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Climate action: a leadership opportunity for the Irish Defence Forces

Eoghan Carton

Climate leadership involves not only reducing emissions but also inspiring others to act. The Climate Action Plan requires the Irish Defence Forces (DF), a public-sector body, to lead by example in driving far reaching climate action. Beyond mandated targets, the organisation has other climate-related roles and obligations including influence in climate governance and climate security operations.

Acknowledging the organisation is active in climate and sustainability, this qualitative study aims to identify how the DF can take the lead in climate action by examining climate leadership in Defence and the implementation of climate action. The paper draws primarily on literature in climate leadership, climate security and CSR/ESG and is supported with primary data, including three expert interviews providing political, industry and Defence perspectives.

Climate leadership in Defence was found to be the delivery of substantive and effective climate action across all of its relevant climate-related areas. At organisational level, this is facilitated by a polycentric approach, involving all personnel and encouraging experimentation and innovation. Exemplary climate leadership, required of public bodies, was found not to act in isolation, but in conjunction with structural, entrepreneurial and cognitive leadership.

Potential barriers to successful climate action were identified for Defence, with 'leadership commitment' and 'knowledge' being the most influential. A Defence-specific framework for implementing climate action was developed with five components (leadership commitment, context, policy, implementation and results). The other key outputs of the paper are a model for conceptualising climate leadership in Defence and a set of climate leadership principles.

As a public sector body, the Irish Defence Forces (DF) must lead by example and reduce its greenhouse gas (GHG) emissions by 51 per cent[1] by 2030 (Government of Ireland, 2022). With an established energy management system and climate action strategy, technical solutions to reducing emissions are well understood in the organisation. This paper explores a leadership opportunity that aligns with the EU's focus and interest, which may be key to unlocking a step change in support for climate action. It will determine how to implement climate leadership, defined as taking action to

[1] Public sector bodies are required to reduce their GHG emissions by 51% by 2030, based on their average energy-related emissions between 2016 and 2018 (Government of Ireland, 2022)

reduce emissions but also encouraging others to take action (Crowley and Nakamura, 2018), at organisational level.

The aim of this paper is to develop an understanding of what climate leadership means in the context of the DF and to identify, adopt and adapt a framework for implementing it into everyday activities with a view to achieving long term and interim decarbonisation targets. What is implicit in these targets is achieving climate neutrality by 2050 (EC, 2019). The research will be grounded in relevant literature and will be supported and validated by primary sources including policy documents and selected expert interviews.

Literature Review

This section provides an overview of the literature examined to develop an understanding of what is meant by climate leadership, its relevance to Defence and what frameworks may be available to support its implementation.

The work of Defence Forces personnel completing the MA in Leadership, Management and Defence Studies (LMDS) is acknowledged, informing the broad topic of climate change and Defence. O'Mahoney (2021) found that climate and non-climate risk factors interact, leading to instability with implications for Defence. Downey (2022) studied DF sustainability, recommending the development of a strategy in line with six UN Sustainable Development Goals (SDGs). More recently, Nally (2023) proposed a strategy for the Irish Air Corps to achieve net-zero carbon emissions by 2050.

Benulic *et al.*'s (2022) study assessing what leadership means in polycentric (experimental efforts at multiple levels) climate action provides the most thorough examination of climate leadership and is representative of other studies in identifying collective leadership as a key concept. It relates climate leadership to polycentric governance, a recurring theme in the literature (Milinski and Marotzke, 2022; Hofstad and Vedeld, 2021; Torney, 2019), and suggests a multi-level rather than a more traditional hierarchical approach across organisations.

Examination of climate and sustainability strategies shows a need for both symbolic and substantive actions (Hatsios, 2023), however there appears to be an emphasis on the latter (Wurzel *et al., 2019)*, warranting further investigation. The Environmental Protection Agency (EPA) provide an adaption-mitigation model (Figure 1) which appears useful in understanding an organisation's response to climate change. It may be built upon to include the responsibilities of Defence, with a view to creating a conceptual framework for climate leadership.

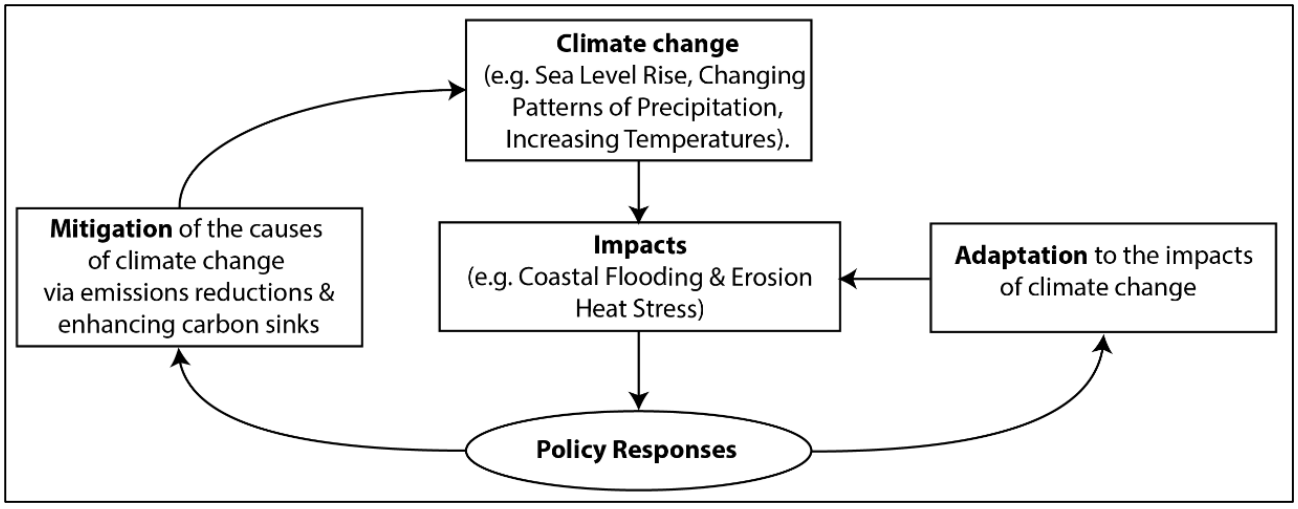

Figure 1 EPA Adaption-Mitigation Model (EPA, 2023a)

There are several contexts in which Defence must consider its response to climate change. These include security operations in a changing environment, adaption and mitigation (Scollick, 2023). Adaption is "anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise damage" and mitigation, is "preventing or reducing the emission of GHG into the atmosphere" (EEA, 2023). It appears climate change mitigation in Defence is not as well studied as adaption, although some recent research has begun to explore the adaption–mitigation nexus in the Defence context (Depledge, 2023; Payne and Swed, 2023). This literature, although thorough, tends to focus on decarbonisation of operations and war-fighting, while placing little importance on peacetime activity and impacts of Defence. Nonetheless, valuable conclusions can be drawn such as the importance of climate literacy as an enabler (Payne and Swed, 2023).

As Corporate Social Responsibility (CSR) and Environmental, Social and Governance (ESG) are well-established concepts (Downey, 2022), recent studies of their implementation are reviewed to identify and adopt a framework for implementing climate action in Defence. Bantan and Thomas (2021) use and validate a CSR framework identified by Graafland and Smid (2019) to explore the difficulties in implementing effective CSR (Figure 2), highlighting tensions related to decoupling and greenwashing (Bromley and Powell, 2012). The three-stage framework of policy, implementation and results appears useful as a basis for implementing climate action in the DF, and will be synthesised with other concepts in this paper.

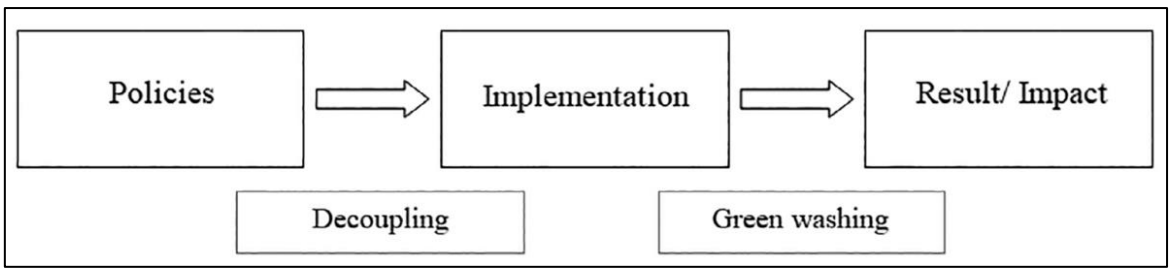

Figure 2 Three-Stage Corporate Social Responsibility Model (Bantan and Thomas, 2021)

A number of scholars identify barriers to CSR/ESG implementation (Latapí *et al.,* 2021), with 'staff knowledge' and 'commitment of top management' appearing to be most prominent. While these cannot simply be translated as barriers in climate leadership, they will be examined in Part 2 and may highlight possible considerations.

This review establishes there is rich literature in climate leadership which can be used to understand the subject in the context of Defence. CSR/ESG literature offer useful frameworks and also reveal challenges such as policy-implementation decoupling and greenwashing. There are however some gaps which must be taken into account.

Research Lacunae

While there is rich literature on the relevance of climate change to the Defence sector (Payne and Swed, 2023; Depledge, 2023; Söder, 2023), these studies focus mainly on the need for adaption, partially on mitigation but very little on climate leadership in Defence. Their recommended actions are focussed on policy, resourcing and finance rather than the potential leadership role Defence can play in wider society.

Looking beyond Defence, the study of climate leadership in public bodies is relatively light. As Ireland requires public bodies to be exemplars in climate action (Government of Ireland, 2022), the contribution of public bodies must be well understood. Wurzel *et al*, (2019) compare the EU, individual states, businesses, non-governmental organisations (NGOs), scientists, epistemic communities and individuals, but not public bodies. Benulic *et al.* (2022) conduct focus groups with professionals from a cross section of Swedish society which includes an unspecified national authority, although not knowing which authority is unfortunate as it is difficult to draw similarities to Defence.

While there is a focus on types of climate leadership, such as structural, entrepreneurial and cognitive (Benulic *et al.*, 2022; Torney, 2019), it does not appear that a comprehensive set of climate leadership principles has been developed heretofore. This may be useful in guiding leadership training and practice in the DF (DF, 2023).

A framework for implementing climate leadership within Defence has not been found. The use of a CSR framework as outlined in the literature review may prove useful in bridging this gap. To address these lacunae, an understanding of climate leadership and identification of a suitable framework for its implementation must be derived from literature which is not specific to Defence, and it can be supported by interview data.

Research Question

The research question (RQ) addressed in this paper is how can the DF take the lead in climate action? The RQ is broken into three separate research objectives (ROs), which provide the content for Parts 1, 2 and 3 of this paper:

- RO1: To understand climate leadership and its implications for the DF.
- RO2: To identify a policy implementation framework for implementing effective climate action which characterises climate leadership.
- RO3: To adapt the policy implementation framework, as identified in RO2, for use in the DF, to achieve its decarbonisation targets and be an exemplar across the public sector.

Sources

The study draws on a number of different sources. Government policy and military publications are used to form the RQ and RO's and establish an initial understanding of the topic. Secondary sources, mainly published literature, will shape the RQ and RO's, before mapping them against primary sources, including policy and data. Primary data includes three interviews with "key players in the field" who can provide valuable insights based on their experience, providing a detailed understanding of the complexities of climate leadership and interconnected factors (Denscombe, 2017, p.203).

Part 1 draws on national policy as a foundation before examining literature on climate leadership, climate governance and Defence's relationship with climate change in detail. Part 2 examines literature in the field of CSR and ESG and attempts to draw lessons for climate action policy, implementation and evaluation. Part 3 synthesises the findings of Parts 1 and 2, drawing on a number of additional sources to identify critical inputs for the DF.

The three interviews are summarised in Table 1. While each interviewee provided material relevant throughout the study, taking their role into account, they were selected with a view to providing expert experience on each RO in the study.

Table 1 Summary of Interviews

Interviewee	**Key Role(s)**	**Focus Part / RO**
Minister Eamon Ryan, TD Referred to as 'Minister Ryan' Cited as (Ryan, 2024)	- Minister for the Environment, Climate, Communications and Transport (2020 – 2025) - Leader of the Green Party (2011 – 2024)	Ch.1 / RO1
Mr Liam McLaughlin Referred to as 'Mr McLaughlin'	- Lead international energy efficiency expert with the United Nations Industrial Development Organization (UNIDO) (2009 – present)	Ch.2 / RO2

Cited as (McLaughlin, 2024)	- CEO at Gen0, working with public and private organisations globally on ISO50001 implementation and decarbonisation (2019 – present)	
Lieutenant General Richard Nugee CB CVO CBE (Retired) Referred to as 'General Nugee' Cited as (Nugee, 2024)	- UK Lead on producing the Climate Change and Sustainability Strategic Approach at the Ministry of Defence (MOD) - Non-Executive Member for the Defence Safety and Environmental Committee (2021 – present) - Chief of Defence People, UK MOD (2016 – 2020)	Ch.1 / RO1 Ch.3 / RO3

Methodology

A qualitative approach was adopted as it appears well suited to the topic of climate leadership as an emerging concept. The researcher adopted a constructivist epistemology allowing exploration "through a framework which is value-laden, flexible, descriptive and context sensitive" (Yilmaz, 2013, p.312). Using Borton's (1970) "what, so what, now what approach" (Figure 3), each RO is addressed with a number of primary and secondary sources, with peer-reviewed academic literature providing the majority of evidence. A phenomenological approach allows themes to emerge based on the lived experience of experts in the field (Finlay, 2013).

There are a number of strengths and weaknesses which must be considered using a qualitative approach. On one hand, qualitative enquiry aligns well with the fact that climate leadership manifests itself differently depending on context, as it assumes that realities are not fixed or static (Yilmaz, 2013). A phenomenological approach also allows for a "narrow range of (interview) sampling" (Creswell, 2007, p.128). On the other hand, from an epistemological perspective, the researcher has worked in the field for six years and will bring personal bias. In order to ensure rigour and mitigate this bias (Finlay, 2013), expert interviews are conducted with individuals outside Defence in Ireland and outside Ireland in Defence. These interviews aim to develop more holistic research by catering for climate leadership in politics, industry and Defence (Yilmaz, 2013).

