Iraq War, the total military expenditure of the Organization of the Petroleum Exporting Countries (OPEC)ⁱⁱⁱ rose sharply, fuelled by insecurity as a consequence of the war, which in turn caused a massive rise in oil prices to fund the increased military spending.

OPEC countries are good examples of the military-oil industry relationship in action, where by oil drives increased military spending, conflict and insecurity (most OPEC countries have experienced conflict in recent times with oil/gas resources playing a major contributing role in triggering conflict).

OPEC includes some of the highest per capita military spending and some of the biggest arms-buying nations in the world. High military spending funded by lucrative oil revenue can also combine to increase the probability of aggression towards neighbours: the invasion of Kuwait by Iraq in 1990; Saudi Arabia’s aggression towards Qatar in 2017 and its ongoing war in Yemen since 2015 are examples of this.

WHAT IF? THE FIVE PERCENT PROPOSAL APPLIED TO OPEC COUNTRIES

OPEC comprises low- and middle-income countries that depend on oil. But being an oil exporter brings its own problems when addressing how best to spend that oil revenue. The ‘oil curse’ is real¹³⁴ and the fact that OPEC members spend more on their militaries than on development is a perfect illustration of this – the revenue of oil is more often used to entrench the hold on power of vested interests while keeping the population poor.

Figure 1 describes a ‘what if’ scenario for the period 2001–2014: what if the Five Percent Proposal’s ‘5% threshold rule’ ($\text{annual military spending growth rate (\%)} = \text{Previous year's GDP growth rate (\%)} - 5(\%)$) is hypothetically applied to OPEC nations (2001 is the reference year)

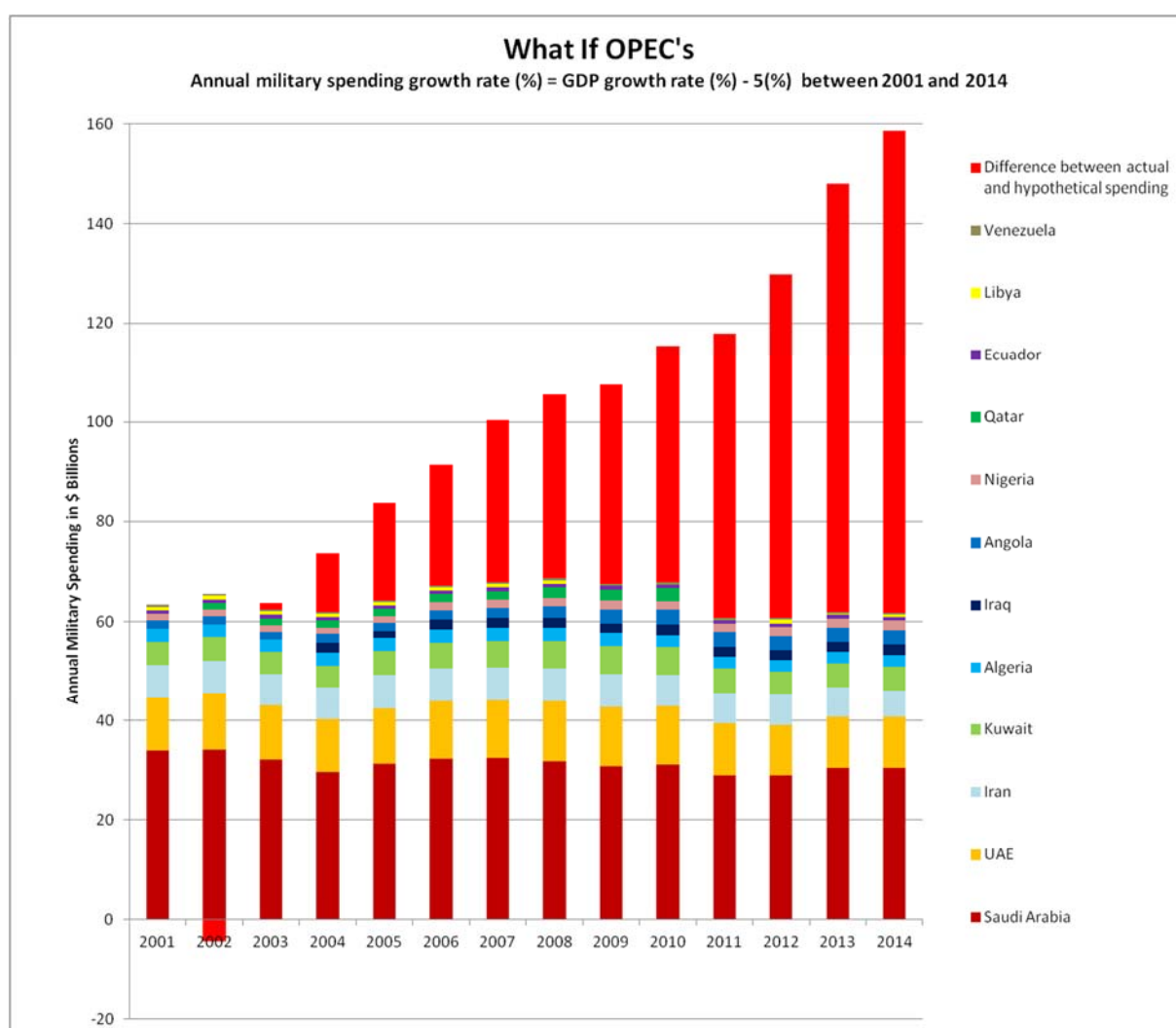
ⁱⁱⁱIn 2014, the OPEC members are Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates and Venezuela.

