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The necessity of a transformational approach to just transition: defence worker views on decarbonisation, diversification and sustainability

Karen Bell[a], Vivian Price[b], Keith McLoughlin[c] and Erik Kojola[d]

[a]Urban Studies, University of Glasgow, Glasgow, Scotland; [b]Interdisciplinary Studies, California State University, Dominguez Hills, Carson, United States; [c]Department of History, University of Bristol, Bristol, England; [d]Department of Sociology and Anthropology, Texas Christian University, Fort Worth, United States

ABSTRACT

This paper highlights the perspectives of defence workers regarding a Just Transition of their industry, one of the most environmentally harmful sectors in terms of greenhouse gas (GHG) emissions, pollution and use of non-renewable resources. It is based on (i) interviews with defence sector workers in the United States and the United Kingdom (n58); and (ii) focus groups with key representatives of national and international labour unions, defence companies and relevant NGOs (n18). Some of these defence workers and their trade union representatives envisioned a transformational path towards sustainability, including converting the defence sector to more socially useful production. Drawing on Gramsci, we define these as 'counter-hegemonic views', since they challenge the hegemonic 'growth coalition' and 'treadmill of destruction' paradigms. Such views support and echo more radical interpretations of Just Transition, emphasising the necessity of a structural transformation of society to achieve a fair and effective transition to sustainability.

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KEYWORDS Military emissions; military-industrial; workplace democracy; trade unions; peace; war

Introduction

The defence sector is responsible for exceptionally high levels of GHGs, pollution and use of non-renewable resources (Bigger and Neimark 2017, Crawford 2019, Belcher *et al.* 2020, Parkinson 2020a). Analysis indicates that the world's militaries combined, and the industries that provide their equipment, contribute 6% to global GHG emissions (SGR 2021a, 2021b). Moreover, as Parkinson (2020a, p. 17) highlights, . . . the military is a unique sector, in that the use of its products,

CONTACT Karen Bell karen.bell.2@glasgow.ac.uk

i.e. weapons, often leads to considerable further GHG emissions, including fires from burning buildings, fuel depots and vegetation, healthcare for civilian and military survivors, and post-conflict reconstruction. Hence, the defence sector needs to be part of the accelerated action to achieve a liveable future that scientists are calling for (IPCC 2022) and the social dialogue needed to achieve a Just Transition.

The 'Just Transition' (JT) concept focuses on the equity issues that could arise from the transition to sustainability. Typologies of JT have located different models on a spectrum according to the type of transition envisioned and the actions that need to be undertaken, ranging from a 'worker-focused' /'managerial' approach at one end to a 'structural'/'transformative' endeavour at the other (Morena *et al.* 2020, Just Transition Research Collaborative 2018, Kalt 2021, Krawchenko and Gordon 2021). The structural interpretation tends to be the broadest, considering JT as a means to improve the lives of workers and their communities, as well as to address the problems of society as a whole, advocating for system transformation. In this latter interpretation, equity, justice and inclusion at local, national and global levels are seen to be vital elements of JT. This would include the procedural, distributional, recognition, restorative and substantive aspects of these concepts (see, for example, Bell 2014, 2020, Abram *et al.* 2022).

The way that JT is interpreted has important implications for campaigns and policy responses and, therefore, it remains a highly contested term, often disputed in social struggles (see, for example, Kalt 2021). It might be assumed that workers would only be interested in the question of maintaining jobs in the transition to sustainability and less in the wider implications of their work. This article argues that this may not be the case and that some workers subscribe to a more transformational vision of JT and, indeed, consider it necessary for an effective societal transition to sustainability.

The paper draws on Gramsci's (1971) insights into how transformative change can be achieved. Noting that rule occurs, not just by coercion but also through consent; he argued that this consent is supported by 'hegemony', generally understood to be a form of power that presents the interests of the globally powerful as universal interests, thereby gaining the support of other classes. Here, we are using the term 'hegemony' to refer to the societally dominant discourse and practice on how to transition to sustainability, i.e. through technical changes that enable business-as-usual, without addressing the drivers of unsustainability, including perpetual economic growth and the profit imperative. A narrower conception of JT does not fundamentally challenge economic and political power, whereas a more transformative vision of JT could be considered 'counter-hegemonic' to this dominant perspective.