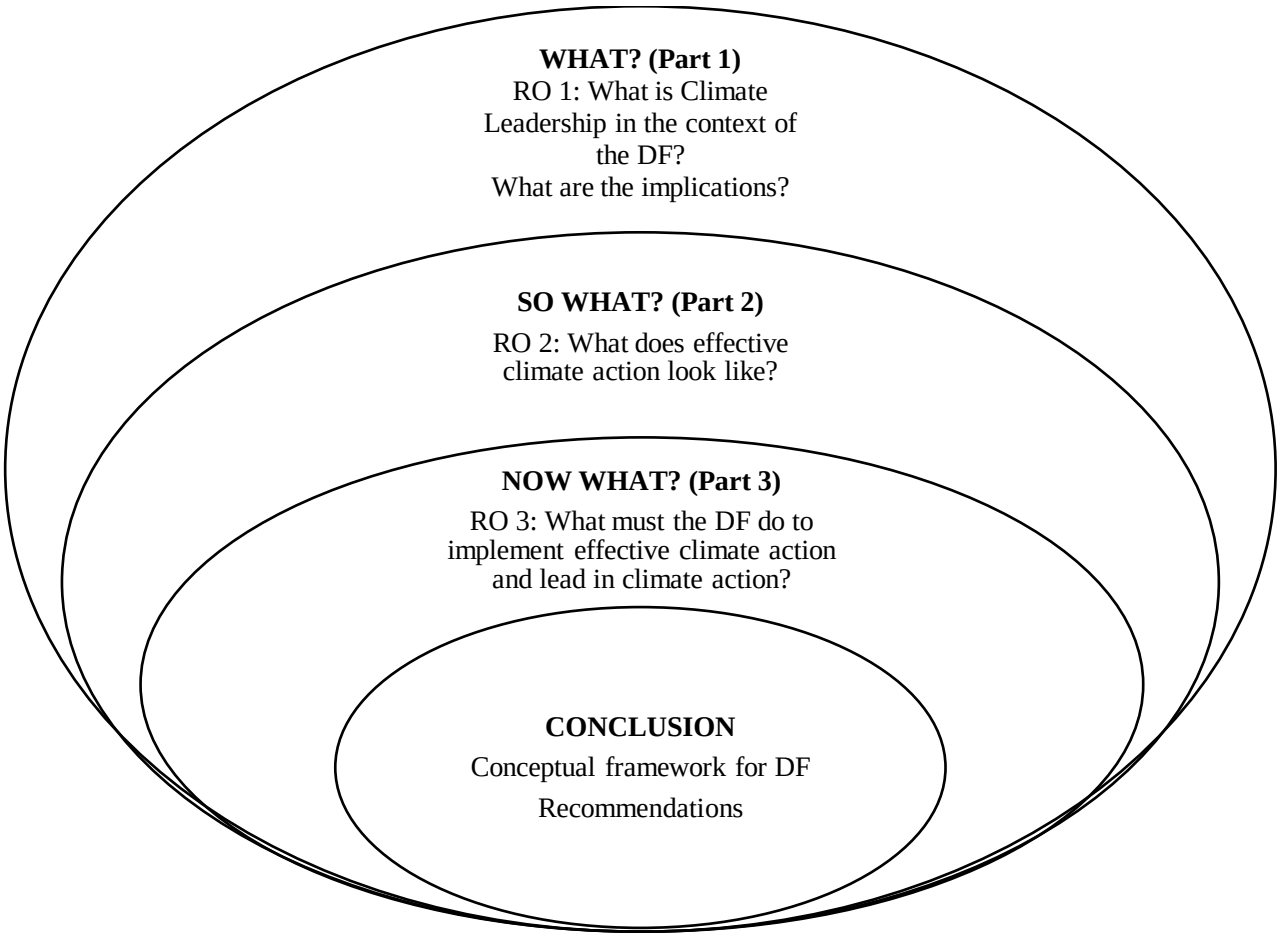

Figure 3 Structure of the Paper (based on Borton (1970) in Grimmer, 2022)

PART ONE. Climate leadership and the nexus with defence

"We will lead by example, embedding climate action as a central value across all public sector organisations, relentlessly focusing on continuous improvements that deliver real progress"
(Government of Ireland, 2022, p.103)

1.1 Introduction

The Climate Action Plan (CAP) 2023 requires the public sector to demonstrate exemplary climate action and "play a leadership role in driving far-reaching climate action across its buildings, transport, waste, and energy usage, as well as wider society" (Government of Ireland, 2022, p.103)[2]. Part 1 aims to understand what is meant by climate leadership, specifically exemplary climate

[2] Mandating Irish public sector bodies to be exemplars in this field dates back to 2009 when Statutory Instrument 542/2009 transposed EU Directive 2006/32/EC Energy End Use Efficiency and Energy Services into Irish law, calling for public bodies to fulfil exemplar roles regarding energy efficiency including reporting, auditing and procurement (Government of Ireland, 2009).

leadership, and how it is relevant to Defence. It begins with exploring the multi-dimensional relationship between climate change and Defence before focussing on climate leadership, drawing on the expert views of Minister Ryan which provide valuable context to the extensive climate leadership literature.

Broadly speaking, environmental strategies involve both symbolic and substantive components (Hatsios, 2023; Liefferink and Wurzel, 2017; Hyatt and Berente, 2017). Symbolic actions, while important, practiced in isolation could be viewed as green washing, whereas substantive actions are tangible, impactful and measurable (Waldman *et al.*, 2020). Figure 4 relates symbolic and substantive leadership to environmental ambition. Constructive pushers adopt unconditionally ambitious actions but conditional pushers adopt actions only if others act similarly (Wurzel *et al.*, 2019). With both achieving followership (Tobin *et al.*, 2023), the overarching concept of delivering substantive actions must therefore be explored further.

While this analysis points towards implementing substantive actions, the value of symbolic actions should not be lost (Pacor, 2024). General Nugee (2024) described the symbolic importance of certain actions such as renaming the (UK) 'Defence Fuels Agency' as the 'Defence Operational Energy Agency' to reflect the understanding of climate and sustainability.

	Internal environmental ambitions	
External environmental ambitions	*Low*	*High*
Low	(a) Laggard	(b) Pioneer
High	(c) Symbolic leader	(d) Substantive leader: - Constructive pusher - Conditional pusher

Figure 4 Internal and External Environmental Ambitions of Actors (Wurzel et al., 2019)

The Low Carbon Development (Amendment) Act 2021 requires Ireland to achieve climate neutrality by 2050 and a 51 per cent reduction in GHG emissions by 2030 (Government of Ireland, 2023). These targets are directly passed to public sector bodies and as such, are substantive targets for the DF. This is of course not the only substantive reason the DF should strive to drive far-reaching climate action.

1.2 A Substantive Role for Defence in Climate Action

The diverse nature of military activities, ranging from warfare and humanitarian operations overseas to aiding the civil power and local authorities at home, will be impacted and shaped by climate change (Scollick, 2023; Tsetsos, 2023). There is a requirement therefore to analyse the role of Defence in "distinctly different contexts" (Söder, 2023, p.6), considering its own, internal responsibility to adapt and mitigate, but also to ensure its ability to sufficiently respond. Payne and Swed (2023) describe three areas of danger for the (US) military from climate change; (i) *physical danger* to military infrastructure, (ii) *logistical danger* by continued reliance on fossil fuels and (iii) *conflict danger* due to operations in conflicts created or exacerbated by climate change. Their study

focusses on security and adaption and characterises much of the research on the military's response to climate change. While climate has become part of military discourse in many cases (Estève, 2023) and is even described as institutionalised in the Swedish Armed Forces (SAF) (Söder, 2023), the focus tends to be on adaption and effects on military operations, as opposed to reducing emissions. The following paragraphs explore climate security, adaption, mitigation, governance and leadership with respect to Defence.

The climate-security nexus is acknowledged by international institutions and militaries worldwide with climate change seen as a risk multiplier, exacerbating existing security issues and contributing to conflict (UNDPPA, 2024; Kertysova, 2023; Nugee, 2024). Climate change is described by scholars as a matter of national, international and human security, characterised by complex operating environments, ranging from permissive to hostile, presenting an array of challenges for militaries in the conduct of their specific missions (Scollick, 2023). In independent research for the Bundeswehr[3], three stark reference scenarios based on varying degrees of global warming, are developed to consider the impact of climate change on Defence (Tsetsos, 2023). It outlines the security implications, implying increased military operations due to climate-induced violent conflict, the fight for raw materials, new maritime routes and climate migration, concluding with a comprehensive list of adaption measures which include policy updates, procurements and cooperation with other agencies.

Domestically, militaries contribute to relief efforts following weather events such as flooding and wildfires (Jayaram and Brisbois, 2021), but are in turn also highly exposed to their impacts due to the geographical spread of infrastructure, particularly along coastlines (Payne and Swed, 2023; VanDervort, 2020). As such, there is a requirement for adaption of its own internal practices. In this context, there may be a link between adaption and mitigation measures. The European Commission frame military capabilities and infrastructure as a major opportunity in the climate-security nexus, due to its vast land assets and the potential carbon and monetary savings associated with a "coherent approach to the climate adaption and mitigation efforts" (EC, 2023b, p.15).

There is growing pressure on defence worldwide to mitigate its contribution to the problem and embrace "low carbon warfare" (Depledge, 2023). Payne and Swed (2023) describe the (US) military's position with respect to climate change as paradoxical, whereby the military is both a polluter and a stakeholder. Despite the contribution the US military has made to climate change (Bekkering, 2023) and the effect climate change is having on its global operations, the US military does not consider "saving the planet" within its mandate (Payne and Swed, 2023, p.3). Consequently, as Payne and Swed (2023) argue, the US military is focussing on adaption over mitigation and that only strong political will and long term vision can ensure a comprehensive path to mitigation. General Nugee (2024) argues that Defence must approach this challenge differently, embracing opportunities to improve capability and save money.

A brief look at other militaries in Europe shows a clear link between adaption and mitigation in their planning. The French Climate and Defence Strategy states the climate crisis requires a

[3] The Bundeswehr is the German Federal Armed Forces

comprehensive approach as it is "gradually changing the international strategic context and affects both the missions and operational capabilities of armed forces" (Ministère des Armées, 2022, p.8). Its four-pillar strategy focuses on developing knowledge, adaption, mitigation and enhanced cooperation. In Austria, acknowledging Defence is increasingly being relied on to "play its part" (Ramnath *et al.* in Federal Ministry Defence, 2022, p.26), there is a recognition that climate mitigation measures strengthen the constitutional tasks of the Armed Forces.

Emerging studies show Defence as an influential actor in climate change discourse and governance (Vogler, 2023; Söder, 2023). With capabilities such as information gathering, resource allocation and operational planning, militaries can make a valuable contribution to both mitigation and adaption efforts (Jayaram and Brisbois, 2021). Motta *et al.* (2021) describe how military personnel, as a trusted cohort in society, can be influential in communicating climate change issues when framed as national security concerns, an effect that can be as powerful at local community level as well as at governmental level. The influence of Defence in wider society therefore should not be discounted, with Söder (2023) arguing that the SAF approach to climate change will have implications for general discussions around the subject in wider society. With a reputation for handling crises competently, the opinions and discourse from military leadership will be held in high regard and will influence perceptions on climate change and climate policy.

Evidently, leadership is a critical aspect of military operations, and most militaries invest considerable effort in developing its leaders through internal and external training and education programmes. In the well-publicised UK MOD Climate Change and Sustainability Strategic Approach, General Nugee refers to the leadership of the Defence Sector and how it will be important in supporting "wider UK objectives" (UK MOD, 2021).

This section (1.2) has outlined the multi-dimensional relationship between Defence and climate change, where unlike other organisations, there are significant additional implications beyond its mandated domestic mitigation targets. The scope is therefore potentially very broad for examining how Defence can take the lead in climate action. As such, it will be narrowed, focusing on domestic mitigation efforts as required in the CAP. It is intended however that concepts developed will be relevant across the entire Defence sector.

As the DF is mandated to be a climate leader (Government of Ireland, 2022), it must understand 'climate leadership'. Sections 1.3-1.7 explore the literature on climate leadership, providing a multitude of styles, types and approaches to addressing climate change. Styles are briefly noted for the purpose of extracting useful content from certain recent studies and for drawing parallels with military doctrine, but will not be developed. Leadership types will be examined in detail as exemplary leadership rests here and the DF as a public body is required to be an exemplar in climate action (Government of Ireland, 2022). Their development will show the emergence of governance approaches to climate leadership, specifically a polycentric approach whereby leadership is required at all levels for an organisation to be a leader. Key traits of individuals and organisations as climate leaders will be captured throughout these sections, developing climate leadership principles.

1.3 The Study of Leadership and Climate Leadership

The study of leadership is evolving to account for a more complex world, requiring leaders to tackle wicked problems such as climate change (Ross *et al.*, 2022; Wade *et al.*, 2020). Minister Ryan (2024) stressed that "everyone is involved" in climate action and when such whole-scale "system change" is required, traditional "hierarchical systems" will not work. This suggests that existing public sector structures, including the DF, may need to be adapted to comprehensively deal with climate change.

Martin (2018) synthesises the study of leadership over several decades, finding that leadership theories are outdated and cannot deal with the "technological advancements, and expectations by stakeholders" (2018, p.iii). Notwithstanding this, the topic of climate leadership is replete in terms such as 'types' and 'styles' and as such, these concepts must be navigated. It is acknowledged there is a parallel and equally rich body of literature on leadership in the wider field of sustainability (Kuenkel *et al.*, 2020; Boeske, 2023). For scoping reasons, this section will focus specifically on climate leadership and will draw on sustainability literature in Part 2.

Climate leadership is well researched in the EU and while there is a recent focus on the concept of exemplary leadership, the literature points towards the need for multiple types of climate leadership to be practiced by individuals and organisations (Liefferink *et al.*, 2023; Tobin *et al.*, 2023). Wurzel *et al.* (2019) synthesise numerous studies of the EU's environmental and climate leadership since 1990, developing four distinct types; structural, cognitive, entrepreneurial and exemplary. These stem from an extensive and overlapping list of leadership types which include intellectual, coercive, instrumental, unilateral, directional and idea-based leadership, with a consensus being reached amongst scholars on the four aforementioned types (Liefferink *et al.*, 2023; Oberthür and Dupont, 2021; Torney, 2019). This recent analysis of the EU's environmental and climate leadership broadens the scope of climate leadership, as exemplary leadership is just one type within the four types associated with the EU (Tobin *et al.*, 2023).