when compared with actual military spending (where in reality, the only way was, and remains, *up*)? Red bars in the chart represent the difference between a country's actual military spending in a given year and the hypothetical level of spending if the 5% threshold rule had been applied.

Figure 1 shows that OPEC countries' actual military spending was on a relentless march during the period 2003–2014, rising from \$64bn to \$159bn (inflation-adjusted to constant 2016 US\$, SIPRI) – an increase of nearly 150%. And if not for the collapse of currencies in OPEC countries in crisis, including and especially Venezuela and Libya, the increase would have been even greater in US\$.

If OPEC members followed the 5% threshold rule, military spending would stabilise, freeing up more money for economic and social development. The result may have been fewer conflicts and therefore a reduction in greenhouse gas emissions. In this hypothetical case, we can see there are big differences between 'what if' and actual annual military spending – **in 2014 alone, nearly \$100 billion in savings could have been diverted to economic and social development.**

Figure 1: The Five Percent Proposal applied to OPEC countries, 2001–2014



**The UAE, one of the top military spenders, stopped giving information about their military expenditure in 2015. Thus, to avoid giving a misleading trend of the total military spending of OPEC countries, 2015 and 2016 are not included.*

Angola can be used as an example. Its military spending was \$1.6bn in 2001 (SIPRI¹³⁵) and its GDP growth rate was 3.1% in 2000 (World Bank¹³⁶). Under the 5% threshold rule, its military spending could rise by a maximum 1.9% (=3.1%-5%), representing a decrease to \$1.58bn in 2002. Angola's actual military spending in 2002 was \$1.65billion (SIPRI). This would have been an annual saving of \$70 million – a significant sum that could make a difference for Angola's healthcare or school education.

WHAT POSES THE GREATEST THREAT TO THE MOST PEOPLE: CLIMATE CHANGE? TERRORISM? CONVENTIONAL WARFARE?

“Measures to adapt the inevitable impacts of climate change are just as important as cutting greenhouse gases. The world requires an integrated approach to disaster risk reduction and tackling climate change.” A joint statement for the International Day for Disaster Reduction by Special Representative of the Secretary General for Disaster Risk Reduction, Ms. Mami Mizutori and the Executive Secretary of the United Nations Framework Convention on Climate Change, Ms. Patricia Espinosa.¹³⁷

Between 2000 and 2011, 2.7 billion people were affected by disasters and \$1.3 trillion was lost as a result of storms, heat waves, extreme cold, landslides, tsunamis, wildfires, cyclones, volcanoes, earthquakes and tsunamis.¹³⁸ Since 2011 we have seen an ever increasing number of extreme weather events with terrible human loss of life and livelihoods, often wiping away years of development. The increasing number of extreme weather events was consistent with scientists' prediction for climate change trends. What will the figures look like for 2011–2022?