Gramsci argued that hegemony is made stable by a 'historic bloc' made up of alliances across social groups and class interests. In order to challenge

aspects of the dominant capitalist system and thereby the interests of economic elites, a 'counter-hegemonic bloc' must be formed which includes subaltern agents as well as intellectuals and social leaders (Gramsci 1971). A counter-hegemonic bloc for challenging the dominant societal approach to addressing unsustainability could be formed around a transformative interpretation of JT as an 'ideological element around which a coalition of change agents coalesces' (Winkler 2020, p. 10). Alongside workers, as subaltern actors, other change agents that could join this historic bloc for transformation might include ENGOs (environmental non-governmental organisations); and social justice organisations.

In this paper, we focus on defence workers' counter-hegemonic views about how to achieve sustainability and their alignment with a more transformative vision of JT. This focus is taken because (1) these views are relatively unexplored in the literature on defence and sustainability; (2) they are counter intuitive for defence sector workers and, as such, have interesting implications; and (3) they relate to Gramsci's theory of counter-hegemonic alliance and, as such, indicate the potential for a transformational Just Transition. The views that were more consistent with a narrower conception of JT and the full range of views can be found in the project reports and the original datasets (see www.decarbonising-defence.co.uk and the UK Data Archive Data Catalogue, under 'Data Collection #855918').

Background

The UK government is now committed to a legally binding greenhouse gas (GHG) reduction target of 78% by 2035 (Gov.UK 2021) and the US government is currently considering the 'CLEAN Future Act' bill (CFA 2021) with a national goal to achieve net zero GHG emissions by 2050. Yet, it is estimated that the MoD accounts for 50% of UK Government GHG emissions and the US DoD consumes 80% of US Government energy (Crawford 2019, Barry 2021). Within this context, reduction of defence GHG emissions has become a government priority for both countries. Government defence departments have also highlighted the security aspects of climate change resulting from extreme weather events, sea level rise and desertification, all of which have the potential to increase conflict (e.g. MoD 2021, NATO 2021). Defence sector companies have also been setting sustainability targets, claiming greatly diminished GHG emissions as a result of their net zero activities and issuing plans regarding how they will continue to meet these targets (e.g. Honeywell 2021). BAE Systems have committed to achieving net zero GHGs across their operations by 2030 (Sutcliffe 2021) as have Rolls Royce (Rolls Royce 2021) and GKN Aerospace has a target to achieve net zero GHGs by 2050 (GKN 2021).

However, while governments, defence companies and military organisations are now, to some extent, acknowledging the environmental impacts of their operations, their solutions are primarily technical, focussed almost entirely on decarbonisation rather than wider sustainability issues, and with no intention to scale back operations. Indeed, the UK government has recently announced its intention to double military spending and to lift defence spending overall from 2.1% of GDP to 3% by 2030 (Sabbagh 2022). Furthermore, the NATO national spending target of 2% of GDP on militaries is considered likely to increase military-related GHGs (Lunn and Williams 2017). The technical approach avoids consideration of the fundamental political and economic systems of militarism and capitalism that are driving unsustainability. Overall plans and actions have included: Using more of the defence estate to generate renewable energy or for capture carbon; increasing use of biofuels for powering ships and aircraft (see Bowcott *et al.* 2021); increasing energy efficiency; electrifying vehicle fleets (e.g. US Defense Secretary, Lloyd Austin, in Vergun 2021); developing more efficient engines and materials (IATA 2019); increasing the use of carbon offsets (Bowcott *et al.* 2021); and reducing the use of manned vehicles (Nugee in Owen-Burge 2021: np.). For example, the MoD's (2021) 'Climate Change and Sustainability Strategic Approach' document states that there is to be increased use of robotic and autonomous systems, biofuels, nuclear power, solar panels, tree planting and carbon offsetting. Similar activities were proposed in the 2020 'Sustainability Report and Implementation Plan' of the US Department of Defense (DoD) (Bowcott *et al.* 2021) and the 2022 'Climate Strategy' of the US Army (2022).

However, the technologies suggested may be inadequate for achieving sustainability and some may exacerbate environmental and social harm. There have been particular criticisms of the proposed fossil fuel replacements (e.g. Bigger and Neimark 2017, Gardner 2017, Parkinson 2021). As Parkinson (2020a, 2020b, 2021) points out, biofuel and nuclear, while low in carbon emissions, are still detrimental to the environment in terms of biodiversity and toxicity. The plans and statements of the governments and defence companies do not take into account the full range of environmental crises (Steffen *et al.* 2015). Technical fixes that apply to just one of these emergencies may create problems elsewhere. Even the use of the 'net zero' language is, itself, problematic in that this policy goal includes the use of risky and ineffective carbon capture technologies to attempt to remove excess emissions from the atmosphere, thereby reducing the incentive to emit less (Dyke *et al.* 2021).