Alongside types of leadership, scholars have noted two styles and/or theories of leadership associated with climate action: transactional and transformational (Tobin *et al.*, 2023; Hofstad and Vedeld, 2021; Hoyne, 2023). In examining *who* can be a climate leader, Wurzel *et al.* (2019) compare regions, states, businesses, NGOs, scientists and individuals and find that although much of the literature focuses on states, all of the above can display climate leadership. Continuing the approach adopted by Wurzel *et al.* (2019), the four types and two styles of leadership associated with climate action will be explored with a view to identifying common themes and synergies with military leadership.

1.4 Types of Climate Leadership

1.4.1 Exemplary Leadership

There is consensus amongst scholars that exemplary leadership is the setting of example for others. Exemplary actions can be divided into leadership which is intentionally setting example (Tobin *et al.*, 2023; Wurzel *et al.*, 2019) and pioneership, which is unintentionally setting example (Wurzel *et al.*, 2019). Torney (2019) posits that this is not the case for other types of leadership, namely cognitive, as it requires a degree of intentionality. Oberthür and Dupont (2021) find that actions

such as setting policy, legislation and targets underpin international credibility and inspire similar actions in others.

Another perspective on exemplary leadership is through a 'power-based' lens (Benulic *et al.*, 2022), whereby an exemplar sets example by moving first to address a problem and exerts social pressure to influence others to act similarly. Legitimacy is highlighted by Torney (2019) as being critical to exemplary leadership, as followers will closely monitor how leaders follow up on their external ambitions. More recently, Tobin *et al.* (2023) describe how the EU's domestic policies (for example the 2020 Climate and Energy Framework) have served to underpin their exemplary leadership. Exemplary leadership takes place in parallel with other types of leadership (Tobin *et al.*, 2023; Liefferink *et al.*, 2023), with the division depending on specific situations.

Minister Ryan (2024) describes exemplary leadership as setting examples, sharing knowledge and involving everyone, using examples of energy retrofitting and the successful introduction of carbon tax in Ireland as exemplary actions. 'Exemplary' suggests setting an example, but structural, cognitive and entrepreneurial suggest *what* the example to be set is. Oberthür and Dupont (2021, p.1100) posit these are "interrelated and interact" to form complete climate leadership. As such, these three types will be explored in similar detail.

1.4.2 Structural Leadership

Structural leadership is associated with actors who are at an advantage over potential followers through their economic and/or military power, shaping their structural leadership through their sphere of influence (Tobin *et al.*, 2023; Liefferink *et al.*, 2023). There is general acceptance amongst scholars that it is economic power, rather than military power which influences climate leadership, although Minister Ryan (2024) describes the DF as an important pillar of the state based on its structure. Wurzel *et al.* (2019) focus on how non-state actors such as businesses and NGOs have the capacity for membership and employment, as well as economic power, thus expanding their potential influence. Research has evolved from describing structural climate leadership as the ability to deploy power-resources (Parker *et al.*, 2015; Karlsson *et al.*, 2012), to focusing on the attractiveness of what an actor has to offer, such as financial resources, markets and technological solutions (Tobin *et al.*, 2023). Benulic *et al.* (2022) link structural leadership to coercive power, with actors exerting influence through negotiating and bargaining.

The commonality throughout this evolution is the relevance of an actor. Counterintuitively, an actor such as China, by virtue of the scale of their emissions, is relevant and thus can potentially exercise structural climate leadership (Tobin *et al.*, 2023). Continuing this theme, the EU, with its reducing emissions, stands to lose structural power, however it attempts to balance this with its economic ability, underpinning the EU Green Deal with €1bn in funding. Yielding structural power, while a necessity for exercising structural leadership, is merely a condition and only actors who mobilise their "structural power in pursuit of collective goods" (Wurzel *et al.*, 2019, p.9) are structural leaders.

1.4.3 Cognitive Leadership

Actors practicing cognitive leadership will rely on scientific evidence, experimentation and the ability to implement ideas and concepts (Wurzel *et al.*, 2019; Benulic *et al.*, 2022). Minister Ryan (2024) repeatedly refers to the importance of science in the development of technological and policy solutions to climate issues, highlighting the importance of a cognitive approach. It involves putting forward, defining and redefining ideas and concepts with a view to influencing the subsequent actions of other actors (Tobin *et al.*, 2023; Liefferink *et al.*, 2023).

This form of leadership is associated with smaller states and actors who cannot necessarily yield significant structural power. Liefferink *et al.* (2023) explain how smaller EU states such as Denmark and Sweden have displayed significant cognitive leadership in recent decades. It must be noted however, that this requires more financial and personnel resources and takes place over a longer timeline, developing ideas and influencing others, whereas structural power can be mobilised much quicker. Torney (2019), considering how followers react to cognitive leadership, concurs with this, warning of the time taken to refine ideas and transform existing conceptions and casual beliefs. The EU Green Deal is described by Tobin *et al.* (2023) as a combination of cognitive and exemplary leadership and serves to underpin the EU's entrepreneurial leadership. As discussed in the previous paragraph, the EU's structural (economic) power gave the EU Green Deal credibility in the first place. These intertwined relationships show the importance of multiple types of leadership.

1.4.4 Entrepreneurial Leadership

Entrepreneurial leadership has its origins in instrumental, intellectual and ideas-based leadership (Karlsson *et al.*, 2012; Parker *et al.*, 2015), whereby actors propose solutions to achieve common goals. More recently it is defined by actors using diplomacy and negotiation skills to set agendas, build coalitions and broker agreements (Tobin *et al.*, 2023; Wurzel *et al.*, 2019). It is generally viewed in a positive light by scholars, in that actors are using these skills to create compromises for the common good. However, Oberthür and Dupont (2021) package entrepreneurial leadership with structural and cognitive under the umbrella term of diplomatic leadership and describe it using stronger terminology including 'coerce', 'convince' and 'cajole' in relation to integration with other actors, and tend not to focus on negotiation and bargaining.

The EU is described as displaying entrepreneurial leadership in its role in global climate negotiations over the last three decades, underpinned by its domestic policies and diplomatic capacity (Tobin *et al.*, 2023; Oberthür and Dupont, 2021). Transparency is important in such negotiations and self-interest and governance issues must be monitored (Liefferink *et al.*, 2023). Similar to cognitive leadership, a wide range of actors can display entrepreneurial leadership and while larger states may have more diplomatic resources at their disposal, smaller states may be more appropriate brokers of agreements (Liefferink *et al.*, 2023).

Torney (2019) explains how entrepreneurial leadership supports other types of leadership and that potential entrepreneurial leaders will attract more followers as they build up their knowledge of the interests and preferences of other actors, allowing them to engage more broadly and design more inclusive packages for agreement. Referring to his experience in this diplomatic

environment, Minister Ryan (2024) highlights the importance of not being divisive in difficult moments and preventing a divide between parties.

1.5 Styles and Climate Leadership

DF Leadership Doctrine supports a combined leadership style approach although it focuses on the importance of transformational leadership (DF, 2023). Transformational leadership, called for by the EU to address climate change (Liefferink *et al.*, 2023), is seen as heroic and visionary, aiming to create profound and revolutionary changes (Hofstad and Vedeld, 2021; Wurzel *et al.*, 2019). Transactional leadership is associated with more routine, marginal adjustments and a softer, nudging approach to encourage actors to make more incremental changes (Tobin *et al.*, 2023; Hofstad and Vedeld, 2021).

In comparing both styles, it can be argued that transformational style is required in the first instance to signal a shift, build momentum and start the process of system changes (Benulic *et al.*, 2022) but transactional style is more predictable and is required to influence more regular and/or less ambitious actions (Wurzel *et al.*, 2019; Hofstad and Vedeld, 2021). In their study of city climate leadership, Hofstad and Vedeld (2021) warn that much studied transformational and transactional theories alone do not provide for a sufficient understanding of how to mobilise climate action and as such, introduce pragmatic and co-creational leadership styles, allowing for allocation of responsibility and collaboration respectively.

To understand how style affects climate action, the EU Green Deal is described as a potential 'man on the moon' moment for the EU, demonstrating strong transformational leadership (Tobin *et al.*, 2023) whereas the regularly updated climate action plans of individual member states are more a reflection of transactional leadership, collectively and cumulatively serving to accomplish the larger goal. Attention must be paid to Torney's (2019) argument that overreliance on transformational leadership in the climate context may push followers beyond their existing preferences; that there is a place for transactional leadership in understanding people's interests over the long term.

1.6 Governance and Climate Leadership

A significant amount of literature on climate leadership stems from governance approaches to climate diplomacy and negotiations (Parker *et al.*, 2015; Oberthür and Dupont, 2021). Scholars focus on three main approaches, state-centric, multi-level and polycentric governance (Liefferink *et al.*, 2023). This is reflective of the evolution of leadership research and resonates with the thoughts of Minister Ryan (2024) regarding public bodies leading on climate action; that delivering system change must involve everybody, at all levels and will not work if reliant on individual responsibilities. Comparisons of these approaches suggest that it is only a polycentric approach that allows for leader-follower relationships amongst all types of actors. In examining 'followership', Wurzel *et al.* (2019) help us understand where an organisation such as the DF sits on the continuum of state-centric, multi-level and polycentric governance. It is suggested that multi-level governance is more focussed on public and state actors while polycentric governance accounts for leader-follower relationships to develop at all levels. While the DF may adopt a multi-level approach interacting with external actors, it is a polycentric approach which is required within the organisation.

Polycentric theory with respect to climate action involves individuals working together to mitigate a common problem (Jordan et al., 2018). A hypothesis by Ostram (2010) that polycentric solutions at lower levels could be scaled up to address a larger problem is supported by Milinski and Marotzke (2022), who study the collective benefit of sub-divided groups acting for the common good; polycentric sub-groups were far more likely to achieve a common goal than the global group. In related literature, Cole (2015) posits that because polycentricity facilitates trust, communication and cooperation, it might be key to accelerating necessary climate action. He also notes that a polycentric approach is applicable at all levels from governments and NGOs to families. Similarly, the comprehensive study by Benulic *et al.* (2022), assessing what leadership means in polycentric climate action, concludes that polycentric transformative leadership is polysemic, meaning it requires different types of leadership, at different levels.

1.7 Principles of Climate Leadership

The exploration of climate leadership types, styles and approaches has revealed certain principles possessed by individuals and organisations practicing climate leadership. As already acknowledged, the trait-based approach to leadership is not useful in dealing with climate change, however capturing these recurring traits as 'principles' may be helpful in explaining the practice of climate leadership in certain contexts. This non-exhaustive list of principles is summarised in Figure 5.

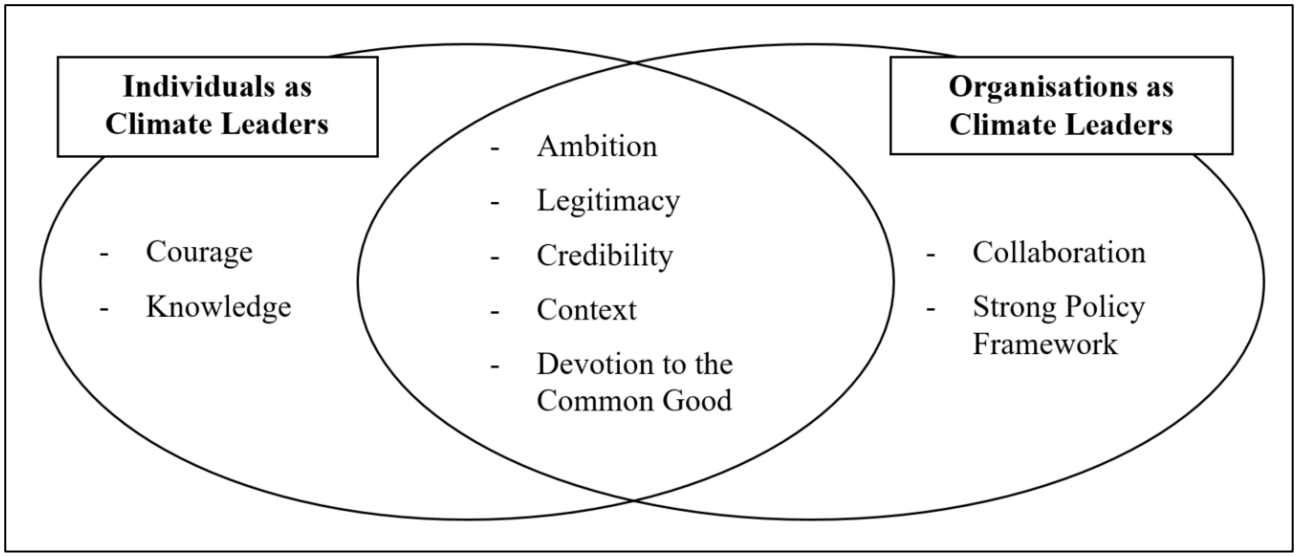

Figure 5 Climate Leadership Principles of Individuals and Organisations

1.8 Climate Leadership in Defence

Based on the findings of Section 1.2, the EPA model discussed in the literature review (Figure 1) can be broadened for Defence to include climate-related actions including 'influence' and 'climate security'. Sections 1.3-1.7 point towards climate leadership encompassing policy formulation as well as the delivery of action (Tobin *et al.*, 2023).

The updated model (Figure 6) outlines the organisation's policy response to climate change and its impacts, leading to the implementation of climate-related actions and the feedback of respective results. These three steps broadly reflect Bantan and Thomas's (2021) three-stage CSR model (Figure 2). Although Bantan and Thomas's (2021) model is specific to CSR, when combined with the EPA model, it allows climate leadership to be conceptualised at organisational level as the application of the policy-implementation-results process. The model reflects the findings of Section 1.1, that implementing substantive climate-related actions characterises climate leadership but that the overall process can be supported by symbolic actions.