The reality on the ground is that way more money is spent 'after the fact' on post-disaster reconstruction than funding efforts on early warning and disaster risk reduction. In the 20 years between 1998 and 2018, \$107bn was spent on disaster response. This was just 0.4% of overall investments in development aid. “This [sum] is inadequate and markedly inequitable, with little consideration of the potential magnitude of risk and realised risk – or actual losses and damages. Since 2003, the financing of DRR [Disaster Risk Reduction] has been roughly at about 10 per cent of overall financing on disasters each year. The investments are driven by few large post-disaster projects rather than by systematic DRR that include local community preparedness and capacity development for risk informed development,” says Sanny Jegillos of UNDP Asia and the Pacific.¹³⁹

Meantime, the UN Office for Disaster Risk Reduction (UNDRR) rightly wants to see a 'culture of prevention and not just a culture of reaction'. DRR is a multi-faceted complex human activity that needs far more investment if it is to be truly preventative rather than reactive. The most notable element of UNDRR's mandate is “to serve as the focal point in the United Nations system for the coordination of disaster reduction and to ensure synergies among the disaster reduction activities of the United Nations system and regional organisations and activities in socio-economic and humanitarian fields”.¹⁴⁰

This is a huge global task that only becomes more demanding with each climate-change affected year. Not only is disaster risk reduction and response under-funded, but also the office of UNDRR itself. Over the course of the 2016–2017 biennium, UNDRR could only raise \$58 million to meet its meagre financial target of \$75 million.¹⁴¹

Perhaps the time has come to challenge the levels of investment in military defence spending – the budgets of which are predicated on and set to address threats of terrorism, conventional or nuclear conflict – with the paucity of funding allocated to the defences of which we are arguably in greater need: that of putting in place all and every measure necessary, wherever needed, to address through early warning and disaster risk reduction the ever-present threat from human-made climate change.

Apart from a nuclear weapons accident or deliberate nuclear exchange, climate breakdown is by far and away the greatest security threat to the world's population.¹⁴² It far outweighs any threats from terrorism or conventional national security (noting that terrorism and perceived/real threats to national security are themselves often intrinsically linked to oil or natural resources).

It has long been argued that high-income countries with the greatest responsibility over the centuries for driving climate change should bear the lion's share of responsibility to tackle the consequences of it – in other words, the *climate-related defence needs of billions of people*.

Unsurprisingly, these high-income countries also happen to be the world's biggest military spenders. India and China are now in the premier league of carbon emitters and military spenders, and though they have little 'historic' responsibility for climate change, their economic and military strength endow both with significant responsibility to ensure the common future of humankind.¹⁴³

While the international community spent \$107 billion on disaster response (not risk reduction) between 1998 and 2018 (an average of approximately \$5 billion annually), the F-35 Joint Strike Fighter programme is expected to cost over \$1.5 trillion over its 55-year lifespan for the United States alone.¹⁴⁴ Costing £100 million each, the UK government planned to buy 138 F35s.¹⁴⁵ Adding up all the planned purchases, the total lifetime cost for all the countries that bought F-35s could be as high as \$2 trillion.¹⁴⁶

In stark contrast to \$2 trillion for F-35s alone, how much will be made available to disaster risk reduction for the next half century? Or even post-disaster response, as we enter climate catastrophe (while the gas-guzzling F35 flies our skies)? Will it match even this one single item of defence expenditure? Meantime, over that same timeframe, at present annual spending rates, we will have spent approximately \$100 trillion on global militaries. If we take the \$5 billion annual average for post-disaster spending (1998–2018), that comes to \$250 billion over half a century – a mere 0.25% (a quarter of one percent) of global military spending.

We have been told we have a decade or so to save our planet. We have a climate emergency declared.¹⁴⁷ We need a quantum shift in redefining 'defence' needs and 'defence' spending aligned to the ever-greater threats to human life and habitat from man-made climate change. Just as the F35 was deemed worth the



expenditure to meet USA and UK governments' (and defence contractors') needs, so expenditure for disaster risk reduction is essential to global human security and must also be framed as a 'defence' issue.

The money is there to do properly, if we demand it.

EU COMMON FOREIGN & SECURITY POLICY IS NOT 'CLIMATE CHANGE READY'

It could be argued that in addition to austerity and climate change, European citizens face another, connected, threat: that of *failing, out-dated security and defence thinking*.

Historically, European nations' military spending has been central to re-enforcing power, poverty, unjust distribution of resources, economic and environmental collapse. The longstanding destructive role of western militaries is only matched by the historic harm caused by those same nations' corporate interests across the global south, notably through the extraction of resources. These commercial interests have been and remain a major cause of instability and armed conflict while developed nations grew rich on those resources.