Furthermore, the strategies overlook the environmental impacts of engaging in war and reconstructing after, such as the destruction of ecological habitats and replacing buildings and infrastructure (Darbyshire and Weir 2021). Moreover, the defence industry and

government plans lack consideration of how to avoid war, for example, through diplomacy, arms control and disarmament treaties. State subsidies for defence are high in the main weapons producing countries (CAAT 2014) and, with a range of ecological emergencies to address, these subsidies might be better used for mitigation and adaptation of these crises, as in a green 'peace dividend'. There are also many social causes that would benefit from such subsidies, such as providing adequate sanitation systems for the Global South, so the opportunity cost of military spending is an important issue. As the IPCC (2022, p. 84) recently stated, ' ... moderate reductions in military spending (which may involve conflict resolution and cross-country agreements on arms limitations) could free up considerable resources for the SDG agenda, both in the countries that reduce spending and in the form of ODA'.

The technical approach to transitioning the defence sector fits with the eco-modernist hegemony of the Global North, based on maintaining a Western lifestyle and dominance, and achieving 'green growth' (Velicu and Barca 2020). Economic growth is pursued as the supposed solution to all social ills and now environmental ills can also be solved through 'green growth' (e.g. Labour 'green growth' strategy, 2022). The historic bloc supporting the growth hegemony has been described as the 'growth coalition' which includes the state, corporations, and workers (Schnaiberg 1980, p. 205).

Growth is among a number of Dominant Hegemonic Environmental Discourses (DHEDS) that Bell (2014, p. 9) refers to as 'the taken-for-granted beliefs about reality that define what is regarded as natural, normal, right and good, in addition to what is considered to be bad, other, undesirable and wrong'. Bell argues that these encourage reductionist, high-tech, growth-orientated solutions. The defence sector fits easily into this framing as it has long been associated with jobs, growth and, ironically, 'peace'. Drawing on Schnaiberg's (1980) 'treadmill of production' where nature is increasingly appropriated for power and wealth, the defence sector has been termed the 'treadmill of destruction' (Hooks and Smith 2005) to signify the growth dynamics of militaries and militarism.

In contrast to the dominant discourse, from within and beyond academia others have argued that a more fundamental political and economic change is required to achieve sustainability (e.g. Kovel, 2002; Magdoff and Foster 2011, Parr 2012, Klein 2014, Bell 2015, 2020). These analysts argue that, within the capitalist political economy, production is driven so that companies can profit, rather than to meet social needs and avert environmental harm. Within capitalist economies, companies have to make short-term decisions based on enabling their business to survive, even if these decisions harm society and the environment. At the same time, wealth becomes concentrated, allowing the large companies to subvert local, national and

international environmental democracy. For example, they are able to fund anti-environmental movements and electoral candidates and form powerful lobbies to shape government policies (see, for example, Faber 2008, Magdoff and Foster 2011). Their power was apparent at the recent Glasgow COP, where fossil fuel representatives outnumbered any national delegations (Global Witness 2021).

Those who are critical of the growth hegemony suggest that we need to consider the type and quantity of production necessary for human and planetary wellbeing. 'Green growth' is considered unviable since decoupling environmental growth from material footprint has had limited success to date, even under very optimistic conditions (Hickel and Kallis 2020, Vadén *et al.* 2020, Hickel 2021b). Therefore, a case is made for reducing overall production and consumption and focussing on producing solely that which has genuine social value (e.g. Hickel 2021a). From this perspective, with their limited focus, the government and defence company plans are inadequate for changing the trajectory of environmental harm.

Just transition framing

The workforce, in particular, play an essential role in the treadmill of production and the treadmill of destruction, as actors in production, as agents of the growth coalition and proponents of DHEDs. Their short-term material survival is caught up with the aims of the treadmill and, hence, this has tended to be the main focus of labour unions to date. Similarly, defence sector workers have historically often come to see their interests intertwined with the industry. Brenes (2014, p. 4), for example, argued that defence workers, though not a homogenous political bloc (even at the height of the Cold War) 'became wedded to the national security state, regardless of where they fell on the political spectrum'. The maintenance of the growth collation and treadmill of destruction for defence workers is echoed in narrow conceptions of JT so that production is maintained with minimal disruption.

