



A Lucas Plan for the Twenty First Century From Asset Manager Arsenal to Green Industrial Strategy

COMMON
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Executive Summary

In 2023, annual global military spending reached \$2.4 trillion, the highest level on record.¹ The UK's military budget that year was the sixth highest of any country, consuming a larger share of GDP than France, Australia, Italy, Germany, Spain or Canada.² There is now cross-party consensus in Westminster to increase military spending to 2.5 per cent of GDP and, in July 2025, the government's Strategic Defence Review will set out a roadmap to this target. In the 2023 financial year, the government spent more than half of its £63 billion military budget on the procurement of weapons systems and services, an outlay that maintains a sprawling domestic industry to produce military equipment.³

Drawing on 21 extended interviews with current and former workers in the UK's military industry, this report explores a pathway to redirect productive capacity from this military industrial base towards addressing the climate crisis and deepening economic resilience instead. This alternative strategy would repurpose parts of the UK's military industry and build on the tradition of proposals by labour movements — most famously by shop stewards at Lucas Aerospace in the 1970s — to convert military production towards civilian sectors, in this case green manufacturing.

Even without accounting for the planned increase of military spending to 2.5 per cent of GDP, the Ministry of Defence (MOD) will spend £288.6 billion on equipment production and support programmes to 2033, which it projects to be £16.9 billion over budget and acknowledges is not affordable.⁴ At present, approximately three quarters of the military equipment budget is spent on a domestic industry that exists to supply the MOD and the UK's arms export customers.⁵ Historically the most significant

1. Nan Tian, Diego Lopes Da Silva, Xiao Liang and Lorenzo Scarazzato, "Trends in World Military Expenditure, 2023", Stockholm International Peace Research Institute, 2024, https://www.sipri.org/sites/default/files/2024-04/2404_fs_milex_2023.pdf

2. Ibid.

3. Data on the UK's military budget is derived from "SIPRI Military Expenditure Database", Stockholm International Peace Research Institute, 2024, <https://www.sipri.org/databases/milex> while data on the MOD's procurement budget is from "MOD trade, industry and contracts: 2023", Ministry of Defence, 2024, <https://www.gov.uk/government/statistics/mod-trade-industry-and-contracts-2023/mod-trade-industry-and-contracts-2023>

4. "The Equipment Plan, 2023-2033", National Audit Office, 2023, <https://www.nao.org.uk/reports/equipment-plan-2023-to-2033>

5. "MOD regional expenditure with industry 2022/23", Ministry of Defence, 2024, <https://www.gov.uk/government/statistics/mod-regional-expenditure-statistics-with-industry-202223/mod-regional-expenditure-with-industry-202223>

customers of weapons produced in Britain have been Gulf monarchies; 23 per cent of the UK's arms exports went to Qatar alone between 2019 and 2023.⁶ As set out in the 2021 Defence and Security Industrial Strategy, the maintenance of the UK's military industrial base is designed to meet political objectives, primarily to play a "global role" and meet "global responsibilities".⁷ This is not an industrial strategy designed for the defence of UK territories, but to maintain a global military force — or "balanced and credible nuclear, conventional, cyber and space forces, and a clearly communicated willingness to use them in the place and at a time of our choosing" — as well as to build military capability for a wide range of allies.⁸

To build public consent for increased spending on the military industrial base, politicians often lean on economic arguments. The Defence Secretary John Healey has suggested that jobs in the military industry produce greater economic benefits than in other sectors while outlining his intention to make the Ministry of Defence (MOD) an "economic department".⁹ On the contrary, the military industry is not of inherent economic value, as asserted by Healey, but the beneficiary of an active industrial strategy that has been less available to civilian manufacturing sectors since the early 1980s. The UK's leading military contractor BAE Systems, for instance, only paid 14 per cent of its £2 billion research and development (R&D) budget in 2022 with the rest of the bill covered on its behalf by government customers.¹⁰ As explored in detail below, the state subsidy and support provided to military companies operates to the benefit of the private investors that own them. Rather than a set of national or publicly-owned companies, the Ministry of Defence procures equipment from an "asset manager arsenal" — a landscape of multinational contractors, many of which are owned by the same few global investment firms.¹¹

The level of public investment and resource afforded to military firms is politically pertinent in the context of climate crisis, in which the coordinated deployment of existing capital stocks, productive equipment and skilled labour towards the energy transition is of planetary importance. Given the state's role in steering industrial

6. Pieter D. Wezeman, Katarina Dojkic, Mathew George, Zain Hussain and Siemon T. Wezeman, "Trends in International Arms Transfers, 2023", Stockholm International Peace Research Institute, 2024, https://www.sipri.org/sites/default/files/2024-03/fs_2403_at_2023.pdf

7. "Defence and Security Industrial Strategy", Ministry of Defence, 2021, <https://www.gov.uk/government/publications/defence-and-security-industrial-strategy>

8. Defence's response to a more contested and volatile world" Ministry of Defence, 2023, https://assets.publishing.service.gov.uk/media/64b55dd30ea2cb000d15e3fe/Defence_Command_Paper_2023_Defence_s_response_to_a_more_contested_and_volatile_world.pdf

9. Lucy Fisher, "China poses 'deadly' threat to UK, says former NATO boss", *Financial Times*, 15 July 2024, <https://www.ft.com/content/57333df7-dceb-4eab-a39a-971dfc112b6b>

10. "Annual Report 2022", BAE Systems, 2023, https://investors.baesystems.com/~/_media/Files/B/BAE-Systems-Investor/documents/bae-ar-complete-2022-new.pdf

11. See Khem Rogaly, "The Asset Manager Arsenal: Who Owns the UK Arms Industry?", Common Wealth, 2023, <https://www.common-wealth.org/publications/the-asset-manager-arsenal-who-owns-the-uk-arms-industry>

capacity towards the military industry, there is an opportunity to repurpose production in the context of a wider economic transition, one that has long term benefits for the sector's workers, communities and the national economy.

To understand the viability of an alternative use for the industrial capacity and skills within the military industry, Common Wealth conducted extended interviews with workers on their experiences of the sector, the potential of industrial repurposing and the policy interventions that would be necessary to deliver it (see the Methodological Annex for further information). Through these interviews and two visits to military industrial sites conducted with trade union representatives, a picture emerged of the technological feasibility of transitioning production. The interviews revealed four sites at which limited production for green industries is already taking place, even without the state coordination needed to accelerate a more comprehensive transition. Interviewees also described the adjacency in skills between naval shipbuilding and manufacturing for green energy production or green transport while others suggested that their skills in aerospace engineering could provide R&D capacity to support transitions elsewhere. Almost all interviewees were in favour of their firms expanding production into green sectors to some extent — a larger recent study indicated that these views are held by a strong minority within the industry — although they conceived of this process in different ways, from a diversification plan to support military production to a wider process of conversion.¹² Together, the interviews indicate that there is a base of capacity and skills within the military industry that could be redeployed towards addressing the climate crisis.

The interviewees also made clear that for a transition to be successful it would require a reordering of state priorities, the redirection of public investment that is currently directed towards the military sector and the use of public procurement of green energy or transport products to coordinate the transition. This report outlines three major benefits to repurposing military production in this way: first, it could provide the basis of a “just transition” in a major industrial sector that directs skills and capacity towards climate goals while providing long term security to workers; second, it would offer an effective means of addressing the carbon footprint of the UK's military and military industry which was greater than that of sixty countries in 2017-18; third, it could support a comprehensive review of military objectives to align with the defence of the UK rather than the global projection of force and ensure that redundant military capacity is repurposed towards essential climate goals.¹³ To realise these benefits, and to deliver a successful industrial transition, the UK government should take forward the following three policy priorities:

12. Karen Bell, Vivian Price, Keith McLoughlin and Miriam Pemberton, “Converting the United States and United Kingdom defence sector to civil production: The views of defence workers”, *Peace & Change*, 49, 2024, pp.101-123.

13. Stuart Parkinson, “The Environmental Impacts of the UK Military Sector”, Scientists for Global Responsibility and Declassified UK, 2020, https://www.sgr.org.uk/sites/default/files/2020-05/SGR-DUK_UK_Military_Env_Impacts.pdf

1 Establish Lucas Holdings, a publicly-owned off-balance sheet company independent of the MOD, to coordinate and lead the repurposing process.

Lucas Holdings would include national and local governance roles for workers and their trade unions to direct the transition. It would acquire industrial sites in strategic clusters — for instance a shipyard and a nearby aerospace R&D facility as set out in the [interactive map](#) that accompanies this report — drawing from existing military procurement spending to invest in conversion projects. Lucas Holdings would additionally have the means to invest directly in repurposing projects itself and to draw on public research capacity from universities to support workers in developing alternative plans.

2 Use the public ownership of energy generation and transport to ensure demand for the repurposing process.

Existing programmes such as Great British Energy, and public bodies such as Transport for London and ScotRail, should support transition clusters using coordinated procurement. Through the alignment of green industrial strategy these public bodies can provide demand for products from Lucas Holdings' industrial clusters. The strategy of Lucas Holdings would be coordinated towards the needs of these public firms.

3 Deliver a strategic review of military commitments and military industrial strategy.

Conduct an independent review to understand where military procurement commitments are designed to maintain overseas intervention capabilities and where they are essential for national defence. This review would redefine the UK's military objectives around national defence and overseas retrenchment. The strategy would redirect weapons procurement spending to support a new industrial strategy, for instance through the repurposing of industrial projects that focus on power projection against China or exports to countries that have recently committed war crimes, such as Saudi Arabia and Israel.¹⁴

14. For examples of Saudi Arabia's violations of international law during the war on Yemen, see "Situation of human rights in Yemen, including violations and abuses since September 2014", United Nations Office of the High Commissioner for Human Rights, 2020, <https://www.ohchr.org/sites/default/files/Documents/HRBodies/HRCouncil/GEE-Yemen/2020-09-09-report.pdf>. For examples of Israel's disregard for international law during its bombardment of Palestinians in Gaza, see for example "Report of the Independent International Commission of Inquiry on the Occupied Palestinian Territory, including East Jerusalem, and Israel", United Nations Office of the High Commissioner for Human Rights, 2024, <https://www.ohchr.org/sites/default/files/documents/hrbodies/hrcouncil/sessions-regular/session56/a-hrc-56-26-auv.docx>

Those lobbying for greater military spending often lean on domestic economic arguments to sell the case for the global projection of the UK's military power. But these arguments are thin: the UK's military industries are viable only because of constant public investment and industrial capacity developed through public resources can serve an alternate range of purposes. Sections of the arms industry should be repurposed for a green industrial strategy. This report demonstrates that such a shift is technologically feasible, socially necessary and welcomed by workers. By repurposing military production sites, we can use existing industrial capacity to help onshore green supply chains and meet vital climate targets.