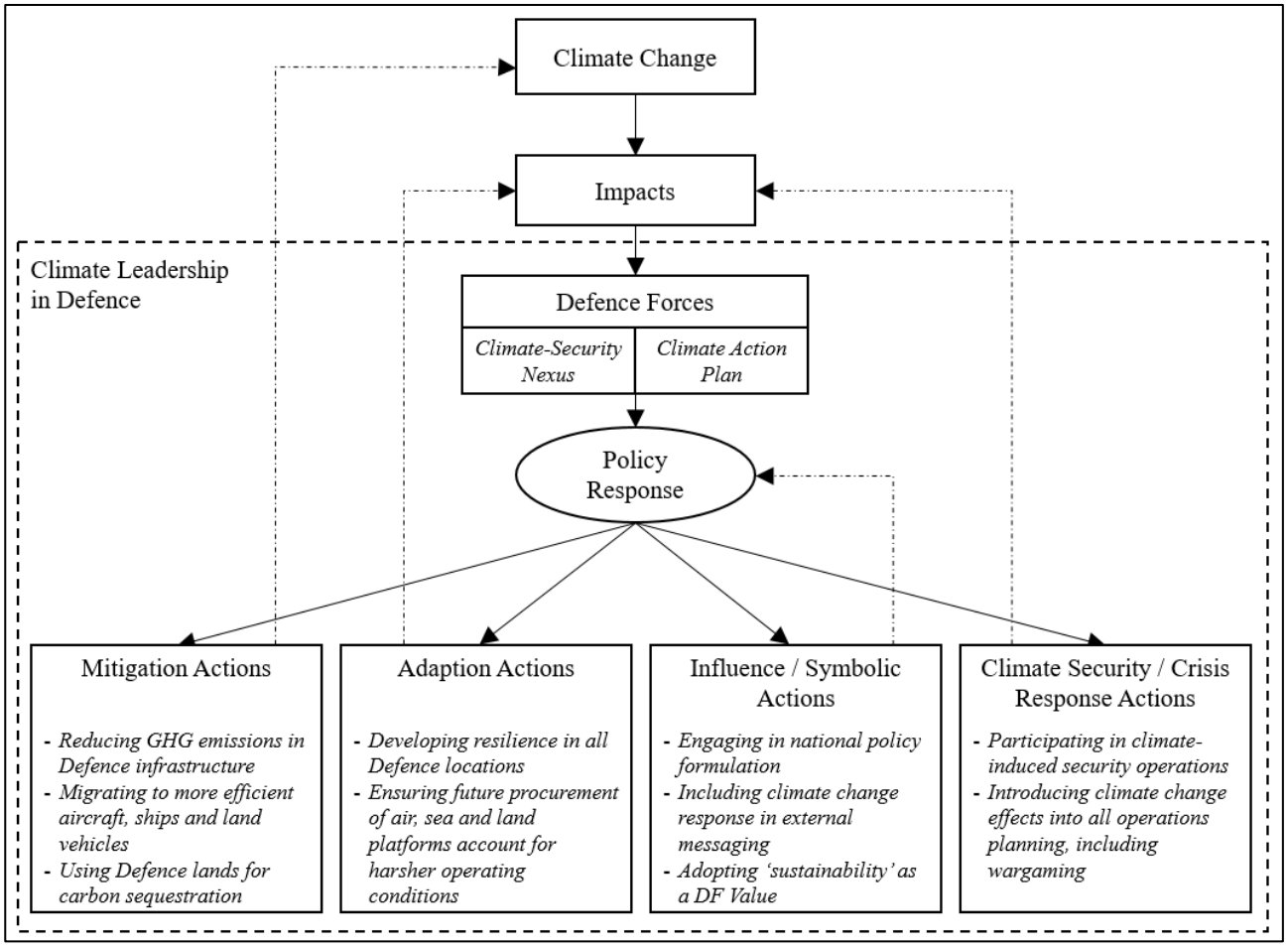

Figure 6 Conceptual Model for Climate Leadership in Defence (based on EPA, 2023a)[4]

[4] The model provides examples of mitigation actions (Scollick, 2023; Nugee, 2024), adaption actions (Payne and Swed, 2023), influence/symbolic actions (Söder, 2023; UG, 2024) and climate security/crisis response actions (Tsetsos, 2023; Bundeswehr, 2024) which represent the broad range of roles the DF can play in climate action.

1.9 Conclusion

Part 1 examined what is meant by climate leadership and its implications for the DF in achieving climate neutrality and leading as an exemplar in the public sector. The complex multi-dimensional relationship between climate and Defence was established before exploring the literature on types, styles and governance approaches. This was contextualised with the expert views of Minister Ryan and through studies conducted within the EU. It is clear that climate action requires a combination of leadership types across states, organisations and individuals. RO1 was conceptualised by broadening the EPA adaption-mitigation model to include other Defence-specific roles, showing climate leadership in Defence as the organisation's application of the entire process.

To be climate leaders, organisations such as the DF must implement substantive climate action, achieving targets underpinned by policy, in the first instance. These actions may then be deemed as exemplary through example setting and influence. Organisations must be ambitious, provide its people with the knowledge, context and resources to foster climate action at all levels in pursuit of a common goal. Public bodies, such as the DF, must note that exemplary leadership does not act in isolation; it is supported by structural, cognitive and entrepreneurial leadership. Playing a leadership role in driving far reaching climate action requires the DF and its personnel to adopt a polycentric approach over its hierarchical traditions and to understand and practice each of the abovementioned leadership types in combination. With this understanding of climate leadership, the paper must now focus on identifying a policy-implementation framework for delivering substantive and measurable actions (Part 2).

PART TWO. A Framework for Implementing Climate Action

"climate has put us in a very serious position and in this crisis we have to see the opportunity"
(Mary Robinson, 2020)

2.1 Introduction

Climate leadership requires the implementation of effective and substantive climate action. Part 2 aims to identify framework for implementing effective climate action which characterises climate leadership. It considers the wider topic of sustainability, looking towards literature on CSR and ESG for concepts and incorporating the expert views and practical experience of Mr Liam McLaughlin.

The focus of this paper is climate leadership, however, the results may be applicable across the broader context of sustainability. The UN outline 17 SDGs for national and global cooperation in meeting urgent environmental, political and economic challenges (UNDP, 2023; Sachs *et al.*, 2019). SDG13 relates specifically to climate action, "taking urgent action to combat climate change and its impacts" (UNDESA, 2023). The SDGs are strongly interlinked and all are relevant to the DF (Downey, 2022).

Environmental, ethical, philanthropic and economic are four forms of CSR which organisations can engage in (Stobierski, 2021), with the environmental component being the most examined in literature (Wang *et al.*, 2016). ESG places more consideration directly on governance

issues (Gillan *et al.*, 2021) and Corporate Sustainability (CS), which has recently stemmed from CSR, places more focus on sustainability (Miska *et al.*, 2018; Ahmed *et al.*, 2021).

As these concepts are linked to the profitability of private firms, there is an abundance of research over many decades which may furnish this study with a suitable means of implementing organisation-level climate action. Acknowledging the DF is active in energy management[5] and has its own Climate Action Roadmap, this exploration of CSR will also identify potential barriers to successful implementation of climate action. Prior to examining CSR in detail, there are a number of limitations which must first be considered.

2.2 Limitations of CSR

The practice of CSR is largely associated with the private sector, involving companies and organisations providing value and furthering social good to a broad set of stakeholders beyond only its shareholders (Bantan and Thomas, 2021; Shao *et al.*, 2022). The study of public sector involvement is largely related to facilitating CSR through policymaking, taxation and enforcement (Ahmed *et al.*, 2021) as opposed to public sector bodies implementing CSR frameworks. Hunoldt *et al.* (2020) outline legitimacy, moral principles and financial performance improvement as three reasons organisations engage in CSR. Notwithstanding the differences between public bodies and state-owned firms, Hunoldt *et al.*'s (2020) findings regarding the application of CSR strategy in state-owned versus private firms are noteworthy; as state-owned firms exist somewhat to contribute to society, implementation of CSR strategies was found to be less challenging, however there was still a need to convince stakeholders of the benefits of CSR.

CSR has evolved over many decades with de Bakker *et al.* (2020) warning of unsatisfactory outcomes and Bantan and Thomas (2021) warning that effective implementation can be very difficult and in some cases illusionary. Despite this, the focus of scholarly research has moved on from whether CSR is useful, to how it can be implemented effectively (Wang *et al.*, 2016).

Amongst the challenges is the lack of a suitable mapping tool which allows senior management to understand the overall process and integrate the concepts into the core business of the organisation (Bocken *et al.*, 2013). This lack of a "clear and precise specification" (Hunoldt *et al.*, 2020, p.1443) for implementation has been found as problematic, causing management in different companies to view and define CSR differently.

Notwithstanding these limitations, in recent years the focus of scholars on the implementation process has produced several useful frameworks for understanding and applying CSR (Graafland and Smid, 2019; Bantan and Thomas, 2021; Fatima and Elbanna, 2023). These studies are synthesised with a view to understanding the whole process and adopting a unified framework for assessing how substantive climate action can be applied in Defence.

[5] The DF has been certified to ISO50001 – Energy Management since 2012

2.3 CSR Frameworks

Graafland and Smid (2019) provide a conceptual CSR framework (Figure 7) which considers policy, implementation and impacts as independent components, examining the relationship between each. They found that implementation programmes depend on policy for guidance, and that impacts depend on implementation programmes for effectiveness. Similarly, they examine how the quality of reporting and allocation of responsibility influence the overall CSR implementation.

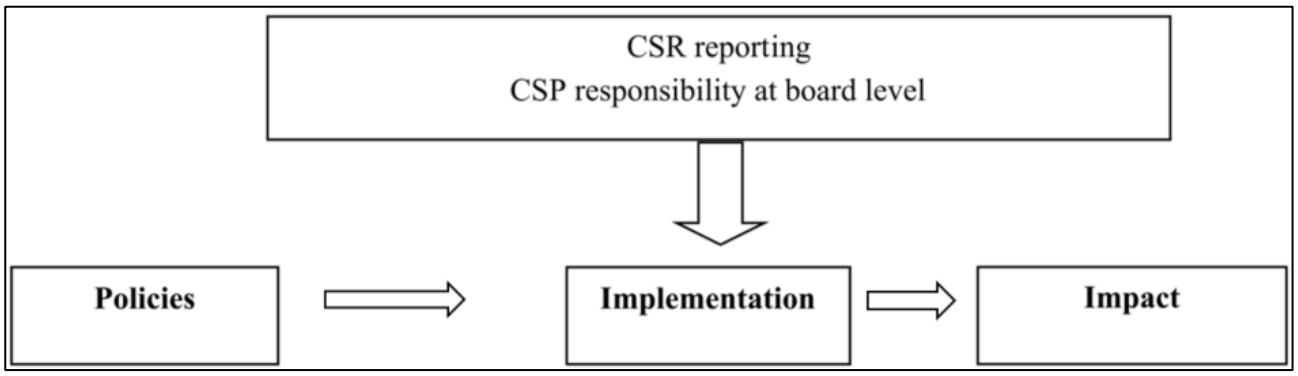

Figure 7 CSR Conceptual Framework (based on Graafland and Smid, 2019)[6]

Bantan and Thomas (2021) build on the above model, noting its usefulness for strategic and ethical reasons beyond that of compliance while illustrating the effects of tensions between policy, implementation and impacts (Figure 8), known as decoupling and greenwashing. Decoupling is described by Bromley and Powell (2012) in two forms; policy-practice decoupling where policies are disconnected from daily practices leading to symbolic adoption, and means-ends decoupling where policies are implemented but are only loosely tied to outcomes, characterised by symbolic implementation. Greenwashing refers to claims that are not substantiated by actions (Graafland and Smid, 2019). Even with extensive and detailed policies in place, there is a significant risk of greenwashing as a result of a failure at the implementation stage (Ahmed *et al.*, 2021).

[6] CSP refers to Corporate Social Performance, seen as a natural consequence or follow-on to CSR which focuses on actual results achieved as a result of the CSR process (Carroll, 2018).

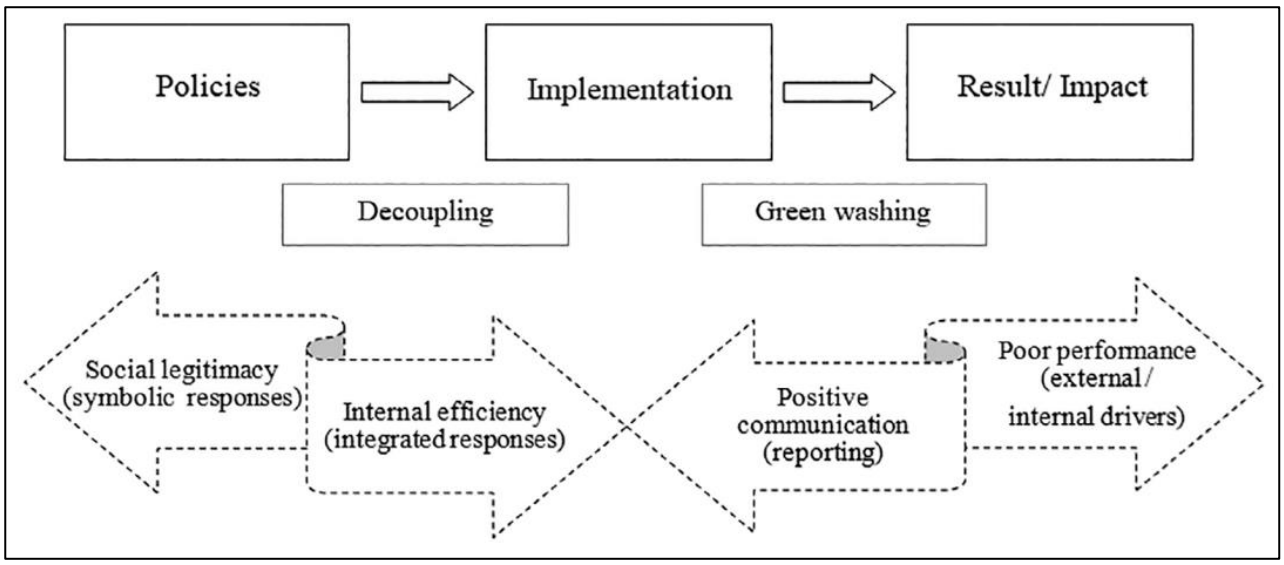

Figure 8 CSR Model with Practice Tensions (Bantan and Thomas, 2021)

Fatima and Elbanna (2023) review 122 empirical studies of CSR implementation with a view to assisting academia and industry in understanding the topic. They use a conceptual framework to assess existing literature, connecting implementation with the other components in the CSR cycle. Figure 9 outlines the four components of their framework; contextual variables, CSR formulation, CSR implementation and outcomes. The inclusion of contextual variables is a useful addition which is carried forward in this paper. Notably, the framework does not include or refer to policy, rather it includes 'type of CSR strategy' under CSR formulation.