Ciplet and Harrison (2020) emphasize that JT processes are marked by contradictions, tensions and trade-offs. Hence, while governments and defence industry companies do not appear to be explicitly discussing JT in relation to this sector at all (Bell *et al.* 2022), defence unions appear to be divided over interpretations of JT. For example, a recent European Union report covering the defence sector has discussed JT in relation to potential job losses resulting from regional integration without any reference to ecological issues (e.g. Shulze-Marmeling *et al.* 2022). In the UK, major unions such as Unite and PCS have backed the idea of diver sification/conversion of the defence sector (e.g. Unite 2016) while the GMB has been opposed (Bell *et al.* 2022). In the US, the main unions have not supported

conversion at the national level, though local branches have (*ibid.*). These tensions were illustrated in the UK when the Trade Union Congress recently voted by a very narrow majority to support increased arms spending – a change in policy from their former commitment to arms diversification (Hudson 2022). During the debate, the difference in JT visions were highlighted by a speaker from the National Education Union who argued, 'Yesterday we passed a motion on a Just Transition. This is what we should fight for, that is a solution to these high-skilled jobs in Barrow and Derby and elsewhere, not investment in pointless, unproductive, murderous weapons' (in Chacko 2022 np). It should also be noted that (a) the motion was a composite, mixed with a general argument for government support for UK manufacturing and (b) it was a card vote so most of the voters had not heard the debate in the room (TUC 2022). A more transformative approach was apparent in a recent conference organised by the European Trade Union Institute entitled 'A Just Transition Beyond Growth? (December 2022), where it was suggested that unnecessary production, including arms, should be 'scaled down' (Hickel 2022).

As key players, workers have the potential to overturn the 'treadmill' (Schnaiberg 1980, Obach 2004, Kalt 2021) and the potential to form part of a counter-hegemonic alliance against weapons production on the grounds of its social and environmental harms. Drawing on Gramsci, Ciplet's (2022) theory of transformative JT suggests that transformational policies are likely to be implemented when a diverse coalition of counter-hegemonic forces, embedded in impacted communities, effectively mobilizes. Also, from a neo-Gramscian perspective, Winkler (2020) asserts the need to establish a new cultural hegemony to achieve JT. The interviews with the defence workers for this study indicate that, even if currently a minority view, there are already seeds of this new counter-hegemonic force.

Method

The project was constructed as a form of 'workers' enquiry', a method that encourages workers to articulate their reflections on the productive process (Brown and Quan-Haase 2012). It has been used to gather data for research and practice when shifts in production are taking place or where such changes could be on the horizon (Woodcock 2021). While it seeks to understand the world from the workers' point of view, the process can vary from using traditional empirical methods to co-research alongside workers as a process of workplace organisation (Wright 2018). In this enquiry, we adopted the empirical approach, interviewing past and present defence sector workers (aged 18+) about defence decarbonising and wider sustainability policy and plans. Research ethics approval was given in November 2021 by the University of the West of England Faculty of

Environment and Technology Research Ethics Committee (FET.21.10.011). The research was carried out in line with the UKRI Concordat to Support Research Integrity, and complied with the ethics policies of the two lead universities – University of the West of England (to January 2022) and University of Glasgow (from January 2022).

While the defence sector produces and consumes globally, this study focussed on the United States (US) and the United Kingdom as they are the two most prolific defence exporting countries on a rolling 10-year basis (DFiT, 2020). They are also high consumers of military equipment and very active operationally, with the US currently first and the UK fifth in terms of national military spending compared to other nations globally (SIPRI 2021). The US military alone emits more CO2e (carbon-dioxide equivalent) than that of most nation states (Belcher *et al.* 2020) and is the single largest institutional consumer of hydrocarbons globally (Bigger and Neimark 2017). With regard to the UK, calculations of GHG emissions by sector indicate that the military-industrial sector has larger direct emissions than nine other sectors, including plastics; vehicles; glass and ceramics; and water and waste management (Parkinson 2020a).

The project included undertaking a literature review, document analysis, semi-structured interviews with defence sector workers, and focus group discussions with defence sector worker representatives and relevant 'experts'. The literature review sources included databases, reference lists, library searches, grey literature and internet search engines. The document analysis phase looked at relevant policy documents, media reports and websites in line with recognised protocols (e.g. Bowen 2009).