Key Findings

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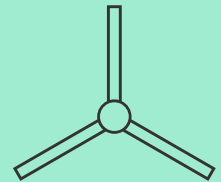
Between 1980 and 2022, employment in the military industry fell by more than half, from 405,000 to 164,000 employees.



Almost all of the 21 workers and trade unionists interviewed for this report were open to their sites expanding into green production and saw it as feasible on technological grounds. However, their visions for this transition were diverse and ranged from a partial diversification away from military products to a more comprehensive process of industrial conversion.



At least four of the UK's naval shipyards — on the Forth, Lagan, Tyne and Mersey — already make products for the offshore wind sector.



There are close adjacencies between the skills contained within the UK's naval shipbuilding sector and those needed to build products for offshore wind, including welding, fabrication and engineering.



One naval shipyard's experience of collaboration with private offshore wind developers indicated that the public procurement and development of green energy and transport would be necessary to provide sustained demand for transition sites while they innovate to repurpose production.

An Introduction to the UK's Military Industry

8

Part of the public relations strategy of the UK's military industry, which produces weapons and provides services such as logistical support to the armed forces, is to position itself as a major contributor to the economy.¹⁵ This strategy is traditionally supported by government, which is the industry's primary customer (followed by its approved export partners). The narrative that jobs in the military sector have a unique economic value omits the fact that the industry is made viable by public investment and state support that is rarely on offer to the civilian economy. As set out in the Defence and Security Industrial Strategy, this means that government makes an exception when it comes to competition in the military sector: "in practice the majority of MOD's expenditure with the defence industry as it would generally be understood is single source".¹⁶

Modelling in the US suggests that directing public investment towards solar or wind energy instead of military procurement would produce economic benefits, creating 2,100 additional jobs per \$1 billion. Similar analysis of continental Europe supports this, indicating that investment in health, education and environmental protection would all create more jobs per euro invested.¹⁷ Based on 21 interviews with workers and trade unionists in the UK military industry, this report sets out

15. For one example, see "New research highlights defence's contribution to British jobs and the economy", BAE Systems, 2023, <https://www.baesystems.com/en-uk/article/new-research-highlights-defences-contribution-to-british-jobs-and-the-economy>

16. "Defence and Security Industrial Strategy", Ministry of Defence, 2021, <https://www.gov.uk/government/publications/defence-and-security-industrial-strategy>

17. See for US modelling, Heidi Peltier, "Cut Military Spending, Fund Green Manufacturing", Watson Institute and Frederick S. Pardee Centre, 2019, <https://watson.brown.edu/costsofwar/files/cow/imce/papers/2019/Peltier%20Nov2019%20Short%20GND%20CoW.pdf>; See for European modelling and analysis, Chiara Bonaiuti, Paolo Maranzano, Mario Pianta, Marco Stamegna, "Arming Europe: Military expenditures and their economic impact in Germany, Italy, and Spain", Greenpeace, 2023, <https://www.greenpeace.org/static/planet4-italy-stateless/2023/11/d4d111bc-arming-europe.pdf>

an alternative to a military-dominated industrial strategy and makes the case for repurposing parts of the military sector to divert its technological capacity towards addressing the climate crisis.

In this first section, the report outlines the political economic transformation of the military industry since the 1980s and the mode through which private investment firms benefit from the state support on offer to the sector. Section Two then explores past and present examples of military industrial repurposing, which together demonstrate the potential of repurposing the UK's industrial and skills base and reorienting it towards new objectives. Section Three examines the case for industrial repurposing in the present, focusing on three core benefits — a just transition for workers, emissions mitigation and military retrenchment — before Section Four begins detailed analysis of interviews with workers in the sector on whether repurposing is technologically viable. Finally, Section Five considers the risks that interviewees highlighted within the repurposing process and sets out the institutional design of an alternative industrial strategy.

As detailed below, the military industry has been restructured over the past forty years, through the consolidation of large firms that rely on public subsidy. Although the sector remains a rare beneficiary of active industrial strategy in the UK economy, its fabric has changed: overall employment has fallen, production has become more capital-intensive, leading companies have been consolidated and then privatised and union density has diminished. This has produced a new political economic arrangement by which international investment firms have emerged as a key beneficiary of the state support given to the industry.

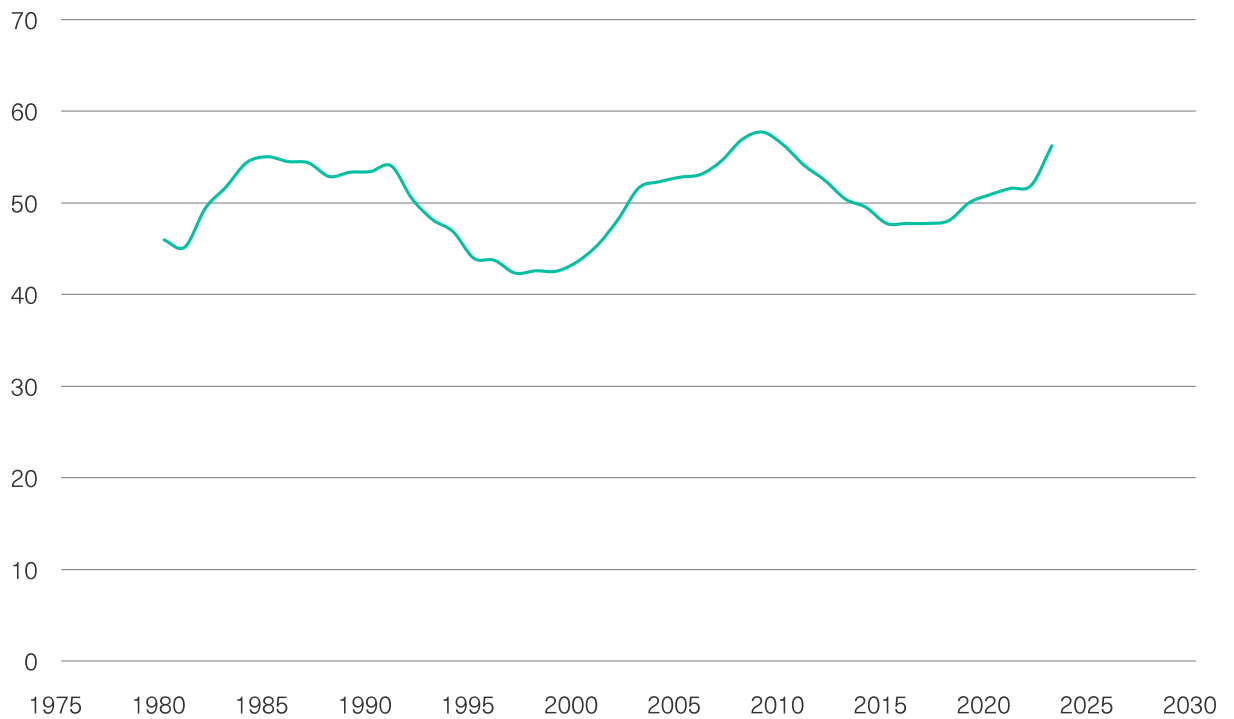
Figure 1: Employment in the Military Industry Has Fallen Sharply Since 1980



Source: MOD and ADS Group.

Figure 2: UK Military Spending Has Remained Consistent Since 1980 When Adjusted for CPI

UK Military Expenditure, 1980-2023 (GBP Adjusted for CPI)

**Source:** SIPRI and ONS.

Central to the recent transformation of the military industry is the loss of tens of thousands of jobs and a shift from manufacturing towards R&D and service provision. While the industry still produces weapons systems across air, land, sea and nuclear, it also encompasses the provision of services (such as IT and logistics) to the British military and its allies. National employment data for the industry is no longer available but, as Figure One illustrates, comparison of statistics released by industry representative group ADS and earlier government analysis suggests that 241,000 full time jobs have been lost in the sector since 1980.¹⁸ Although it now occupies a much lower share of GDP, Figure Two shows that military spending has remained relatively stable between 1980 and 2023. Falling employment despite consistent military spending could be partially explained by growth in real wages, but it is also an indicator of changes to the nature of production and work in the industry.

18. The available data for military industry employment is produced by the military industry association ADS, see "Industry Facts and Figures", Aerospace and Defence Group, 2024, https://www.adsgroup.org.uk/knowledge/facts-figures/?utm_source=Web&utm_medium=web&utm_campaign=FAF+2024+Web&utm_id=Facts+%26+Figures+2024+launch; ADS figures are compared with earlier government estimates, see AJW Turner, MG Chalmers and K Hartley, "Estimated UK Employment Dependent on Ministry of Defence Expenditure and Defence Exports, Defence Statistics Bulletin No 5, 2003, <https://webarchive.nationalarchives.gov.uk/ukgwa/20140116143358/http://www.dasa.mod.uk/publications/finance-and-economics/archive/defence-statistics-bulletins/defence-statistics-bulletin-number-05-expenditure-and-defence-export-1-march-2003.pdf>

The precipitous decline of military industrial jobs demonstrates that the sector has not been immune to a process of national deindustrialisation that saw the manufacturing share of employment fall at the steepest rate in the G7 between 1962 and 2008.¹⁹ Underlying the loss of military industrial jobs is a shift towards capital intensive production and service provision that has mirrored the wider transformation of the UK economy and its outsourcing of manufacturing. According to a survey of leading military firms operating in the UK, 36.4 per cent of workers are now in manufacturing or production roles while customer services, training, support and R&D account for 43.5 per cent of jobs.²⁰ The shift in the nature of military industrial work was explained by Mark, a worker at an aerospace plant, as well as several other interviewees:



So that wasn't a technological shift, that was a political decision to ... outsource the "metal bashing", as they saw it, right? It's not as skilled and specialist ... It was mostly political decisions made by the management, who were very aggressive. Anti-union. Anti-manufacturing. They want to focus in on where they really thought the money was being created, which is in the specialist professional skills: design, development, that kind of stuff. And the more manual side of it, they thought, "Well, anybody can do that, right?"

Mark, worker in the aerospace sector

19. Robert Rowthorn and Kenneth Coutts, "De-industrialisation and the balance of payments in advanced economies", Government Office for Science, 2013, <https://assets.publishing.service.gov.uk/media/5a7caa60ed915d7c983bc27f/ep31-de-industrialisation-and-balance-of-payments.pdf>

20. "2024 Annual Economic Report", Ministry of Defence and Defence Growth Partnership, 2024, https://jedhub.org/docs/2024/20242904_JEDHub_Annual_Economic_Report_2024_v1.0.pdf

Mark further explained in his interview that the decision to outsource manufacturing was designed to replace unionised blue collar workers with white collar workers that were less densely unionised, as part of a wider set of political economic changes to military production.

This decline in union density has had an impact on workplace culture. All interviewees with experience of work in the 1980s described a closed shop in which union membership was mandatory. Rick, a union steward at a shipyard, recalled the experience of working at a heavily unionised and publicly-owned site:



I think life was easier with the MOD. You had security, you were never pushed. It was far more relaxed. I would probably say it was a better apprenticeship back then than it is now, purely that the MOD would give you time to do everything. So people had time to train you ... In the private sector... there isn't the same time. You're asked to get the work done...