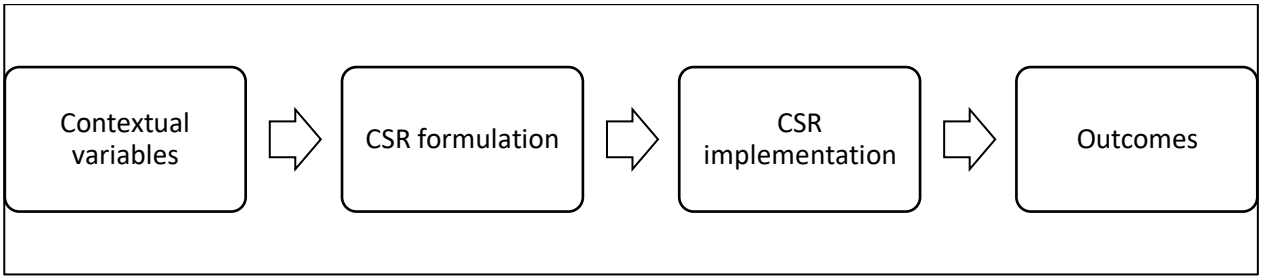

Figure 9 Integrative Multi-Level CSR Implementation Framework (based on Fatima and Elbanna, 2023)

A combination of elements from these studies will be used as the basis to explore CSR literature for a suitable framework which may be applicable to implementing substantive climate action in Defence (Figure 10). The risk of decoupling and greenwashing will be monitored throughout.

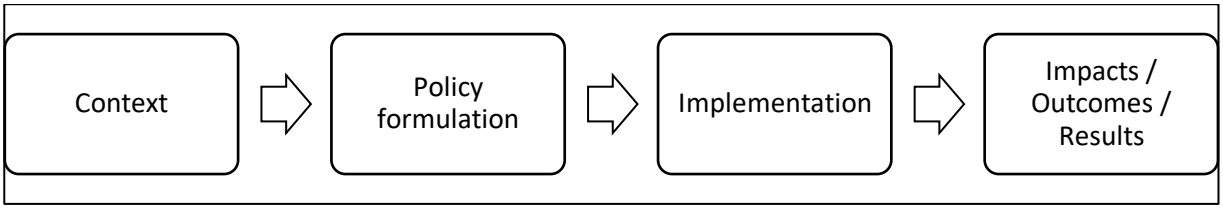

Figure 10 Framework for Exploration of CSR Literature

2.4 Context

The specific context within which an organisation sits will influence its CSR implementation (Gillan *et al.*, 2021; Hunoldt *et al.*, 2020). Five contextual variables posited by Fatima and Elbanna (2023) are outlined in

and populated with a non-exhaustive list of considerations. While all factors may not be relevant at all times, the organisation must understand these contexts, as they may influence CSR strategy and the relationship between CSR policy formulation and implementation (Fatima and Elbanna, 2023). The contextual variables cover all levels from individual employees to the international context, pointing towards the relevance of the polycentric approach outlined in Part 1 (Benulic *et al.*, 2022; Ryan, 2024).

Contextual Variable	**Considerations**	**References**
Individual-level	CSR perspectives of all stakeholders, management and employees	(Fatima and Elbanna, 2023; McLaughlin, 2024).
	Support from top, middle and lower management	(Latapí *et al.*, 2021)
	Perceptions and understanding the purpose of CSR activities	(Wu *et al.*, 2021)
Organisational-level	Unique organisational logics, culture and identity	(Miska *et al.*, 2018; Fatima and Elbanna, 2023)
	Synergies between environmental processes and the organisations economic concerns	(Hunoldt *et al.*, 2020)
Industry-level	How the organisation operates and the effect it has on the environment, particularly scope one, two and three emissions contributions	(Fatima and Elbanna, 2023; McLaughlin, 2024)
	Interactions with suppliers, their development practices and supply chain sustainability	(Fatima and Elbanna, 2023; Subramaniam et al., 2020)
Institutional-level	How are CSR policies, practices, procedures and initiatives shaped, influenced, enabled and/or constrained and what supports are available	(Bantan and Thomas, 2021; Fatima and Elbanna, 2023)
	The link with other sustainability issues, such as interlinked SDGs, and how an organisation's specific objectives might affect them	(McLaughlin, 2024).
Country-level	The role and influence of the organisation at national and international level	(Fatima and Elbanna, 2023; Ryan, 2024)
	Understanding and planning for uncertainty in regulations	(Fatima and Elbanna, 2023; Graafland and Smid, 2019)

Table 2. CSR Contextual Variables (Fatima and Elbanna, 2023)

At the individual-level, all relevant personnel, particularly those relied on for support, must understand the purpose of CSR activities. Moving to organisational level, synergies between CSR and core business must be understood and exploited, noting that sustainability shouldn't be at the expense of operational efficiency but that in many cases it can actually improve operational efficiency (McLaughlin, 2024). The industry-level context relates to how the organisation operates and the effect it has on the environment. Analysis of the institutional-level context ensures the organisation understands where it sits with respect to other institutions, the relevant legislation and targets and what supports are available. A country-level perspective is important for public bodies, understanding how they are viewed and their influence; Minister Ryan (2024) described the DF as "a key pillar of the state", reflecting how the organisation is considered at the highest level of government. At this level, uncertainty is introduced (Fatima and Elbanna, 2023). Importantly, as Graafland and Smid (2019, p.232) warn, organisations characterised by uncertainty and "multiple conflicting expectations" can experience decoupling between CSR policies, implementation and results.

2.5 Policy

Strong policy, contextualised by Mr McLaughlin (2024) as demonstrating leadership and commitment, was found to characterise exemplary climate leadership in Part 1 (Oberthür and Dupont, 2021). Graafland and Smid (2019) draw on Rhee and Lee's (2003, p.177) definition of environmental strategy rhetoric to explain policy as an organisation's "environmental intention declared externally or internally.....written and published symbolic statements", warning that organisations can have strong policies but without strong implementation programmes, can yield no impacts and thus will be punished by external stakeholders. This resonates with the concept of internal and external environmental ambitions explored in Part 1, whereby organisations with high external and low internal ambitions are symbolic leaders (Wurzel *et al.*, 2019). Policy is argued as so important by Ahmed *et al.* (2021), that it should be considered for inclusion as part of an organisation's overarching strategy, as the best means of effecting environmental issues along with the core organisational business.

Bantan and Thomas (2021) posit policy as the starting point for an organisation intending to act responsibly through CSR and self-regulation. Furthermore, they highlight that engagement with stakeholders, including employees, early in the process to identify CSR priorities through a practice-orientated framework has been shown to shift from symbolic to substantive impacts. This aligns with Mr McLaughlin's (2024) observation that policy is the connection between the organisation's leadership, its employees and the proposed CSR actions. Policy objectives and targets should be clear, accessible and related to the wider context, incorporating other SDGs which are relevant to the organisation (McLaughlin, 2024).

Graafland and Smid (2019) warn that policies can be copied from other organisations but implementation plans are organisation-specific. In their first of four hypotheses, they test the incidence of policy-practice decoupling using four useful criteria for distinguishing between the qualities of policies (Table 3). They found that the existence and the quality of the CSR policy significantly influences the implementation of CSR programmes. Interestingly, they also found that

even the existence of a weak policy has positive effects on the implementation of programmes. Bantan and Thomas (2021) validate this finding, that clear policies are crucial and are key preconditions or enablers in CSR implementation. Furthermore, Ahmed *et al.* (2021) attributes the risk of CSR failure to the gap between policy and implementation, which must be bridged with clear communication to ensure that policy is correctly interpreted and understood (Ménard *et al.*, 2018).

Table 3 Quality of CSR Policy (Graafland and Smid, 2019)

Ref.	Policy in place	Remarks
A	no policy	-
B	weak policy	the company has a written policy statement that is not very detailed
C	adequate policy	the company has a detailed, written, policy statement, but it only addresses a few issues
D	strong policy	the company has a detailed, written, policy statement for all important issues

"Formulating policies will initiate a (CSR) process" (Graafland and Smid, 2019, p.260) within an organisation, paving the way for implementation and realisation of impacts. There is a clear link between the importance of policy in CSR literature and in exemplary climate literature, that strong policy is a precondition for substantive actions. Strong policy formulation which includes early stakeholder engagement (Bantan and Thomas, 2021), quality (Graafland and Smid, 2019) and alignment with overarching strategy (Ahmed *et al.*, 2021) is required and will be carried forward in this paper.

2.6 Implementation

Implementation delivers policy objectives through a programme of actions, integrating CSR into the organisation's practices; the greater the integration, the more successful the impacts will be (Graafland and Smid, 2019). There is much research on the challenges of implementation, the need for sound mapping tools to enable management to understand the overall value of CSR and the shifting from rhetoric to practices which are integrated into core business (Bantan and Thomas, 2021). Hunoldt *et al.* (2020) posit that difficulties in implementation are associated with organisational complexities and tensions between the pursuit of environmental (and social) good and the focus on exclusive economic goals of the organisation. Mr McLaughlin (2024) outlines creating a sense of urgency and identification of barriers as crucial first steps in implementation.

Graafland and Smid's (2019) second hypothesis tests means-ends decoupling by testing and distinguishing between the quality of CSR programmes (Table 4), finding that strong programmes yield positive results. Bantan and Thomas (2021) warn however of the difficulty of designing quality into the CSR process. A strong programme includes creating a suitable team, breaking targets in manageable intermediate targets, each with their own baselines and indicators, and ensuring lessons are learned for future iterations (McLaughlin, 2024). Similar to their first hypothesis, the existence of a weak programme was still found to provide positive impacts. The fourth hypothesis tested by Graafland and Smid (2019) considers the relationship between the allocation of responsibility at board level and the quality of the CSR implementation. Organisations rating CSR as highly important will allocate responsibility at top management level, sending a strong signal to both employees and external stakeholders. They found that CSR implementation depends on and is

improved if responsibility is allocated to board level rather than at lower levels. This is discussed in more detail in Section 2.9.

Table 4 Quality of CSR Programme (Graafland and Smid, 2019)

Ref.	Programme in place	Remarks
A	no programme	-
B	weak programme	only applies to part of the company's operations
C	adequate programme	applies to all operations, but no quantitative targets or clear deadlines
D	strong programme	quantitative targets and clear deadlines

Scholars have identified numerous other factors which influence CSR implementation. Employee involvement is seen as an enabler and a vital component in the successful implementation of CSR plans (Bouraoui *et al.*, 2020; Wu *et al.*, 2021; Roszkowska-Menkes, 2018), with active engagement throughout the process necessary for achieving sustainability objectives (Kucharska and Kowalczyk, 2019). The motivation for adopting CSR, the resources devoted to it and the level to which it is integrated into the culture and strategy of the organisation are all important considerations for success (Graafland and Smid, 2019; Hunoldt *et al.*, 2020). Mr McLaughlin (2024) described personnel resources and varying degrees of technical expertise as "hugely important" at the implementation stage.

Roszkowska-Menkes (2018) posit that open innovation, the purposeful and managed flow of information across organisational boundaries, is required to achieve strategic CSR. This relates to Minister Ryan's (2024) idea that managing the many technologies and the nodal system on which they operate requires vast information flow. This type of open innovation can occur internally but also with external stakeholders such as public institutions, universities and businesses (Roszkowska-Menkes, 2018).

The importance of strong, organisation-specific implementation programmes are evident in this research. The quality and strength of programmes (Graafland and Smid, 2019; McLaughlin, 2024), inclusion of employees and other stakeholders (Bouraoui *et al.*, 2020) and consideration for innovative solutions will be brought forward in considering how the DF implements effective climate action.

2.7 Results

In the business context, CSR impacts are the achievement of environmental and social goals (Graafland and Smid, 2019) with scholars using the term 'result' interchangeably with 'impact' and 'outcome' (Bantan and Thomas, 2021; Hatsios, 2023; Barnett *et al.*, 2020). It is important to differentiate outcomes from outputs, a term used to describe the product of the implementation programmes[7]. While CSR research tends to focus on financial rather than non-financial results, it

[7] Fisher (2024) outlines the difference between CSR outputs and outcomes using an environmental example; the outputs of a sustainable tree programme are 4,500 planted trees whereas the outcome or result of the programme is 750 metric tons of carbon dioxide eliminated from the atmosphere.

provides useful understanding of the importance of measuring CSR results to ensure they are linked to policy objectives (Barnett *et al.*, 2020).

CSR results are found to be directly linked to strong implementation programmes and indirectly linked to CSR policies (Graafland and Smid, 2019). Therefore, measurement of results is required to confirm as well as "track, and optimise impact" (Bantan and Thomas, 2021, p.345; McLaughlin, 2024), without which an organisation could be accused of greenwashing. Acknowledging the importance of measurement, scholars point towards differences in how CSR/ESG performance is measured and the need for further research on the topic (Gillan *et al.*, 2021).

CSR can yield many nuanced results and benefits which may be useful to an organisation beyond achieving substantive sustainability targets. These include attracting people to engage with the organisation, increased profitability and long-term economic, environmental and social success (Bantan and Thomas, 2021). Pope and Kim (2021) find a general link between CSR and brand value, although this has become less prominent in recent years due to CSR being practiced and promoted more widely. These benefits are associated with the private sector but may be transferrable to public sector bodies through recruitment opportunities (Wang *et al.*, 2016) and cost savings instead of profitability. Mr McLaughlin (2024) observed climate change knowledge and perceptions of staff as a hugely important, enabling, benefit which could result from a communication programme, linking such programmes to strong organisational leadership.

The measured results of CSR must be reported to internal and external stakeholders in an effective manner that is both simple, relevant and credible (Stobierski, 2021; Bantan and Thomas, 2021; McLaughlin, 2024). Graafland and Smid's (2019) third hypothesis tests the link between CSR reporting and the quality of implementation programmes, finding that with higher quality reporting, transparency will be improved. This means external stakeholders will have visibility on the organisation's performance, thus creating the incentive for the organisation to have a high-quality implementation programme in the first place. They also found that the quality of reporting significantly and substantially influenced the quality of implementation, supporting the hypothesis and leading to stronger results. The quality of reporting includes its presentation and readability, although Zhihong *et al.* (2018) found that environmental performance is less likely to affect the readability of reports than social performance. These points will be considered in Part 3 to ensure the DF has a mechanism to measure and report the results of implementation programmes against stated policy objectives.