The interviews with the defence sector workers in the US and UK discussed their aspirations, concerns and ideas in relation to the decarbonisation of the defence sector and its wider transition to sustainability. 'Defence sector workers' were defined, for the purposes of this study, as those who work(ed) in the defence sector or for a company that supplies the defence sector, including military and civil service defence sector workers. In total, 58 workers were interviewed (30 in the UK and 28 in the US), mostly online or by telephone due to Covid restrictions. We continued to recruit a diverse range of interviewees until we reached the point of 'data saturation'. More than 200 large and small organisations were approached including defence sector companies; the main trade unions that include defence sector workers in each country; defence interest organisations, including US Military, US Airforce, Defence Forum, and Defence and Security Portal Facebook groups; veteran organisations, including Veterans for Peace in the US and UK; and environmental voluntary sector groups and NGOs. Participants were recruited through an advert which was uploaded to social media, placed in company newsletters and snowballed via email contacts, including cold contacts, to the above organisations. The advert asked prospective

participants to contact the research team if they were interested in participating. 'Snowball sampling' has been criticised for relying too heavily on single networks and adding to confirmation bias. However, the method was useful for accessing hard-to-reach workers where trust is a factor. The weaknesses can be somewhat offset by adding several starting points (Bloch and McKay 2016) and so we accessed participants via a wide range of groups and contacts.

The broad demographics of the sample were: Over 40 years of age (n35), under 40 (n23); men (n47), women (n11); white nationals (n48), Black, Asian, Minority Ethnic (n9), not identifying (n1); senior managers (n6), other workers (n52). For a more nuanced breakdown of the sample, see the project reports. It is not clear whether this sample is representative of the sector as a whole as there is no demographic breakdown of the entire sector and limited information on parts of it. Defence workers might be assumed to be predominantly male, given the sectoral dominance of traditionally male employment domains, such as engineering.

Questions included, for example:

- Are you aware of any policies or plans for decarbonisation/diversification/Just Transition that might apply to your type of work?
- How do you think these policies or plans will impact on yourself/your family/your workplace/your community?

We also held two online focus group discussions with a further 18 participants, all representing large organisations with many thousands of members. These groups included key representatives and leaders from defence companies, relevant national government departments, academics, NGOs and trade unions. Hence, the individual workers were interviewed separately, and these organisational representatives made up the two focus groups. We did not monitor the demographic composition of the focus groups as these were all 'expert' members representing the most relevant organisations.

We analysed the interviews and focus groups thematically using the Framework Method (Ritchie and Lewis 2003). The themes were decided upon on the basis of discussions among the researchers and advisory board, as well as being derived from the literature review and directly from the transcripts during the coding process. We did not compare the US and the UK data as we had small samples which could not represent the views of each nation's defence workers. Despite the samples not being large enough for us to generalise about defence sector workers, we were able gain a number of insights. A stronger evidence base for discussion and recommendations was developed through triangulating this primary data with the literature review and document analysis.

Interviews and focus groups

As the JT literature might predict, there were very different views among the workers and defence experts about what a Just Transition should include, with some focussing primarily on technical change, some on behavioural change, and others on more transformational systemic and political change. Here we focus on their discussion of the transformational change required and their views in relation to the political and economic factors that were driving unsustainability.

Contrary to the 'treadmill of destruction' and 'growth coalition' hegemonies, some of the workers interviewed discussed the possibility of there being a more focused defence sector with reductions in weapons production and military operations. For example, the following participants, while very committed to the necessity for defence, brought up questions of limits, ethics and priorities, as in the following comments:

> . . . I do think that the military and the defence sector do get involved in some things that either they shouldn't, or that they should not prioritise as much as they are. One example would be investment in arms in Saudi Arabia. I'm not in agreement with that . . . Defence should always be a last resort. That's kind of the point really *(UK002: male, white, current government defence service).*

> Do we really need any more weapons? I don't think I can answer that . . . I think we do need, given the current state of play with the world, I think we do need some kind of defence but, in the same token, are we producing too much? *(UK005: female, white, current government defence service).*

> . . . let's say we send a flotilla of ships across the world as a publicity exercise. Would we do that if we really looked at the carbon involved in doing that and pollution involved in it? Maybe we would question it a little bit more if there was a culture more akin to looking after the environment (UK008: male, black, current government defence service).