Rick, shop steward at a naval shipyard

Although experiences of these changes to workplace culture were complex and varied among interviewees, they were part of a deeper transformation of the industry — reduced employment, decreased unionisation and the growing dominance of larger firms that operate in the interests of private shareholders as well as government.

At the same time as thousands of military industrial jobs have been cut since 1980, the ownership of the sector and the nature of the companies within it has also changed. In the 1980s, the government sold the recently consolidated and nationalised firms British Aerospace and British Shipbuilders. This process of consolidating firms and then listing them on the stock exchange widened the interests in military industrial production to include private investment companies. Perhaps most starkly, even the MOD's Defence Evaluation and Research Agency was privatised in 2001 to form the



Image: Flickr / Defence Imagery

private R&D company QinetiQ, which moved from private equity ownership to public listing in 2006.

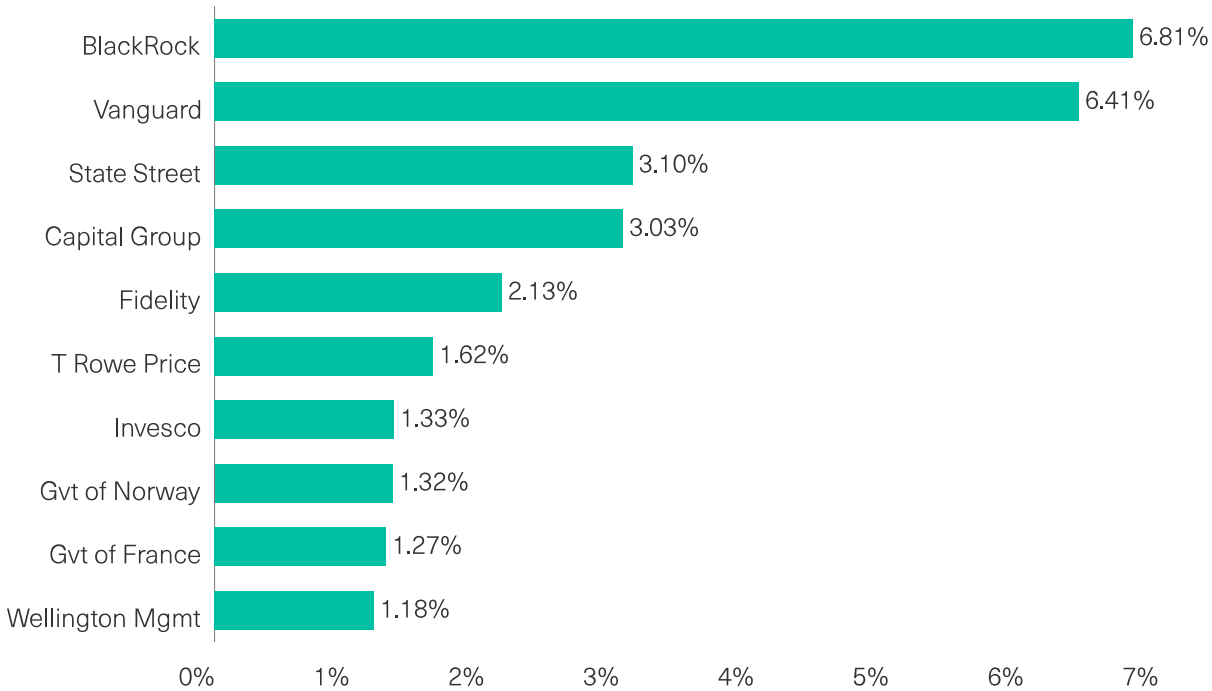
Aside from consolidation, as described by interviewees, the privatisation of the sector has been accompanied with the acquisition of several historic British manufacturing firms by US-headquartered multinationals.²¹ While 40 of the largest 100 military industrial firms in the world operate in the UK, all but six are headquartered elsewhere. Only half of the UK-headquartered military firms specialise in manufacturing while the rest provide services or R&D.²² With the exception of continental European companies such as Airbus, Thales, Kongsberg and Leonardo, in which various governments retain minority stakes, military firms that operate in the UK are united as part of an asset manager arsenal, owned by international investors, as shown in Figure Three. Aside from the Atomic Weapons Establishment, which produces warheads for Trident nuclear missiles, none of the military firms that operate in the UK are owned by the British government.

21. For instance, this has included the acquisitions of Cobham, Meggitt and Smiths Aerospace by Eaton, Parker Hannifin and GE Aviation respectively since 2007. All of these were British firms that primarily worked in aerospace.

22. This is based on the Stockholm International Peace Research Institute (SIPRI) database of major arms companies. See “SIPRI Arms Industry Database”, Stockholm International Peace Research Institute, 2023, <https://www.sipri.org/databases/armsindustry>

Figure 3: Ownership of Military Companies Operating in the UK is Dominated by Investment Firms

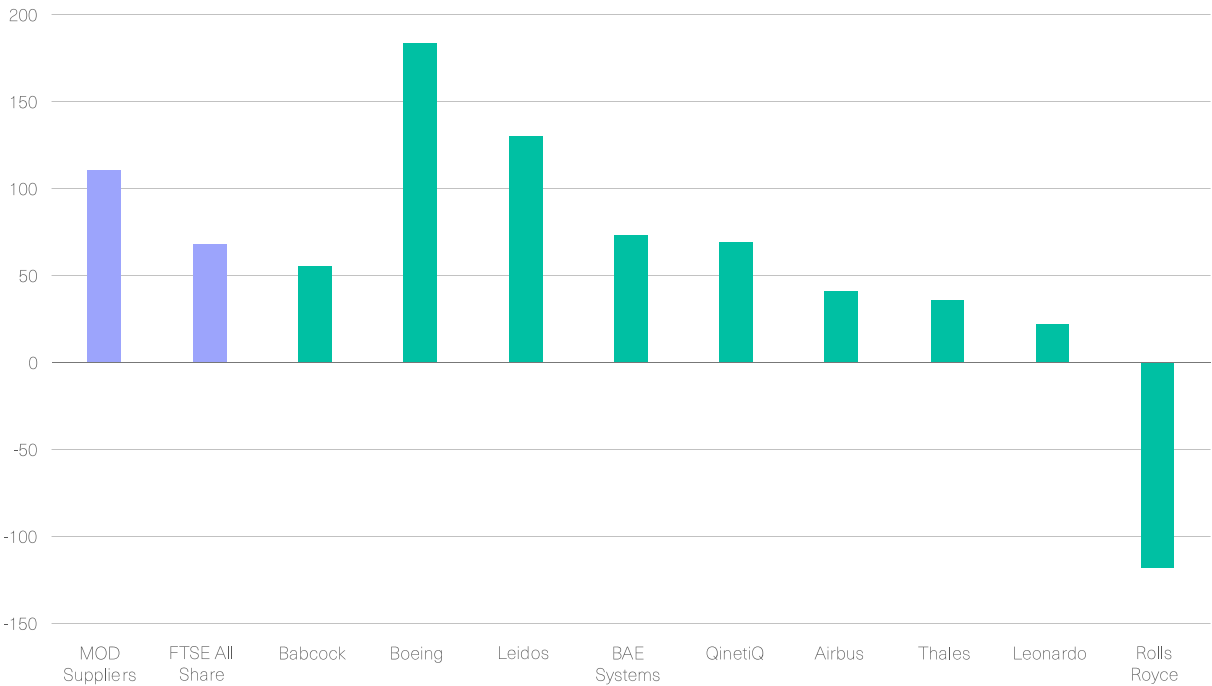
Top Ten Shareholders of Military Companies Operating in the UK



Source: LSEG Refinitiv. For methods see previous [report](#).

Figure 4: MOD Suppliers Paid Their Shareholders a Higher Share of Profits Than the FTSE All Share Average (2012/13-2021/22, excl. 2020)

Shareholder Payouts as a Percentage of Profits at the MOD's Leading Suppliers



Source: LSEG Refinitiv. For methods see previous [briefing](#).

The transformation of the sector has produced a political economic arrangement in which a private, consolidated military industry is supported by active state industrial strategy. As a result, private investors benefit from the state support given



to companies, predominantly through direct subsidies for R&D. Between 1987 and 2009 more than a third of public R&D spending in the UK went to the military sector — a result of how far military production is prioritised by the state above its economic value.²³ As the Office for National Statistics noted in a 2018 bulletin, “civil and defence R&D have alternative ways of funding” — in civilian sectors, three per cent of private R&D costs in 2018 were paid by the UK government while military firms had 61 per cent of their R&D costs paid on their behalf.²⁴ The special relationship between the military industry and government underpins steady returns on investment. Between 2013 and 2020, returns on invested capital at BAE Systems, Babcock International and QinetiQ were above the FTSE median with QinetiQ, which specialises in R&D, gaining 24.2 per cent returns.²⁵ Through the benefit of this subsidy, most of the MOD’s leading suppliers that are not part-owned by other states have been able to channel these

23. Enrico Moretti, Claudia Steinwender, John Van Reenen, “The Intellectual Spoils of War? Defense R&D, Productivity and International Spillovers, NBER Working Paper, 2019, https://www.nber.org/system/files/working_papers/w26483/revisions/w26483.rev0.pdf