2.8 Barriers to Successful Implementation

Mr McLaughlin (2024) outlined identification and understanding of barriers as a first step in planning. The results of several studies examining the barriers to successful CSR/ESG implementation were reviewed alongside the results of a report commissioned by the European Defence Agency (EDA) examining barriers to success in energy efficiency in Defence buildings across Europe. Six recurring themes are evident across the five sources (Liou *et al*., 2023; Ahmed *et al*., 2021; Hunoldt *et al*., 2020; EDA, 2024; Latapí *et al*., 2021):

2.8.1 Leadership Commitment[8]

The commitment of leadership is described as the most influential barrier in CSR/ESG, with strong commitment and support resulting in increased levels of priority, awareness and funding (Liou *et al*., 2023; EDA, 2024). Managers operating throughout organisations are more likely to drive strategies and initiatives when senior executives show their commitment through, for example, allocation of resources and including results in annual reports. (Hunoldt *et al*., 2020).

2.8.2 Knowledge and Awareness

A lack of knowledge and awareness of the issue at hand and the CSR response amongst staff was the second most recurring barrier. It can be overcome by developing an understanding of the subject (for example, climate change), the organisation's contribution and the practical actions required to mitigate or adapt to it (Hunoldt *et al.*, 2020; McLaughlin, 2024).

2.8.3 Structure

The need for an organisation to adapt its structure to CSR implementation was significant in two studies, with more traditional or hierarchical structures limiting CSR integration into core practices (Latapí et al., 2021). Drawing on experience working with militaries across Europe, Mr McLaughlin (2024) suggests current military structures are not well positioned for effective climate action, noting there is insufficient technical expertise permanently working in each location and recommending lessons are learned from the many good projects being implemented in isolation.

2.8.4 Human Resources

Human resources, specifically those with technical expertise[9], are seen as barriers particularly when the conversation moves beyond appointing a CSR/sustainability manager. Is the organisation willing to allocate appointed individuals with the necessary support, ensuring the overall approach is substantive rather than symbolic (Hunoldt et al., 2020; Hatsios, 2023)?

2.8.5 Finance

Lack of finances featured in two of these studies, indicating it is not the most significant barrier. This may be due to the "availability of significant funding for investment in energy efficiency and in decarbonisation" being considered an opportunity at present (EDA, 2024, p.130).

[8] The term 'leadership commitment' is used as it best captures the descriptions amongst the various studies on barriers to successful implementation. These descriptions include 'top management', 'senior leadership', 'executives' and 'senior levels'.

[9] Mr McLaughlin was referring to engineers and technicians proficient in the management of significant energy using systems such as heating systems and hot water generators (McLaughlin, 2024).

2.8.6 Integration

The integration of CSR with core business is a common barrier that Hunoldt *et al.* (2020) posit can be overcome by emphasising the business case for CSR and creating synergy between CSR activities and the goals of the organisation. The same may be the case for climate leadership, with integration of climate action into core business as a guiding principle.

While these barriers are specific to CSR/ESG, they provide useful considerations for climate action and would need to be identified and mitigated against early in the implementation process. As leadership commitment is the most common barrier identified across all studies, it will be examined in more detail (Section 2.9). Mitigation of the Defence-specific barriers will be examined in Part 3.

2.9 Leadership Commitment

As Minister Ryan (2024) highlighted, all individuals in an organisation must be involved in climate action. Central to this is the commitment of top management, which was found to drive implementation efforts. Therefore, the appointment of specific staff (for example, a director of sustainability) and their position within the organisational structure is a key consideration in CSR (Hunoldt *et al.*, 2020; Gillan *et al.*, 2021). The link between senior management responsibility and integration of CSR practices is seen by Graafland and Smid (2019) as the institutionalisation of CSR into an organisation. Furthermore, Hunoldt *et al.* (2020) find that in addition to the level at which CSR managers operate, those operating in a centralised (CSR) role as opposed to a decentralised role will apply implementation strategies more intensively.

The training and education of senior leadership and management is found to influence CSR implementation (Hatsios, 2023; Shao *et al.*, 2022). This foundation allows them to understand the difficulty of what the organisation is trying to achieve and can contribute to taking difficult and courageous decisions (McLaughlin, 2024). Shao *et al.* (2022) find that CSR activities are a motivational factor for employees displaying creative behaviour and thus becoming involved. Their study finds this creativity is supported and promoted by 'inclusive' managers, at all levels and to exploit this behaviour, recommend training and development programmes for its various levels of management.

Part 1 introduced polycentricity as an important approach in climate action (Benulic *et al.*, 2022), a concept which could initially appear incompatible with a traditional organisation such as the DF. However, having leadership at different levels in a hierarchical structure was found to be a mediator between organisational CSR and environmentally responsible behaviour of employees (Wu *et al.*, 2021). Mr McLaughlin (2024) recalls a particular company[10] he worked with, which displayed commitment at all levels; the president strongly supported the energy management programme, regularly updating shareholders and the energy manager was enthusiastic, conducted his own research and "pushed everybody to keep up with him".

[10] 'Mutua Madrileña', based in Madrid, was a Central Energy Ministerial (CEM) 'Award of Excellence Winner' 2017.

2.10 A Framework for Defence

RO2 sought to identify a framework for implementing effective climate action in Defence. Part 2 identified five important CSR components which may be useful in the framework. Graafland and Smid's (2019) three-part policy-implementation-impact framework is built upon with 'leadership commitment' and 'context', conceptualising the implementation of climate action in Defence (Figure 11).

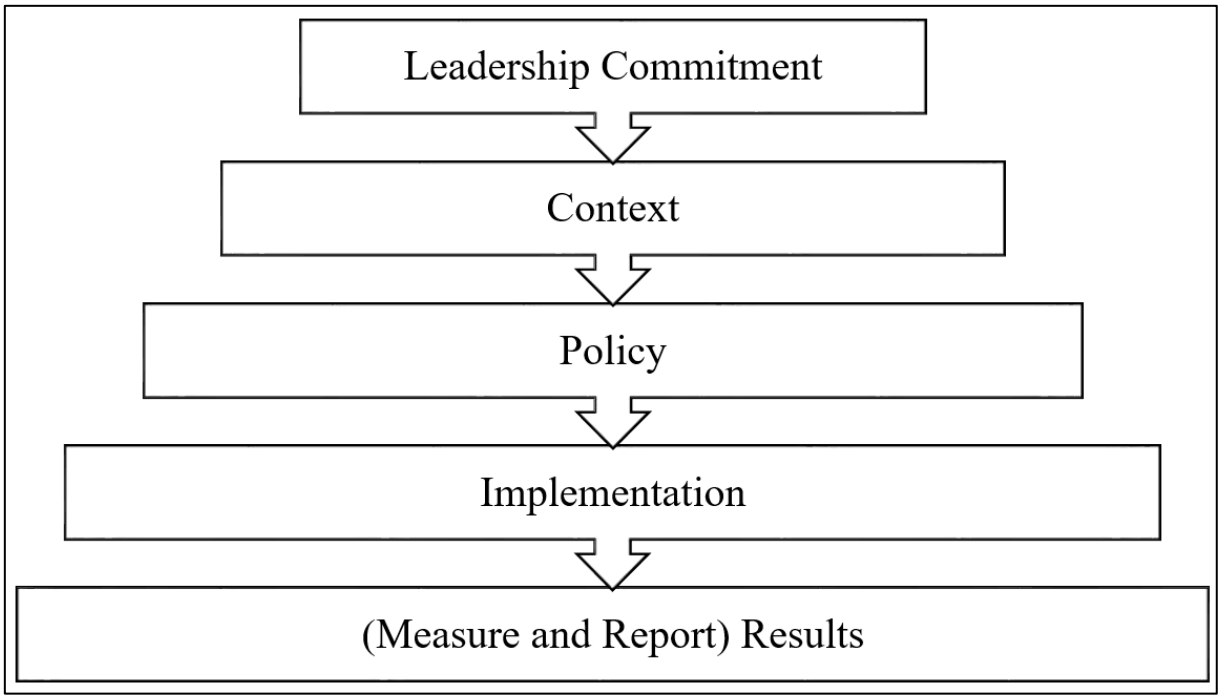

Figure 11 Climate Action Implementation Framework

2.11 Conclusion

Part 2 identified a framework (Figure 11) for implementing effective climate action across an organisation such as the DF. In doing so, it acknowledges the DF has been active in energy management and climate action for over a decade. The main sources used, CSR/ESG literature, were supported by the expert views of Mr McLaughlin, which provided a highly useful and insightful perspective into the realities and practicalities of implementing climate action.

The extensive CSR literature revealed several implementation frameworks which provided their own important components, with four key elements initially identified for the conceptual framework; context, policy, implementation and results. Following an examination of barriers to implementation, 'leadership commitment' as the most common barrier was examined and added at the beginning, creating a five-part framework.

Part 3 will apply the Climate Action Implementation Framework to the DF, with a view to developing critical inputs based on the organisation's specific context. In addition, mitigation of barriers specific to Defence will be examined.

PART THREE. Implementing climate leadership in the defence forces

"If you don't deal with it today, you won't be able to deal with it tomorrow" (Nugee, 2022)

3.1 Introduction

Part 3 aims to adapt the Climate Action Implementation Framework (Figure 11), identified in Part 2, for use in the DF. It is intended that this framework is applicable at the strategic, operational and tactical level of the organisation, loosely translated to Organisational level, Service/Corps/Brigade level and Installation/Unit level. There are a number of themes identified across Part 1 and 2 which must be borne in mind while working through the framework.

Climate change effects the DF in many ways highlighting the need for far-reaching climate action, as such the framework (Figure 11) should be adaptable to all climate action and not just mandated GHG emissions reduction. As exemplary climate leadership does not act in isolation, the framework should account for, at some stage, structural, cognitive and entrepreneurial leadership with the developed climate leadership principles serving as a guiderail. Most importantly, the framework should allow for polycentric leadership throughout. The CSR framework of policy-implementation-impacts provided by Graafland and Smid (2019) was built upon with the addition of a contextual analysis and the consideration of barriers, most importantly 'leadership commitment'. With these themes in mind and supported by the expert view of General Richard Nugee, this part examines how the DF can adapt each component of the framework (Figure 11).

Each component of the Climate Action Implementation Framework (Figure 11) is examined from a DF perspective in this part, starting with 'leadership commitment'. 'Context' is examined in most detail, with a focus on targets and objectives, setting the conditions for strong policy formulation and subsequent implementation. Acknowledging that climate action is a stated high level goal of the Department of Defence (DoD) in the DF Strategy Statement (DoD, 2023), the findings from Part 2 are incorporated to ensure strong policy at all levels, reducing the risk of decoupling. Thereafter implementation programmes can be developed linking policy and results, while ensuring responsibility is assigned at the correct level and climate action is integrated into core processes. The examination of results shows the DF can build on its existing measurement and reporting structures, using standardised formats and accounting for other benefits of climate action and lessons learned. Having already examined 'leadership commitment', overcoming other organisation-specific barriers, specifically knowledge, is considered with a view to developing a structured approach for mitigating further barriers in the future.

3.2 Leadership Commitment

The commitment of top management is potentially the most significant barrier to the implementation of substantive climate action and thus the ability to display exemplary climate leadership (Hunoldt *et al.*, 2020; Latapí *et al.*, 2021; EDA, 2024). In the UK context, General Nugee (2024) highlights the importance of a two star general in each command being responsible for climate change and sustainability, albeit not as their only role, because at this very senior level they have credibility and can effect change.

Graafland and Smid's (2019) fourth hypothesis clearly highlights the link between the level at which responsibility is allocated and the quality of implementation. The practical application of this concept requires consideration of the organisational context (Ahmed *et al.*, 2021); personnel within the DF structure can be overburdened with taskings (CODF, 2022, p.62) which could serve to reduce the impact of assigning climate action responsibility to a member of top management. Looking to energy management, a subset of climate action, the DF implements ISO50001 which insures an energy 'management representative' is appointed on behalf of top management to conduct the practical implementation of energy management programmes (SEE, 2024). Combining this with the findings of Graafland and Smid (2019), it may be useful at each level in the DF for overall 'climate action' responsibility to lie with the senior individual at that level, but with 'assigned authority' for implementation to another member of top management.

General Nugee (2024) emphasised that the civilian and military components of Defence are "working to the same purpose", indicating the need for a coherent approach. His description of the directorate established for implementing the UK MOD strategy has similarities with the recently established Capability Development Unit in Ireland, a joint civilian/military office[11] (McManus, 2023). At the strategic level, building on General Nugee's (2024) concept of combined civilian-military cooperation, the DF/DoD may consider a unified approach to climate and sustainability at top management level in the form of a unit, the establishment of which could be guided by the recent establishment of the Capability Development Unit (DoD, 2023; McManus, 2023). Table 5 summarises the recommendations of this section which create the foundations for a thorough contextual analysis, developed in Section 3.3.

Table 5 Leadership Commitment Critical Inputs

Leadership Commitment Critical Inputs	**Associated leadership approach / type / principle**
Develop a joint civilian/military climate change and sustainability unit	Polycentric Approach Structural Leadership Ambition Credibility
Elevate responsibility for climate action at the strategic, operational and tactical levels to the senior individuals and other members of top management	

3.3 Context

A contextual understanding is necessary when formulating policy that includes "all important issues" (Graafland and Smid, 2019, p.238). Section 2.4 outlines five contextual variables which must be considered in advance of policy formulation. The breakdown of contextual variables over five levels by Fatima and Elbanna (2023) is useful in the general sense and highlights the importance of considering a wide scope of perspectives. This can be adapted for use by the DF (Figure 12), however it must be used with caution, allowing for organisation specific factors such as the role of Defence

[11] The Capability Development Unit, established in 2023, is a top-down, civilian/military office, with the objective of delivering an initial Capability Development Programme that identifies short, medium and longer term capability needs (DoD, 2023).

in climate action (1.2) and must always be guided by Defence's primary purpose, "defending the nation and protecting its citizens" (Nugee, 2024).