Some voiced counter-hegemonic arguments in favour of more drastic reductions in production and operations, questioning the relative social value of defence, as these workers argued:

> Just green-washing isn't going to do it. Just putting solar panels up isn't going to do it. So, we're trying to stress that the only way to really lower emissions of the military is you've got to make the military smaller . . . Why don't we take those resources and use them someplace else where they really should be? *(US008: male, white, ex-military).*

> I would like to reduce the whole defence sector to decarbonise it. . . . the thought of biofuels being used for tanks is so insane I can't believe anyone suggested it, less food and more fuel for tanks I mean it's . . . I think it [the defence sector] will do anything to keep the whole show on the road, actually *(UK019: male, white, ex-military, current defence manufacturing).*

While these two workers were accessed via the Veterans for Peace organisation, similar views were voiced by other participants. Related to this, some of the interviewees spoke about how the money spent on defence could be better used to meet human needs and address the causes of war as, for example, in the following statements:

> So, if we weren't spending as much [on defence] or if we were taking that money and putting it towards social needs, those could have a great impact on the quality of life for most Americans in terms of stuff like national healthcare and a lot of the safety net things that, say, most countries in Europe take for granted because they don't spend as much money on weaponry as we do . . .
> *(US011: male, white, current defence manufacturing).*

> . . . I suppose the biggest one is the amount of resources that are taken up . . . taking up enormous amounts of resources that could be transferred to mitigating the causes of war
> *(UK019: male, white, ex-military, current defence manufacturing).*

These views suggest support for a transformational vision of JT, questioning the value of what is produced and focusing on contributing to societal benefits. However, others made it clear that they did not want to consider reducing the defence sector or military. These were strongly opposed to decreasing military production and replacing with civil production, arguing that the defence sector was essential to be able respond to known unknown threats, as in the following comments:

> The entire reason of defence is to protect the nation. . . if we diversified from defence, . . . we would basically have no defence. We would lose our capabilities in order to defend ourselves and our interests both at home and abroad
> *(UK002: male, white, current government defence service).*

> . . . a strong defence is what you have to have in order to show the world that you can take them on, and the United States . . . some people would like to call it 'the protectors of the world' . . .
> *(US007: female, white, current defence manufacturing).*

From one of the focus groups, a sustainability manager at an international defence company, argued that:

> . . . I think it's really important that we remember that defence is about defending our way our life and we can't achieve what we want to . . . if, actually, we're not able to maintain, as democratic nations, where we have freedom of speech. For me that's what defence is about. Defence, not attack.

Hence, alongside the counter-hegemonic views, identifying the need for a fundamental transformation of the section, were these notions of defence as a means of securing peace and freedom (see further testimonies in the project transcripts).

Barriers to transformation

Those who expressed a wider and more transformative vision were, however, aware of the barriers to achieving this. They discussed the profit motive under capitalism, the power of the defence sector, their close links with government, offshoring to circumvent regulations and a lack of workplace democracy. For example, some of those interviewed discussed company desire to maximise profit as a barrier, as in the following statements:

> . . . it's a very lucrative business for a start. I mean, I think when you have a permanent arms industry that has to make lots of money and sell arms then you're going to have a dynamic to fight wars
> *(UK019: male, white, ex-military, current defence manufacturing).*

> . . . there's people who live off war and war based industries and you would have to overcome that barrier . . . If you can convince them, I think, that they could make as much money in another field, that would be the barrier that would have to be broken
> *(US013: female, white, current defence manufacturing union leader).*

They recognised that scaling back operations would be difficult because of the power of the defence sector, their close relationship with government, and the lobbying they were involved in, as discussed here.:

> Well, the major barrier is this, for Trident, the only reason they have got it - they can't use it because if they used it, you would be talking the annihilation of civilisation - the only reason they have got it is to keep a seat at the top table of the Security Council at the UN and it's a political thing. It's no' really a defence weapon, it's a macho thing. Britain is still the imperial power, or it thinks it is . . . *(UK020: male, white, ex-military).*

> I always revert back to lobbyists because they're the ones controlling our politicians. If we can somehow take the money out of the voting system in the States, then we'll take the power away from lobbyists. . . . We're under the guise of a lot of propaganda, unfortunately. *(US019: male, black, ex-military).*

Linked to this lobbying power of the defence companies, some workers interviewed felt that diversification was unlikely to happen because of the government subsidies involved in defence, as discussed here:

> . . . the defence industry, from my point of view, is essentially a magic money tree. There is always money available no matter what you do and so . . . they almost need to be made less dependent on that to make them do other things
> *(UK022: male, white, current defence manufacturing).*