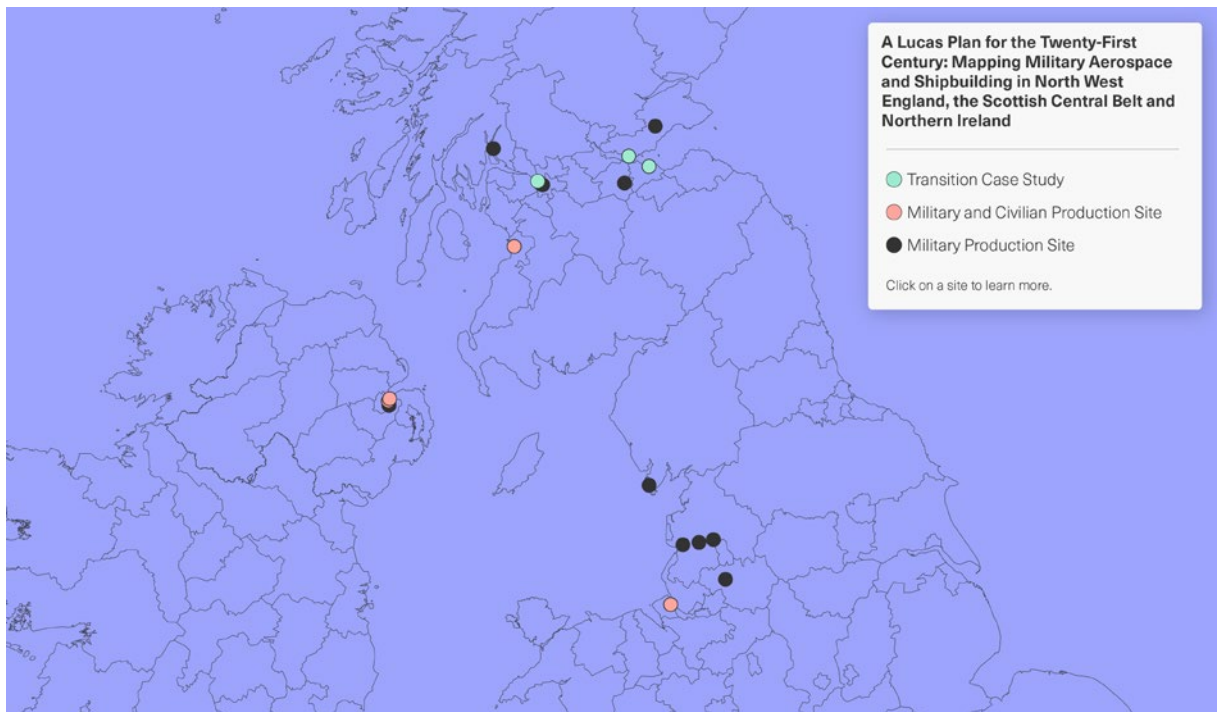
24. “Business enterprise research and development, UK: 2018”, Office for National Statistics, 2019, <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/businessenterpriseresearchanddevelopment/2018#civil-and-defence-r-d-continue-to-grow>

25. Rogaly, “The Asset Manager Arsenal: Who Owns the UK Arms Industry?”, Common Wealth, 2023, <https://www.common-wealth.org/publications/the-asset-manager-arsenal-who-owns-the-uk-arms-industry>

benefits to shareholders, paying out a higher share of profits than the FTSE All Share average since 2012, as shown by Figure Four.²⁶

Military industrial firms do contribute to local economies, but this is a result of the public investment and industrial strategy that shapes the sector. The military industry is not itself, as we are often led to believe, a unique hub of economic dynamism, but a sector that receives state support for the delivery of foreign policy objectives. This drives a powerful coalition of state, industry and investor interests to support expansive procurement projects.²⁷ Nonetheless, by subsidising this industry the state has developed a productive base — of workers, skills and fixed capital — that could be otherwise directed towards a wider set of societal needs, as described in Section Four.

Figure 5: Map of Military Industrial Sites in North West England, the Scottish Central Belt and Northern Ireland



Note: Click [here](#) to view full interactive version.

As Figure Five shows, military industrial programmes are important to local economies in the north west of England and central belt of Scotland in particular. BAE Systems dominates this geography and all domains of domestic military production across air, land, sea and nuclear. In the aerospace sector, BAE builds parts for the F35 and the Eurofighter Typhoon fighter jets in Samlesbury and Warton and is the leading contractor for the development of the new Tempest fighter programme. In its land division, BAE's plants in Glascoed and on the Tyne produce munitions for

26. Khem Rogaly, "Welfare to Arms: Shareholder Payouts in the Arms Industry Since 2010", Common Wealth, 2023, <https://www.common-wealth.org/publications/welfare-to-arms>

27. Thomas Palley, "The military-industrial complex as a variety of capitalism and threat to democracy: rethinking the political economy of guns versus butter", Post Keynesian Economic Society, 2024, <https://www.postkeynesian.net/downloads/working-papers/PKWP2409.pdf>

artillery systems. Despite Babcock's emergence as a competitor in naval shipbuilding, BAE leads the MOD's most lucrative frigate contract on the Clyde and produces the Dreadnought nuclear submarine in Barrow where it will also build a new nuclear-powered submarine through the AUKUS agreement.²⁸

Although local employment can fluctuate, BAE Systems receives a steady flow of government contracts that provides certainty to its investors.²⁹ In 2009, BAE signed a fifteen year terms of business agreement for its shipbuilding division which guaranteed £230 million of MOD contracts annually for fifteen years.³⁰ The funding arrangement specified that BAE could reduce the size of its industrial base while retaining the contracts — a further indication that military industrial strategy is not designed to support workers. Nonetheless, the public spending and coordination used to support military projects has developed engineering and industrial capacity that can be strategically repurposed. As explored below, the past and present opportunity of military diversification offers a route towards an alternative industrial strategy that may provide a greater set of benefits — for workers, climate and the UK's foreign policy.

28. AUKUS is a defence partnership between the UK, US and Australia designed to compete with China in the Indo-Pacific region. The British military industry will play a role in the production of new nuclear-powered, conventionally-armed submarines for the Australian navy as part of the pact. See "UK firm appointed to build Australian AUKUS submarines", Ministry of Defence, 2024, <https://www.gov.uk/government/news/uk-firm-appointed-to-build-australian-aukus-submarines>

29. "MOD trade, industry and contracts: index", Ministry of Defence, , 2024, <https://www.gov.uk/government/collections/defence-trade-and-industry-index>

30. "Supplementary written evidence from the Ministry of Defence: Major Projects Report 2010", Public Accounts Committee, 2010, <https://publications.parliament.uk/pa/cm201011/cmselect/cmpubacc/687/687we05.htm>



Past and Present Alternatives to Military Industrial Strategy



We're not pacifists. We've always said that [chuckles] the world has far too many weapons, particularly nuclear ones. We've always said that the state should maintain a sensible level of defence. And where the Lucas Plan came in was really to remove the jobs argument. We've always said that one of the great obstacles to peace is the jobs issue, because any debate you've ever seen in the past on the cancellation of a military weapon, the whole debate is not about whether you actually need that weapon system, it's about the jobs. So I think one of the most valuable contributions the Lucas Plan has made is actually helping to take the jobs issue out of the armament debate.

Phil Asquith, Lucas Aerospace shop steward



When I joined Lucas Aerospace it was on the basis of working for a living wage for me and my family. It was only later that I realised the value of being a member of a trade union and ... we considered the contradictions that existed in the production process when profit was the only consideration [for the company].

The company's answer was to make people redundant from an industry that was becoming more and more capital intensive. Our Lucas Plan was to retain the surplus workers to manufacture goods that answered social need.

Brian Salisbury, Lucas Aerospace shop steward³¹

The history of labour organising within the military industry indicates the concrete possibility of an industrial strategy to repurpose capacity within the sector towards a different set of uses. The historic evidence below, and Common Wealth interviews with former Lucas Aerospace shop stewards, demonstrate the deep roots of these alternatives within the military sector. Even at present, the diversified nature of many of the UK's military industrial sites reflects the technological feasibility of alternative production. However, the fact that conversion from military to civilian production has not achieved greater success at earlier junctures indicates that it requires the redeployment of public resources and the redirection of state coordinating capacity that is currently deployed to the benefit of private military firms.

While the Lucas Plan is the most famous example of a proposal for conversion from military to civilian production, industrial repurposing projects have a longer

31. Interviews with Brian Salisbury and Phil Asquith, former Lucas Aerospace Shop Stewards, were conducted with the author for this report.

history in the UK and US. In the wake of the First World War, the naval shipyard in Barrow that now makes nuclear submarines underwent a short company-led process of diversification while the trade union branch conducted its own audit of skills and proposed alternative civilian products.³² Although the company strategy was soon reversed and the Barrow audit did not receive support from government, the shipyard later created and maintained a successful cement and pump production business for civilian purposes until the end of the 1960s.³³

During the reconversion process after the Second World War in the US — in which much civilian industrial capacity that had been repurposed to supply the military was converted back, sold or decommissioned — the United Auto Workers leader Walter Reuther set out an alternative path for government-owned plants at which workers were losing their jobs.³⁴ To prevent mass job cuts, Reuther argued that government facilities should be converted to make products for the railroad and pre-fabricated housing for returning GIs.³⁵ Although these proposals for conversion failed to receive the state support necessary to be enacted, Reuther continued to develop similar projects until his death. Alongside Reuther, the economist Seymour Melman supported attempts to legislate for conversion away from the “permanent war economy” that were put to the Senate by George McGovern throughout the 1960s and reintroduced by House speaker Ted Weiss at the end of the Cold War.³⁶ While there were some successful cases of diversification during this period, such as Boeing-Vertol's production of Chicago subway cars at a military helicopter site after the Vietnam war, industrial policy to shift the commercial priorities of military companies was not introduced.³⁷

In the wake of the Second World War in the UK, rearmament formed the centre of political debates in which both Labour and Conservative politicians raised concerns that military spending would consume economic and engineering capacity that could

32. “Defence Diversification Revisited: A history of defence diversification in the UK and elsewhere – lessons learned and ways forward”, Unite the Union, 2016, <https://www.unitetheunion.org/media/1108/unite-diversification-revisited.pdf>

33. Keith McLoughlin, *The British left and the defence economy: Rockets, guns and kidney machines, 1970-83*, Manchester University Press: 2022.

34. Mark Wilson, *Destructive Creation: American Business and the Winning of World War II*, University of Pennsylvania Press: 2016; Miriam Pemberton, *Six Stops on the National Security Tour: Rethinking Warfare Economics*, Routledge: 2023.

35. Pemberton, *Six Stops on the National Security Tour: Rethinking Warfare Economics*.

36. For a summary of this history see Jonathan Feldman, “Economic Conversion” in Lester Kurtz, *Encyclopaedia of Violence, Peace & Conflict* (Second Edition), Elsevier: 2022.

37. Jonathan Feldman, “The Conversion of Defense Engineers’ Skills: Explaining Success and Failure Through Customer-Based learning, Teaming and Managerial Integration at Boeing-Vertol” in Gerald I. Susman and Sean O’Keefe, *The Defense Industry in the Post Cold War Era: Corporate Strategies and Public Policy Perspectives*, Pergamon: 1998.

be better directed towards social welfare and civilian industry.³⁸ At the Labour party conference in 1963, Harold Wilson questioned the military dominance of industry:



We have spent thousands of millions in the past few years on misdirected research and development contracts in the field of defence. If we were now to use the technique of R&D contracts in civil industry I believe we could within a measurable period of time establish new industries which would make us once again one of the foremost industrial nations in the world.³⁹

Harold Wilson

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Although in government Wilson's record on the reappropriation of military capacity was mixed, the centrality of debates on the military industry in US and UK politics set the scene for an upsurge in activity the following decade.