How we face our past and re-make our future; how we establish equitable trading relations; how we put an end to poor people fleeing as economic, climate or conflict refugees and drowning in Europe's waters, will only be fully addressed when we also put foreign, security and defence/military matters into that equation. *Peaceful green prosperity* for Europe, and our sisters and brothers across the global south, will remain elusive as long as the military-oil industry relationship remains intact, all powerful and unchallenged.

As the 2nd largest military spending entity, the EU's national militaries are a major consumer of fossil fuel, contributing significantly to climate change – climate change which we know has had and will continue to have, the greatest impact on nations of the global south – which in itself, is deeply at odds with that part of EU Foreign and Security policy addressing the EU's international development activity. Even in those instances where the EU are a part of humanitarian and/or peacekeeping missions, the EU itself may well have played a role in the crisis – whether through military intervention or its contribution to climate change. This does not sit easily with EU policy on international development and commitment for nations to achieve the 0.7% ODA/GNI target.

While European citizens face ever-greater threats from climate change, EU bodies tasked with shaping defence policy appear to have barely come across the phrase 'sustainable security'. While, of course, the various strands of climate change threat are acknowledged, there is hardly any detailed thought given addressing climate change as a major, if not *the* major, threat to EU citizens.

Nor is there a single reporting mechanism for EU countries to report GHG emissions of their national gas-guzzling militaries, thus turning a collective blind eye to their militaries and defence industries' destructive role in climate breakdown. Incredibly, EU Security and Defence Policy omits to factor in climate change as a major (man-made) threat to human security.¹⁴⁸

In sum, as UK-based international security expert Professor Paul Rogers accurately describes it, the west has an 'obsolete security paradigm.'¹⁴⁹

For EU Common Foreign and Security Policy and Common Security and Defence Policy, real, detailed, meaningful and well funded policy on climate change is a very big elephant in the room.

Just as it is unacceptable to call for net zero GHG emissions across all sectors while giving the military a 'free pass', so EU Foreign and Security Policy and EU Security and Defence Policy must go beyond including climate change *as just one of a list* of threats but acknowledge it as a major, if not *the* major, urgent, threat to our collective human security. *A shift in EU military spending priorities* to prioritise risk reduction, mitigation, and adaptation to climate breakdown, within the EU and overseas would be a far better use of taxes than the current call for increasing military budgets to advance the notion of an EU Army. Militarisation does nothing to advance our collective human security in the face of runaway climate change. Nor is it compatible with a progressive EU advancing solidarity based GND principles. *Collectively, EU countries make up the second largest share of global military expenditure* (\$280bn in 2018, 15% of the world's total) after the US (\$649bn).¹⁵⁰ While European citizens continue to suffer the consequences of austerity cuts to public services, EU Security and Defence Policy calls upon all EU nations to significantly increase their military spending and EU-funded defence research.¹⁵¹ How is it right to make cuts to health, education, social security and housing while increasing funding to further expand on plans for an EU Army?

CLIMATE CHANGE AND THE GLOBAL SECURITY INDUSTRY

"Climate change is a threat multiplier because it has the potential to exacerbate many of the challenges we already confront." Chuck Hagel, former US defense secretary

The world's militaries and attendant wars are arguably the biggest unaccounted-for contributor to climate change. This ongoing emissions-burden will be sustained as long as there is excessive global military spending used to buy ever more expensive jets, tanks and missiles, which in turn create destruction and greenhouse gases on the one hand and shareholder profits on the other. Considering their integral role in the climate crisis, there is great irony (indeed hypocrisy) in the fact that the USA military and others have been among some of the loudest voices calling for action on climate change – climate change has been recognised, even by the Pentagon, as the biggest threat humanity faces today. Yet despite increasing talk about the human (in)security implications of climate change, there is another, much hidden, dimension to this, as Nick Buxton of the Transnational Institute writes in 2015:¹⁵²

"A close look at military climate change strategies reveals that their focus is on securing borders, protecting trade supply-routes for corporations, controlling conflicts around resources and instability caused by extreme weather, and repressing social unrest. They turn the victims of climate change into 'threats' to be controlled or combated. There is no critical examination of the military's own role in enforcing a corporate-dominated fossil-fuel economy that has caused the climate crisis." Nick Buxton, Transnational Institute

While the military-oil economy speaks loudly about recognising climate change as a threat, it is less forthcoming about its other interests, for just as conflict and war are good for business, so is the climate change threat. It is, in truth, yet another untapped and significant opportunity for profit-making. Defence and security industries require instability and conflict to thrive, and climate change is expected to be another goldmine alongside the ongoing War on Terror.