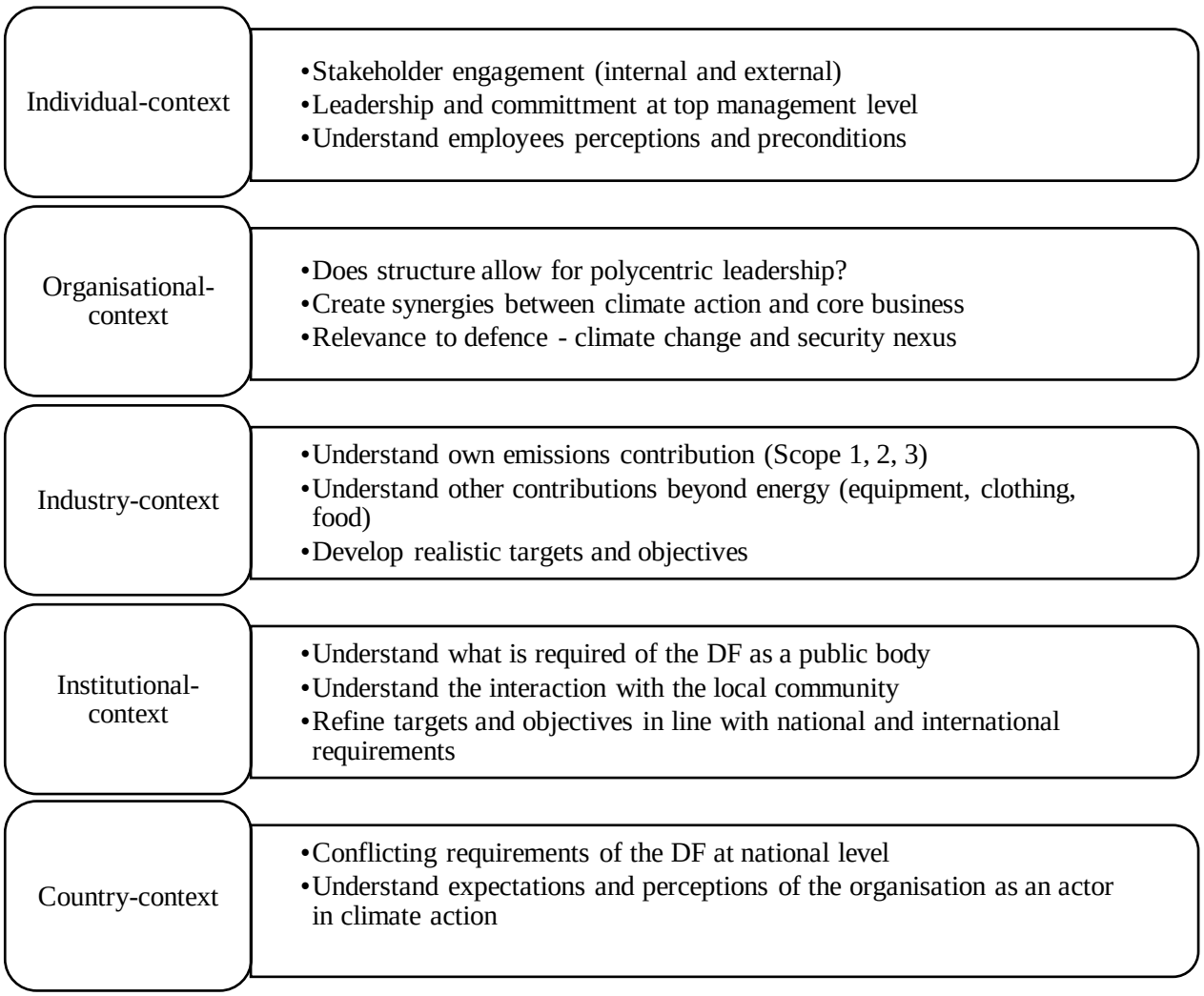

Figure 12 Contextual Analysis Framework for the DF (based on Fatima and Elbanna, 2023)

The extent to which the contextual analysis is carried out will vary dependent on the level. At the tactical level, units and installations will focus on their own contribution to climate change, (industry-context), aligning this with the mandated targets at the institutional-context (Fatima and Elbanna, 2023). At the operational level, services and corps will focus on their specific organisational responsibilities such as operational aviation and naval emissions in the context of the Air Corps and Navy respectively, or infrastructure for the Corps of Engineers. This will allow for specific targets and objectives to be developed. At the strategic level, a detailed multi-dimensional analysis of the context is required which will include the organisation's place within the national and international context. At this level, targets and objectives from the operational level will be combined and adjusted as necessary to reflect the overall mandated targets.

The intersection of industry-context and institutional-context is where targets and objectives are set. The DF Climate Action Roadmap outlines goals for achieving 2030 decarbonisation targets

(SEE, 2023). Each individual goal captures an extensive amount of work over several years[12]. It is logical that this must allow for differing targets at the operational and tactical level while still cumulatively reaching the organisational (strategic) target. Similarly, a conundrum exists between the energy consumption of "operational activities" which "cannot be avoided or reduced" (SEE, 2023, p.2) and the more predictable consumption from non-operational activities and infrastructure. The DF can approach this problem is several ways.

At the strategic level, through detailed contextual analysis, the organisation can reallocate targets and objectives from operational activities to non-operational activities. Similar to how Michaelowa *et al.* (2022) call on researchers to develop a research programme for capturing military emissions during peace and war, a programme could be considered for segregating operational and non-operational emissions with a view to assigning separate targets and developing policies and implementation programmes for each. However, acknowledging the danger in seeking exemptions (Nugee, 2024), the DF may consider the internal reallocation of targets based on difficulties decarbonising certain areas. This may be reflective of carbon budgeting at national level.

General Nugee (2024) discussed long term contextual understanding, referencing the climate-security nexus, crisis response, and potential changes to alliances, which all inform decision making. He also references Defence's responsibilities within domestic climate legislation[13]. The UK MOD's strategic approach to short, medium and long term targets, or 'epochs', is noteworthy with varying levels of detail, allowing for technological advancements and innovation, while ensuring early action (Nugee, 2024).

Depledge (2023, p.676) notes a recent shift in military thinking from viewing decarbonisation as a "goal which must be balanced against the need to maintain operational effectiveness" to questioning whether militaries can be effective without decarbonising. He does however highlight the urgent need for scholarly research into how this might be rapidly achieved; the DF can approach this as an opportunity, exploiting internal and external resources to develop green operational technology. Increased engagement, collaboration and ambition to lead on projects with external agencies such as the EDA (SEE, 2023) will have the secondary benefit of exhibiting cognitive and entrepreneurial leadership. Utilising internal resources such as the DF Research, Technology and Innovation (RTI) unit facilitates the innovation which is seen as essential for developing complex solutions to the climate problem at all levels in the organisation (Roszkowska-Menkes, 2018; Nugee, 2022). This can be cross-cutting in Defence with other militaries accounting for innovation and experimentation with eco-camps, the use of hybrid vehicles (Ministère des Armées, 2022), alternative fuels and food production onsite (UK MOD, 2021)

Finally, the organisation must understand how its activities contribute to national GHG emissions (EPA, 2023b). While public services account for a minor portion of national emissions, it

[12] Goal 2.1 (Buildings) aims to carry out 'deep retrofit on all buildings' with a projected saving of 7,360,000 Tonnes CO2 by 2027 (SEE, 2023, p.27).

[13] In June 2019, the 2008 UK Climate Change Act was strengthened, committing the UK to bring all GHG emissions to net zero by 2050 (Department for Energy Security & Net Zero, 2023).

is possible the organisation contributes to emissions in other sectors such as the makeup of food contracts or the manufacturing processes for military equipment. By understanding this contribution, the organisation can decide whether to mitigate these contributions, through for example, green public procurement practices, and to what extent. The context-related inputs (Table 6) will allow for formulation of strong policy, a precondition for substantive actions, as outlined in Section 2.5.

Table 6 Context Critical Inputs

Context Critical Inputs	**Associated leadership approach / type / principle**
Carry out detailed contextual analysis at each level as formal part of climate and sustainability planning	Polycentric Approach Cognitive Leadership Knowledge Context
Adopt a flexible approach to reallocation of targets internally, based on contextual analysis, to reflect difficulties in decarbonising certain areas	

3.4 Policy

The organisation must have a strong policy statement, detailing all important issues (Graafland and Smid, 2019) including objectives and targets which are clear and simple to understand, with intermediate targets where possible. In addition, it must be communicated appropriately to ensure it is interpreted correctly and understood (Ménard *et al*., 2018). As the policy must connect with staff (McLaughlin, 2024), there is a strong argument for separate policies at the strategic, operational and tactical levels. A well-constructed and detailed strategic-level policy which covers all important organisational issues may fail to connect to the staff at the tactical level. As such it may be at risk of decoupling from the subsequent implementation programme. This is further reinforced by the fact that strategic-level targets and objectives may have little meaning at the tactical-level. The DF Climate Action Roadmap outlines the initiatives required to achieve its current mandated decarbonisation targets[14]. These initiatives must be captured in the relevant policy statements at the strategic, operational and tactical levels.

At the strategic level, a combined DoD/DF policy may be considered, similar to the UK MOD Climate Change and Sustainability Approach (UK MOD, 2021). General Nugee (2024), author of the report predating the abovementioned strategy, pointed towards “no real distinction” between the civilian and military sides in this regard. Such a policy may include mandated national targets and objectives and relate to other SDGs. The organisation may also consider climate action and/or sustainability for inclusion in the organisation’s overarching strategy, roles or values (Ahmed *et al.*, 2021); University of Galway recently updated their core values to include ‘sustainability’, following a poll conducted with all staff and students as part of its five-year strategy update (UG, 2024).

General Nugee (2024) argued that Defence has a role in setting national policy and discussed how the UK MOD sit on committees playing a leading role in setting national climate policies. The

[14] Public sector bodies are required to reduce their GHG emissions by 51% by 2030, based on their average energy-related emissions between 2016 and 2018 (Government of Ireland, 2022)

rationale for this is that if Defence allows itself to be excluded from these conversations, there is a risk that national climate and sustainability policies will be incompatible with Defence, leading to discussions around exemptions, which in turn could damage the Defence sector and compromise its legitimacy (Nugee, 2024). Engaging in national policy setting is an example of how Defence can practice entrepreneurial climate leadership and exhibit the organisational principles of climate leadership identified in Section 1.8. Ensuring strong policy through these recommendations creates the preconditions for the implementation of action (Table 7).

Table 7 Policy Critical Inputs

Policy Critical Inputs	**Associated leadership approach / type / principle**
Develop policies appropriate to each level in the organisation	Polycentric Approach Structural Leadership Entrepreneurial Leadership Collaboration Strong Policy Framework
Develop a unified DoD/DF Climate and Sustainability Policy	
Consider inclusion of Sustainability in DF Values	
Engage in policy development at national and international level	

3.5 Implementation

Each target, objective and goal stated in policies and strategies must have an associated implementation programme, the strength of which will affect the probability of means-ends decoupling (Graafland and Smid, 2019); Table 4 defines a strong programme as having quantitative targets and clear deadlines. Acknowledging the DF is accustomed to Project Management methodologies, it is important this use of language is applied with flexibility as an individual project or a programme or portfolio of projects could be managed at any level (PMI, 2024). For the remainder of this part, the term programme will be used for continuity, however depending on the level applied, the concepts remain the same for projects and portfolios.

Ashbridge and Beard (2022) warn of the risk of greenwashing by publishing a comprehensive and ambitious strategy but not following up with *how* it will be achieved and withholding details on finance and resourcing; this *how* is the implementation programme. Furthermore, they highlight the need for quick wins, exploiting opportunities such as energy efficiency and re-wilding of Defence lands, a point supported by General Nugee (2024) in the context of building momentum. Acknowledging that the DF is active in energy management, with the DF Senior Energy Executive (SEE) managing an annual energy action plan, the foundations are in place to create strong programmes which are connected to policy thus reducing the risk of decoupling and greenwashing, and increasing the chances of positive results. The DF must exploit this foundation with the development of implementation programmes for all initiatives outlined in the DF Climate Action Roadmap.

Graafland and Smid (2019) find that allocation of responsibility of CSR activities to top management level increases the chances of successful implementation. In the context of the DF implementing climate action, this can be interpreted as assigning responsibility to a suitably senior individual for delivery of a programme. At the earliest opportunity, the programme manager and their team must identify and understand the barriers to successful implementation (McLaughlin,

2024). These must be reported to senior management with proposed mitigation measures and any associated additional requested resources. Strong programmes are defined by clear deadlines (Graafland and Smid, 2019) which will be accompanied by manageable intermediate targets, and where applicable, baselines and indicators (McLaughlin, 2024).

Integrating implementation into the organisation's core business is vital (Graafland and Smid, 2019; Bouraoui *et al.*, 2020) but might be challenging given that following a contextual analysis, the majority of the DF's climate actions will likely involve activities surrounding infrastructural upgrades. Looking to other militaries such as the Bundeswehr and the UK Armed Forces, there are some useful strategies being employed to integrate climate action; for example, the impacts of climate change are being introduced into wargaming, military planning and the conduct of operations (Bundeswehr, 2024; Nugee, 2024).

General Nugee (2024) describes momentum and embedding (climate and sustainability) in all processes as most important in implementation with examples such as building a green defence network and encouraging a polycentric approach whereby responsibility is delegated to each service along with the freedom to experiment and innovate. He described the Joint Requirements Oversight Committee (JROC), where major project proposals are scrutinised, as an example of high-level embedding, or integrating, climate and sustainability into Defence; all future projects must consider climate change alongside performance, cost and risk. In the DF, the inclusion of mandatory climate and sustainability considerations as part of capability development, procurement and other activities similar to General Nugee's description may achieve integration as identified in this study as crucial to successful implementation. Table 8 outlines inputs for strong implementation programmes while maintaining the link between policy and results.

Table 8 Implementation Critical Inputs

Implementation Critical Inputs	**Associated leadership approach / type / principle**
Develop and update programmes for all DF Climate and Sustainability initiatives with quantitative targets and clear deadlines	Polycentric Approach Structural Leadership Exemplary Leadership Legitimacy Credibility
Allocate responsibility for each programme	
Integrate climate action and sustainability in all core processes	

3.6 Results

Greenwashing is avoided by ensuring clear policies upstream of implementation and maintaining an effective link between implementation and results (Bantan and Thomas, 2021), therefore results must be measured appropriately against policy objectives and targets. Results and reporting are inextricably linked and any recommendations for the delivery of substantive climate action in the DF must consider both hand in hand. A system must be put in place early in the process to ensure outputs and outcomes (results), including other benefits, are measured in order that they can be reported on, but also that they can be tracked for optimisation (Bantan and Thomas, 2021).