In 1976, trade union shop stewards at Lucas Aerospace, then a leading military firm with sites across the country, published an alternative production plan based on a mass audit of their members' skills. What became known as the "Lucas Plan" was a proposal to convert production from parts for military aircraft towards a far-reaching set of "socially-useful products" that included wind turbines, hybrid cars and heat pumps. As Phil Asquith, a former Lucas Aerospace steward, recalled, the response from company management appears embarrassing in retrospect: "'we see no long term market for wind turbines' is what they replied".⁴⁰ Reflected in this response were two threats to the repurposing of military production: the assumption that civilian products would not be commercially viable and the managerial desire to maintain control of what is produced. The former is the result of the absence of industrial policy to support firms through the adaptation process and coordinate between the needs

38. McLoughlin, *The British left and the defence economy: Rockets, guns and kidney machines, 1970-83*.

39. Ibid, p.19.

40. Author interview with Phil Asquith, 2024.

of producer and customer, while the latter was one reason that Lucas Aerospace management refused to engage in detail with the shop stewards' proposals.⁴¹

The technological viability of conversion itself has been less of a historic issue than the battle between workers and management over the governance of production. In the case of Lucas Aerospace, the shop stewards sought greater industrial democracy through the repurposing process. According to another Lucas steward Brian Salisbury:



The Lucas Aerospace workforce knew far more about aerospace technology than the General Manager who freely admitted his lack of engineering knowledge. He had previously developed his managerial experience in a... company famous for the making of Mars bars.

Brian Salisbury, Lucas Aerospace steward

This tension between workers and management for control of production reflects the fundamental difference between company-led diversification and plans for worker governance that have emerged from the labour movement. The present views of workers and trade unionists on how best to deliver a conversion project are explored in Section Five.

The Lucas Plan itself was not a one-off case, but the centre of an upsurge in worker-led plans for arms conversion and industrial democracy in 1970s Britain. Despite popular support for this Lucas moment, the rejection by company management of alternative plans and the eventual job losses that resulted demonstrate the need for much greater state involvement to make conversion a reality. In the years following the publication of the Lucas Plan, workers at several industrial sites from Vickers in Elstree to Unisys in Minnesota developed projects based on engagement with the Lucas

41. See McLoughlin, *The British left and the defence economy: Rockets, guns and kidney machines, 1970-83*. For more on the managerial tensions in historic conversion projects, see Jonathan Feldman, "Can British defence firms diversify? The case of Nanoquest and the limits to dual use theories", *The Economics of Peace and Security Journal*, 3, 2008, pp.56-63.



stewards.⁴² In Minnesota, workers that made circuit boards for submarines presented an alternative plan in response to job losses and the company's response — to close the plant and move production to a non-union site in Utah — was indicative of the strategies used to foreclose alternatives in the military industry.

Even after the Lucas moment, industrial conversion away from military production remained a popular and viable project within the industry. The end of the Cold War and the temporary reduction in military spending that followed led to a range of conversion programmes reaching the centre of politics in the UK, continental Europe and the US. However, the failure of the state to enact these programmes at scale again indicates that public resources need to be redeployed to make conversion a success. In the UK and continental Europe, several relatively limited rounds of European Union funding aimed to manage job losses in defence dependent areas, while the UK's Arms Conversion Project, supported by local authorities and trade unions, aimed to manage the process at a regional level.⁴³

42. See Hillary Wainwright and Dave Elliott, *The Lucas Plan: A New Trade Unionism in the Making?*, Allison and Busby: 1982 and Pemberton, *Six Stops on the National Security Tour: Rethinking Warfare Economics*.

43. "Diversification '95", Arms Conversion Project, 1995, https://www.nuclearinfo.org/wp-content/uploads/2023/05/Ian_Goudie_Arms_Conversion_Project_Diversification_1995_1995.pdf

The military conversion agenda was most prominent in the US, featuring in Bill Clinton's 1992 election victory speech.⁴⁴ However, just as in continental Europe and the UK, conversion did not form part of a wider industrial strategy in the US after the Cold War; 85 per cent of the federal government's savings from cuts to military spending were used for "deficit reduction" rather than reinvestment in industrial alternatives.⁴⁵ Without a public programme to deliver a transition in production, military companies managed falling military spending through restructuring, cutting their workforces while rewarding shareholders and executives. At General Dynamics — the most enthusiastic proponent of corporate restructuring — the workforce was cut by half between 1991 and 1993 while executives were given record bonuses and \$4.6 billion was siphoned to shareholders.⁴⁶ Although alternative strategies were available, military industrial firms were able to downsize and distribute in the absence of a state-compelled effort to reorganise the industrial base.

Despite the state's failure to deliver an alternative industrial strategy in the UK, the technological viability of alternative production remains evident. Over the course of Common Wealth's interviews, workers identified several areas in which their companies already produce civilian products including the fitting of train rolling stock, the development of search and rescue technology, civilian ship repair and manufacturing for wind energy supply chains. The primary barrier to industrial repurposing that interviewees identified was a lack of state support for the process. While the MOD runs a centre through its Defence Science and Technology Laboratory named "Ploughshare", its stated mission of spinning government IP into civilian sectors is often directed instead to spinning military applications into alternative military applications.⁴⁷ Despite the lack of state support provided to military repurposing projects, they represent past and present opportunities for an alternative strategy to make more productive use of the UK's industrial base.

44. Pemberton, *Six Stops on the National Security Tour: Rethinking Warfare Economics*.

45. Ibid.

46. Rachel Weber, *Swords Into Dow Shares: Governing the Decline of Military-Industrial Complex*, Westview, 2001.

47. For further information see the Ploughshare mission statement, "What we do", Ploughshare, 2024 https://ploughshare.co.uk/about-us/what_we_do/. For an example of military-military conversion supported by Ploughshare, see "Our Company", Sentinel Photonics, 2024, <https://www.sentinelphotonics.co.uk>

What Is the Case for Industrial Repurposing?

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Industrial repurposing to civilian production still retains a base of support in today's military industry. A study based on 58 interviews with military industrial workers in the US and UK carried out in 2022 indicated that a significant group within the workforce are supportive of diversification towards civilian production.⁴⁸ These findings were echoed in the interviews conducted by Common Wealth, many of which outlined the technological viability of industrial repurposing and the state interventions necessary to deliver it at scale. Before examining the interview data on how and in which contexts the project of repurposing would be viable, this section outlines the potential benefits of conversion projects. As explored below, repurposing is first a means of providing a just transition that directs the skills and capacity of a major industry towards climate goals while providing long-term security to workers; second, repurposing production towards green sectors offers a route to mitigate military industrial emissions and, third, a programme of repurposing can support the retrenchment of military objectives and the development of a security policy designed around national defence rather than the global projection of power.

48. Karen Bell, Vivian Price, Keith McLoughlin and Miriam Pemberton, "Converting the United States and United Kingdom defence sector to civil production: The views of defence workers", *Peace & Change*, 49, 2024, pp.101-123.

A just transition for workers



A hundred and fifty odd painters were in my department, and they paid off a hundred and twenty-six. And by the way, took them into a big shed. Everybody. And everybody was just told, each department, “We’re losing this, we’re losing that, we’re losing that, that’s the figures.” And so, we lost — we went down to something like twenty-six, twenty-seven painters.

Andy, worker at a naval shipyard

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While they are often portrayed as stable, jobs in the military industry are shaped by geopolitical priorities that change over time. In some sectors, such as naval shipbuilding, this leads to cyclical patterns of job losses between military contracts, whether for domestic procurement or export agreements. Even amid a political climate of “rearmament” and the cross party goal of increasing military spending to 2.5 per cent of GDP, investments move quickly between different parts of the industry as military objectives pivot. As a result, the capacity of the industrial base is constrained by defence objectives which can have negative implications for jobs. The coordinated repurposing of military sites, especially towards sectors like green energy and transport that have a more sustained base of demand, would provide the basis of a just industrial transition, orienting skills and capacity towards climate goals while providing greater stability to workers than reliance on military contracts.

Since 1980, employment in the military industry has fallen by more than half, with 75,000 jobs lost in shipbuilding in the 1980s alone.⁴⁹ The experience of job losses was regularly mentioned in interviews with workers and trade unionists in naval shipyards. As Alan, a worker at a shipyard, recalled:

49. For the overall fall in military industrial employment since 1980 see footnote 15. For job losses in shipbuilding see Laurence Turner, “Turning the Tide: Rebuilding the UK’s defence shipbuilding industry and the Fleet Solid Support Order, 2018, <https://www.gmb.org.uk/assets/media/downloads/2129/turningthetide-rebuildingtheukdefence-shipbuilding-industry.pdf>



So, unfortunately, the joiner shop when I started in here had just under a hundred joiners on-site. To this day, I think, however it started, I think we've only got five, six left. But the joiners shop actually went through a massive redundancy. I'm not sure when that would have been. Maybe about 2006, maybe? 2005, 2006. And they must have paid off maybe — best part of sixty something joiners. Which people were left with no choice but to leave. Some of them set up their own businesses, and some of them have been successful, some of them not so much.

Alan, shop steward at a shipyard

This pattern of job losses continued after production ended for the UK's two aircraft carriers. While production is now accelerating in some sites to meet contracts for Type 26 and 31 frigates, several interviewees at different shipyards suggested that work is volatile with large scale hiring for international agency workers followed by the future possibility of redundancies if contracts are not replaced.

In the aerospace sector, job losses have not followed such a dramatic pattern. However, Mike, a worker in aerospace, described how his site faces closure and the threat of redundancies due to changes in military procurement. Mike perceived repurposing to civilian sectors as a missed opportunity to save his workplace. Moreover, the wider pattern of restructuring towards capital intensive production has still resulted in long term job losses across the sector. Mark, another worker in aerospace, described an asset stripping company buying eight sites across his city in the 1990s:



I remember at the time being horrified when I found out. It was like they just set about — after about six months, nine months, they just set about a programme of closures. Every eight or nine months there's a new HR1 redundancy notice and a closure. And so the whole — I mean, the city used to employ eight thousand people. It's now down to two thousand at one site.