*“New threats and conflict arenas are placing unprecedented demands on military forces and presenting BAE Systems with new challenges and opportunities.”¹⁵³ **Annual Report 2005, BAE Systems***

*“Recent actions and statements by members of Congress, members of the UN Security Council, and U.S. military officers have drawn attention to the consequences of climate change, including the destabilizing effects of storms, droughts, and floods. Domestically, the effects of climate change could overwhelm disaster-response capabilities. Internationally, climate change may cause humanitarian disasters, contribute to political violence, and undermine weak governments. Customers’ needs are changing as the world transitions to a low-carbon economy where energy efficiency, renewable energy, and highly efficient energy delivery becomes paramount. Expanded business opportunities will arise to Raytheon as a result of these security concerns and the possible consequences.”¹⁵⁴ **Raytheon Company, the world’s largest producer of guided missiles***

Raytheon, the world’s largest producer of guided missiles, spells it out clearly: “Expanded business opportunities are likely to arise as consumer behaviour and needs change in response to climate change.” The opportunities include not just the company’s renewable energy technologies, weather-prediction products, and emergency response equipment for natural disasters but also “demand for its military products and services as security concerns may arise as results of droughts, floods, and storm events, and as a result of climate change.”¹⁵⁵

Hurricane Katrina was a watershed moment, demonstrating what a security-led approach to climate change looks like – and in a rich, democratic country at that: rather than treating an environmental crisis as a social justice issue, it was taken advantage of as a security issue, one to justify the militarisation of governments’ responses to climate change.

*“The oil industry wasn’t the only one to profit from Hurricane Katrina. Immediately after the storm, the whole gang of contractors who had descended on Baghdad when war broke out – Bechtel, Fluor, Halliburton, Blackwater, CH2M Hill and Parsons, infamous for its sloppy Iraq work – now arrived in New Orleans. They had a singular vision: to prove that the kinds of privatised services they had been providing in Iraq and Afghanistan also had an ongoing domestic market – and to collect no-bid contracts totalling \$3.4bn.”¹⁵⁶ **Naomi Klein, author of “No Is Not Enough: Defeating the New Shock Politics”***

“Many of us watched in disbelief as we saw how the world’s richest and most powerful state seemed unable, then unwilling, to rescue its own citizens – sending in trigger-happy troops who shot at the hurricane’s victims instead. Coming so soon after the Iraq war, the hapless Bush administration appeared unable to respond to any crisis without resort to the military. As the waters receded, America’s deep-seated racism and inequality was laid bare for the whole world to see. ...

Two years after Katrina, in 2007, the Pentagon released its first major report on climate change, warning in no uncertain terms of an “age of consequences” in which, amongst other things, “altruism and generosity would likely be blunted.” This was followed up a year later by an EU security report that talked of climate change as a “threat multiplier” that “threatens to overburden states and regions which are already fragile and conflict prone.” It warned that this would lead to “political and security risks that directly affect European interests”. Over the next few years, the national security strategies of the countries across the global north would be rewritten to offer the same self-interested and dystopian vision. ...

Dystopian preparations by the state are reflected in the corporate arena. Where we see a future climate crisis, many companies see only opportunity: oil firms looking forward to melting ice caps delivering new accessible fossil fuels; security firms touting the latest technologies to secure borders

from 'climate refugees'; or investment fund managers speculating on weather-related food prices – to name but a few. In 2012, Raytheon, one of the world's largest defence contractors, announced "expanded business opportunities" arising from "security concerns and their possible consequences," due to the "effects of climate change" in the form of "storms, droughts, and floods". The rest of the defence sector has been quick to follow.

Ultimately, a security-led approach to climate change and complex emergencies not only fails to address the fundamental causes of these crises – it will often exacerbate them. Worldwide the increased focus on food security is already driving increased land grabbing. The diversion of resources into military spending and strategies is preventing much needed investment in crisis-prevention and tackling the root causes of human insecurity. Given that climate change will impact disproportionately on the poorest, a militarisation of our response merely compounds a fundamental injustice – that those least responsible for climate change will be most affected.”¹⁵⁷ Nick Buxton & Ben Hayes, editors of “The Secure and the Dispossessed: How the military and corporations are shaping a climate-change world”

CLIMATE JUSTICE: CALLING OUT THE MILITARY FOR ITS ROLE IN CLIMATE CHANGE

Just as global civil society is working hard to try to prevent climate change reaching the point of no return, it is absolutely vital not to lose sight of the 'shock doctrine' policies put in play by vested interests in anticipation of the fact that every crisis is an opportunity to remake the world towards a neoliberal and/or neoconservative dystopia.