> . . . defence work is essentially state run. It's a state run industry and the majority of the funding is through the taxpayer. . . . they don't care where their money comes from as long as they make their money. So, if they can see the same type of profit margin through renewable energy then maybe they will invest as much in that as they have in aviation in the past, but the problem is

> with defence work it's kind of like a blank cheque
> *(US015: male, white, current defence manufacturing).*

It was generally considered that there was a lack of democracy around sustainability in relation to the defence sector. The majority of those interviewed had not been consulted on decarbonisation, Just Transition or other sustainability plans and some did not feel they could speak freely about their views on this, as discussed here:

> . . . in the civil service as well as the military, you don't want to upset your boss, because your boss is God and has the ability to make or break a career, so that means that people don't tend to push their passions quite so much
> *(UK011: female, white, current government defence service).*

While the workers interviewed were concerned about job losses arising from outsourcing and automation, they generally expressed few concerns about job losses occurring in the defence sector as a result of the transition to sustainability. However, some were concerned that more stringent environmental policies can increase operating costs with the result that companies, in order to maintain their profits, relocate some or all of their operations to low-regulation regions or countries, as discussed in this excerpt:

> I think companies are outsourcing work to places where they don't have to be environmentally responsible and they can get cheap labour and that puts a lot of people in harm's way overall which contributes, I think, to global warming, to pollution, to things that limit people's access to quality water, quality air and just their general health and safety
> *(US013: female, white, current defence manufacturing union leader).*

Hence, some of the interviewees argued that what is needed is a more structural understanding of the defence sector in relation to the climate and other environmental crises, focussing on the economic system constraining what decisions can be made. They felt a more transformative vision of JT was required to address these issues, considering the technical approaches to JT to be 'green washing'.

Achieving a transformative just transition

Those interviewees that were involved in their labour union felt the way forward would be to take collective action, via the unions, in order to have greater influence on their companies and workplace with regard to JT. A key message from the focus groups was that social dialogue with workers and their communities will be important for achieving JT. Within the focus groups, it was also argued that a shift in industrial policy was required, away from a military-industrial policy towards one that focused on the

national security threat of climate change. For example, an NGO representative stated:

> I believe that a large part of military spending in, not just the UK or the US, but in a lot of major countries, is not actually contributing to our real security needs; that it's not simply about defending democracy from attack. Too much of it is about making, or being prepared to make, military interventions as an attempt to solve political problems which have usually turned out disastrously over the last 20 years. ... Also, a lot of defence production ... is not for defending themselves but for export. Our biggest customer is Saudi Arabia. Arms exported to Saudi Arabia are definitely not about defending democracy.

Addressing questions of outsourcing to avoid social and environmental regulation, the trade union representatives in the focus groups also discussed how they have been working at making sure that global supply chains are run in a way which doesn't undermine workers' basic rights.

Transformational views of JT, therefore, permeated the discussions with workers and their representatives, as well as some of the NGOs, indicating the seeds of a new cultural hegemony in relation to the treadmill of destruction and the growth coalition. Yet the workers and others were generally clear that the struggle to overcome these barriers would be immense.

Analysis

It has been argued that labour's focus on economic material gains, while important for improving lives and capturing more political power, has 'tended to lock the working class within a political horizon limited to maintaining the same system' (Velicu and Barca 2020, p. 267). Yet here we see that some defence sector workers were looking beyond the growth coalition and treadmill of destruction. This indicates the opportunities that are opening up for social transformation which can coalesce around the concept of JT.

For some of these workers, to effectively transition to sustainability would mean taking on the power of the defence companies and the capitalist system itself that appears to be driving irrational production. They called for more emphasis on 'human security', as opposed to 'national security' and argued that only a transformational JT would be effective as it addresses the causes of unsustainability. They were also alert to the militarism and nationalism that justifies the sector making it a greater struggle to shift towards sustainability. Such an analysis points to the need for a counter-hegemonic alliance to take on their economic and political power.