Mark, worker in the aerospace sector

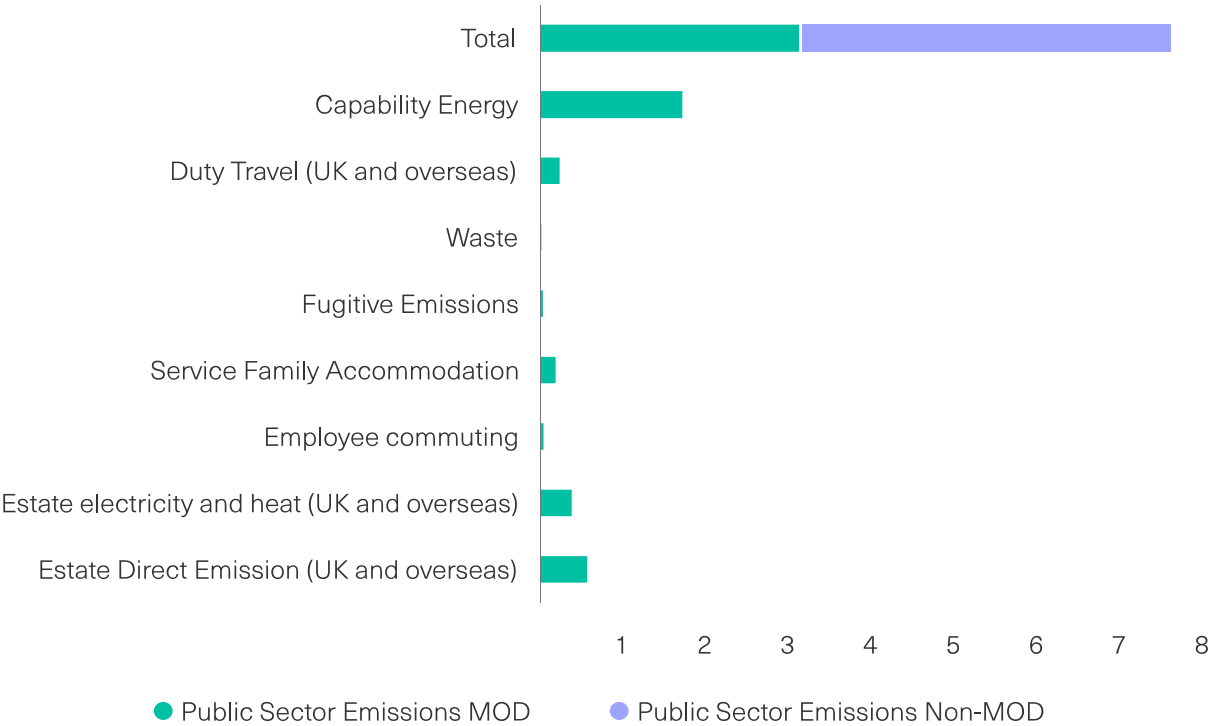


This reflects a secular decline and cyclical volatility to working in the military industry: while in specific areas such as shipbuilding there are cycles of mass hiring and redundancy, the economic restructuring of the sector has led to reduced employment, especially in manufacturing roles. As outlined in detail in Section Four, repurposing production towards green energy and transport will make use of existing capacity and skills to meet urgent and essential industrial shortfalls while providing long term security for workers at military sites.

Addressing the ecological impact of military industrial production

Figure 6: Even Without Including Emissions From Military Industrial Production, the MOD Accounts for 40 Per Cent of the Public Sector’s Carbon Footprint

Reported UK public sector emissions in 2022-23 (GHG emissions, mTCO₂e)



Source: MOD.

Military industrial repurposing carries added urgency in the context of climate crisis. Military operations and infrastructure as well as the production of weapons and equipment are significant sources of greenhouse gases — combined they are responsible for an estimated 5.5 per cent of global emissions.⁵⁰ As Figure Six shows, direct emissions from military infrastructure, operations and the use of hardware accounted for 40 per cent of the reported carbon footprint of the UK’s public sector in

50. Stuart Parkinson and Linsey Cottrell, “Estimating the Military’s Global Greenhouse Gas Emissions”, Scientists for Global Responsibility and Conflict and Environment Observatory, 2022, https://ceobs.org/wp-content/uploads/2022/11/SGR-CEOBS_Estimating_Global_Military_GHG_Emissions.pdf

2022-23. This data excludes the climate impact of the industrial production of military equipment in the UK, which is highly carbon intensive: emissions from the UK's military industry were equivalent to all domestic commercial flights in 2017-18.⁵¹ Direct emissions from MOD activity and emissions from military industrial production are approximately equivalent; together, they exceed the national carbon footprints of sixty countries.⁵² As a further indicator of the relative carbon intensity of military industrial production, the US military — the world's largest institutional consumer of fossil fuels — is at least matched as a source of greenhouse gas emissions by the private industries that supply it with weapons.⁵³ Industrial repurposing can mitigate emissions from the production of military hardware while simultaneously developing the capacity of green sectors such as energy and transport. Moreover, in the long term, a process of industrial conversion will reduce the overall scale of military activity and emissions from the use of military equipment as a result.

Not only is the military industry a significant source of emissions, but military industrial projects operate on such long timeframes and are so expensive that they lock in future emissions: for example, the F35 fighter jet, of which the UK produces 15 per cent, is set to cost \$2 trillion in total over its lifetime and to be in use until 2088.⁵⁴ The high financial cost disincentivises partners in the F35 programme from buying alternative equipment even if it were technologically possible to build a zero-emissions fighter jet. This is emblematic of the military industrial lifecycle: carbon intensive and expensive production leads to emissions in the immediate term which are then compounded by the long-term use of equipment. Industrial repurposing offers a twin benefit — by following the approach set out in Sections Four and Five of this report and converting production in strategic areas towards green sectors, the government can directly mitigate military industrial emissions while building out its green manufacturing capacity.⁵⁵

51. Parkinson, "The Environmental Impacts of the UK Military Sector", Scientists for Global Responsibility and Declassified UK, 2020, https://www.sgr.org.uk/sites/default/files/2020-05/SGR-DUK_UK_Military_Env_Impacts.pdf

52. Ibid.

53. See Neta Crawford, *The Pentagon, Climate Change and War: Charting the Rise and Fall of U.S. Military Emissions*, The M.I.T. Press: 2022. Crawford estimates the 2019 emissions of the US military industry using two different methods. Both estimates suggest that the military industry had a slightly higher carbon footprint than the reported direct emissions of the Department of Defense in 2019.

54. "F-35 Joint Strike Fighter: Program Continues to Encounter Production Issues and Modernization Delays", Government Accountability Office, 2024, <https://www.gao.gov/assets/gao-24-106909.pdf>

55. The potential development of green manufacturing has wider benefits for the UK economy which has lost manufacturing capacity far faster than other G7 economies since the mid-1990s. Over that period, the UK has lost one third of its basket of competitive manufacturing exports. See Pranesh Narayanan, George Dibb, Enrico Vanino, Simone Gaspein and Luke Murphy, "Manufacturing Matters: The Cornerstone of a Competitive Green Economy", 2024, https://ippr-org.files.svdcn.com/production/Downloads/Manufacturing-matters-May-24_2024-05-15-131750_sldr.pdf

Supporting a strategic review of military retrenchment

Industrial repurposing is also an opportunity to reorder defence priorities around what is necessary to protect the UK and, as a result, to redirect technological capacity within the military industrial base towards climate objectives. The MOD's equipment budget supports procurement programmes designed to maintain a military force that can intervene globally and engage in geopolitical competition rather than to defend the UK itself or provide baseline deterrent. For instance, the chair of the forthcoming Strategic Defence Review (who headed the last defence review under a Labour government in 1998) has indicated the direction of travel in defence policy by positioning China as a geopolitical rival and claiming that it is a “deadly” threat to the UK.⁵⁶ As explored below, the existing defence strategy directs the UK's public investment and industrial capacity towards the maintenance of global military capabilities as a junior partner to the US. Industrial repurposing would instead create the space to redefine the UK's objectives and to direct its industrial base towards addressing the climate crisis and rebuilding national economic security.

In the 2023 Defence Command paper, the policy document which sets the UK's military objectives, defence strategy is defined around maintaining the capability to project military force globally whether through direct intervention, the export of weapons to allies or the maintenance of overseas military installations. As the Defence Command paper sets out, the UK is, for instance, committed to “support[ing] the vision for a free and open Indo-Pacific” as well as to maintaining close relationships with Gulf Cooperation Council (GCC) countries, in particular Saudi Arabia. Underlying these objectives is the idea that it is necessary for the UK to support the US in the global projection of military power — in this case competition with China and the protection of the Saudi monarchy — a policy approach that has previously led the UK to involvement in military interventions in Iraq, Afghanistan, a brutal Saudi-led war on Yemen and, most recently, Israel's genocidal assault on Gaza.⁵⁷ The aim of maintaining a global military force underpins public spending on military procurement.

According to the Defence Command paper, the UK military is required to retain capacity for “campaigning and global competition”, a “global response force” and a

56. For an analysis of the 1998 Strategic Defence Review, see David Edgerton, “Tony Blair's Warfare State”, *New Left Review*, 1998, <https://newleftreview.org/issues/i230/articles/david-edgerton-tony-blair-s-warfare-state>. For the recent comments of the chair of both Labour-led reviews, Fisher, “China poses ‘deadly’ threat to UK, says former NATO boss”, *Financial Times*, 15 July 2024, <https://www.ft.com/content/57333df7-dceb-4eab-a39a-971dfc112b6b>

57. On the genocidal nature of Israel's assault on Gaza, see for example Francesca Albanese, “Anatomy of a Genocide: Report of the Special Rapporteur on the situation of human rights in the Palestinian territories occupied since 1967”, United Nations Human Rights Council, 2024, <https://www.un.org/unispal/document/anatomy-of-a-genocide-report-of-the-special-rapporteur-on-the-situation-of-human-rights-in-the-palestinian-territory-occupied-since-1967-to-human-rights-council-advance-unedited-version-a-hrc-55/>

“persistent presence” to “project soft power”.⁵⁸ These objectives demand investment in military capabilities and industrial production that exceeds the requirements of national defence. For instance, the government’s £6.4 billion investment in two Queen Elizabeth class aircraft carriers was explicitly designed to support the projection of military power globally and led to the establishment of naval support facilities in Bahrain and Oman — the first “East of Suez” in almost fifty years.⁵⁹ While much of the political pressure to increase the UK’s military spending is framed as necessary to ramp up munitions production (and replenish stockpiles) in response to Russia’s invasion of Ukraine, these plans have only accounted for a fraction of additional spending within existing roadmaps.⁶⁰ The current procurement strategy, and proposals to expand it, are not designed around what is needed to defend the UK or even the European continent, but rather to devote public and industrial resources to maintain the capacity for global interventions. As a result of this strategy, the UK continues to invest in overseas military installations, including bases on the Persian Gulf that trained Saudi and Emirati militaries for the war on Yemen.⁶¹ Repurposing production would enable the UK to reconsider its objectives, providing a transition away from military production programmes designed for direct military intervention overseas or arms exports to countries that have a consistent track record of war crimes, such as Israel and Saudi Arabia.⁶²

The maintenance of military force at this scale is extremely expensive, with the MOD set to spend £288.6 billion on equipment programmes over the next decade that are already estimated to be £16.9 billion over budget.⁶³ The Global Combat Air Programme is not even included within these estimates and the MOD has not yet produced a projected cost for it. Industrial repurposing would open the space to use public investment more effectively — retaining production for national defence but also to direct existing skills and capacity towards climate targets. In climate terms, this could support energy independence, a much greater geopolitical asset than expensive weapons programmes.