As Nick Buxton and Ben Hayes rightly point out,¹⁵⁸ “a security-led approach to climate change and complex emergencies not only fails to address the fundamental causes of these crises – it will often exacerbate them”. Furthermore, “climate change will impact disproportionately on the poorest, a militarisation of our response merely compounds a fundamental injustice – that those least responsible for climate change will be most affected”. Therefore, social, economic and environmental justice need always to be the central part of our response to climate change and its consequences.¹⁵⁹

Finally, let's remind ourselves again that the military's role in a society is to ensure our *collective* safety. An integral part of this responsibility is *conflict prevention*. When it is no

DOES CLIMATE SECURITY EQUAL CLIMATE JUSTICE?

More than 15 years ago, different defence and intelligence agencies from many countries started to consider the serious risks that climate change may pose to global stability. Various scenarios were forecast: climate-induced food shortages, decreasing water supplies, and disrupted access to energy – leading to economic and political turmoil, social unrest, riots, deadly battles and even all-out war. Security officials wanted to know what they should be doing. The Americans were quick on the draw. In 2003, the Pentagon published the first of what was to become a series of long-running assessments... These assessments have come to be known as the climate security agenda. Despite all the sophistication and wealth of knowledge it has generated, the climate security agenda remains limited and short-sighted. It targets only the symptoms, not the causes of climate change. As the Transnational Institute emphasised: “The US military may be the last defender of climate science within the Trump administration, but don't expect the Pentagon to fight for climate justice.” As such, there is a wider, more comprehensive agenda called climate justice. It is now codified into the 2015 Paris Agreement of the United Nations (UN) Framework Convention on Climate Change, signed by 195 countries, of which 145 have ratified. Christian Aid argues that the best form of climate security is climate justice.¹³⁵

longer deniable that climate change/catastrophe is the greatest threat to human survival on Earth, the security community – the military, politicians, civil servants – as emphatically argued by Professor Paul Rogers, has “the responsibility to demand sustained decarbonisation and related policies as a core element of ensuring security.”¹⁶⁰

But since the military-oil industry complex has yet to ‘come clean’ on the glaring contradiction in their approach to climate change, it is left to us, civil society, to insist that our governments act with urgency to take oil out of the military-oil industry relationship and in doing so grasp a difficult truth: the world’s militaries must surrender their part in driving climate change and the consequent collapse of human civilisation. This reform ensures they can become part of the overall solution.

RECOMMENDATIONS

This report seeks to bring the critical issue of the global military as a driver of climate change to the attention of policy-makers, the media, journalists and thought leaders; other NGOs working in the area; and the COP process. This is especially important in 2020, as it is the year all countries are due to revise their own nationally determined contributions and submit new more ambitious greenhouse gas emission reduction targets, of which reductions to emissions in the military sector should be included.

This report has eight key recommendations for COP26 (2020/21).^{iv}

1. **COP26 (2020/21): Call for an IPCC Special Report on the role of the global military in climate change.**
2. **COP26 (2020/21): Call for a new UNFCCC Topic: Carbon Neutral Peace and Defence** in the UNFCCC Topics Categories.
3. **COP26 (2020/21): Call for every nation to require their military to deliver compulsory full GHG emission reporting to UNFCCC.** Devise the mechanisms and means of accountancy whereby nations’ militaries and attendant conflicts and wars are included in their international emissions reporting and carbon-reduction targets. This reporting must also include emissions figures for those nations with overseas bases.
4. **COP26 (2020/21): Nationally Determined Contributions 2020/21. Call for all countries to include their militaries and defence industries in their GHG emission reduction targets,** taking into account *total carbon bootprints* of their militaries and defence industries. Militaries to publish their plans to decarbonise to meet the net-zero goal – simple technical measures will not be sufficient.
5. **Call for the European Union to report on its collective military carbon emissions and to adopt measures that direct EU governments to take oil out of the military-oil industry relationship,** surrendering their significant role in driving catastrophic climate change and attendant human suffering.

^{iv} Some of our recommendations are similar to earlier calls by International Peace Bureau in 2014. See Appendix Two.