It may be that those that wanted a reduced or more focussed defence sector and those that saw the barriers as political and economic may not be as few as might be assumed, since they are evident even in this small sample, including among some current defence sector workers. Given the sample

size, we cannot make correlations with demographics or affiliations that would help us explain why some current defence workers appeared to have a more transformative vision. A quantitative survey engaging many more participants could follow up on this question, exploring some hypotheses arising from our study findings, such as active engagement in trade unionism, more skilled occupations, and stronger commitments to environmentalism, as potential variables. In particular, our analysis suggests that those workers with a more transformative vision had always had some reservations about their jobs but were drawn to defence because of a lack of alternative employment. For example, UK022 and US013 explained:

> I am uncomfortable working in the defence industry at large so I am looking to make that move already because I'd rather be working for a business that's good for the planet rather than what I would really see as bad
>
> *(UK022: male, white, current defence manufacturing).*

> . . . one of the reasons that I didn't wanna come to work at [ANONYMISED defence company] was because of the defence industry. I didn't wanna work in a factory and I didn't wanna work in something that supported making machines of war . . . I would be happy to lose this job and find another. And if it was in a renewable resource, research or job that would be fantastic
>
> *(US013: female, white, current defence manufacturing union leader).*

Being an ex-defence worker seemed to make it easier to express counter-hegemonic views, but some current workers were able to cope with the cognitive dissonance of needing to do work that didn't align with their values because they felt their employment choices had been constrained by the availability of work. This chimes with the conclusions of Levy and Egan (2003, p. 813) who note that workers will have different perspectives, some self-contradictory, in part because of 'the capacity of agents to comprehend social structures and effect change, while simultaneously being constructed and constrained by them'. It should also be noted that the interviews for this project took place before the Russian armed intervention in Ukraine. Given that UK and US societies are highly militarised (see, for example, Kelly 2023) and are the largest providers of military equipment to Ukraine (Mills 2023), the dominant discourse currently is for increased defence spending to counter external threats.

It is difficult to say the extent to which workers in other sectors will be interested in a transformative JT. Clearly, different industries and sectors will have different priorities. Some sectors will grow in the transition, such as rare earth elements and wind energy, requiring a focus on regulating associated harms (Sadan *et al.* 2022) and worker rights (e.g. Schulte *et al.* 2022), respectively. It may be that, where jobs are immediately at risk, the focus needs to be on the narrower conception of JT as it has been, for example, in

relation to coal (Galgóczi 2019). Since the workers interviewed here were not fearing job losses in relation to the transition to sustainability, perhaps they were more able to focus on the wider issues and to consider preferable employment, rather than clinging on to what they have. It is clear that there will be 'varieties of Just Transitions' reflecting the varying industries, contexts and societies (Galgóczi 2020). However, as Abram *et al.* (2022) argue, a narrow, sectoral approach may not address wider aspects of justice. There are many interlinkages and overlaps across sectors, including the defence sector, and all sectors could play a part in a transformative JT, as appropriate to particular contexts.

Conclusion

Hence, there are competing ideas of JT within the defence sector and some of these ideas challenge hegemonic notions of what the transition to sustainability will involve. Defence sector workers, historically tending to support the growth of the sector (Brenes, 2014), would appear to be an unlikely group to argue for a transformative approach. As such, the study suggests it may be possible to begin to organise for a new cultural hegemony that could be built around the idea of a transformative Just Transition. However, given the barriers to achieving this, a counter-hegemonic coalition will be necessary, joining with other workers, as well as peace and justice NGOs.

A transformative JT within the defence sector would mean worker dialogue around JT with all options on the table, including a discussion of arms conversion to socially useful production. It would mean building solidarity with, and including the perspectives of, workers in the Global South and other relatively lower income regions who are supplying the defence sector and, in some cases, have suffered the impacts of war and colonialism led by the Global North. It would include focusing agendas and budgets on supporting a 'human security' approach to foreign policy, addressing global and national poverty, inequality, health and environmental crises and investing in the jobs that would accompany implementing this agenda.

This focus on the defence sector echoes the wider debates around how to transition to sustainability and the degree to which this can occur within the current capitalist political economy. It also highlights the difficulty of transitioning given the power of companies and their close association with the state and military in capitalist society. However, the study also helps us to see where hope might lie – through supporting workers that are challenging the hegemonic discourses and practices on transitioning to sustainability, including trade union endeavours to establish international solidarity around JT, improving workplace democracy and engaging the public with new understandings of social and environmental problems. We see all this happening currently

in the UK with a surge in union membership interest (ITV 2022) and industrial action (Wall 2022), particularly through the work of the rail workers union, the RMT (Rail, Maritime and Transport), where their leaders are being held up as heroes for simply saying that services are being organised around the drive for profit, rather than social and environmental wellbeing. This is also the message from some of these defence sector workers. Through further collective action around a transformational vision of JT, they may be able to break the treadmill of destruction.

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