General Nugee (2024) discusses the link between results and policy, referencing the UK MOD's interaction and policy-making with other departments. He also highlights the importance of

impacts and results in the context of wider societal influence; that people pay attention to what happens in Defence. This is a practical explanation of Defence's ability to utilise its structural leadership (Tobin *et al.*, 2023; Liefferink *et al.*, 2023) and its influence on wider society (Söder, 2023). The DF must therefore interpret and understand the power of its results, ensuring they are based on policy, captured correctly and communicated appropriately.

Acknowledging there are multiple means of measuring results and that further research is required on the topic (Gillan *et al.*, 2021), the DF should exploit established measurement techniques, such as the Certified Measurement and Verification Professional (CMVP) methodology[15]. However, as climate action programmes will be taking place at all levels and given that reporting of results must be simple, reliable and credible (McLaughlin, 2024; Bantan and Thomas, 2021), the use of CMVP might be restrictive. The DF could simplify the concepts, standardising measurement of results, making the process more accessible for all personnel throughout the organisation.

High quality, transparent reporting strengthens the link between implementation and results (Graafland and Smid, 2019). Bantan and Thomas (2021) recommend policymakers mandate minimum standards of reporting; in the DF context this can be interpreted as top management mandating measurement and reporting for all climate action. This can be aided with a standardised reporting format which ensures readability (Zhihong *et al.*, 2018) and is clearly linked to stated policy objectives and targets. The DF may also consider communicating climate action progress externally (Pope and Kim, 2021), further strengthening the implementation-results link.

The need to capture and learn lessons for future climate action iterations was identified in Part 2 (McLaughlin, 2024). Furthermore, the importance of capturing and disseminating lessons learned in climate risk management are highlighted as a role for Chiefs of Defence Staff (da Costa *et al.*, 2024). Utilising the existing DF lessons learned process (DF, 2023, p.101) and incorporating the use of a standardised reporting format, will ensure valuable lessons are captured and disseminated throughout the organisation.

Table 9 Results Critical Inputs

Results Critical Inputs	**Associated leadership approach / type / principle**
Develop a framework for measuring and interpreting results of climate action	Exemplary Leadership Legitimacy Credibility
Report results in a standardised format, internally and externally	
Capture and disseminate lessons learned	

[15] CMVP refers to a person who applies the concepts of measurement and verification to determine the performance improvement resulting from energy management activities (AEE, 2021). DF engineers practice this methodology in DF energy management.

3.7 Mitigating Barriers in Defence

With 'leadership commitment' identified as the most significant potential barrier and therefore adopted into the conceptual framework (Figure 11), it is worth considering the other potential barriers in the Defence context. Drawing on the barriers identified in Section 2.8 and contextualised by the experience of General Nugee and the researcher, knowledge, staff turnover and adopting a polycentric approach will be discussed in this section.

Knowledge was identified as a barrier (Hunoldt *et al.*, 2020; Latapí *et al.*, 2021), as well as being developed as a principle of climate leadership in individuals which "will affect the degree of followership" (Torney, 2019, p.505). The French Climate and Defence Strategy includes developing knowledge as a key pillar alongside mitigation and adaption (Ministère des Armées, 2022). Given the emphasis placed on an organisation's specific context (Gillan *et al.*, 2021; McLaughlin, 2024), there may be value in delivering a bespoke suite of training and education courses for the DF which takes into account the relevance of climate change to Defence (Scollick, 2023; EC, 2023b; Nugee, 2024). These can be tailored to the appropriate staff level and to include a "mix of policy, technical, leadership and change management content" (Hoyne and Barry, 2022, p.31). There are several general examples of climate change and sustainability courses available in Ireland, to develop knowledge of employees throughout organisations, which may serve as a useful basis for the DF in developing such training. Furthermore, drawing on the study of military ethics training, the DF may consider the use of 'in-group' teaching as a more effective means of growing knowledge, rather than a limited number of subject matter experts providing training (de Graaff et al., 2017).

Lack of human resources is identified as a potential barrier to success in climate action (Ahmed et al., 2021; EDA, 2024). Given that DF staff turnover is an issue that affects specialist roles (CODF, 2022), maintaining a knowledgeable cohort of personnel is likely to impact on the organisation's ability to deliver effective climate action. Mitigating this barrier may be linked with the barrier of knowledge and awareness, ensuring all personnel are aware of the organisation's climate action policies and their role within it. General Nugee (2024) refers to leaders having a narrative they believe in and discuss it regularly and that everybody in the organisation is being educated on the topic.

Establishing new structures and a lack of flexibility and adaptability are recurring barriers (Latapí *et al.*, 2021; Hunoldt *et al.*, 2020) which could be exacerbated in the Defence context by not adopting a polycentric approach to climate action. The study of climate governance in Part 1 shows that a polycentric approach involving individuals and organisations working together collaboratively, facilitates trust, communication and cooperation, which are key to accelerating climate action. As such, the DF must embrace this approach over its more traditional hierarchical structure, encouraging collaboration within but also maximising its collaboration externally with other militaries and relevant organisations.

While this section explores 'knowledge', 'staff turnover' and 'polycentricity in the Defence context', the organisation must remain vigilant for other potential barriers which could affect the delivery of climate action.

3.8 Conclusion

The objective of this part was to adapt the Climate Action Implementation Framework, as identified in Part 2, for use in the DF. Acknowledging the DF's progress in climate change mitigation, but also the challenges required in adaption and climate security (Scollick, 2023), the framework was contextualised with a view to identifying several key inputs for each component. These inputs reflect a polycentric approach throughout and the four types of climate leadership at various stages.

The most significant potential barrier to successful climate action, leadership commitment, was examined first, identifying the value in developing a strategic level civilian/military unit and ensuring elevated responsibility at all levels, in doing so practicing structural leadership. Cognitive leadership can be shown by carrying out a detailed contextual analysis at all levels and adopting flexibility in internally reallocating targets. Strong policy practices at all levels internally, while also engaging in policy setting externally, will reduce the risk of decoupling from implementation, demonstrating both structural and entrepreneurial leadership. Strong implementation programmes, correct allocation of responsibility and integration into core Defence processes will allow for the delivery of effective climate action. If measured and reported appropriately the risk of greenwashing will be reduced and the organisations climate-related actions will demonstrate exemplary climate leadership. Developing Defence-specific training and education for employees will improve knowledge and awareness at all levels, helping to overcome one of the potential barriers to success in climate action. It must be noted that all inputs resulting from this analysis will require adequate resourcing, further highlighting the need for a fully staffed unit.

The integration of General Nugee's views with the broader data and literature, together with practical examples from the development of the MOD Strategic Approach, aided in contextualising each component of the Climate Action Implementation Framework (Figure 11). Throughout the interview with General Nugee, the importance of the polycentric approach in building momentum, embedding climate action into core processes and ultimately Defence playing a leading role was evident.

CONCLUSION

Climate leadership is about taking action to reduce emissions but also encouraging others to take action (Crowley and Nakamura, 2018). This paper, centred on how the DF can take the lead in climate action, starts by understanding what is meant by climate leadership and what it means in the context of Defence. It then aims to identify and adapt a framework for implementing climate leadership, through climate action, into everyday activities with a view to achieving long term and interim decarbonisation targets. Understanding climate leadership and adopting such a framework may allow the DF to lead in climate action, a requirement of the public sector in the Climate Action Plan (Government of Ireland, 2022).

The paper draws on literature in the field of climate leadership, the relationship between Defence and climate change, and CSR/ESG. It refers to relevant policy documents and military publications and is contextualised by expert interviews with Minister Eamon Ryan, Mr Liam McLaughlin and General Richard Nugee (Retd.). The key findings which have implications for the DF

are outlined, leading to four main recommendations. These recommendations, along with a number of limitations, provide the basis for future research.

Key Findings

While symbolic actions can be useful, climate leadership was found to be the delivery of substantive climate action and in the process, encouraging others to follow suit. First and most importantly, a polycentric approach is required for an organisation to deliver substantive climate action (Benulic *et al.*, 2022; Ryan, 2024). It suggests the capacity for independent actors to operate at multiple levels, an interconnected approach that encourages experimentation and increases the benefits of innovation. Secondly, exemplary climate leadership, required of public sector bodies, does not act in isolation (Tobin *et al.*, 2023); it is supported by structural, cognitive and entrepreneurial climate leadership.

Climate leadership in Defence was conceptualised by broadening the EPA adaption-mitigation model to include the many roles Defence can play in climate action (Figure 6) including climate security and crisis response operations, and exerting influence (Tsetsos, 2023; Söder, 2023; Nugee, 2024). It is the application of each component of this model which represents climate leadership in Defence.

The literature review identified no clear set of climate leadership principles despite climate leadership types, styles and approaches being well established. A key associated outcome of this paper therefore, are the principles of climate leadership, depicted in Figure 5. These may be useful for guiding practice and explaining climate leadership as a concept in the DF and other organisations.

With CSR/ESG literature providing the foundation, the five-part Climate Action Implementation Framework (Figure 11) was developed for Defence, identifying how the DF can adapt its approach to delivering both substantive and symbolic climate action. While this paper focused on mitigation through decarbonisation, it is intended this framework is applicable to all climate action. Examples of actions include adaption through future procurements, influencing through engaging in policy creation and climate security through operational approach.

Common themes identified in this paper include the need for a comprehensive contextual understanding and strong policy, connecting the organisation's leadership with its employees (McLaughlin, 2024). These enable successful implementation which is confirmed by the measurement and reporting of results. The research showed that monitoring and managing the link between each component is crucial in preventing decoupling and greenwashing (Graafland and Smid, 2019).

A number of potential barriers to successful implementation of climate action were identified. Leadership commitment was identified as the greatest potential barrier, leading to its inclusion on the conceptual framework (Figure 11). In the context of Defence, knowledge of employees, staff turnover and the ability to adapt from a hierarchical to a polycentric approach were identified as potential barriers which must be overcome.

Recommendations

1. The DF should prioritise the adoption of the Climate Action Implementation Framework (Figure 11) in order to create the conditions for climate action across the wide-spectrum of climate-related areas and specifically to achieve mandated targets. The framework facilitates a polycentric approach and accounts for the five key components identified in this paper (leadership commitment, context, policy, implementation and results), each with critical inputs outlined in Part 3.

2. With leadership commitment highlighted as a major potential barrier (Liou *et al*., 2023) and allocation of responsibility at board level linked to high quality implementation (Graafland and Smid, 2019), the DoD and DF might consider a unified approach to climate and sustainability in the form of a civilian/military unit. Such an entity could be modelled on the recently established DF Capability Development Unit, however, responsibility should lie at the highest level in the organisation. One example of its responsibilities may include the formation of a stakeholder advisory group to guide policy development and implementation.

3. The DoD and DF should consider developing a Defence-specific climate and sustainability training and education suite. This will overcome the identified barrier of 'knowledge and awareness' and serve to equip all personnel, from top management to individual aircrew, sailors, soldiers and civilian staff, with appropriate knowledge, a principle of climate leadership.

4. Innovation and experimentation were common themes in the expert interviews and in the literature on climate leadership, polycentric governance and CSR. The DF must encourage an experimental approach to climate action, pushing beyond the existing energy management structure, to all levels in the organisation. The recently established Defence Research, Technology and Innovation Unit could be exploited to support the delivery of climate action.

Limitations of the Paper

As climate leadership in Defence is a broad subject, Part 1 briefly explored the multitude of roles for Defence in climate action with a view to managing the scope of the paper. As mandated decarbonisation targets are highly topical, well defined and an area of personal interest of the researcher, they were the focus of the paper. As a result, other roles were not explored in great detail; these include adaption of infrastructure and operations, assisting the wider national and international adaption effort, responding to climate-related crises and being an influential actor in climate governance.

Due to the scope of the paper and the time available, the researcher encountered the practical reality of utilising limited data sources. Although the literature was supported by carefully selected expert interviewees which provided valuable contextual insight, the paper may have benefited from the experience of more experts in the field.

Areas for Further Research

This paper recognises the DF is active in climate and sustainability. However, aside from implementing individual action programmes such as ISO50001, there is no overall measurement of performance. Utilising the Climate Action Implementation Framework (Figure 11), there may be an opportunity to audit the efficacy of current climate and sustainability practices in the DF. Continuous improvement through self-regulation could lead to opportunities for the DF to lead amongst its military peers and making use of its relative size, perhaps in the same way Estonia and its military is playing a leadership role in cybersecurity (Wierenga, 2022).

An implication of this paper is the resources required for realisation of substantive climate action. Acknowledging the DF is overburdened (CODF, 2022, p.22), there is a research opportunity to assess the resources, personnel and financial, to deliver an effective organisational climate action programme. Such a programme may use the existing Climate Action Roadmap as a basis but should account for the broad range of climate-related actions identified, including adaption and climate security operations.

With knowledge of employees identified as a major potential barrier, there is a research opportunity to develop a bespoke climate change education programme for the DF which could be tiered for different levels. This may be achieved by synthesising studies on climate change theory, the climate-security nexus and military training and education policy.

Concluding Remarks

With a lifelong interest in sustainability and having worked as a military engineer in this field for six years, I was privileged to delve into the non-technical aspects of climate change response and specifically leadership, a focus of the LMDS. The paper provided a unique opportunity to develop an understanding of climate leadership and how the DF can be a leader in addressing this "existential crisis" (President Higgins, 2020).

Navigating extensive literature helped me understand what is meant by exemplary climate leadership. Although important, the leadership styles, principles and types merely only tell us how a 'climate leader' will be judged retrospectively. While I deem this exploration necessary, it led me to the inevitable conclusion that climate leadership is the delivery of substantive climate action. Minister Ryan's experience of climate diplomacy, Mr McLaughlin's expertise in industry and General Nugee's ambition in Defence, aided in contextualising the theoretical and conceptual foundation provided by the literature.

Climate change is no longer an emerging threat, it is a clear and present danger, affecting everything we do. Individually and organisationally, we have an obligation to act. The DF, a key pillar of the state, has an opportunity to lead in climate action, not just by achieving ambitious decarbonisation targets, but by incorporating substantive climate action as discussed in Section 1.2 into all of its activities. By seizing this leadership opportunity, the DF can continue to protect Ireland and its citizens, encouraging others to follow suit and therefore becoming the exemplar required of it in the Climate Action Plan.

Please note that the views expressed above are those of the author alone and should not be taken to represent the views of the Irish Defence Forces or of any other group or organisation.

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