58. “Defence’s response to a more contested and volatile world”, Ministry of Defence, 2023, https://assets.publishing.service.gov.uk/media/64b55dd30ea2cb000d15e3fe/Defence_Command_Paper_2023_Defence_s_response_to_a_more_contested_and_volatile_world.pdf

59. For a cost estimate of the Queen Elizabeth programme, see “Carrier Strike — Preparing for Deployment”, National Audit Office, 2020, <https://www.nao.org.uk/reports/carrier-strike-preparing-for-deployment/>. On the military objectives behind the carrier strike programme see “Carrier strike strategy and its contribution to UK defence”, House of Commons Library, 2019, <https://researchbriefings.files.parliament.uk/documents/CDP-2019-0050/CDP-2019-0050.pdf>

60. “PM announces ‘turning point’ in European security as UK set to increase defence spending to 2.5% by 2030”, Prime Minister’s Office 10 Downing Street, 2024, <https://www.gov.uk/government/news/pm-announces-turning-point-in-european-security-as-uk-set-to-increase-defence-spending-to-25-by-2030#:~:text=Prime%20Minister%20Rishi%20Sunak%20has,spending%20to%202.5%25%20by%202030.&text=On%20a%20visit%20to%20Poland,billion%20a%20year%20in%202030>

61. Tom Stevenson, *Someone Else’s Empire: British Illusions and American Hegemony*, Verso: 2023.

62. See footnote 14.

63. The Equipment Plan, 2023-2033”, National Audit Office, 2023, <https://www.nao.org.uk/reports/equipment-plan-2023-to-2033>

Is Military Industrial Repurposing Technologically Viable?



There's always a possibility to repurpose things, I think. You know, engineering a lot of the time has transferability; you can sort of use things for different applications. I think the reality ends up being ... an economic decision.

Sam, engineer at a dual use company

Across the interviews conducted for this project, almost all participants were open to industrial repurposing from military to green sectors to differing degrees, varying from the full-scale conversion of the industry to plant level diversification plans to keep jobs secure. Between these different visions, almost all interviewees perceived industrial repurposing to be technologically viable. In particular, interviewees in naval shipbuilding described the skills transfer possible between their work and green energy and transport supply chains, while those in aerospace outlined the potential for R&D intensive workplaces to be directed towards civilian projects.

Mike, a worker in aerospace, reflected on his disappointment that a transition had not been directed sooner:



Image: Flickr / Rovingl

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We should have been at the forefront ... of the green technologies. I mean, it's not a stretch to think from an aircraft propeller to a wind turbine, is it? ... A lot of these places like Barrow-in-Furness are on the coast ... they could have generated everything we needed for wind farms ... Many of the companies could have transitioned.

Mike, worker in the aerospace sector

As detailed below, the industrial capacity and skills within the military industrial base are well situated for repurposing to green sectors such as offshore wind and public transport. Successful delivery of this process would require the public ownership

of transition sites to manage conversion as well as close coordination with public procurement bodies for green energy and transport to ensure sustained demand for new products. Public ownership would allow the conversion process to benefit from the risk bearing capacity of the state and enable sites to initially focus on innovation and the development of new products instead of maximising profit.

Naval shipbuilding

In naval shipbuilding, interviewees suggested that the repurposing process would benefit from a base of skills that are transferable to green energy supply chains: for instance, steel fabrication, engineering and electrical installation. As Declan a worker at a naval shipyard suggested, a plan to diversify what the yard produced would have at least ensured that work continued during quieter periods:



At the end of the day, this place is a fabrication shop. It's nuts and bolts, and it's steel. That's what built the ships. So if you get anything that's nuts and bolts and steel, like bridges, and I used to stand and watch...when there was a lot of demand for the wind turbines. The wind turbines would sail past here, and I'd be saying to them, "Why are we not ... building stuff like that? Why are we not even asking? We could build that for you. We could put that together." We've got all the workshops that you would ever need to do that stuff, but we don't.

Declan, worker at a naval shipyard

Declan also noted that investments in plant and machinery at the site shifted frequently which led to equipment being abandoned as military procurement priorities changed. To Declan, a failure to use productive capacity more flexibly had led to missed opportunities to make use of investments. This account of poor coordination

further reflects the risks to job security associated with military production as demand is dictated by volatile geopolitical priorities.

Martin, who works as a welder, described seeing wind turbines imported to a site close to his shipyard. Based on his assessment of the yard, he argued that its workforce was equipped to build similar products:



It's just welding. Probably a lot easier than what, you know, we're doing now. So, yeah. I might be wrong, yeah. But no, it looks a lot, lot easier ... Because it's very, very complicated these ships.

Martin, welder at a shipyard

This confidence in the preparedness of naval shipbuilders to take on work for the offshore wind industry is not misplaced. Shipyards on the Tyne, Forth, Mersey and Lagan are all undertaking work in the offshore wind sector. In Bremerhaven, Germany, a combination of state investment and local authority policy coordination has developed nacelle, blade and substructure manufacturing from the city's prior industrial and skills base in shipbuilding.⁶⁴ Given that naval shipyards have a strong foundation in related skills and are set up to produce specialised products at a low volume, they are well situated to develop and transition into new products without the need to repurpose large production lines.

Although the skills and productive capacity on offer in naval shipbuilding would only meet a small proportion of the demand for offshore wind development in the UK, they are a resource that can be deployed towards an essential goal. Despite the ambition of the 2019 Offshore Wind Sector deal to increase domestically produced content in the UK's wind farms to 60 per cent by 2030, there is a limited manufacturing base at present. Blade manufacturing in the UK extends to a Siemens Gamesa site in Hull and a Vestas plant on the Isle of Wight. The only turbine manufacturing site in Scotland was

64. Alexander Jaax, "Skill relatedness and economic restructuring: The case of Bremerhaven" *Regional Studies, Regional Science*, 3, 2015, pp.58–66. For an account of the post Cold War conversion process in the city-state of Bremen, see Barnaby Pace, "Defence Diversification: International Learning for Trident Jobs", Nuclear Education Trust, 2018, <https://nucleareducationtrust.org/wp-content/uploads/2023/03/NET-Defence-Diversification-Report.pdf>



37

operated by CS Wind in Campbeltown until 2021 when it shut despite having received a series of state subsidies.⁶⁵ With the government planning to quadruple offshore wind production by the end of the decade and expected supply shortages in parts of the global offshore wind sector that may unfold in parallel, the Crown Estate and the renewables industry have identified opportunities to expand domestic manufacturing of blades, turbines, foundations, substructures and even installation and maintenance vessels.⁶⁶ If repurposed under public ownership, naval shipyards offer one source of manufacturing capacity to meet this demand, and workers there have the required welding, fabrication and engineering skills. However, as described below, this process would require coordination with a public procurement body to facilitate the transition and provide long term demand for manufacturing.

Aerospace and R&D

The engineering and R&D capacity within the aerospace sector also contains potential for repurposing towards green industries and to support the conversion of

65. Ewan Gibbs, “Why don’t more Scots work in wind power”, Future Economy Scotland, 2023, <https://www.futureeconomy.scot/posts/43-why-don-t-more-scots-work-in-wind-power>

66. “2024 Offshore Wind Industrial Growth Plan”, Renewable UK, Offshore Wind Industry Council and the Crown Estate, 2024, https://cdn.ymaws.com/www.renewableuk.com/resource/resmgr/publications/reports/Offshore_Wind_Industrial_Gro.pdf

naval shipyards. As outlined in Section 1, R&D in the military industry is primarily paid for by the UK government and represents an example of public resource that could otherwise be diverted towards the climate transition. Examples of previous conversion between the aerospace sector and public transport — including Lockheed Martin's development of hybrid buses that are used in Tokyo, New York and Paris — indicate the technological feasibility of this transition.⁶⁷

Our interviews captured the adjacency between aerospace and green transport as well as other civilian and military sectors. David, who works as an aerospace engineer, suggested that his business could produce hi-tech components for any vehicle system:



For us it's just a broad ... base of potential uses of the sub-technology that we create. So we call them "adjacencies" as well. Whereby, our core business is aviation, whether it be military or civil, but there are a lot of parallel opportunities in the nuclear industry, or trains, submarines. You know, there's lots of opportunities. ... We could have no military work, or all military work. I think it just depends on the opportunities that...we win.

David, aerospace engineer

The dominance of military procurement on sites like David's is one effect of state capacity and industrial strategy being directed towards the military industry instead of other manufacturing sectors. With the redirection of public investment and policy coordination, the work conducted even in high-tech aerospace manufacturing could be repurposed towards a greater range of civilian uses.

67. See Pemberton, *Six Stops on the National Security Tour: Rethinking Warfare Economics*, Routledge: 2023.

Connor, another aerospace engineer, suggested that R&D capacity in aerospace could be brought into the public sector and used to support civilian manufacturing. Connor reflected on this in reference to his site:



I understand that it's shifted away from manufacturing to an extent, in the sense that ... very few things are made from scratch there. So I see it more as research and development, still having manufacturing capabilities to an extent of like ... being able to produce equipment or units for specialist needs, whether that's air traffic control or coastguard applications or something like that. But predominantly research.

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Connor, Aerospace engineer

Even where there is not production capacity that can be redeployed for civilian sectors, R&D and engineering skills can be repurposed towards civilian manufacturing projects elsewhere, such as the conversion of shipbuilding towards green energy or transport manufacturing. Further, given that some universities, such as Imperial College, Southampton and Lancaster, use extensive research partnerships with industry to develop military equipment, there is a base of public R&D capacity that could be similarly redirected to support a transition.⁶⁸ Connor stressed the point that his site was focused primarily on engineering research and could be directed towards a different set of problems if the necessary public investment was there.

68. See for more detail: Okopi Ajonye, "Weaponising Universities: Research Collaborations between UK Universities and the Military Industrial Complex", Campaign Against the Arms Trade and Demilitarise Education, 2024, <https://caat.org.uk/publications/weaponising-universities-research-collaborations-between-uk-universities-and-the-military-industrial-complex>

Overcoming hurdles

Despite a broad openness to diversification and industrial repurposing, interviewees also identified potential risks. These clustered around two core issues — competing in private markets for civilian goods and maintaining labour intensity in newly diversified sectors. Rick, a shop steward at a naval shipyard, mentioned a negative experience at his shipyard when producing goods for private renewable energy companies in the past:



So an example would be that [we] went into those renewables, and we were building units for windfarms. And it became that it was impossible to actually make anything out of the contracts because you're constantly getting hit with penalties for just ridiculous stuff that wouldn't normally happen.

Rick, shop steward at a naval shipyard

Rick recalled that, in looking to extract as much as possible from their contract with the shipyard, the renewables company had imposed a series of penalties. This is likely the result of the Contracts for Difference (CfD) system which fixes the revenues from renewable generation projects and makes cost reductions in supply chains the primary avenue to additional profit for developers.⁶⁹ Rick and his colleagues were open to the idea of industrial repurposing but he felt that it would require a public procurement model to avoid harsh demands set by private companies and ensure the sustained demand for civilian products necessary to innovate and repurpose production.