6. **Call for action on the UN P5+1 nations (USA, China, Russia, France, UK and Germany) responsible for keeping the world's peace, yet accounting for 80% of its arms sales**, to support a shift to invest in climate finance, education or health.
7. **Call for the implementation of drastic cuts to excessive global military spending in order to redirect to urgent global human needs** such as mitigation and disaster risk reduction; renewable energy and energy access; peacekeeping and peacebuilding; and support for universal basic health and education services.
8. **Call for governments to deliver foreign, security, defence and international development policies that work in tandem for better outcomes. Our collective human security to supersede national interest.** We need (a) international development to become global social justice; (b) foreign policy-making to be ethical and (c) progressive defence policy that generates fresh thinking on how taxes directed to military spending should reflect a different type of security policy-making that delivers equity, human security, green jobs and minimisation and mitigation of climate breakdown and de-escalating climate refugee crisis.

APPENDIX ONE: GREEN NEW DEAL *PLUS*

THE GROWING CALL FOR A GREEN NEW DEAL

Over the past two years, USA Democrats Senator Bernie Sanders and Congresswoman Alexandria Ocasio-Cortez have been amongst the loudest voices in support of a transformative Green New Deal (GND). AOC has catapulted GND thinking into the USA's public discourse as a radical way forward to address both the climate emergency and austerity.

The Green New Deal was inspired in part by U.S. President Roosevelt's successful 1930s New Deal, which saw investment in public works as key to reviving the USA economy after the Great Depression. It was a concept revisited with the Green New Deal Group's proposal for a 'Green New Deal' published by the New Economics Foundation in 2008¹⁶¹ and their follow up 'Plan' in 2013¹⁶². Today, a Green New Deal is a central plank in the Democratic Party's election offer to the American people; here in the UK it is coming to the fore of Labour Party policy-thinking and is being revived by the Green Party who first adopted it as policy in 2008. There is also now a call for a progressive EU-wide Green New Deal, following in the footsteps of Green Parties across Europe.

The 21st century Green New Deal comprises primarily a set of government funded social and economic reforms and public works projects with renewable energy, resource efficiency and decarbonisation at their heart, and deliverable through a massive programme of investment in clean-energy jobs and infrastructure.

However, notably absent in all Green New Deal thinking is awareness of the role of the world's militaries and their significant (and profoundly under-reported, if not concealed) contribution to climate breakdown.

GREEN NEW DEAL *PLUS* – A GREEN NEW DEAL THAT ADDRESSES GLOBAL MILITARY SPENDING

Through its **Transform Defence for Sustainable Human Safety**¹⁶³ project, including the **Five Percent Proposal**¹⁶⁴, [Tipping Point North South](#)¹⁶⁵ (TPNS) has been building the case that global runaway spending is of profound relevance to international development, the global green economy and, increasingly, climate change. It argues that runaway military spending should therefore be of much more serious concern than at present to those working in the international and development sectors, both NGOs and politicians alike, and calls for them to make a much greater effort to engage with it.

Historically, military spending has been central to re-enforcing power, poverty, unjust distribution of resources, economic and environmental collapse. Peace and green prosperity will remain elusive as long as the military-oil industry relationship remains intact and all powerful. We need a very different starting point to consider and address the annual almost \$2 trillion global military spend – we need to transform defence in favour of *sustainable human safety*. Only if we can lay *that* as the foundation stone, can the human family create and sustain peaceful prosperity in a green economy working in harmony with the natural world.

KEY ITEMS FOR GREEN NEW DEAL *PLUS*

Tipping Point North South's **Green New Deal *Plus***¹⁶⁶ argues that unless or until we include the issue of military spending and its impact on our climate in current Green New Deal thinking, the economic, social and environmental gains of such a deal will only ever be partial. High defence spending inhibits economic and social development and is incompatible with GND goals. *Peace* must accompany – indeed enable – *green prosperity*.

In brief, it comprises three calls:

- **The break-up of the military-oil industry relationship and complete decarbonisation of the world's militaries.**

NB A decarbonised military, defence and security sector is not about delivering 'greener ways to conduct war': weaponry and war will always kill living beings, will always destroy and pollute environments. Rather, this idea is the starting point for much needed if challenging discussion, one that can lead us to a paradigm shift in national and international defence and security policy-making for a carbon-neutral world.