69. Melanie Brusseler, Chris Hayes, Adrienne Buller and Mathew Lawrence, "The Greatest Generation: How Public Power Can Deliver Net Zero Faster, Fairer and Cheaper", 2024, <https://www.common-wealth.org/publications/the-greatest-generation-how-public-power-can-deliver-net-zero-faster-fairer-and-cheaper>

The second risk raised by interviewees was that civilian sectors would not have the same degree of labour intensity as the military industry. Rhys, a sheet metal worker at a shipyard, made this point strongly:



Yeah. I mean, we've got the facilities here. There's absolutely no question about that. We've got the facilities to take on other projects... But the shipbuilding is quite labour-intensive. There's a lot of different parts involved. The fear is diversifying into something like wind turbines — would they require the same amount of labour going ahead? And the worry would be for talking's sake redundancies if we went down that road. But we've no question about it, we've got the facilities here.

Rhys, sheet metal worker at a shipyard

This is a potential barrier to an effective industrial transition as military customers set different requirements to civilian sectors. Military projects are complex as a result and require ongoing customer support. That said, there are also distinct risks contained in military procurement, with the employment base — especially in shipbuilding — subject to volatile demand and poor coordination. This has a particularly sharp effect in shipbuilding as different trades are required across the lifetime of building a ship. Public procurement for the civilian production of green energy and transport can, if coordinated correctly with societal needs for energy and transport products, offer the possibility of steadier demand and production at a higher volume despite reduced complexity. As outlined below, several interviewees described policy architectures that could address potential hurdles to industrial repurposing.

Sketching an Alternative

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Although repurposing military production to green energy and transport would require public investment and coordination, the state capacity to deliver a transition already exists within the military sector. To make an industrial transition possible, interviewees mentioned different policy mechanisms — related to both procurement and ownership — that could be deployed. The interviewees gave differing views on the ownership of the military industry itself — some felt mistrustful of either devolved or national government taking a greater role in the sector, for instance — but several interviewees identified the use of public procurement and ownership as transitional steps to repurpose parts of the military industry.

As mentioned in Section Four, Rick argued that a publicly-owned energy generation firm could provide demand for goods produced by a repurposed shipyard:



I think for me, that no manufacturing business is going to go near renewables until there's some kind of fairness within the manufacturing world. [The shipyard] got burned. Their work was good, [the renewables developer] got the kit they needed, but they refused to pay... And

that put [the shipyard] off operating in that environment because it was cowboys. So I think a nationalised industry would help. Or certainly a structure around it where there was guaranteed payments for work carried out... But I think the plan of a nationalised power company, or at least a nationalised infrastructure company would be good...

Rick, shop steward at a naval shipyard

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The experience of Rick and the workforce at his shipyard demonstrate the necessity of public procurement and coordination to safeguard jobs during an industrial transition. This has historically been the case in successful industrial repurposing projects: for instance, the Boeing-Vertol military helicopter site in Philadelphia that produced carriages for the Chicago subway relied on close coordination between the government customer and the producer.⁷⁰ At present, similar dynamics are clear in offshore wind manufacturing, with public investment a more stable route for supply chain firms to innovate.⁷¹ With the right architecture, coordination between the transition site and publicly-owned procurement firms could backstop demand for civilian products to ensure the needs of the workforce are met.

In addition to the redirection of state resources to increase the viability of repurposing production, interviewees suggested ownership models that would increase worker governance of the transition. John, an electrician at a shipyard, put forward a co-operative structure:

70. Feldman, "The Conversion of Defense Engineers' Skills: Explaining Success and Failure Through Customer-Based Learning, Teaming and Managerial Integration at Boeing-Vertol" in Gerald I. Susman and Sean O'Keefe, *The Defense Industry in the Post Cold War Era: Corporate Strategies and Public Policy Perspectives*, Pergamon: 1998. In a recent interview based study with workers in the UK and US defence industries, the role of industrial policy to incentivise the conversion process was also raised by workers. See Karen Bell et al, "Decarbonising and Diversifying Defence in the United Kingdom and United States: A Workers' Enquiry for a Just Transition", *The British Academy*, 2022, <https://static1.squarespace.com/static/6269b19b302d187c75609234/t/62eae280c06bf43b4a62be5a/1659560580300/DDD-Full-Report.pdf>

71. Brusseler, Hayes, Buller and Lawrence, "The Greatest Generation: How Public Power Can Deliver Net Zero Faster, Fairer and Cheaper", 2024, <https://www.common-wealth.org/publications/the-greatest-generation-how-public-power-can-deliver-net-zero-faster-fairer-and-cheaper>



I don't know if I'm talking in favour of a nationalised solution. I'm more interested in it starting from the workers up. So whether it's a worker buyout — whether we can gather all the funds for a buyout. Or whether it would be part of a cooperative kind of takeover.... It's kind of a model I'm looking more to. It's kind of a cooperative model. And trying to create something a bit different.

John, electrician at a shipyard

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John's ideal structure is reminiscent of a proposal by workers at GKN in Florence. GKN is a manufacturing company that previously worked across the aerospace and automotive sectors, but after an aggressive takeover by Melrose (a private equity business that specialises in asset stripping), several of its automotive sites were closed. Although trade unionists at the GKN Driveline site in Birmingham put forward an alternative plan, they were forced into redundancies in 2022.⁷² In Florence, workers occupied their factory and have proposed conversion of the automotive site to produce cargo bikes and solar panels under a cooperative structure.⁷³ Their plan follows a long tradition of worker initiatives to govern new investment and design new models of production. Unfortunately, the workers have not yet been able to buy their site from Melrose to deliver the plan due to a lack of access to capital. While the cooperative model described by John and enacted by GKN workers offers democratic potential, it is difficult to develop at scale without public investment. The policies for worker governance within and of the transition put forward below therefore reflect the ideas of a broader range of interviewees as a transitional step, after which a cooperative model may be possible.

72. "GKN Automotive workers present plan to keep Birmingham plant open", *Made in the Midlands*, 10 June 2021, <https://gkndriveline.madeinthemidlands.com/news/gkn-automotive-workers-present-plan-to-keep-birmingham-plant-open>

73. "An Important Communication From ex-GKN Factory Workers in Italy", *Notes From Below*, 14 November 2023, <https://notesfrombelow.org/article/important-communication-ex-gkn-factory-workers-ita>

To combine public ownership with greater worker governance of production Connor, the aerospace engineer, argued:



I think I'm of the opinion that it would be very difficult to achieve diversification ... without the participation of trade unions — of worker involvement in that movement of private ownership to public ownership..... I think the trade union would be beneficial in that transition just to provide job security and support for people who might risk losing their job, or who might move to something else as a result, if that makes sense. That's how I understand it.

Connor, Aerospace engineer

This is a similar perspective to John's but with a greater role for public ownership at least as an initial step; as Mark put it "that would be a good step forward, if they renationalised large parts of [the military industry] as a prerequisite to moving beyond militarism." The three policy priorities outlined below could build on these suggestions and use the tools of public ownership and worker governance to begin the transition.

Policy Priorities

1 Found Lucas Holdings, a publicly-owned off-balance sheet company independent of the MOD, to coordinate and lead the repurposing process.

Lucas Holdings would include national and local governance roles for workers and their trade unions to direct the transition. It would acquire industrial sites in strategic clusters — for instance a combination of a shipyard and an aerospace R&D facility nearby as set out in the [interactive map](#) that accompanies this report — drawing from existing military procurement spending to invest in conversion projects. Lucas Holdings would additionally have the means to invest directly in repurposing projects itself and to draw on public research capacity from universities to support workers in developing alternative plans.

2 Use the public ownership of energy generation and transport to ensure demand for the repurposing process.

Existing programmes such as Great British Energy, and public bodies such as Transport for London and ScotRail, should support transition clusters using coordinated procurement. Through the alignment of green industrial strategy these public bodies can provide demand for products from Lucas Holdings' industrial clusters. The strategy of Lucas Holdings would be coordinated towards the needs of these public firms.

3 Deliver a strategic review of military commitments and military industrial strategy.

Conduct an independent review to understand where military procurement commitments are designed to maintain overseas intervention capabilities and where they are essential for national defence. This review would redefine the UK's military objectives around national defence and overseas retrenchment. The strategy would redirect weapons procurement spending to support a new industrial strategy, for instance through the repurposing of industrial projects that focus on power projection against China or exports to countries that have recently committed war crimes, such as Saudi Arabia and Israel.⁷⁴

74. See footnote 14.

Conclusion

The fiscal exceptionalism granted by the UK government to military procurement is often justified in economic terms. However, the PR narrative of the military industry as an economic powerhouse obscures its reliance on the public resources that subsidise military production. As demonstrated by historical labour movement proposals to repurpose military sites, and the 21 interviews with workers and trade unionists in the military industry that form the basis of this report, the public resources, productive capacity and skills currently devoted towards war production can be repurposed to develop green industries.

A transition from the asset manager arsenal to a green industrial strategy would first, divert capacity and skills currently concentrated within the military industry towards the production of public energy and transport systems and create long-term security for workers in the process; second, it would mitigate the emissions and ecological damages that result from military production and third, support an alternative foreign policy focused on national defence rather than the global projection of force and export of weaponry. A transition at



strategic sites from military to green production would benefit from an existing and transferrable base of skills and industrial capacity. Moreover, the public resources needed to make this transition a success already exist but are currently devoted to the MOD's equipment budget and its maintenance of an expansive war industry. The new approach to state priorities set out in this report can be the foundation of a thriving green industrial policy.

Methodological Annex

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The 21 interviews that form the basis of this report are anonymised through the use of pseudonyms (other than for the two retired Lucas stewards) to protect the identity of those currently working in the military industry. Of the 21 interviewees, 18 presently work at military industrial sites. The sample was recruited by contacting a list of trade union convenors at sites from across the industry. The majority of interviews were self-selecting based on the sites at which convenors agreed to facilitate interviews. We then deployed a snowballing model in addition to introductions from personal contacts, to reach the remaining interviewees. This approach meant that our interview data includes accounts of conventional aerospace and shipbuilding but not nuclear. This was not an active choice but the result of the responses that we received. The interviews were conducted between February and June 2024.

The use of trade union contacts to build our interview sample does mean that trade union members and shop stewards are overrepresented.

Of the 21 interviewees, 20 were male and one was female. Although women are underrepresented in the military industry — making up 21 per cent of those employed at the firms included in a recent MOD survey — they were further underrepresented in our sample due to the snowballing model.⁷⁵

The interviews were semi-structured and lasted between 35 and 90 minutes, varying based on the extent of engagement with core topics. The transcribed interviews were analysed using Atlas.Ti software and grouped around 30 codes, which were produced through an iterative process involving a combination of deductive coding based on existing literatures and inductive coding to capture emergent themes.

75. "2024 Annual Economic Report", Ministry of Defence and Defence Growth Partnership, 2024, https://jedhub.org/docs/2024/20242904_JEDHub_Annual_Economic_Report_2024_v1.0.pdf



A Lucas Plan for the Twenty First Century: From Asset Manager Arsenal to Green Industrial Strategy

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