- **Open up debate about what kind of 'defence' policy is fit for the 21st century.**

We need a decarbonised, sustainable, global military with a *transformed and transformative doctrine* fit for purpose in this century of climate breakdown – one based on revisiting and updating earlier work on the concept of *non-offensive defence*¹⁶⁷ and prioritising funds for *human safety* through peacekeeping, peacebuilding, disaster risk reduction, and investment in social, economic and environmental justice. Primarily, national self-interest should be replaced with global sustainable human safety.

- **Implementation of TPNS's *Five Percent Formula* to progressively cut runaway global military spending and emissions in order to fund sustainable human safety, address international development needs and the impact of climate change, and meet global green economy needs.**

APPENDIX TWO: INTERNATIONAL PEACE BUREAU RECOMMENDATIONS FOR DECARBONISATION 2014

IPB's full list of recommendations from its 2014 report¹⁶⁸ is a valuable and comprehensive overview, particularly in relation to the UN-led Deep Carbonisation Pathway for all nations and their economies. (Prepared by Tamara Lorincz.)

- For Deep Decarbonization, the SDSN (Sustainable Development Solutions Network) and IDDRI (Institute for Sustainable Development and International Relations) should include a decarbonization pathway for the military sector in every state in the final report.
- If the military sector is not a pathway explored, the exclusion of military emissions should be acknowledged in the Deep Decarbonization final report.
- The UNFCCC should put on the agenda and re-negotiate military exemptions in the next climate agreement.
- The UNFCCC should end all military exemptions to greenhouse gas reporting in future climate change agreements.
- The UNFCCC and the IPCC should establish a working group to investigate the greenhouse gas emissions of the military sector and release a report.
- The UNFCCC roster of experts should include specialists with an expertise in defence materiel and fuel use.
- The UNFCCC expert review teams should do a desk study and in-country visit for the military sector.
- For National Communications, the IPCC should create mandatory reporting guidelines to disaggregate data for the military and make the military a separate sector.
- For National Adaptation Programmes of Action, they should include peacebuilding initiatives to ensure climate-resiliency in communities and states.
- UNEP should convene a special meeting and report related to its mandate *Preventing Military Impacts on Environments* with a focus on greenhouse gas emissions.
- UNEP should include greenhouse gas emission estimates in post-conflict environmental assessment reports.
- UNEP to conduct post-conflict environmental assessment reports that include greenhouse gas emission calculations and environmental impacts of weapons use for recent wars in Iraq, Afghanistan, Libya, Gaza and Syria.
- UN to create a formal link and liaison between the UN Office on Disarmament and the UN Green Economy Initiative for better collaboration and coherence among environment, development, peace and climate.
- Across the UN and its agencies, peace and peacebuilding should be mainstreamed and expressly linked to climate change programmes and disaster risk reduction planning.
- UN General Assembly should introduce and pass a resolution on the creation of a special commission to examine demilitarization and economic conversion from militarised industries to civilian industries in order to green the economy.
- The UN General Assembly should put forward a *Uniting for Peace* Resolution (377) that gives the body the right to directly deal with issues not effectively addressed in the UN Security Council, such as demilitarization for deep decarbonization. Any member of the GA can introduce a *Uniting for Peace* Resolution.

- The UN appoint a new Group of Governmental Experts to update the 2004 disarmament-development report from a climate perspective.
- The UN Special Rapporteur for Climate, Mary Robinson, should convene a meeting and report on the climate impacts of the military and a decarbonization plan for the military.
- The OECD should compile data on state budgets that compare public spending on environment and climate. The OECD is already collecting environmental statistics and should add countries' expenditures for the public financing of environment and climate change.
- States must reduce military spending and redirect it to meeting the UN Green Climate Fund for climate mitigation and adaptation and to environmental remediation.
- States must reduce military spending and redirect it to meet the *UN Decade of Sustainable Energy for All* for global energy security and the Global Environmental Facility for trans-boundary problems.
- States must report the life-cycle fuel use, greenhouse gas emissions and environmental impacts of their domestic and international military operations, procurement and facilities and make those reports publicly available for peer review and verification.
- States must cease R&D into new weapons and invest in RDD&D into renewable energy technologies, energy efficiency and conversion from the war economy to the green economy.
- States must abolish nuclear weapons, decommission nuclear power plants and re-direct nuclear spending and R&D for renewable energy and investment in climate financing.
- The scientific and R&D communities should acknowledge the limitations of their analysis if they do not include military emissions in their research and reporting.
- The scientific and R&D communities should undertake more research into conversion and demilitarization as a pathway to deep decarbonization and the conversion of defence industries.

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